May 3, 2000

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: NRC EXAMINATION REPORT 50-254/2000301(DRS); 50-265/2000301(DRS)

Dear Mr. Kingsley:

On April 3, 2000, the NRC completed initial operator licensing examinations at your Quad Cities Units 1 and 2 reactor facilities. The enclosed report presents the results of the examination.

This examination was the Quad Cities training department's first opportunity to prepare an operator license examination in accordance with NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Revision 8, April 1999. NRC examiners administered the operating examination during the week of March 27, 2000, and your training department personnel administered the written examination on April 3, 2000. Four applicants were administered Reactor Operator examinations and one applicant was administered a Senior Reactor Operator examination. The license applicants' performance evaluations were finalized on April 24, 2000. All applicants passed all sections of their examinations and were issued Reactor Operator or Senior Reactor Operator licenses to operate your Quad Cities Units 1 and 2 reactor facilities.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Electronic Reading Room (PERR) link at the NRC homepage, http://www.nrc.gov/NRC/ADAMS/index.html.

We will gladly discuss any questions you have concerning this examination.

Sincerely

David E. Hills, Chief
Operations Branch
Division of Reactor Safety

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

Enclosures:
1. Operator Licensing Examination Report 50-254/2000301(DRS); 50-265/2000301(DRS)
2. Simulation Fidelity Report
3. Written Examination and Answer Keys (RO, SRO)

cc w/encls 1 & 2:
D. Helwig, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President, Nuclear Operations
H. Stanley, Vice President, Nuclear Operations
R. Krich, Vice President, Regulatory Services
DCD - Licensing
J. Dimmette, Jr., Site Vice President
G. Barnes, Quad Cities Station Manager
C. Peterson, Regulatory Affairs Manager
M. Aguilar, Assistant Attorney General
State Liaison Officer, State of Illinois
State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission
W. Leech, Manager of Nuclear
MidAmerican Energy Company

cc w/encls 1, 2 & 3: F. S. Tsakeres, Training Manager

DOCUMENT NAME: G:DRS\QUA2000301 DRS.WPD

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: License Nos:	50-254; 50-265 DPR-29; DPR-30
Report No:	50-254/2000301(DRS); 50-265/2000301(DRS)
Licensee:	Commonwealth Edison Company
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	22710 206th Avenue North Cordova, IL 61242
Dates:	March 27 through April 3, 2000
Examiners:	D. McNeil, Chief Examiner A. M. Stone, Examiner
Approved by:	David E. Hills, Chief, Operations Branch Division of Reactor Safety

SUMMARY OF FINDINGS

Quad Cities Nuclear Power Station, Units 1 & 2
NRC Examination Report 50-254/2000301(DRS); 50-265/2000301(DRS)

During the week of March 27, 2000, NRC examiners conducted an announced operator licensing initial examination in accordance with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8. This examination implemented the operator licensing requirements of 10 CFR §55.41, §55.43 and §55.45.

One Senior Reactor Operator and four Reactor Operator applicants were administered the written examination and operating tests. The NRC administered the operating test during the week of March 27, 2000 and the licensee administered the written examination on April 3, 2000.

Examination Summary:

- All applicants passed all portions of their respective examinations and received Senior Reactor Operator or Reactor Operator licenses (Section 4OA5.1).

Report Details

4. OTHER ACTIVITIES (OA)

4OA5 Other

.1 Initial Licensing Examinations

a. Scope

The NRC examiners conducted announced operator licensing initial examinations during the week of March 27, 2000. The facility licensee developed the written examinations and operating tests. One Senior Reactor Operator and four Reactor Operator applicants received written examinations and operating tests.

b. Issues and Findings

The facility licensee submitted an examination which was acceptable for a proposed examination. All five applicants passed all portions of the examination.

The NRC examiners determined that the written examinations and operating test were developed in accordance with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 8. The NRC examiners did not identify any significant examination material deficiencies or security concerns associated with the development or administration of the tests.

The licensee's training department personnel administered the written examination on April 3, 2000, in accordance with NUREG-1021. The NRC examiners independently graded the written examination and concluded that all five applicants passed. The licensee conducted a post-examination item analysis of the senior reactor operator and reactor operator written examinations and identified eleven questions which were incorrectly answered by more than 50 percent of the applicants. The licensee initiated a training request to address the deficiencies. The licensee did not submit post-examination comments.

The NRC examiners administered the operating tests during the week of March 27, 2000. All five applicants passed the operating tests. The NRC examiners identified several individual deficiencies in applicant performance during the operating examination which are described in each individual's examination report, Form ES-303-1, "Operator Licensing Examination Report." The NRC forwarded copies of the evaluations under separate correspondence to the Site Training Manager.

4OA6 Meetings (Including Exit Meeting)

.1 Exit Meeting Summary

The inspectors presented the preliminary examination observations to Mr. Dimmette and other members of licensee management at the conclusion of the operating test on March 31, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Barnes, Station Manager
J. Dimmette, Site Vice President
J. Hansen, NGG Initial License Training Examination Coordinator
C. Ibsen, Operations
C. Peterson, Regulatory Assurance Manager
D. Snook, Training
C. Symonds, Operations Training Superintendent
G. Thennes, Training
F. Tsakeres, Training Manager

Enclosure 2

SIMULATION FACILITY REPORT

Facility Licensee: Quad Cities Units 1 and 2

Facility Licensee Docket Nos: 50-254; 50-265

Operating Tests Administered: March 27 through 30, 2000

The following documents observations made by the NRC examination team during the March 2000, initial license examination. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of non-compliance 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 conduct of the simulator portion of the operating tests, the following items were observed:

	ITEM	DESCRIPTION
1.	Simulated fault on Torus spray valve did not occur	In Event #8 of Scenario #2, a breaker trip should have, but did not, prevent the operator from opening the torus spray valves, MO 1001-37 A/B. This problem was not repeatable.
2.	Simulated fault on standby condensate pump did not occur	In Event #5 of Scenario #4, the standby condensate pump was expected to fail to automatically start when the "A" condensate/condensate booster pump tripped. During the operating test, the standby pump automatically started. The licensee identified a software error and wrote a work request to address the issue.

Commonwealth Edison Company
Quad Cities Generating Station
22710 206th Avenue North
Cordova, IL 61242-9740
Tel 309-654-2241

cc: M. Bielly
A. M. Stone

ComEd

SVP-98-343

November 13, 1998

U. S. Nuclear Regulatory Commission
ATTN: Mr. Melvyn N. Leach, Chief
U. S. Nuclear Regulatory Commission
Region III Operator Licensing Branch
801 Warrenville Road
Lisle, IL 60532-4351

Subject: **Year 2000 NRC Exam**

This letter is being written to request our Year 2000 NRC Exam. We request an NRC Exam for six Reactor Operator candidates the week of March 6, 2000.

Should you have any questions concerning this letter, please contact Mr. D. Snook at (309) 654-2241, extension 4007.

Respectfully,

FOR/

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Nuclear Power Station

Attachment

cc: M. McDowell
J. Stortz
R. Svaleson
F. Tsakeres
C. Symonds
SVP Letter File

NOV 16 1998

cc: M. Bully

September 8, 1999

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

Dear Mr. Kingsley:

In response to J. P. Dimmette's letter dated November 13, 1998, we have tentatively scheduled an initial licensing examination for Quad Cities operator license applicants during the week of March 27, 2000. Validation of the examination will occur at the station during the week of March 6, 2000. In the unlikely event that we are unable to support the examination during the scheduled week, we will inform you immediately upon discovery of such conditions and make arrangements to administer the examination at a mutually acceptable date.

As agreed upon in a telephone conversation on June 4, 1999, your staff will develop the examination. Please inform us at your earliest opportunity if you discover you are unable to support the examination on the scheduled dates.

A supplementary letter will be sent to the training department approximately 120 days prior to the examination outlining examination security expectations, listing the materials required by the NRC to conduct the examination, reconfirming the examination dates, and reconfirming the number of candidates you have in the training program. If you have any questions concerning this information, please contact Mary Ann Bies of my staff at 630-829-9711.

Sincerely,

/s/ David E. Hills

David E. Hills, Chief
Operations Branch

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

See Attached Distribution

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R. Krich, Vice President, Regulatory Services
DCD - Licensing
J. Dimmette, Jr., Site Vice President
G. Barnes, Quad Cities Station Manager
C. Peterson, Regulatory Affairs Manager
M. Aguilar, Assistant Attorney General
State Liaison Officer, State of Illinois
State Liaison Officer, State of Iowa
Chairman, Illinois Commerce Commission
W. Leech, Manager of Nuclear
MidAmerican Energy Company
F. S. Tsakeres, Training Department

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M. A. Bies, DRS

Commonwealth Edison Company
Quad Cities Generating Station
22710 206th Avenue North
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Tel 309-654-2241

ComEd

DRMA

FILE

November 11, 1999

SVP-99-221

U. S. NRC Region III Administrator
801 Warrenville Road
Lisle, IL 60532-4351

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Submittal of Integrated Initial License Training Examination Outline

In accordance with NUREG 1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors," Quad Cities Nuclear Power Station is submitting the integrated initial licensing training examination outline. This submittal supports the initial license examination scheduled for the week of March 27, 2000.

Should you have any questions concerning his letter, please contact Mr. C.C. Peterson at (309) 654-2241, extension 3609.

Respectfully,

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Nuclear Power Station

Enclosures: (Hand delivered to Mr. McNeil, Lead Examiner, NRC Region III)

ES-201-2, Examination Outline Quality Checklist
ES-201-3, Examination Security Agreements
ES-301-1, Administrative Topics Outline
ES-301-2, Control Room Systems and Facility Walk-Through Test Outline
ES-301-5, Transient and Event Checklist
ES-301-6, Competencies Checklist
ES-401-1, BWR SRO Examination Outline
ES-401-2, BWR RO Examination Outline
ES-D-1, Scenario Outlines

NOV 15 1999

cc: D. McNeil
A.M. Stone

November 15, 1999

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

Dear Mr. Kingsley:

In a telephone conversation on November 12, 1999 between Mr. Frank Tsakeres, Training Manager, Chris Simmons, Initial License Training Supervisor, and Mr. Michael Bielby, Principle Examiner, arrangements were made for the administration of licensing examinations at the Quad Cities Nuclear Station the week of March 27, 2000. In addition, the NRC will make an examination validation visit to your facility the week of March 6, 2000.

As agreed during the telephone conversation, your staff will prepare the examinations based on the guidelines in Revision 8 of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The NRC regional office will discuss with your staff any changes that might be necessary before the examinations are administered.

To meet the above schedule, it will be necessary for your staff to furnish the examination outlines by January 17, 2000. The written examinations, operating tests, and the supporting reference materials identified in Attachment 2 of ES-201 will be due by February 10, 2000. Pursuant to 10 CFR 55.40(b)(3), an authorized representative of the facility licensee shall approve the outlines, examinations, and tests before they are submitted to the NRC for review and approval. All materials shall be complete and ready to use. Any delay in receiving the required examination and reference materials, or the submittal of inadequate or incomplete materials, may cause the examinations to be rescheduled.

In order to conduct the requested written examinations and operating tests, it will be necessary for your staff to provide adequate space and accommodations in accordance with ES-402, and to make the simulation facility available on the dates noted above. In accordance with ES-302, your staff should retain the original simulator performance data (e.g., system pressures, temperatures, and levels) generated during the dynamic operating tests until the examination results are final.

Appendix E of NUREG-1021 contains a number of NRC policies and guidelines that will be in effect while the written examinations and operating tests are being administered.

To permit timely NRC review and evaluation, your staff should submit preliminary reactor operator and senior reactor operator license applications (Office of Management and Budget (OMB) approval number 3150-0090), medical certifications (OMB approval number 3150-0024), and waiver requests (if any) (OMB approval number 3150-0090) at least 30 days before the first examination date. If the applications are not received at least 30 days before the examination date, a postponement may be necessary. Signed applications certifying that all training has been completed should be submitted at least 14 days before the first examination date.

This letter contains information collections that are subject to the *Paperwork Reduction Act of 1995* (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget, approval number 3150-0101, which expires on September 30, 2000.

The public reporting burden for this collection is estimated to average 500 hours per response, including the time for reviewing instructions, gathering and maintaining the data needed, writing the examinations, and completing and reviewing the collection of information. Send comments on any aspect of this collection of information, including suggestions for reducing the burden, to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001, or by Internet electronic mail at BJS1@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0101), Office of Management and Budget, Washington, D.C. 20503.

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Thank you for your cooperation in this matter. Mr. Tsakeres and Mr. Simmons have been advised of the policies and guidelines referenced in this letter. If you have any questions regarding the NRC's examination procedures and guidelines, please contact Dell McNeil at 630-829-9737, or me at 630-829-9733.

Sincerely,

Original Signed by David E. Hills

David E. Hills, Chief
Operations Branch

Docket Nos. 50-254; 50-265
License Nos. DPR-29; DPR-30

<u>See Attached Distribution</u>

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R. Krich, Vice President, Regulatory Services
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R. M. Pulsifer, LPM, NRR

Facility: QUAD CITIES Date of Examination: 3/27/2000

Examinations Developed by: Facility / NRC (circle one)

Target Date*	Task Description / Reference	Chief Examiner's Initials
-180	1. Examination administration date confirmed (C.1.a; C.2.a & b)	AMS [illegible]
-120	2. NRC examiners and facility contact assigned (C.1.d; C.2.e)	AMS [illegible]
-120	3. Facility contact briefed on security & other requirements (C.2.c)	AMS [illegible]
-120	4. Corporate notification letter sent (C.2.d)	AMS [illegible]
[-90]	[5. Reference material due (C.1.e; C.3.c)]	N/A [illegible]
-75	6. Integrated examination outline(s) due (C.1.e & f; C.3.d)	AMS [illegible]
-70	7. Examination outline(s) reviewed by NRC and feedback provided to facility licensee (C.2.h; C.3.e)	AMS [illegible]
-45	8. Proposed examinations, supporting documentation, and reference materials due (C.1.e, f, g & h; C.3.d)	AMS [illegible]
-30	9. Preliminary license applications due (C.1.l; C.2.g; ES-202)	AMS [illegible]
-14	10. Final license applications due and assignment sheet prepared (C.1.l; C.2.g; ES-202)	AMS [illegible]
-14	11. Examination approved by NRC supervisor for facility licensee review (C.2.h; C.3.f)	AMS [illegible]
-14	12. Examinations reviewed with facility licensee (C.1.j; C.2.f & h; C.3.g)	AMS [illegible]
-7	13. Written examinations and operating tests approved by NRC supervisor (C.2.i; C.3.h)	AMS [illegible]
-7	14. Final applications reviewed; assignment sheet updated; waiver letters sent (C.2.g, ES-204)	AMS [illegible]
-7	15. Proctoring/written exam administration guidelines reviewed with facility licensee and authorization granted to give written exams (if applicable) (C.3.k)	AMS [illegible]
-7	16. Approved scenarios, job performance measures, and questions distributed to NRC examiners (C.3.i)	AMS [illegible]

* Target dates are keyed to the examination date identified in the corporate notification letter. They are for planning purposes and may be adjusted on a case-by-case basis in coordination with the facility licensee.

[ ] Applies only to examinations prepared by the NRC.

INITIAL SUBMITTAL OF THE OUTLINE

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Commonwealth Edison Company
Quad Cities Generating Station
22710 206th Avenue North
Cordova, IL 61242-9740
Tel 309-654-2241

ComEd

November 11, 1999

SVP-99-221

U. S. NRC Region III Administrator
801 Warrenville Road
Lisle, IL 60532-4351

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Submittal of Integrated Initial License Training Examination Outline

In accordance with NUREG 1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors," Quad Cities Nuclear Power Station is submitting the integrated initial licensing training examination outline. This submittal supports the initial license examination scheduled for the week of March 27, 2000.

Should you have any questions concerning his letter, please contact Mr. C.C. Peterson at (309) 654-2241, extension 3609.

Respectfully,

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Nuclear Power Station

Enclosures: (Hand delivered to Mr. McNeil, Lead Examiner, NRC Region III)

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ES-201-3, Examination Security Agreements
ES-301-1, Administrative Topics Outline
ES-301-2, Control Room Systems and Facility Walk-Through Test Outline
ES-301-5, Transient and Event Checklist
ES-301-6, Competencies Checklist
ES-401-1, BWR SRO Examination Outline
ES-401-2, BWR RO Examination Outline
ES-D-1, Scenario Outlines

Facility: Quad Cities Nuclear Power Station   Date of Examination: 3/27/00

Item	Task Description	Initials a	Initials b*	Initials c
1. WRITTEN	a. Verify that the outline(s) fit(s) the appropriate model per ES-401.	GMT	MD	Jn AMS
	b. Assess whether the outline was systematically prepared and whether all knowledge and ability categories are appropriately sampled.	GMT	MD	Jn AMS
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.	GMT	MD	Jn AMS
	d. Assess whether the repetition from previous examination outlines is excessive.	GMT	MD	Jn AMS
2. SIM	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, and major transients.	GMT	MD	Jn AMS
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity; ensure each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s)*, and scenarios will not be repeated over successive days.	GMT	MD	Jn AMS
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.	GMT	MD	Jn AMS
3. W/T	a. Verify that: (1) the outline(s) contain(s) the required number of control room and in-plant tasks, (2) no more than 30% of the test material is repeated from the last NRC examination, (3)* no tasks are duplicated from the applicants' audit test(s), and (4) no more than 80% of any operating test is taken directly from the licensee's exam banks.	GMT	MD	Jn AMS
	b. Verify that: (1) the tasks are distributed among the safety function groupings as specified in ES-301, (2) one task is conducted in a low-power or shutdown condition, (3) 40% of the tasks require the applicant to implement an alternate path procedure, (4) one in-plant task tests the applicant's response to an emergency or abnormal condition, and (5) the in-plant walk-through requires the applicant to enter the RCA.	GMT	MD	Jn AMS
	c. Verify that the required administrative topics are covered, with emphasis on performance-based activities.	GMT	MD	Jn AMS
	d. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on successive days.	GMT	MD	Jn AMS
4. GENERAL	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam section.	GMT	MD	Jn AMS
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.	GMT	MD	Jn AMS
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.	GMT	MD	Jn AMS
	d. Check for duplication and overlap among exam sections.	GMT	MD	Jn AMS
	e. Check the entire exam for balance of coverage.	GMT	MD	Jn AMS
	f. Assess whether the exam fits the appropriate job level (RO or SRO).	GMT	MD	Jn AMS

	Printed Name / Signature	Date
a. Author	Gary Thennes / Gary Thennes	11/11/99
b. Facility Reviewer(*)	Michael H. Swegle / Michael H. Swegle	(cert) 11/11/99
c. Chief Examiner	Dell R. McNeil / Dell R. McNeil / Ann Marie Stone / Ann Marie Stone	11/17/99
d. NRC Supervisor	David E. Hills / David E. Hills	11/17/99

(*) Not applicable for NRC-developed examinations.

Administrative Topics Outline	Form ES-301-1

Facility: Quad Cities — Date of Examination: 3/27/00

Examination Level : RO

	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Reactor Mode Change	JPM (New) Given plant conditions, determine if those conditions satisfy the procedural requirements to transfer the Reactor Mode Switch from STARTUP to RUN.
	Core Thermal Limits	JPM (New) Demonstrate the ability to retrieve and interpret a print out of Core Performance Calculation (OD-20).
A.2	Surveillance Test	JPM (New) Perform JP/Shroud Access Hole Cover Test for Dual Loop Operation (Identify failed jet pump)
A.3	Radiation Work Permit	JPM (new) Given a RWP, determine the protective clothing requirements and the maximum stay time for a specific task.
A.4	EALs	JPM (New) Determine if Chimney Radiation Levels Exceed EAL Values.

Administrative Topics Outline		Form ES-301-1
Facility: Quad Cities Examination Level : SRO		Date of Examination: 3/27/00
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Reactor Mode Change	JPM (New) Verify plant surveillance requirements prior to mode change.
	Core Thermal Limits	JPM (New) Demonstrate the ability to retrieve and interpret a print out of Core Performance Calculation (OD-20) and identify applicable TS required actions.
A.2	Surveillance Test	JPM (New) Review JP/Shroud Access Hole Cover Test for Dual Loop Operation (Identify errors in the surveillance)
A.3	Determine Excess Exposure	JPM (New) Given a list of workers and their exposure, determine which one(s) may perform a specific task in a high radiation area.
A.4	PAR Determination	JPM (Direct) Given specific plant conditions determine the PARs.

Control Room Systems and Facility Walk-Through Test Outline		Form ES-301-2
Facility: Quad Cities Exam Level: RO/SRO		Date of Examination: 3/27/00

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. 217000 Initiate RCIC for RPV Pressure Control. Failure of the RCIC controller to establish and maintain flow.	A, S, M	II
b. 209001 Monthly Core Spray Surveillance Minimum flow valve failure.	A, S, D	IV
c. 288000 Bypassing Group 2 and RB Ventilation Isolations This JPM is to be done on Unit Two.	C, D	IX
e. 201002 Withdraw Control Rods to Make the Reactor Critical Uncoupled control rod during rod withdrawal	A, L, S, M	I
d. 223001 Transfer Torus Water to the Main Condenser Via the Condensate Demineralizers	S, D	V
f. 262001 Transfer Auxiliary Power From Xfmr 11 to Xfmr 12	S, D	VI
g. 201006 Bypass the RWM	S, D	VII

B.2 Facility Walk-Through

a. 206000 Locally Start HPCI for RPV/L Control	D, R	II
b. 218000 De-energize ADS Valves by Removing Fuses.	D	III
c. 264000 Locally Start Diesel Generator Failure of Vent Fan to Start	A, D	VI

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

ES-301 Transient and Event Checklist Form ES-301-5

OPERATING TEST NO.: 1

Applicant Type	Evolution Type	Minimum Number	Scenario Number			
			1	2	3	
RO	Reactivity	1	1/	4/	1/	N/A
	Normal	1	/2	/1	/3	N/A
	Instrument	2	6/3	2/3, 9	4/9	N/A
	Component	2	4/5,8	7/5, 8	2,8/ 5,6 ,10, 12	N/A
	Major	1	7,9/7, 9	6/6	7,11 /7, 11	N/A
SRO-I As RO	Reactivity	1	N/A	N/A	N/A	N/A
	Normal	0	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A
SRO-I As SRO	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A
SRO-U	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

NOTE: Scenario Number 3 is a "spare" scenario and is represented on both ES-301-5 for Operating Test 1 and Operating Test 2 for comparison purposes only in Examination Outline submittal.

The "/" in the cells for the "RO'" applicant type represents the position the applicant is expected to fill during the scenario. The events are listed for the identified position: RO / BOP.

Author: [signature] 11/12/99

Chief Examiner: [signature] / AnnMarie Stone (act) 11/17/99

ES-301 | Competencies Checklist | Form ES-301-6

OPERATING TEST NO.: 1

Competencies	Applicant #1 RO/**SRO-I**/SRO-U				Applicant #2 **RO**/SRO-I/SRO-U				Applicant #3 **BOP**/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	N/A	N/A	N/A	N/A	4,6,7,9	2,6,4	2,7	N/A	3,5,7-9	3,5,6,9	5-7,9,12	N/A
Diagnose Events and Conditions	N/A	N/A	N/A	N/A	4,6,7,9	2,6,4,7	2,4,7	N/A	3,5,7-9	3,5,6,8,9	5,7,12	N/A
Understand Plant and System Response	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	1,2,4,7,11	N/A	2,3,5,7-9	1,3,5,6,8,9	3, 5-7,9-12	N/A
Comply With and Use Procedures (1)	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	1,2,4,7,8	N/A	2,3,5,7-9	1,3,5,6,8,9	3,5-7,9,10,12	N/A
Operate Control Boards (2)	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	1,2,4,7,8	N/A	2,3,5,7-9	1,3,5,6,8,9	3, 5-7,9,10,12	N/A
Communicate and Interact With the Crew	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	1,2,4,7,8	N/A	2,3,5,7-9	1,3,5,6,8,9	3, 5-7,9,10,12	N/A
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: [signature] 11/12/99
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Simulation Facility: Quad Cities Examination Date: 3/27/00	Scenario No.: ILT Exam 2000-01 OP Test #1

Objectives: The crew will continue rod withdrawal for heat up and pressurization. The BOP Operator will initiate chest warming. They will respond to a Refuel floor ARM failure and refer to TS. A CRD hydraulic pump trip will occur requiring the RO to start the standby CRD pump. The ECCS Keep Fill pump will trip. The crew will respond IAW the QCOA. They will respond to a IRM failure, reset the half scram and refer to TS. A steam leak will develop in the DW causing DW/P to rise to above 2.5 psig. ECCS injection will occur immediately due to LP permissives being satisfied. All rods will not insert due to a hydraulic ATWS. The DG cooling water pump fails to start when the DG starts.

ECCS injection will be terminated. The DG will be tripped due to loss of cooling and rods will be inserted per QCOP 0300-28. Boron injection will not be required.

Initial Conditions: IC 13, 300 psig. Sequence Step 8 @ F7, Position 04
Start the first feed pump and verify that turbine chest warming has not been initiated.

Turn over:
Plant startup in progress. QCGP 1-1 is to be continued at step F.4.y. Control rod withdrawal is to continue to raise reactor pressure to 950 psig. Startup of the first feed pump has been completed and turbine chest warming is to be initiated per QCOP 5600-04. (No relief valve, RCIC or HPCI testing required.)

Event No.	Malf. No.	Event Type*	Event Description
1	None	R(RO)	Continue rod withdrawal to maintain reactor pressurization.
2	None	N(BOP)	Initiate turbine chest warming.
3	RM02M	I(BOP)	Fuel Pool Channel 'A' Rad Monitor fails downscale
4	RD07A	C(RO)	CRD Hydraulic Pump 'A' Trip
5	Console Override RMCS04R	C(BOP)	ECCS Keep Fill Jockey Pump trip
6	NM05C Severity 100%	I(RO)	IRM 'C' High High, half scram
7	MS04C Severity 3%, Ramp 10:00	M(All)	Steam leak in the DW (Ramp slow enough that AOP is entered.)
8	DGCWP #1 Trip	C(BOP)	DG Cooling Water Pump fails to automatically start.
9	RD13A, Severity 100% RD13B, Severity 100%	M(All)	Reactor fail to scram, Hydraulic ATWS

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-01 Outline

1. Scenario will begin with a reactor startup in progress. Control rods are to be withdrawn to maintain reactor pressurization.

2. Per QCGA 1-1 the second operator will initiate main turbine chest warming.

3. A Refuel Floor ARM fails down scale. The crew will respond and declare the instrument INOP and the SRO will refer to Technical Specifications.

4. CRD Hydraulic Pump 'A' will trip. The crew will respond IAW QCAN 901-5, B-2 and QCOA 0300-01. The standby pump will be started.

5. The ECCS Keep Fill Pump trip will require the crew to take actions IAW QCOA 1000-01 and crosstie the Condensate Transfer System to keep the systems filled and vented.

6. IRM 'C' will fail High High resulting in a half scram. The crew will bypass the IRM and reset the half scram. The IRM will be declared INOP and the SRO will refer to Technical Specifications.

7. A steam leak develops in the DW. DW/P will slowly rise above the Primary Containment High Pressure Alarm setpoint (1.55 psig). The crew will respond IAW QCAN 901-3, A-16 and QCOA 0201-01. When drywell pressure exceeds 2.5 psig, the crew will enter QGA 100 and 200. RPV level will rise very rapidly as all LP ECCS injection valves automatically open (RPV/P is less than 325 psig). High RPV/L will be identified, injection will be terminated and the MSIVs may be closed.

8. The DG Cooling Water Pump fails to start when it's respective DG starts. Cooling water flow cannot be established and the DG will be tripped.

9. Control rods do not insert due to a hydraulic ATWS and QGA 101 will be entered. Rods will be inserted per QCOP 0300-28. Boron injection is not required.

The scenario will be terminated when the crew has control of RPV level and control rods are being inserted.

Based on the outline, the critical tasks are:

- Initiating Drywell Sprays
- Inserting control rods following the ATWS IAW QCOP 0300-28.
- Controlling injection into the RPV to prevent a power excursion and overfill of the RPV.

Simulation Facility: Quad Cities Examination Date: 3/27/00	Scenario No.: ILT Exam 2000-02 OP Test #1

Objectives: The crew will respond to a controller failure during performance of the SGBT monthly surveillance. A APRM fails hi resulting in a half-scram. The crew bypasses the APRM and resets the half-scram. High vibration will be indicated on the "A" RRC pump. Reactor power will be reduced with flow. The vibrations will cause gross seal degradation and eventually a RRC suction line break. Actions taken to isolate the seal will be unsuccessful and DW/P will rise to above 2.5 psig. All LP and HP ECCS systems will receive an initiation signal. HPCI will not inject due to a controller failure until the crew takes manual control of the HPCI controller. QGA 100 and 200 will be entered. The first loop of torus spray selected will not operate, the second loop will be effective in controlling torus pressure. One set of SDV drain valves will not close when the scram occurs. The RO will close the valves from the 901-5 panel.

Initial Conditions: IC 21, 100 % power. "C" Reactor Feed Pump is tagged OOS.

Turn over:
Plant is presently at 100% power. "C" Reactor Feed Pump is tagged OOS for a bearing inspection.
Monthly operability test (QCOS 7500-05) for "B" SGT train is to be performed following shift turnover.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N(BOP)	Perform monthly SGT operability surveillance.
2	NM08A Severity 100	I(RO)	APRM Channel 'A' drifts high
3	PC11B Severity 40	I(BOP)	SGT flow controller fails to maintain required system flow.
4	Override Alarm 901-4, C-3 ON	R(RO)	Reduce core flow in response to high RRC pump vibration alarm.
5	RR06A and RR07A Severity 100%, Ramp 10:00	C(BOP)	RRC Seal failure.
6	RR10 Severity 10%, Ramp 10:00	M(All)	RRC suction break.
7	RD23A	C(RO)	Scram Discharge Volume Drain Valve Sticks Open. (Removed by event trigger when RO attempts to close the valves from the 901-5 panel.)
8	MO 37A or 37B override *See note at bottom of page*	C(BOP)	The selected Torus Spray valve fails to open.
9	HP09 Event trigger, 2.5 psig DW pressure	I(BOP)	HPCI controller failure prevents HPCI injection into the RPV. (Manual operation is possible.)

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Note: The method for initiating Event Number 8 is being developed by the simulator engineer on the exam agreement. It will involve inserting malfunctions that fail both torus spray valves closed, then deletes the malfunction on one valve after the other valve's switch has been operated by the crew.

Scenario 2000-02 Outline

1. Scenario will begin with the reactor at 100% power. "B" SBGT monthly operability surveillance is to be completed per QCOS 7500-05.

2. An APRM 'A' will fail hi resulting in a half-scram. The reactor operator will bypass the APRM and reset the half-scram. The SRO will refer to and comply withTechnical Specifications for loss of one APRM.

3. A failure of the SBGT controller prevents satisfactory surveillance and the "B" SBGT system will be shutdown and declared inoperable.

4. High vibration is annunciated on recirculation pump "A". The alarm cannot be reset and reactor power is lowered with RRC flow as directed by QCAN 90X-4 C-3 and IAW QCGP 3-1.

5. As flow/power is being lowered RRC seal failure is indicated on the "A" RRC pump. The failure degrades rapidly causing DW/T and DW/P to rise.

6. Excessive vibrations cause a suction line break on the "A" RRC pump. DW/P and DW/T continue to rise. The reactor should be scrammed as a conservative action before DW/P reaches the trip setpoint. QGA 100 and 200 will be entered and executed.

7. Torus sprays will be directed, but the spray valve for the selected loop will not open when the valve is stroked. The other loop can be initiated successfully.

8. A HPCI controller failure will prevent proper initiation and injection. This failure will be identified and reported. Manual operation of HPCI is possible if so desired by the crew.

9. One set of SDV drain valves fails to close on the scram. The Reactor Operator will close the valves from the 901-5 panel IAW QCGP 2-3.

The scenario will be terminated when the crew has stabilized RPV level above TAF, initiated containment sprays and containment parameters are stable.

Based on the outline, the critical tasks are:

- Initiating Drywell Sprays.
- Isolating the SDV drain valves following the scram.
- Maintaining RPV water level above TAF.

Simulation Facility: Quad Cities **Examination Date**: 3/27/00	**Scenario No.**: ILT Exam 2000-03 Spare

Objectives: The crew will raise reactor power to rated with RRC flow. They will also swap reactor building ventilation fans. After power has been raised ≈ 5% a control rod drift will occur. Following recovery from the rod drift, RRC pump 'B' will suffer a speed signal failure.

All of the following will ultimately result in using Alternate Injection systems to restore RPV/L.
An over current condition will exist on bus 18 and its respective feed breaker fails to open. Bus 13-1 will subsequently trip on overcurrent. The crew will respond to a loss of Bus 13-1. The B feed header will rupture in the drywell causing lowered RPV/L and elevated DW/T and DW/P. Feed, Condensate, HPCI and SSMP will be unavailable to restore RPV/L. RCIC will be available. RHR pump "D" breaker fails to close and Core Spray 'B' fails to automatically initiate. Core Spray Pump 'B' can be started manually, but Core Spray injection valve 25 'B' will not open from the Control Room. The crew will blowdown and inject with alternate injection systems. Core Spray valve 25B can be manually opened WHEN such action is directed by the US.

Initial Conditions: IC 21, with reactor power lowered with RRC flow to 90% power. "B" RHR pump tagged OOS.

Turn over:
Reactor power was lowered to 90% at the request of the load dispatcher. Power is to be returned to rated following turnover.
Reactor Building Ventilation fans are to be swapped IAW QCOP 5750-02
"B" RHR pump is tagged OOS for coupling replacement. A 5.9 magnitude earthquake has occurred near Keokuk, Iowa. The previous shift has implemented QCOA 0010-09, "Earthquake". The IMs are gathering information from the seismographs and operators are inspecting the plant for leaks.

Event No.	Malf. No.	Event Type*	Event Description
1	None	R(RO)	Raise reactor power with RRC flow.
2	RD03, 06-19 (Rod B-5)	C(RO)	Control rod drift in
3	None	N(BOP)	Swap Reactor Building Ventilation Supply/Exhaust Fans.
4	RR09B Severity 100%, Ramp 2:00	I(RO)	Recirc Pump 'B' Speed Signal Failure
5	ED05D *and Console Override to keep bus 18 feeder breakers indicating shut (See note on next page.)*	C(BOP)	480V Bus 18 overcurrent, breaker fails to trip.
6	ED03D Time Delay ≈ 3 seconds after Event 5.	C(BOP)	4160V Bus 13-1 overcurrent trip.
7	FW09B Severity 100%, Ramp 5:00	M(All)	FW header 'B' ruptures in the drywell. (Takes out HPCI and SSMP)
8	Console override on FW Isolation Valve MO 3205B DIHS13205B N_A_ OPEN	C(RO)	MO-1-3205B fails to close when switch is taken to CLOSE.

9	CS04B	I(BOP)	Core Spray Logic 'B' fails to initiate.
10	Console override CS injection valve 25'B' DIHS1140225B CLOSE	C(BOP)	Core Spray Injection Valve'B' fails to open from the Control Room.
11	RR10 Severity 10%, Ramp 5:00	M(All)	RRC suction break (Small LOCA)
12	RHO1D	C(BOP)	RHR Pump D breaker fails to close. (Overcurrent Trip)

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Note: The simulator engineer on the exam agreement is creating a batch file or remote function that will keep the indications for the Bus 18 feeder breakers open when this malfunction occurs.

Scenario 2000-03 Outline

1. Scenario will begin with a reactor at 90% power. Power will be raised to 100% with RRC flow.

2. Respond to control rod drift IAW QCOA 0300-11

3. Per QCOP 5750-02, the second operator will swap RB Ventilation fans.

4. The crew will respond to a failure of RRC Pump 'B' speed signal. SRO refers to and complies with Technical Specifications for RRC pump speed mismatch. The simulator operator, acting as the Shift Operations Superintendent, will direct the SRO to secure RRC Pump 'B' and enter single loop operation. The crew will comply.

5. A bus fault on Bus 18 generates an overcurrent condition. The 13-1 feed breaker to Bus 18 fails to trip. The crew will take actions IAW QOA 6700-04.

6. Bus 13-1 trips on overcurrent. The 1/2 DG will auto start and be stopped as an immediate action of QOA 6500-05. In addition, the crew will send an operator to start the 1/2 DG Cooling Water Pump. All associated LP ECCS systems are inoperable. The SRO will refer to Technical Specifications.

7. The crew will restore RPS Bus 'A' using alternate power and start the standby RBCCW pump as part of their response to the loss of buses 13-1 and 18. When those actions are completed, the feedwater header rupture malfunction is entered.

8. The "B" feedwater header ruptures in the drywell before the check valve. All feedwater is directed into the drywell. RPV/L lowers and DW/P and DW/T rise. MO-1-3205B will fail to close (QCOA 201-1), preventing isolation of the feedwater header leak. The feed and condensate systems should be secured. In addition to the loss of feed capability, loss of the "B" feedwater header prohibits use of HPCI and the SSMP. QGA 100 and 200 will be entered.

9. RHR D breaker fails to close when ECCS initiation signal is received. This will be identified and reported to the US.

10. Core Spray 'B' initiation logic fails and Core Spray Pump 'B' must be started manually. Core Spray injection valve 25 'B' cannot be opened from the Control Room. An operator must be sent to locally open the valve. It will open locally.

11. When the crew has stabilized RPV water level with RCIC and started DW sprays to control DW pressure, a small RRC suction header break occurs. RPV/L will slowly lower to the point where alternate injection systems (SBLC) are used and reactor Blowdown is required. QGA 500-1 will be entered.

The scenario will be terminated when RPV Blowdown has been complete RPV water level is being restored with available injection systems, and primary containment pressure and temperature are being controlled with available RHR.

Exam 2000-03 Continued

Based on the outline, the critical tasks are:

- Initiate Drywell Sprays.
- Manually start Core Spray 'B'
- Initiate RPV Blowdown before RPV water level reaches –166 inches and restore RPV water level above TAF.

OPERATING TEST NO.: 2

Applicant Type	Evolution Type	Minimum Number	Scenario Number 4	Scenario Number 5	Scenario Number 6	Scenario Number 3
RO	Reactivity	1	1/	5/	1/	1/
	Normal	1	/3	/1	/4	/3
	Instrument	2	2/4,10	3/2, 11	3/7	4/9
	Component	2	6,7/5	6,/4,7 ,9,10	2/6, 8	2/5,6,8, 10,12
	Major	1	8,9/8, 9	8/8	5,9/ 5,9	7,11/7, 11
SRO-I: As RO	Reactivity	1	1	5	1	1
	Normal	0				
	Instrument	1	2	3,11	3	4
	Component	1	6,7	6	2	2
	Major	1	8,9	8	5,9	7,11
SRO-I: As SRO	Reactivity	0	1	5	1	1
	Normal	1	3	1	4	3
	Instrument	1	2,4	2,3, 11	3,7	4,9
	Component	1	5-7	4,6, 7,9	2,6, 8	2,5,6,8, 10,12
	Major	1	8,9	8	5,9	7,11
SRO-U	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A

Instructions:
(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

NOTE: Scenario Number 3 is a "spare" scenario and is represented on both ES-301-5 for Operating Test 1 and Operating Test 2 for comparison purposes only in Examination Outline submittal.

The "/" in the cells for the "RO'" applicant type represents the position the applicant is expected to fill during the scenario. The events are listed for the identified position: RO / BOP.

Author: [signature] 11/12/99

Chief Examiner: [signature] / Ann Marie Stone (act) 11/17/99

ES-301 Competencies Checklist Form ES-301-6

OPERATING TEST NO.: 2

Competencies	Applicant #1 RO/**SRO-I**/SRO-U				Applicant #2 **RO**/SRO-I/SRO-U				Applicant #3 **BOP**/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	4	5	6	3	4	5	6	3	4	5	6	3
Understand and Interpret Annunciators and Alarms	4-9	3-4,6,7-11	2,3,5-9	2,4-12	6-9	3,6	2,3,5,9	2,7	4,5,8,9	4,7 8,10-11	5-9	5-7,9,12
Diagnose Events and Conditions	2, 4-9	2-4,6,7-11	2,3,5-9	2,4-12	2,6-9	3,6	2,3,5,9	2,4,7	4,5,8,9	2,4 7,8,10,11	5-9	5-7,9,10,12
Understand Plant and System Response	1-9	1-11	1-9	1-12	1,2,6-9	3,5,6,8	1-3,5-9	1,2,4, 7, 11	3-5,8,9,10	1,2,4,7-11	4-9	3, 5-7,9-12
Comply With and Use Procedures (1)	1-9	1-11	1-9	1-12	1,2,6-9	3,5,6	1-3,5-9	1,2,4, 7, 8	3-5,8,9,10	1,2,4,7-11	4-9	3, 5-7,9, 10,12
Operate Control Boards (2)	N/A	N/A	N/A	N/A	1,2,6-9	3,5,6	1-3,5-9	1,2,4, 7, 8	3-5,8,9,10	1,2,4,7-11	4-9	3, 5-7,9, 10,12
Communicate and Interact With the Crew	1-9	1-11	1-9	1-12	1,2,6-9	3,5,6	1-3,5-9	1,2,4, 7, 8	3-5,8,9,10	1,2,4,7-11	4-9	3, 5-7,9, 10,12
Demonstrate Supervisory Ability (3)	1-9	1-11	1-9	1-12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comply With and Use Tech. Specs. (3)	4	7	3	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: [signature] 11/12/99

Chief Examiner: [signature] / AnnMarie Stone (cert) 11/17/99

Simulation Facility: Quad Cities **Examination Date:** 3/27/00	**Scenario No.:** ILT Exam 2000-04 OP Test #2

Objectives: Rod withdrawal will continue to raise power to 40%. During rod withdrawal, the CRD FCV will fail closed and the standby FCV will be placed in service. The second feed pump will be started without incident. Following the RFP start the crew will respond to a trip of a Service Water Pump. Once the BOP operator starts the standby Service Water Pump, a Rx. Bldg. Radiation Monitor fails high. While the BOP Operator is responding to the failed radiation monitor, the 'B' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump. Following response and TS declaration for the failed radiation monitor, a small leak in the steam tunnel will cause a MSIV isolation and reactor scram. A full hydraulic ATWS will exist. SLC will be initiated. Reactor level will be lowered intentionally and rods will be inserted IAW QOP 0300-28.

Initial Conditions: IC 5 with some modification.
Verify all actions are taken up to step F.7.r, start of second RFP.
Set up such that rod withdrawal is necessary to raise power prior to RFP start.

Turn over:
Plant startup in progress. QCGP 1-1 is to be continued at step F.7.r. Control rod withdrawal is to continue to raise reactor power to 40% after which the second RFP will be started. All prerequisites for pump start are satisfied and an operator is standing by.

Event No.	Malf. No.	Event Type*	Event Description
1	None	R(RO)	Rod withdrawal to raise power to 40%.
2	RD11 Severity 0%	I(RO)	In-service CRD FCV fails closed.
3	None	N(BOP)	Start the second RFP.
4	RM02K	I(BOP)	Reactor Bldg. Vent Radiation Monitor Ch. 'A' fails high.
5	SW1A	C(BOP)	Service Water Pump 'A' trip.
6	FW17B	C(RO)	Condensate/Condensate Booster Pump 'B' Trip.
7	Console Override C/CB Pump Auto Start Switch in OFF DISH13302 2D_OFF	C(RO)	Failure of Selected Condensate/Condensate Booster Pump to start.
8	MS09B Severity 5%, Ramp 5:00	M(All)	MSIV isolation due to MST high temperature.
9	RD13A and B 100	M(All)	Hydraulic ATWS
10	Console overide open	I(BOP)	Failure of 1-220-44 and 45 to close on Group I isolation

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-04 Outline

1. Scenario will begin with the reactor just below 40%. Control rods are to be withdrawn to establish 40% power.

2. During rod withdrawal, the CRD FCV fail closed. This will be recognized and the standby FCV will be placed in service IAW QCOA 0300-06.

3. The second reactor feed pump will be placed in service without incident.

4. When the plant is stable, the 'A' Reactor Building Ventilation Radiation Monitor will fail high. The crew will respond IAW QCAN 901-3, A-3 and QCOS 1700-05. The SRO will refer to and comply with Technical Specifications.

5. After the Rad Monitor response, the 'A' Service Water Pump will trip. The crew will respond IAW QCAN 912-1-A-3 and start the standby pump.

6. The 'B' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump.

7. A small steam leak develops in the main steam tunnel. Temperature will eventually reach the point of MSIV isolation. A scram may be manually initiated as a conservative action. Ultimately, the MSIV's will isolate on a Group I signal. Valves 1-220-44 and 45 will fail to close automatically on the Group I and the operators must manually close the valves to complete the isolation.

8. A hydraulic ATWS prevents rod insertion. QGA 101 will be entered. RPV/P will be controlled with the SRVs and RPV/L will be intentionally lowered to reduce reactor power. Rods will be inserted IAW QCOP 0300-28.

The scenario will be terminated when the crew has established Torus cooling and control rods are be inserted per QCOP 0300-28.

Based on the outline, the critical tasks are:

- Intentionally lower RPV water level to reduce reactor power during the ATWS.
- Control RPV pressure after the initial lifting of the safety valves as directed by QGA 101, RPV Control (ATWS).
- Inject SBLC IAW QGA 101, RPV Control (ATWS).
- Insert control rods following the ATWS IAW QCOP 0300-28.

Simulation Facility: Quad Cities **Examination Date:** 3/27/00	**Scenario No.:** ILT Exam 2000-05 OP Test #2

Objectives: The crew will take the shift at 100% power and perform a partial test of the Turbine BPVs. Position indication for one of the BPVs fails to respond during the test. The 'A' GEMAC reactor level indicator fails high requiring the RO to swap level detectors to control RPV water level. When RPV water level is recovered, '1A3' feedwater heater develops a tube rupture. During the subsequent power reduction one control rod sticks requiring the RO to raise drive pressure to insert the rod. A turbine bearing vibration results in a main turbine trip. TR-12 then trips resulting in a LOOP. HPCI fails and RCIC is started to control RPV water level. A subsequent steam leak in the RCIC steam line and a failure of the Group Five Isolation requires the BOP Operator to isolate RCIC. SSMP, and potentially SBLC, are used to restore and maintain RPV water level.

Initial Conditions: IC 21, 100% power.
APRM "C" bypassed and tagged OOS.
A copy of QOS 5600-05 to perform BPV testing.
Make sure LT 1-646A is selected for FWLC

Turn over:
Plant is at rated conditions.
APRM "C" bypassed and OOS for power supply replacement.
A special operability test of Turbine Bypass Valves 1,4,5,7 and 9 is to be completed using QOS 5600-05.

Event No.	Malf. No.	Event Type*	Event Description
1	None	N(BOP)	Test BPVs
2	Console Override AOZI 15650507	I(BOP)	#7 BPV position indication failure during test.
3	RR15A Severity 100%, Ramp 20:00	I(RO)	FW Level Control Level Transmitter 'A' Failure low
4	FW14C Severity 100%, Ramp 5:00	C(BOP)	FW Heater '1A3' Tube Rupture (Loss of FW Heating)
5	None	R(RO)	Power reduction because of loss of FW heating.
6	RDO2, 30-55 (Rod H-14) Event Trigger to DMF at Drive Pressure of 300 psig	C(RO)	Stuck Control Rod. (Rod moves when drive pressure is raised to 300 psig.)
7	ED02 Event Trigger on TG Field Breaker Trip	C(BOP)	Trip of TR-12(LOOP)
8	TU02E Severity 50%, Ramp 2: 00	M(All)	#5 Bearing high vibration with turbine trip
9	HP01	C(BOP)	HPCI Turbine Trip
10	RC11 Severity 50%	C(BOP)	RCIC Steamline Rupture at Turbine Inlet

11	RC13	I(BOP)	Group Five Isolation Fails to Actuate

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

- Scenario 2000-05 Outline

1. Scenario will begin with the reactor at rated conditions. A special test of several BPV will be performed IAW QOS 5600-05.

2. BPV #7 position indication will fail to respond during BPV testing, all other parameters indicate that the valve is opening. This is reported and investigated.

3. The 'A' GEMAC RPV level indicator fails low, resulting in a rising RPV water level. The RO will swap level detectors to regain RPV water level control and restore level to the normal band.

4. A tube rupture will occur in FW heater '1A3'. Power will be reduced with RRC flow and control rods.

5. During the reactor power reduction, one control rod sticks. The rod moves when drive pressure is raised to 300 psig.

6. TR-12 trips and SRO refers to and complies with Tech Specs. A vibration develops on the main turbine resulting in a main turbine trip. (LOOP)

7. HPCI fails to start and cannot be started. RCIC is started to control RPV water level.

8. A steam leak develops on the RCIC steam line with the subsequent failure of the Group Five Isolation Logic. Temperatures rise in the RCIC room resulting in an alarm and manual isolation of RCIC by the crew.

9. The crew uses SSMP, and potentially SBLC, to restore and maintain RPV water level.

The scenario will be terminated when RCIC is isolated and RPV water level is being restored with the SSMP.

(There is the possibility that the crew will start the SSMP without starting RCIC. If that occurs, the SSMP discharge valve breaker should be tripped. Once RCIC is isolated, the crew can open the SSMP discharge valve manually.)

Based on the outline, the critical tasks are:

- Reduce reactor power following the loss of feedwater heating.
- Maintain RPV water level above TAF.
- Isolate RCIC following indication of the RCIC steam line leak.

Simulation Facility: Quad Cities **Examination Date**: 3/27/00	**Scenario No.**: ILT Exam 2000-06 OP Test #2

Objectives: The crew will raise reactor power following MSIV testing. They will respond to a FWLC valve lock up. Torus cooling will be secured as directed by the shift turnover. A recirc loop flow transmitter fails high requiring insertion of a half-scram. A small steam leak in the DW will cause DW/T and DW/P to rise. The leak will require a reactor scram. When DW/P reaches 2.5 psig bus 14-1 will trip when RHR pump C starts. RHR Loop B spray logic fails such that RHR Loop B containment spray valves cannot be opened. DW spray valve 26A breaker trips when the valve is stroked open and blowdown will be performed when DW/T cannot be maintained below 280°F. RPV saturation conditions will be reached following the blowdown and RPV Flooding will be performed. Once RPV Flooding is entered, the scenario is terminated.

Initial Conditions: IC 20, with minor modification.
Raise reactor power to ≈ 75% with flow.
Place torus cooling in service.
"B" Core Spray pump tagged OOS

Turn over:
Reactor power is presently at 75% to support weekly MSIV timing testing which has been completed satisfactorily. A special test of RCIC has also just been completed satisfactorily. RCIC is operable and in standby. Power is to be raised back to 100% once turnover is complete. In addition, torus cooling, which was in service for the special RCIC test, is to be secured during the power rise. "B" Core Spray Pump is OOS for motor winding inspection. No other equipment is OOS and no other evolutions are planned for the shift.

Event No.	Malf. No.	Event Type*	Event Description
1	None	R(RO)	Raise reactor power with RRC flow.
2	FW08A	C(RO)	Feedwater Level Control Valve 'A' Lock Up
3	RR14A Severity 100%	I(RO)	Recirc Loop Flow Transmitter Failure High
4	None	N(BOP)	Secure Torus Cooling.
5	MS04 Severity 1%, Ramp 10:00	M(All)	Small steam leak in DW (Slow rise in DW/T and DW/P)
6	ED03E	C(BOP)	Bus 14-1 OC trip when RHR Pump C auto starts.
7	Console Override DIHS11001S17B	I(BOP)	Spray Logic Failure on RHR Loop 'B'
8	Console Override See Note 1 on next page	C(BOP)	RHR Spray valve 26A breaker trips as valve starts to stroke open. (Opens once breaker is reset.)
9	See Note 2 on next page	M(ALL)	RPV water level indicators saturate.

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-06 Outline

1. Scenario will begin with reactor power being raised from 75% following MSIV testing.

2. A lockup occurs on Feedwater Level Control Valve 'A'. The operators respond IAW QCAN 901-5, G-7 and QCOA 0600-01. When the crew sends someone to investigate, tell the SRO that time is compressed, the problem was a loose connection on the hydraulic line to the valve actuator. The connection has been tightened and the problem is fixed. At this point the simulator operator will clear the malfunction. The RO will reset the level control valve IAW QCOA 0600-01.

3. Recirc Loop Flow Transmitter FT-1-261-6A fails high resulting in an APRM Flow Reference Off Normal alarm. The operators respond IAW QCAN 901-5, D-6. The crew will send an operator to check the Flow Converter Power Supply. When this is done, cue the SRO that the flow bias signal is upscale. A half-scram is inserted by the RO and the SRO will refer to and comply with Technical Specifications.

4. Torus cooling will be shut down as directed in the shift turnover.

5. A steam leak develops in the DW causing a slow but continuous rise in DW/P. A scram and ECCS initiation will be initiated at 2.5 psig. QGA 100 and 200 will be entered.

6. Bus 14-1 will trip when the 'C' RHR pump start rendering RHR pumps 'C' and 'D' inoperable.

7. RHR Loop 'B' Spray Logic fails preventing operation of RHR Loop 'B' containment spray and cooling valves.

8. DW spray valve 26A breaker fails to open when the valve switch is placed in OPEN and DW temperature continues to rise. When DW temperature cannot be maintained below 280°F reactor blowdown will be initiated. Following blowdown, RPV saturation conditions will be reached and RPV flooding will commence as directed in QGA 500-4. When RPV flooding is started, the scenario is terminated.

The scenario will be terminated when the crew has commenced RPV Flooding.

Note 1: The simulator engineer on the exam agreement is building a file or remote function to prevent the valve from opening and simulate a breaker trip.

Note 2: The simulator engineer on the exam agreement is building a batch file that can be inserted to cause all the RPV water level indicators to flash.

Based on the outline, the critical tasks are:

- Initiate an RPV Blowdown to restore DW temperature and/or as part of RPV Flooding.
- Initiate actions to restore adequate core cooling following the loss of all RPV water level indication IAW QGA 500-4, RPV Flooding.

Simulation Facility: Quad Cities **Examination Date:** 3/27/00	**Scenario No.:** ILT Exam 2000-03 Spare

Objectives: The crew will raise reactor power to rated with RRC flow. They will also swap reactor building ventilation fans. After power has been raised ≈ 5% a control rod drift will occur. Following recovery from the rod drift, RRC pump 'B' will suffer a speed signal failure.

All of the following will ultimately result in using Alternate Injection systems to restore RPV/L.
An over current condition will exist on bus 18 and its respective feed breaker fails to open. Bus 13-1 will subsequently trip on overcurrent. The crew will respond to a loss of Bus 13-1. The B feed header will rupture in the drywell causing lowered RPV/L and elevated DW/T and DW/P. Feed, Condensate, HPCI and SSMP will be unavailable to restore RPV/L. RCIC will be available. RHR pump "D" breaker fails to close and Core Spray 'B' fails to automatically initiate. Core Spray Pump 'B' can be started manually, but Core Spray injection valve 25 'B' will not open from the Control Room. The crew will blowdown and inject with alternate injection systems. Core Spray valve 25B can be manually opened WHEN such action is directed by the US.

Initial Conditions: IC 21, with reactor power lowered with RRC flow to 90% power. "B" RHR pump tagged OOS.

Turn over:
Reactor power was lowered to 90% at the request of the load dispatcher. Power is to be returned to rated following turnover.
Reactor Building Ventilation fans are to be swapped IAW QCOP 5750-02
"B" RHR pump is tagged OOS for coupling replacement. A 5.9 magnitude earthquake has occurred near Keokuk, Iowa. The previous shift has implemented QCOA 0010-09, "Earthquake". The IMs are gathering information from the seismographs and operators are inspecting the plant for leaks.

Event No.	Malf. No.	Event Type*	Event Description
1	None	R(RO)	Raise reactor power with RRC flow.
2	RD03, 06-19 (Rod B-5)	C(RO)	Control rod drift in
3	None	N(BOP)	Swap Reactor Building Ventilation Supply/Exhaust Fans.
4	RR09B Severity 100%, Ramp 2:00	I(RO)	Recirc Pump 'B' Speed Signal Failure
5	ED05D *and Console Override to keep bus 18 feeder breakers indicating shut (See note on next page.)*	C(BOP)	480V Bus 18 overcurrent, breaker fails to trip.
6	ED03D Time Delay ≈ 3 seconds after Event 5.	C(BOP)	4160V Bus 13-1 overcurrent trip.
7	FW09B Severity 100%, Ramp 5:00	M(All)	FW header 'B' ruptures in the drywell. (Takes out HPCI and SSMP)
8	Console override on FW Isolation Valve MO 3205B DIHS13205B N_A_ OPEN	C(RO)	MO-1-3205B fails to close when switch is taken to CLOSE.

9	CS04B	I(BOP)	Core Spray Logic 'B' fails to initiate.
10	Console override CS injection valve 25'B' DIHS1140225B CLOSE	C(BOP)	Core Spray Injection Valve'B' fails to open from the Control Room.
11	RR10 Severity 10%, Ramp 5:00	M(All)	RRC suction break (Small LOCA)
12	RHO1D	C(BOP)	RHR Pump D breaker fails to close. (Overcurrent Trip)

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Note: The simulator engineer on the exam agreement is creating a batch file or remote function that will keep the indications for the Bus 18 feeder breakers open when this malfunction occurs.

Scenario 2000-03 Outline

1. Scenario will begin with a reactor at 90% power. Power will be raised to 100% with RRC flow.

2. Respond to control rod drift IAW QCOA 0300-11

3. Per QCOP 5750-02, the second operator will swap RB Ventilation fans.

4. The crew will respond to a failure of RRC Pump 'B' speed signal. SRO refers to and complies with Technical Specifications for RRC pump speed mismatch. The simulator operator, acting as the Shift Operations Superintendent, will direct the SRO to secure RRC Pump 'B' and enter single loop operation. The crew will comply.

5. A bus fault on Bus 18 generates an overcurrent condition. The 13-1 feed breaker to Bus 18 fails to trip. The crew will take actions IAW QOA 6700-04.

6. Bus 13-1 trips on overcurrent. The 1/2 DG will auto start and be stopped as an immediate action of QOA 6500-05. In addition, the crew will send an operator to start the 1/2 DG Cooling Water Pump. All associated LP ECCS systems are inoperable. The SRO will refer to Technical Specifications.

7. The crew will restore RPS Bus 'A' using alternate power and start the standby RBCCW pump as part of their response to the loss of buses 13-1 and 18. When those actions are completed, the feedwater header rupture malfunction is entered.

8. The "B" feedwater header ruptures in the drywell before the check valve. All feedwater is directed into the drywell. RPV/L lowers and DW/P and DW/T rise. MO-1-3205B will fail to close (QCOA 201-1), preventing isolation of the feedwater header leak. The feed and condensate systems should be secured. In addition to the loss of feed capability, loss of the "B" feedwater header prohibits use of HPCI and the SSMP. QGA 100 and 200 will be entered.

9. RHR D breaker fails to close when ECCS initiation signal is received. This will be identified and reported to the US.

10. Core Spray 'B' initiation logic fails and Core Spray Pump 'B' must be started manually. Core Spray injection valve 25 'B' cannot be opened from the Control Room. An operator must be sent to locally open the valve. It will open locally.

11. When the crew has stabilized RPV water level with RCIC and started DW sprays to control DW pressure, a small RRC suction header break occurs. RPV/L will slowly lower to the point where alternate injection systems (SBLC) are used and reactor Blowdown is required. QGA 500-1 will be entered.

The scenario will be terminated when RPV Blowdown has been complete RPV water level is being restored with available injection systems, and primary containment pressure and temperature are being controlled with available RHR.

Exam 2000-03 Continued

Based on the outline, the critical tasks are:

- Initiate Drywell Sprays.
- Manually start Core Spray 'B'
- Initiate RPV Blowdown before RPV water level reaches –166 inches and restore RPV water level above TAF.

Facility: QCNPS		Date of Exam: 3/27/00						Exam Level: SRO					
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	4	3	9				4	3			3	26
	2	4	4	1				1	5			2	17
	Tier Totals	8	7	10				5	8			5	43
2. Plant Systems	1	2	3	1	3	2	1	2	2	3	1	3	23
	2	1	0	2	3	1	1	1	1	1	2	0	13
	3	1	0	0	0	0	1	0	0	0	1	1	4
	Tier Totals	4	3	3	6	3	3	3	3	4	4	4	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					6		3		4		4		

Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. Actual point totals must match those specified in the table.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

BWR SRO Examination Outline

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6			X				AK3.03 Reason for load shedding	3.6	1.0
295006 SCRAM / 1					X		AA2.06 Cause of the Scram **RO**	3.8	1.0
295007 High Reactor Pressure / 3 *			X				AK3.04 Safety/Relief valve operation **RO**	4.1	1.0
295009 Low Reactor Water Level / 2 *		X					AK2.03 Recirc System **RO**	3.2	1.0
295010 High Drywell Pressure / 5						X	2.4.1 EOP Entry conditions and immediate actions **RO**	4.6	1.0
295013 High Suppression Pool Temp. / 5 *	X						AK1.03 Localized SP heating	3.3	1.0
295014 Inadvertent Reactivity Addition / 1						X	2.4.20 Operating implications of warnings, cautions and notes. **RO**	4.0	1.0
295015 Incomplete SCRAM / 1	X						AK1.02 Cooldown effect on reactor power **RO**	4.1	1.0
295016 Control Room Abandonment / 7 *			X				AK3.03 Disabling control room controls **RO**	3.7	1.0
295017 High Off-site Release Rate / 9 *		X					AK2.06 Site Emergency Plan	4.6	1.0
295023 Refueling Accidents Cooling Mode / 8				X			AA1.07 SGT response	3.4	1.0
295024 High Drywell Pressure / 5		X					EK2.11 Drywell sprays **RO**	4.2	1.0
295025 High Reactor Pressure / 3	X						EK1.03 SRV tailpipe temperature/pressure relationship **RO**	3.8	1.0
295026 Suppression Pool High Water Temp. / 5						X	2.4.18 Specific bases of the EOPs	3.6	1.0
~~295027 High Containment Temperature / 5~~									
295030 Low Suppression Pool Water Level / 5 *			X				EK3.02 HPCI response	3.7	1.0
295031 Reactor Low Water Level / 2			X				EK3.05 Reason for Emergency Depressurization **RO**	4.3	1.0
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 *			X				EK3.01 Reason for RRC pump trip **RO**	4.2	1.0
295038 High Off-site Release Rate / 9					X		EA2.03 Radiation levels	4.3	1.0
500000 High Containment Hydrogen Conc. / 5				X			EA1.06 Operate drywell sprays **RO**	3.4	1.0
295007 High Reactor Pressure / 3 *			X				AK3.03 RCIC operation	3.5	1.0
295009 Low Reactor Water Level / 2 *				X			AA1.03 RRC system response	3.1	1.0
295013 High Suppression Pool Temp. / 5 *			X				AK3.01 Suppression pool cooling operation **RO**	3.8	1.0
295016 Control Room Abandonment / 7 *					X		AA2.06 Plot cool down rate	3.5	1.0
295017 High Off-site Release Rate / 9 *			X				AK3.02 Plant ventilation	3.5	1.0
295030 Low Suppression Pool Water Level / 5 *	X						EK1.02 Pump NPSH	3.8	1.0
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1 *				X			EA1.03 Operate ARI.RPT/ATWS	4.1	1.0
* Chosen twice by random selection									
K/A Category Totals:	4	3	9	4	3	3	Group Point Total:		26

BWR SRO Examination Outline

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)			Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		X					AK2.07	Core flow indication	RO	3.4	1.0
295002 Loss of Main Condenser Vacuum / 3	X						AK1.03	Loss of heat sink	RO	3.8	1.0
295004 Partial or Total Loss of DC Pwr / 6					X		AA2.04	Determine system lineups	RO	3.3	1.0
295005 Main Turbine Generator Trip / 3							Not chosen by random selection.				
295008 High Reactor Water Level / 2						X	2.4.49	Immediate actions	RO	4.0	1.0
~~295011 High Containment Temperature / 5~~											
295012 High Drywell Temperature / 5					X		AA2.01	Determine/interpret drywell temperature	RO	3.9	1.0
295018 Partial or Total Loss of CCW / 8					X		AA2.03	Cause for partial or complete loss	RO	3.5	1.0
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.01	Reason for backup air system supply	RO	3.4	1.0
295020 Inadvertent Cont. Isolation / 5 & 7				X			AA1.01	Operate or monitor PCIS/NSSSS	RO	3.6	1.0
295021 Loss of Shutdown Cooling / 4		X					AK2.07	Relationship to Reactor Recirculation		3.2	1.0
295022 Loss of CRD Pumps / 1	X						AK1.01	RPV pressure vs. Rod insertion capability	RO	3.4	1.0
295028 High Drywell Temperature / 5					X		EA2.03	Determine reactor water level	RO	3.9	1.0
295029 High Suppression Pool Water Level / 5		X					EK2.06	Interrelationship to SRV's and discharge piping		3.5	1.0
295032 High Secondary Containment Area Temperature / 5					X		EA2.02	Equipment operability		3.5	1.0
295033 High Secondary Containment Area Radiation Levels / 9		X					EK2.01	Area radiation monitoring system	RO	4.0	1.0
295034 Secondary Containment Ventilation High Radiation / 9						X	2.4.2	Knowledge of setpoints, interlocks and immediate actions	RO	4.1	1.0
295035 Secondary Containment High Differential Pressure / 5	X						EK1.01	Implications to secondary containment integrity		4.2	1.0
295036 Secondary Containment High Sump/Area Water Level / 5							Not chosen by random selection.				
600000 Plant Fire On Site / 8	X						AK1.02	Knowledge of operational application fire fighting	RO	3.1	1.0
K/A Category Point Totals:	4	4	1	1	5	2	Group Point Total:				17

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
~~201005 RCIS~~														
202002 Recirculation Flow Control								X				A2.05 Impact of scoop tube lockup RO	3.1	1.0
203000 RHR/LPCI: Injection Mode										X		A4.05 Manual initiation controls RO	4.1	1.0
206000 HPCI				X								K4.19 Suction auto swap RO	3.8	1.0
~~207000 Isolation (Emergency) Condenser~~														
209001 LPCS		X										K2.03 Power to initiation logic RO	3.1	1.0
~~209002 HPCS~~														
211000 SLC									X			A3.08 Monitor system Initiation RO	4.2	1.0
212000 RPS *		X										K2.01 Power to MG sets RO	3.3	1.0
215004 Source Range Monitor									X			A3.04 Monitor control rod block statusRO	3.6	1.0
215005 APRM / LPRM											X	2.1.19 Computer for status (AGAF) RO	3.0	1.0
216000 Nuclear Boiler Instrumentation									X			A3.01 Actual vs. Indicated readings RO	3.4	1.0
217000 RCIC *		X										K2.02 Initiation logic RO	2.9	1.0
218000 ADS				X								K4..01 Prevent inadvertent initiation RO	3.9	1.0
223001 Primary CTMT and Auxiliaries								X				A2.09 Vacuum breaker malfunction RO	3.6	1.0
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.02 Predict valve closures RO	3.7	1.0
226001 RHR/LPCI: CTMT Spray Mode					X							K5.06 Operation of Vacuum breakers	2.8	1.0
239002 SRVs											X	2.1.32 Explain/apply L&P RO	3.8	1.0
241000 Reactor/Turbine Pressure Regulator	X											K1.02 Relationship to reactor pressureRO	4.1	1.0
259002 Reactor Water Level Control							X					A1.01 Predict change in level RO	3.8	1.0
261000 SGTS											X	2.2.22 LCO & Safety Limits RO	4.1	1.0
262001 AC Electrical Distribution						X						K6.02 Effect of a loss of off-site power	3.9	1.0
264000 EDGs			X									K3.01 Effect on ECCS systems RO	4.4	1.0
290001 Secondary CTMT	X											K1.04 Relationship to SGT	3.9	1.0
212000 RPS *					X							K5.02 Logic arrangement RO	3.4	1.0
217000 RCIC *				X								K4.02 Prevent overfilling Rx vessel RO	3.3	1.0
* Chosen twice by random selection														
K/A Category Point Totals:	2	3	1	3	2	1	2	2	3	1	3	Group Point Total:		23

BWR SRO Examination Outline
Plant Systems - Tier 2/Group 2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic												Not chosen by random selection.		
201002 RMCS												Not chosen by random selection.		
201004 RSCS												Not chosen by random selection.		
201006 RWM	X											K1.03 Relationship to reactor feed flow RO	3.2	1.0
202001 Recirculation				X								K4.11 Recirc flow mismatch limits RO	3.5	1.0
204000 RWCU									X			A3.04 Response to interlocks and trips RO	3.5	1.0
205000 Shutdown Cooling					X							K5.02 Implication of valve operation RO	2.9	1.0
214000 RPIS										X		A4.02 Operate/monitor CR position RO	3.8	1.0
215002 RBM												Not chosen by random selection.		
215003 IRM												Not chosen by random selection.		
219000 RHR/LPCI: Torus/Pool Cooling Mode				X								K4.03 Interlocks to prevent loss of inventory RO	3.8	1.0
230000 RHR/LPCI: Torus/Pool Spray Mode							X					A1.10 Monitor changes in system lineup RO	3.7	1.0
234000 Fuel Handling Equipment												Not chosen by random selection.		
239003 MSIV Leakage Control												Not chosen by random selection.		
245000 Main Turbine Gen. and Auxiliaries			X									K3.01 Effect of loss on AC Dist. RO	3.7	1.0
259001 Reactor Feedwater												Not chosen by random selection.		
262002 UPS (AC/DC)												Not chosen by random selection.		
263000 DC Electrical Distribution			X									K3.03 Effect on system DC components RO	3.8	1.0
271000 Offgas				X								K4.08 Automatic isolation RO	3.3	1.0
272000 Radiation Monitoring								X				A2.02 Effect of loss of RPS RO	3.6	1.0
286000 Fire Protection										X		A4.06 Monitor/operate fire Diesel RO	3.4	1.0
290003 Control Room HVAC												Not chosen by random selection.		
300000 Instrument Air												Not chosen by random selection.		
400000 Component Cooling Water						X						K6.05 Effect of loss of pump RO	3.1	1.0
K/A Category Point Totals:	1	0	2	3	1	1	1	1	1	2	0	Group Point Total:		13

BWR SRO Examination Outline

Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism												Not chosen by random selection.		
215001 Traversing In-core Probe												Not chosen by random selection.		
233000 Fuel Pool Cooling and Cleanup											X	G2.1.28 Function of components **RO**	3.3	1.0
239001 Main and Reheat Steam	X											K1.27 Relationship to RPS	4.1	1.0
256000 Reactor Condensate												Not chosen by random selection.		
268000 Radwaste										X		A4.01 Monitor integrators **RO**	3.6	1.0
288000 Plant Ventilation						X						K6.03 Effect of a loss of air **RO**	2.7	1.0
290002 Reactor Vessel Internals												Not chosen by random selection.		
K/A Category Point Totals:	1	0	0	0	0	1	0	0	0	1	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason		Points
212000/Loss of RPS effects on operation of RHR Shutdown Cooling	212000 K5.02 Tier 2 Group 1	Plant event, PIF Q1997-04521	3.4	1.0
259002/FWLC response to flow indicator failure	259002 A1.01 Tier 2 Group 1	Plant event, PIF Q1998-04135	3.8	1.0
Plant-Specific Priority Total (limit 10):				

Facility: QCNPS		Date of Exam: 3/27/00	Exam Level: SRO	
Category	**K/A #**	**Topic**	**Imp.**	**Points**
Conduct of Operations	2.1.1	Knowledge of Conduct of Operations Requirements	3.8	1.0
	2.1.3	Shift turnover.	3.4	1.0
	2.1.7	Evaluate plant performance and make operational judgements.	4.4	1.0
	2.1.10	Conditions and limitations facility license.	3.9	1.0
	2.1.19	Use computer to obtain and evaluate status.	3.0	1.0
	2.1.31	Locate C/S and determine correct lineup.	3.9	1.0
	Total			6
Equipment Control	2.2.2	Manipulate controls between shutdown and designated power levels.	3.5	1.0
	2.2.11	Process of controlling temporary changes.	3.4	1.0
	2.2.19	Maintenance work orders	3.1	1.0
	2.2.			
	2.2.			
	2.2.			
	Total			3
Radiation Control	2.3.1	10 CFR 20 and facility radiological control requirements.	3.0	1.0
	2.3.2	Knowledge of the ALARA program	2.9	1.0
	2.3.9	Process of performing a containment purge	3.4	1.0
	2.3.10	Perform procedures to reduce exposure	3.3	1.0
	2.3.			
	2.3.			4
	Total			
Emergency Procedures/ Plan	2.4.17	EOP terms and definitions	3.8	1.0
	2.4.24	Loss of cooling water procedure.	3.7	1.0
	2.4.30	Reportability to outside agencies	3.6	1.0
	2.4.46	Verify alarms are consistent with plant conditions.	3.6	1.0
	2.4.			
	2.4.			
	Total			4
Tier 3 Point Total (SRO)				17

Facility: QCNPS   Date of Exam: 3/27/00   Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K1	K 2	K 3	K 4	K5	K6	A 1	A 2	A3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	2	2	3				2	1			3	13
	2	3	3	4				3	4			2	19
	3	1	0	0				1	0			2	4
	Tier Totals	6	5	7				6	5			7	36
2. Plant Systems	1	2	3	3	4	2	1	2	3	3	2	3	28
	2	1	0	2	4	2	1	2	2	3	2	0	19
	3	0	0	0	0	1	1	0	0	0	1	1	4
	Tier Totals	3	3	5	8	5	3	4	5	6	5	4	51

3. Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	13
	6	2	3	2	

Note:

1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. Actual point totals must match those specified in the table.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.

6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

BWR RO Examination Outline

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3				X			AA1.07 AC Distribution	3.3	1.0
295006 SCRAM / 1					X		AA2.06 Cause of the Scram	3.5	1.0
295007 High Reactor Pressure / 3			X				AK3.04 Safety/Relief valve operation	4.0	1.0
295009 Low Reactor Water Level / 2		X					AK2.03 Recirc System	3.1	1.0
295010 High Drywell Pressure / 5						X	2.4.1 EOP Entry conditions and immediate actions	4.3	1.0
295014 Inadvertent Reactivity Addition / 1						X	2.4.20 Operating implications of warnings, cautions and notes.	3.3	1.0
295015 Incomplete SCRAM / 1	X						AK1.02 Cooldown effect on reactor power	3.9	1.0
295024 High Drywell Pressure / 5		X					EK2.11 Drywell sprays	4.2	1.0
295025 High Reactor Pressure / 3	X						EK1.03 SRV tailpipe temperature/pressure relationship	3.6	1.0
295031 Reactor Low Water Level / 2			X				EK3.05 Reason for Emergency Depressurization	4.2	1.0
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1			X				EK3.01 Reason for RRC pump trip	4.1	1.0
500000 High Containment Hydrogen Conc. / 5				X			EA1.06 Operate drywell sprays	3.3	1.0
295031 Reactor Low Water Level / 2 *						X	2.4.6 Symptom based mitigation strategies	3.1	1.0
* Chosen twice by random selection.									
K/A Category Totals:	2	2	3	2	1	3	Group Point Total:		13

BWR RO Examination Outline

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4		X					AK2.07 Core flow indications	3.4	1.0
295002 Loss of Main Condenser Vacuum / 3	X						AK1.03 Loss of heat sink	3.6	1.0
295003 Partial or Complete Loss of AC Pwr / 6				X			AA1.02 Emergency generatores	4.2	1.0
295004 Partial or Complete Loss of DC Pwr / 6					X		AA2.04 Determine system lineups	3.2	1.0
295008 High Reactor Water Level / 2						X	2.4.49 Immediate actions	4.0	1.0
~~295011 High CTMT Temperature / 5~~									
295012 High Drywell Temperature / 5					X		AA2.01 Determine/interpret drywell temperature	3.8	1.0
295013 High Suppression Pool Temp. / 5			X				AK3.01 Suppression pool cooling operation	3.6	1.0
295016 Control Room Abandonment / 7			X				AK3.03 Disabling control room controls	3.5	1.0
295017 High Off-site Release Rate / 9							Not chosen by random selection.		
295018 Partial or Complete Loss of CCW / 8					X		AA2.03 Cause for partial or complete loss	3.2	1.0
295019 Part. or Comp. Loss of Inst. Air / 8			X				AK3.01 Reason for backup air system supply	3.3	1.0
295020 Inadvertent Cont. Isolation / 5 & 7				X			AA1.01 Operate or monitor PCIS/NSSSS	3.6	1.0
295022 Loss of CRD Pumps / 1	X						AK1.01 RPV pressure vs. Rod insertion capability	3.3	1.0
295026 High Suppression Pool Water Temp. / 5			X				EK3.04 Reason for SLC injection	3.7	1.0
~~295027 High Containment Temperature / 5~~									
295028 High Drywell Temperature / 5					X		EA2.03 Determine reactor water level	3.7	1.0
295029 High Suppression Pool Water Level / 5							Not chosen by random selection.		
295030 Low Suppression Pool Water Level / 5		X					EK2..08 Interrelation between SRV discharge submergence	3.5	1.0
295033 High Sec. Cont. Area Rad. Levels / 9		X					EK2.01 Area radiation monitoring system	3.8	1.0
295034 Sec. Cont. Ventilation High Rad. / 9						X	2.4.2 Knowledge of setpoints, interlocks and immediate actions	3.9	1.0
295038 High Off-site Release Rate / 9				X			EA1.03 Operate/monitor process liquid radiation monitoring	3.7	1.0
600000 Plant Fire On Site / 8	X						AK1.02 Knowledge of operational application fire fighting	2.9	1.0
K/A Category Point Totals:	3	3	4	3	4	2	Group Point Total:		19

BWR RO Examination Outline

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
295021 Loss of Shutdown Cooling / 4							Not chosen by random selection.		
295023 Refueling Accidents / 8				X			AA1.03 Ability to monitor/operate fuel handling equipment	3.3	1.0
295032 High Secondary Containment Area Temperature / 5	X						EK1.04 Impact on operating components	3.1	1.0
295035 Secondary Containment High Differential Pressure / 5						X	2.4.11 Knowledge of abnormal condition procedures	3.4	1.0
295036 Secondary Containment High Sump/Area Water Level / 5						X	2.4.4 Recognize entry conditions to EOP and abnormal procedures	4.0	1.0
K/A Category Point Totals:	1	0	0	1	0	2	Group Point Total:		4

BWR RO Examination Outline
Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)		Imp.	Points
201001 CRD Hydraulic			X									K3.03	Effect on CRD Mechanisms	3.1	1.0
201002 RMCS *			X									K3.01	Failure affect ability to move CR's	3.4	1.0
~~201005 RCIS~~															
202002 Recirculation Flow Control								X				A2.05	Impact of scoop tube lockup	3.1	1.0
203000 RHR/LPCI: Injection Mode										X		A4.05	Manual initiation controls	4.3	1.0
206000 HPCI *				X								K4.19	Suction auto swap	3.7	1.0
~~207000 Isolation (Emerg.) Condenser~~															
209001 LPCS		X										K2.03	Power to initiation logic	2.9	1.0
~~209002 HPCS~~															
211000 SLC									X			A3.08	Monitor system Initiation	4.2	1.0
212000 RPS *		X										K2.01	Power to MG sets	3.2	1.0
215003 IRM								X				A2.02	Effect of IRM inop condition	3.5	1.0
215004 SRM									X			A3.04	Monitor control rod block status	3.6	1.0
215005 APRM / LPRM											X	2.1.19	Plant computer for status (AGAF)	3.0	1.0
216000 Nuclear Boiler Instrumentation									X			A3.01	Actual vs. Indicated readings	3.4	1.0
217000 RCIC *		X										K2.02	Loss of power to initiation logic	2.8	1.0
218000 ADS *				X								K4..01	Prevent inadvertent initiation	3.7	1.0
223001 Primary CTMT and Auxiliaries								X				A2.09	Vacuum breaker malfunction	3.4	1.0
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.02	Predict valve closures	3.7	1.0
239002 SRVs											X	2.1.32	Explain/apply L&P	3.4	1.0
241000 Reactor/Turbine Pressure Regulator	X											K1.02	Relationship to reactor pressure	3.9	1.0
259001 Reactor Feedwater				X								K4.11	RRC runback	3.5	1.0
259002 Reactor Water Level Control *							X					A1.01	Predict change in level	3.8	1.0
261000 SGTS											X	2.2.22	LCO & Safety Limits	3.4	1.0
264000 EDGs			X									K3.01	Effect on ECCS systems	4.2	1.0
201002 RMCS *	X											K1.08	Relationship to refuel interlocks	3.2	1.0
206000 HPCI *					X							K5.05	Turbine speed control	3.3	1.0
212000 RPS *					X							K5.02	Specific logic arrangements	3.3	1.0
217000 RCIC *				X								K4.02	Prevent overfill Rx vessel	3.3	1.0
218000 ADS *						X						K6.02	Effect of a loss of LP ECCS	4.1	1.0
259002 Reactor Water Level Control *										X		A4.05	Runout flow control reset	3.8	1.0
* Chosen twice by random selection.															
K/A Category Point Totals:	2	3	3	4	2	1	2	3	3	2	3	Group Point Total:			28

BWR RO Examination Outline

Plant Systems - Tier 2/Group 2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X							K5.07 Control rod effect on core reactivity	3.3	1.0
201004 RSCS												Not chosen by random selection.		
201006 RWM	X											K1.03 Relationship to reactor feed flow	3.1	1.0
202001 Recirculation				X								K4.11 Recirc flow mismatch	3.1	1.0
204000 RWCU									X			A3.04 Response to interlocks and trips	3.4	1.0
205000 Shutdown Cooling					X							K5.02 Implication of valve operation	2.8	1.0
214000 RPIS										X		A4.02 Operate/monitor CR position	3.8	1.0
215002 RBM				X								K4.02 Rod block set point setup	2.9	1.0
219000 RHR/LPCI: Torus/Pool Cooling Mode				X								K4.03 Interlocks to prevent loss of inventory	3.8	1.0
226001 RHR/LPCI: CTMT Spray Mode								X				A2.19 Impact of negative pressure in Torus	3.5	1.0
230000 RHR/LPCI: Torus/Pool Spray Mode							X					A1.10 Monitor changes in system lineup	3.7	1.0
239001 Main and Reheat Steam												Not chosen by random selection.		
245000 Main Turbine Gen. and Auxiliaries			X									K3.01 Effect of loss on AC Dist.	3.4	1.0
256000 Reactor Condensate									X			A3.02 Automatic pump starts	3.0	1.0
262001 AC Electrical Distribution									X			A3.04 Load sequencing	3.4	1.0
262002 UPS (AC/DC)												Not chosen by random selection.		
263000 DC Electrical Distribution			X									K3.03 Effect on system DC components	3.4	1.0
271000 Offgas				X								K4.08 Automatic isolation	3.1	1.0
272000 Radiation Monitoring								X				A2.02 Effect of loss of RPS	3.3	1.0
286000 Fire Protection										X		A4.06 Monitor/operate fire Diesel	3.4	1.0
290001 Secondary CTMT							X					A1.01 Predict/monitor lineup	3.1	1.0
290003 Control Room HVAC												Not chosen by random selection.		
300000 Instrument Air												Not chosen by random selection.		
400000 Component Cooling Water						X						K6.05 Effect of loss of pump	3.0	1.0
K/A Category Point Totals:	1	0	2	4	2	1	2	2	3	2	0	Group Point Total:		19

BWR RO Examination Outline
Plant Systems – Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
215001 Traversing In-core Probe												Not chosen by random selection.		
233000 Fuel Pool Cooling and Cleanup											X	2.1.28 Function of components	3.2	1.0
234000 Fuel Handling Equipment					X							K5.05 Fuel Orientation	3.0	1.0
~~239003 MSIV Leakage Control~~														
268000 Radwaste										X		A4.01 Monitor integrators	3.4	1.0
288000 Plant Ventilation						X						K6.03 Effect of a loss of air	2.7	1.0
290002 Reactor Vessel Internals												Not chosen by random selection.		
K/A Category Point Totals:	0	0	0	0	1	1	0	0	0	1	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points
212000/Loss of RPS effects on operation of RHR Shutdown Cooling	212000 K5.02 Tier 2 Group 1	Plant event, PIF Q1997-04521 3.3	1.0
259002/FWLC response to flow indicator failure	259002 A1.01 Tier 2 Group 1	Plant event, PIF Q1998-04135 3.0	1.0
Plant-Specific Priority Total: (limit 10)			

Facility: QCNPS	Date of Exam: 3/27/00	Exam Level: RO		
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of Conduct of Operations requirements	3.7	1.0
	2.1.3	Shift turnover.	3.0	1.0
	2.1.7	Evaluate plant performance and make operational judgements.	3.7	1.0
	2.1.10	Conditions and limitations facility license.	2.7	1.0
	2.1.19	Use computer to obtain and evaluate status.	3.0	1.0
	2.1.31	Locate C/S and determine correct lineup.	4.2	1.0
	Total			6
Equipment Control	2.2.2	Manipulate controls between shutdown and designated power levels.	4.0	1.0
	2.2.11	Process of controlling temporary changes.	2.5	1.0
	Total			2
Radiation Control	2.3.1	10 CFR 20 and facility radiological control requirements.	2.6	1.0
	2.3.2	Knowledge of the ALARA program.	2.5	1.0
	2.3.9	Process of performing a containment purge.	2.5	1.0
	Total			3
Emergency Procedures/ Plan	2.4.24	Loss of cooling water procedure.	3.3	1.0
	2.4.46	Verify alarms are consistent with plant conditions.	3.5	1.0
	Total			2
Tier 3 Point Total (RO)				13

INITIAL SUBMITTAL OF THE EXAMINATION

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Commonwealth Edison Company
Quad Cities Generating Station
22710 206th Avenue North
Cordova, IL 61242-9740
Tel 309-654-2241

ComEd

January 28, 2000

SVP-00-001

U. S. NRC Region III Administrator
801 Warrenville Road
Lisle, IL 60532-4351

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Submittal of Integrated Initial License Training Examination Materials

Enclosed are the examination materials, which Quad Cities Nuclear Power Station is submitting in support of the Initial License Examination scheduled for the week of March 27, 2000, at Quad Cities Nuclear Power Station.

This submittal includes the Senior Reactor Operator and Reactor Operator Written Examinations, Job Performance Measures, Administrative Walkthrough Job Performance Measures, and Integrated Plant Operation Scenario Guides.

These examination materials have been developed in accordance with NUREG-1021, "Operator Licensing Examination Standards," Revision 8. Please note that reference materials are attached to each individual examination question or item.

Some minor modifications have been made to the Integrated Examination Outline with regards to the written examinations, administrative walkthroughs, and operational scenarios in order to improve balance and content. These changes improve examination quality and are in compliance with Revision 8 of NUREG-1021, "Operator Licensing Examination Standards."

Some modifications or adjustments to the examination material may be required due to procedural changes.

In accordance with NUREG 1021, Revision 8, Section ES-201, please ensure that these materials are withheld from public disclosure until after the examinations are complete.

Should you have any questions concerning this letter, please contact Mr. C.C. Peterson at (309) 654-2241, extension 3609. For questions concerning examination materials, please contact Gary Thennes at (309) 654-2241, extension 4173.

Respectfully,

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Nuclear Power Station

Enclosures: (Hand delivered to Mr. McNeil, Lead Examiner, NRC Region III)

Updated RO Written Exam Sample Plan
Updated SRO Written Exam Sample Plan
Updated Operational Scenarios Sample Plan
Updated Administrative Walkthrough Job Performance Measures Sample Plan
RO/SRO Composite Examination with references attached
Job Performance Measures with references attached
Integrated Plant Operation Scenario Guides.
Completed Checklists: ES-301-3
ES-301-4
ES-301-5
ES-301-6
ES-401-7
Examination Security Agreements (ES-201-3)
Listing of Submitted Sample Plan Changes

Facility: Quad Cities Nuc. Plant Date of Examination: 27 MAR 00 Operating Test Number: 2000301

1. GENERAL CRITERIA		Initials a	Initials b	Initials c
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).	GMT	MS	AMS
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.	GMT	MS	AMS
c.	The operating test shall not duplicate items from the applicants' audit test(s)(see Section D.1.a).	GMT	MS	AMS
d.	Overlap with the written examination and between operating test categories is within acceptable limits.	GMT	MS	AMS
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.	GMT	MS	AMS
2. WALK-THROUGH (CATEGORY A & B) CRITERIA		--	--	--
a.	Each JPM includes the following, as applicable: · initial conditions · initiating cues · references and tools, including associated procedures · validated time limits (average time allowed for completion) and specific designation if deemed to be time critical by the facility licensee · specific performance criteria that include: - detailed expected actions with exact criteria and nomenclature - system response and other examiner cues - statements describing important observations to be made by the applicant - criteria for successful completion of the task - identification of critical steps and their associated performance standards - restrictions on the sequence of steps, if applicable	GMT	MS	AMS
b.	The prescripted questions in Category A are predominantly open reference and meet the criteria in Attachment 1 of ES-301.	N/A	N/A	N/A
c.	Repetition from operating tests used during the previous licensing examination is within acceptable limits (30% for the walk-through) and do not compromise test integrity.	GMT	MS	AMS
d.	At least 20 percent of the JPMs on each test are new or significantly modified.	GMT	MS	AMS
3. SIMULATOR (CATEGORY C) CRITERIA		--	--	--
a.	The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.	GMT	MS	AMS

	Printed Name / Signature	Date
a. Author	[signature]	2-3-00
b. Facility Reviewer(*)	Mike Swegle	2-3-00
c. NRC Chief Examiner (*)	Ann Marie Stone / Dell R. McNeil [signature]	2-24-00 / 3/22/00
d. NRC Supervisor (*)	David E. Hills / [signature]	3/22/00

(*) The facility signature is not applicable for NRC-developed tests; two independent NRC reviews are required.

Authorization to validate:

[signature] 2/24/00
CHIEF EXAMINER

[signature] 3-1-00
BRANCH CHIEF

OPS EXAM #1

Facility: Quad Cities Nuc. Plant Date of Exam: 27MAR00 Scenario Numbers: 1 / 2 / 3 Operating Test No.: 1

	QUALITATIVE ATTRIBUTES	Initials a	Initials b	Initials c
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.	GMT	MS	AMS
2.	The scenarios consist mostly of related events.	GMT	MS	AMS
3.	Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)	GMT	MS	AMS
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.	GMT	MS	AMS
5.	The events are valid with regard to physics and thermodynamics.	GMT	MS	AMS
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	GMT	MS	AMS
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.	GMT	MS	AMS
8.	The simulator modeling is not altered.	GMT	MS	AMS
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.	GMT	MS	AMS
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.	GMT	MS	AMS
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	GMT	MS	AMS
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).	GMT	MS	AMS
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	GMT	MS	AMS

	TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)	Actual Attributes	–	–	–
1.	Total malfunctions (5-8)	7 / 6 / 7	GMT	MS	AMS
2.	Malfunctions after EOP entry (1-2)	1 / 3 / 2	GMT	MS	AMS
3.	Abnormal events (2-4)	2 / 3 / 3	GMT	MS	AMS
4.	Major transients (1-2)	2 / 1 / 2	GMT	MS	AMS
5.	EOPs entered/requiring substantive actions (1-2)	2 / 2 / 2	GMT	MS	AMS
6.	EOP contingencies requiring substantive actions (0-2)	1 / 0 / 1	GMT	MS	AMS
7.	Critical tasks (2-3)	3 / 3 / 4	GMT	MS	AMS

Scenario # 1 2 3

ES-301	Transient and Event Checklist	Form ES-301-5

OPERATING TEST NO.: 1

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1	2	3	
RO	Reactivity	1	1/	4/	2/	N/A
	Normal	1	/2	/1	/1	N/A
	Instrument	2	6/3	2/3, 9	4/8	N/A
	Component	2	4/5,8	7/5, 8	3,7/ 5,9 ,11	N/A
	Major	1	7,9/7, 9	6/6	6,10 /6, 10	N/A
SRO-I As RO	Reactivity	1	N/A	N/A	N/A	N/A
	Normal	0	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A
SRO-I As SRO	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A
SRO-U	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A

Instructions: (1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

NOTE: Scenario Number 3 is a "spare" scenario and is represented on both ES-301-5 for Operating Test 1 and Operating Test 2 for comparison purposes only in Examination Outline submittal.

The "/" in the cells for the "RO"' applicant type represents the position the applicant is expected to fill during the scenario. The events are listed for the identified position: RO / BOP.

Author: Gary Thomas

Chief Examiner: AnnMarie Stone / Sue R. McGill

ES-301 | Competencies Checklist | Form ES-301-6

OPERATING TEST NO.: 1

Competencies	Applicant #1 RO/**SRO-I**/SRO-U				Applicant #2 **RO**/SRO-I/SRO-U				Applicant #3 **BOP**/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4	1	2	3	4
Understand and Interpret Annunciators and Alarms	N/A	N/A	N/A	N/A	4,6,7,9	2,6,4	3,6,10	N/A	3,5,7-9	3,5,6,9	5,6,8,10,11	N/A
Diagnose Events and Conditions	N/A	N/A	N/A	N/A	4,6,7,9	2,6,4,7	3,4,6,7,10	N/A	3,5,7-9	3,5,6,8,9	5,6,8-11	N/A
Understand Plant and System Response	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	2-4,6,7,10	N/A	2,3,5,7-9	1,3,5,6,8,9	1,5,6,8-11	N/A
Comply With and Use Procedures (1)	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	2-4,6,7,10	N/A	2,3,5,7-9	1,3,5,6,8,9	1,5,6,8-11	N/A
Operate Control Boards (2)	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	2-4,6,7,10	N/A	2,3,5,7-9	1,3,5,6,8,9	1,5,6,8-11	N/A
Communicate and Interact With the Crew	N/A	N/A	N/A	N/A	1,4,6,7,9	2,4,6,7	2-4,6,7,10	N/A	2,3,5,7-9	1,3,5,6,8,9	1,5,6,8-11	N/A
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author: [signature]
Chief Examiner: AnnMarie Stone / [signature] *

* ~~Events not provided for SRO(I)~~ will add after determining ~~which scenarios will be used~~ to evaluate SRO.

OPS EXAM #2

Facility: Quad Cities Nuc. Plant Date of Exam: 27MAR00 Scenario Numbers: 4/5/6 Operating Test No.: 2

	QUALITATIVE ATTRIBUTES	Initials a	Initials b	Initials c
1.	The initial conditions are realistic, in that some equipment and/or instrumentation may be out of service, but it does not cue the operators into expected events.	bmr	ms	
2.	The scenarios consist mostly of related events.	bmr	ms	
3.	Each event description consists of · the point in the scenario when it is to be initiated · the malfunction(s) that are entered to initiate the event · the symptoms/cues that will be visible to the crew · the expected operator actions (by shift position) · the event termination point (if applicable)	bmr	ms	
4.	No more than one non-mechanistic failure (e.g., pipe break) is incorporated into the scenario without a credible preceding incident such as a seismic event.	bmr	ms	
5.	The events are valid with regard to physics and thermodynamics.	bmr	ms	
6.	Sequencing and timing of events is reasonable, and allows the examination team to obtain complete evaluation results commensurate with the scenario objectives.	bmr	ms	
7.	If time compression techniques are used, the scenario summary clearly so indicates. Operators have sufficient time to carry out expected activities without undue time constraints. Cues are given.	bmr	ms	
8.	The simulator modeling is not altered.	bmr	ms	
9.	The scenarios have been validated. Any open simulator performance deficiencies have been evaluated to ensure that functional fidelity is maintained while running the planned scenarios.	bmr	ms	
10.	Every operator will be evaluated using at least one new or significantly modified scenario. All other scenarios have been altered in accordance with Section D.4 of ES-301.	bmr	ms	
11.	All individual operator competencies can be evaluated, as verified using Form ES-301-6 (submit the form along with the simulator scenarios).	bmr	ms	
12.	Each applicant will be significantly involved in the minimum number of transients and events specified on Form ES-301-5 (submit the form with the simulator scenarios).	bmr	ms	
13.	The level of difficulty is appropriate to support licensing decisions for each crew position.	bmr	ms	

	TARGET QUANTITATIVE ATTRIBUTES (PER SCENARIO; SEE SECTION D.4.D)	Actual Attributes	–	–	–
1.	Total malfunctions (5-8)	5 / 8 / 5	bmr	ms	
2.	Malfunctions after EOP entry (1-2)	1 / 3 / 3	bmr	ms	
3.	Abnormal events (2-4)	2 / 4 / 2	bmr	ms	
4.	Major transients (1-2)	2 / 1 / 2	bmr	ms	
5.	EOPs entered/requiring substantive actions (1-2)	1 / 2 / 2	bmr	ms	
6.	EOP contingencies requiring substantive actions (0-2)	1 / 1 / 2	bmr	ms	
7.	Critical tasks (2-3)	4 / 3 / 2	bmr	ms	

Scenarios # 4 5 6

OPERATING TEST NO.: 2

Applicant Type	Evolution Type	Minimum Number	Scenario Number 4	5	6	3
RO	Reactivity	1	2/	5/	2/	2/
	Normal	1	/1	/1	/1	/1
	Instrument	2	3/4	3/2, 11	4/7	4/8
	Component	2	6,7/5, 10	6,/4,7 ,9,10	3/6, 8	3/7,5,9, 11
	Major	1	8,9/8, 9	8/8	5,9/ 5,9	6,10/6, 10
SRO-I As RO	Reactivity	1	2	5	2	2
	Normal	0				
	Instrument	1	3	3,11	4	4
	Component	1	6,7	6	3	3,7
	Major	1	8,9	8	5,9	6,10
SRO-I As SRO	Reactivity	0	2	5	2	2
	Normal	1	1	1	1	1
	Instrument	1	3,4	2,3, 11	4,7	4,8
	Component	1	5-7, 10	4,6, 7,9	3,6, 8	3,5,7,9, 11
	Major	1	8,9	8	5,9	6,10
SRO-U	Reactivity	0	N/A	N/A	N/A	N/A
	Normal	1	N/A	N/A	N/A	N/A
	Instrument	1	N/A	N/A	N/A	N/A
	Component	1	N/A	N/A	N/A	N/A
	Major	1	N/A	N/A	N/A	N/A

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

NOTE: Scenario Number 3 is a "spare" scenario and is represented on both ES-301-5 for Operating Test 1 and Operating Test 2 for comparison purposes only in Examination Outline submittal.

The "/" in the cells for the "RO"" applicant type represents the position the applicant is expected to fill during the scenario. The events are listed for the identified position: RO / BOP.

Author:

Chief Examiner:

ES-301	Competencies Checklist	Form ES-301-6

OPERATING TEST NO.: 2

Competencies	Applicant #1 RO/**SRO-I**/SRO-U				Applicant #2 **RO**/SRO-I/SRO-U				Applicant #3 **BOP**/SRO-I/SRO-U			
	SCENARIO				SCENARIO				SCENARIO			
	4	5	6	3	4	5	6	3	4	5	6	3
Understand and Interpret Annunciators and Alarms	4-9	3-4,6,7-11	3–9	3,5 6,8,10,11	6-9	3,6	3-5,9	3,6, 10	4,5,8, 9	1,4,7, 8-11	5-9	5,6,8 10,11
Diagnose Events and Conditions	3-10	2-4,6,7-11	3-9	3-11	3,6-9	3,6	3-5,9	3,4,6, 7,10	4,5,8-10	2,4 7,8-11	5-9	5,6,8-11
Understand Plant and System Response	1-10	1-11	1-9	1-11	2,3 6-9	3,5,6, 8	2-5,9	2,3,4, 6,7, 10	1,4,5 8-10	1,2,4, 7-11	1,5-9	1, 5,6 8-11
Comply With and Use Procedures (1)	1-10	1-11	1-9	1-11	2,3 6-9	3,5,6	2-5,9	2,3,4, 6,7, 10	1,4,5 8-10	1,2,4, 7-11	1,5-9	1, 5,6 8-11
Operate Control Boards (2)	N/A	N/A	N/A	N/A	2,3 6-9	3,5,6	2-5,9	2,3,4, 6,7, 10	1,4,5 8-10	1,2,4, 7-11	1,5-9	1, 5,6 8-11
Communicate and Interact With the Crew	1-10	1-11	1-9	1-11	2,3 6-9	3,5,6	2-5,9	2,3,4, 6,7, 10	1,4,5 8-10	1,2,4, 7-11	1,5-9	1, 5,6 8-11
Demonstrate Supervisory Ability (3)	1-10	1-11	1-9	1-11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comply With and Use Tech. Specs. (3)	4	7	4	4,5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Circle the applicant's license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.

Author:

Chief Examiner:

Changes to Written Outline

295017 (S)	Tier 1 Group 1 From K3.02 3.5, Effect on plant ventilation To K3.04 3.5, Reason for power reduction on high rad. release rates Too many plant ventilation questions
295003 (S)	Tier 1 Group 1 From 295009 AK2.03 3.2, Recirc. System Interrelations with Vessel Level To 295003 AA1.02 4.3*, Partial or Complete Loss of AC, Emerg. Gen. Double jeopardy with 295009 AA1.03
203000 (B)	Both are Tier 2 Group 1 From A4.05 4.3/4.1, Operation of Manual Initiation PB To A4.02 4.1/4.1, Monitor valve position There are no manual initiation PBs at QC
294001 (B)	Both are Generic From G2.1.19 3.0/3.0, Use computer to obtain and evaluate plant status To G2.1.25 2.8/3.1, Use reference material for plant performance data Too similar to JPM walkthrough
400000 (B)	Both are Tier 2 Group 2 Correction to importance ratings Was 3.0/3.1 Should be 2.8/2.9
234000 (R)	Tier 2 Group 3 From 234000, Fuel orientation To 215001 K4.01 3.4, TIP response to Primary Containment Isolation There is no LO to support question regarding fuel orientation for RO.

Changes to JPM Outline

ADM-A.1.1-SRO	QCIS 5600-01 not completed within 92 days changed to QCOS 0250-01 not completed within 31 days. TS did not require completion of QCIS 5600-01 until after the mode change.
ADM-A.1.2-SRO	Allows use of printout or computer screen for OD-20 review rather than requiring a printout.
ADM-A.4-SRO	Developed new JPM to use conditions at completion of Scenario #4 for EAL/PAR determination rather than use bank JPM SS-020ii.07 for just the PAR determination.
ADM-A.1.2-RO	Allows use of printout or computer screen for OD-20 review rather than requiring a printout.
ADM-A.2-RO	Actually use QCOS 0202-07 rather than QCOS 0202-06 for individual jet pump operability. QCOS 0202-06 does not provide for determination of individual jet pump operability.
ADM-A.3-RO	Changed to focus on stay time and not meeting of administrative dose limitations due to similar JPM on the certification examination.
NRC JPM-04	K/A changed from 201002 to 201003 to more accurate reflect the JPM task of responding to an uncoupled control rod during rod withdrawal.

Changes made to scenarios

Scenario #1

1. For the initial conditions reactor pressure was raised from 300 to 400 psig by rod withdrawal which changed the rod step sequence. This was done due to expedite the reactivity change. In the original setup, the sequence called for low worth rods and greater than 15 rod pulls were needed to attain a 3% power change. With the slightly higher pressure, all events do not occur so rapidly that the candidates can respond to them, demonstrating their knowledge to anticipate plant response as pressure drops. This allows the BOP to identify the EDG cooling water pump failure (event #8) and take action to fulfill a component failure rather than having it trip due to overheating due to BOP activities with the containment and reactor level priorities.
2. More detail added to event #5 regarding procedures referenced and subsequent actions.
3. IRM "C" was changed to IRM 13 to match plant designation in event #6.

Scenario #2

1. Changed the severity of the recirculation loop break to enforce use of HPCI to restore level so action can be taken on event #9 HPCI instrument failure.

Scenario #3

1. Reordered the first three events to place the swap of reactor building fans first to ensure this gets done prior to reactivity change and subsequent events which may prevent it from occurring.
2. Removed event #5 due to not being deemed credible event during validation by plant operations staff due to transformer and pair of breakers between the two buses which would prevent the 480 VAC bus 18 overcurrent from also tripping the 4160 VAC bus 13-1. Changed to overcurrent trip of bus 13-1 which de-energizes bus 18 which allows operator action to re-energize the bus, but does not further greatly impact the rest of the scenario.
3. On event #10 changed the malfunction from an override on the core spray valve to a malfunction for valve binding. This was changed to allow use of a regular simulator command and doesn't effect the event, the valve won't move in either case.
4. Changed severity and ramp time of the recirculation line break due to simulator response and time needed by perform all the other events.

Scenario #4

1. Raised reactor power slightly to facilitate changing the startup of the reactor feed pump to be the first event. This was done due to the fact that the validation crew reached the threshold to start the pump midway through the reactivity change.

Scenario #5

1. On event #1, changed to a regular surveillance rather than a special surveillance to allow the US to approve and direct the performance of the surveillance.
2. APRM "C" was changed to APRM 3 to match plant designation in the initial conditions.
3. In event #3 the feedwater level control transmitter failure was changed from failing low to failing high. This was to utilize procedures that had immediate operator action to allow the RO to meet an instrument failure requirement.

Scenario #6

1. Reordered the first four events to secure torus cooling first as this would not be allowed during the reactivity change, per the validating operating crew, as originally ordered.
2. Added possibility of blowdown occurring from either high drywell temperature or reaching PSP limit as shown in validation.
3. Changed the drywell spray valve from 1-1001-26A to 1-1001-23A and changed from a console override to an event trigger to prevent from obtaining any spray flow prior to valve breaker trip.

Facility: Quad Cities Nuclear Power Station Date of Exam: March 27, 2000 Exam Level: RO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				bmr	ms	AMS / br
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				bmr	ms	AMS / br
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401				bmr	ms	AMS
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right		NRC: 9	Other: 0	bmr	ms	AMS / br
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]				bmr	ms	AMS / br
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank: 22	Modified: 3	New: 75	bmr	ms	AMS / br
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory: 43		C/A: 57	bmr	ms	AMS / br
8.	References/handouts provided do not give away answers				bmr	ms	AMS / br
9.	Question distribution meets previously approved examination outline; deviations are justified				bmr	ms	AMS / br
10.	Question psychometric quality and format meet ES, Appendix B, guidelines				bmr	ms	AMS / br
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet				bmr	ms	AMS / br

	Printed Name / Signature	Date
a. Author	Dan Thomm	2-3-00
b. Facility Reviewer(*)	Mike Swesle	2-3-00
c. NRC Chief Examiner(*)	Ann Marie Stone / Ann Marie Stone Dell R. McNeil / Dell R. McNeil	2/24/00 / 3/22/00
d. NRC Regional Supervisor(*)	David E. Hills / David E. Hills	3/22/00

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[ ] The items in brackets do not apply to NRC-prepared examinations.

AUTHORIZATION TO VALIDATE

Dell R. McNeil 2/24/00
CHIEF EXAMINER

David Hills 3-1-00
BRANCH CHIEF

Facility: Quad Cities Nuclear Power Station Date of Exam: March 27, 2000 Exam Level: SRO

	Item Description				Initial a	Initial b*	Initial c#
1.	Questions and answers technically accurate and applicable to facility				GMT	MS	AMS/DH
2.	a. NRC K/As referenced for all questions b. Facility learning objectives referenced as available				GMT	MS	AMS/DH
3.	RO/SRO overlap is no more than 75 percent, and SRO questions are appropriate per Section D.2.d of ES-401				GMT	MS	AMS/DH
4.	No more than 25 questions are duplicated from [practice exams, quizzes, and] the last two NRC licensing exams; enter the actual number of duplicated questions at right		NRC: 9	Other: 0	GMT	MS	AMS/DH
5.	[No (Less than 5 percent) question duplication from the license screening/audit exam (if independently written)]				GMT	MS	AMS/DH
6.	Bank use meets limits (no more than 50 percent from the bank, at least 10 percent new, and the rest modified); enter the actual question distribution at right	Bank: 19	Modified: 5	New: 76	GMT	MS	AMS/DH
7.	Between 50 and 60 percent of the questions on the exam (including 10 new questions) are written at the comprehension/analysis level; enter the actual question distribution at right	Memory: 44	C/A: 56		GMT	MS	AMS/DH
8.	References/handouts provided do not give away answers				GMT	MS	AMS/DH
9.	Question distribution meets previously approved examination outline; deviations are justified				GMT	MS	AMS/DH
10.	Question psychometric quality and format meet ES, Appendix B, guidelines				GMT	MS	AMS/DH
11.	The exam contains 100, one-point, multiple choice items; the total is correct and agrees with value on cover sheet				GMT	MS	AMS/DH

	Printed Name / Signature	Date
a. Author	[signature]	2-3-00
b. Facility Reviewer(*)	Mike Swegle	2-3-00
c. NRC Chief Examiner(*)	Ann Marie Stone / [signature] D. McNeil / [signature]	2/24/00 / 3/22/00
d. NRC Regional Supervisor(*)	David E. Hills / [signature]	3/22/00

Note: * The facility reviewer's signature is not applicable for NRC-developed examinations; two independent NRC reviews are required.
See special instructions (Section E.2.c) for Items 1, 4, 5, and 6.
[ ] The items in brackets do not apply to NRC-prepared examinations.

AUTHORIZATION TO VALIDATE:

[signature] 02/24/00
CHIEF EXAMINER

[signature] 3-3-00
BRANCH CHIEF

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
1	H	2		x		x						U	the stem states there is no response from RPS indicating ATWS. therefore, distractors c & d are implausable. rework stem.
2	F	2										S	
3	H	2				x						S	
4	F	3										S	
5	H	2										E	correct spelling of "identifes"
6	H	2										E	correct spelling of "lght" uncapitalize light in distractors a. and b.
7	F	2				x						E	a. and d. are correct. eliminate d. as a correct answer. put in past tense.
8	F	1.5										E	use procedure title vs NSP reference. is this RO knowledge? (yes - at validation)
9	H	2										S	
10	F	2										E	change distractor d. to 50 (more plausable).

Instructions

[Refer to Appendix B for additional information regarding each of the following concepts.]

1. Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level.
2. Enter the level of difficulty (LOD) of each question using a 1 - 5 (easy - difficult) rating scale (questions in the 2 - 4 range are acceptable).
3. Check the appropriate box if a psychometric flaw is identified:
   - The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).
   - The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).
   - The answer choices are a collection of unrelated true/false statements.
   - More than one distractor is not credible.
   - One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
4. Check the appropriate box if a job content error is identified:
   - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational in content).
   - The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from memory).
   - The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons).
   - The question requires reverse logic or application compared to the job requirements.
5. Based on the reviewer's judgment, is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
6. For any "U" ratings, at a minimum, explain how the Appendix B psychometric attributes are not being met.

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
11	F	2										S	
12	F	2										S	
13	H	2										S	
14	H	2										S	
15	F	2										S	
16	H	2										E	put in past tense for easier understanding
17	H	2										S	
18	F	2										E	is this asking for immediate actions? Not enough info to rule out distractor a.
19	F	2										E	distractor b may also be correct
20	F	2										S	
21	F	2										S	
22	F	2										S	
23	H	2										E	typo in distractor b. should be pump "A" not "B"
24	H	2										E	change "is" to "was" in distractor d.
25	H	2										S	
26	F	2										S	
27	H	2										S	
28	F	2										S	
29	H	2										S	
30	F	2										S	
31	F	2										S	
32	H	3										S	
33	H	3										S	
34	F	2				x						U	there is no correct answer provided. resolved at validation - a. is correct.
35	F	2										E	put the question in past tense. current edition is confusing

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
36	H	4										S	answer is a memorized example in the student text. change numbers or change to fundamental. put indicated in present tense in distractor b.
37	H	5										S	
38	H	2.5										S	
39	H	3										S	
40	F	3										S	
41	H	2.5										S	
42	F	2.5	x									U	K/A doesn't match. Change isolated in distractor d. to closed to be consistent w/ other distractors
43	H	3				x						U	distractors a and b are not credible. why would depressing a timer reset pushbutton prevent using the ADS valves? - not credible
44	H	2.5										E	highlight TWO MINUTES AGO
45	F	2.5										S	
46	H	3										S	
47	H	1										S	
48	F	2										S	
49	F	2										S	
50	H	2										E	combine columns (1001-34A) and (1001-36A) or change one of the distractors
51	F	2										S	
52	H	2.5						x				U	not an SRO level question - replace/rework
53	F	2										S	
54	F	2										S	
55	H	3										S	
56	F	2										E	reword stem to state operator inadvertently placed pump in PTL or STOP (confusion)
57	H	3										S	
58	H	3										S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
59	H	3										S	
60	H	3										S	
61	H	3										S	
62	H	3										E	put in past tense, change experienced to occurred
63	F	2										S	
64	F	2										S	
65	F	2										S	
66	H	2										S	
67	H	3										S	
68	F	3										S	verify diesel fire pump status lights are in control room - not in reference material
69	F	2										S	
70	F	2										S	
71	F	2	x		x							U	doesn't match K/A distractors are a series of T/F statements - rework stem
72	H	3	x			x						U	doesn't match K/A K/A refers to the effect that a malfunction of a motor will have on CCWS while the question deals with how RBCCW responds to a LOCA signal
73	F	2										E	fix the grammar or reword distractor b.
74	F	2										S	
75	H	2										S	
76	F	3										S	
77	F	3	x									U	can't get to correct answer from stem. need reference to show c. is correct
78	F	3										S	
79	F	3										S	verify pressure at which MSIVs close - not provided in reference
80	H	3										S	
81	F	2	x									U	target rock safety/relief is opened in the safety mode at this pressure. no correct answer. change stem to correct
82	F	2										S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
83	H	2										S	verify 2.2 psig doesn't do anything in their ECCS.
84	F	2										S	
85	F	3										S	
86	F	3										E	change "to to" in distractor d. to "to"
87	F	2										E	stem does not eliminate the ability to reopen MSIVs making distractor a. possible correct. rewrite the stem to eliminate distractor a.
88	F	2										S	
89	F	2										S	
90	H	2										S	
91	H	3										S	
92	F	2										E	too easy. Reason for evacuation of the control room is base knowledge. (not changed during exam review - valid question at sro level)
93	H	2										S	
94	F	3										S	
95	H	2										S	
96	H	3										E	put in columns for easier assimilation
97	H	3										S	
98	F	2						x				U	not an SRO level question - (replaced during validation)
99	F	2										E	reword to eliminate candidate use of a procedural reference - make it GE design basis
100	F	2										S	
101	H	2										E	minor grammar errors - add "the" in front of "B" and "is" in front of "open" in distractor a.
102	F	2	x									U	K/A doesn't match K/A deals with sprays and high drywell pressure, question deals with sprays and reactor level
103	F	2										E	distractors a. and c. are easily eliminated because of acoustic monitor info and other indications. (after station discussion - leave as is)
104	F	2										S	spell out acronyms
105	F	2										S	

Q#	1. LOK (F/H)	2. LOD (1-5)	3. Psychometric Flaws					4. Job Content Flaws				5. U/E/S	6. Explanation
			Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job-Link	Minutia	#/ units	Back-ward		
106	H	2										S	
107	F	2										S	
108	F	1										S	
109	H	2										S	
110	F	2										S	
111	F	2										S	
112	F	2										S	
113	H	3										E	add a statement that a transient occurred which resulted in these conditions.
114	H	2										E	use actual window nomenclature, check the K/A, should be 295032K3.03
115	H	3										S	
116	H	3										E	include the titles of the QGAs.
117	H	3										S	
118	F	3										S	
119	H	3										S	
120	H	3						x				U	not an SRO only question.
121	F	2										E	discuss need to modify distractor b.
122	F	2										S	verify these are immediate or automatic actions
123	H	2										S	
124	H	3										S	check - do sprays have to be secured at 2 psig? place 2 below 1 for easier reading
125	F	2							x			S	subsequent operator action - discuss the need to memorize or justify as a system knowledge question - may want to replace.

INITIAL SUBMITTAL OF THE OPERATING TEST

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

INITIAL SUBMITTAL OF THE ADMINISTRATIVE JPMS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

		Administrative Topics Outline	Form ES-301-1

Facility: Quad Cities

Date of Examination: 3/27/00

Examination Level : SRO

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Reactor Mode Change	JPM No. ADM-A.1.1-SRO(New) K/A 2.1.23 Rating 4.0 JPM Title: Verify Reactor Mode Change Requirements Verify plant surveillance requirements prior to mode change.
	Core Thermal Limits	JPM No. ADM-A.1.2-SRO (New) K/A 2.1.25 Rating 3.1 JPM Title: Update and Interpret Core Thermal Limits Demonstrate the ability to update and interpret a print out of Core Performance Calculation (OD-20) and identify applicable TS required actions.
A.2	Surveillance Test	JPM No. ADM-A.2-SRO (New) K/A 2.2.12 Rating 3.4 JPM Title: JP/Shroud Access Hole Cover Test for Dual Loop Operation Review JP/Shroud Access Hole Cover Test for Dual Loop Operation (Identify errors in the surveillance)
A.3	Determine Excess Exposure	JPM No. ADM-A.3-SRO (New) K/A 2.3.10 Rating 3.3 JPM Title: Determine Radiation Exposure Given a list of workers and their exposure, determine which one(s) may perform a specific task in a high radiation area.
A.4	PAR Determination	JPM No. ADM-A.4-SRO (New) K/A 2.4.38 Rating 4.0 JPM Title: Determine EAL and PARs Given specific plant conditions determine the EAL and PARs.

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Job Performance Measure

Verify Reactor Mode Change Requirements

JPM Number: _ADM-A.1.1-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swegle
Operations Representative

2-3-00
Date

Approved By: [signature]
Training Department

2-3-00
Date

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC __ N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Provide the SRO with a copy of Attachment B of QCGP 1-1. QCOS 250-01 must be marked completed 33 days ago. All other surveillance tests must be marked completed within the dates and times required to support a mode change for the day the JPM is scheduled to be administered.

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at 10% reactor power during a plant startup. QCGP 1-1 is complete to Step F.4.nn.

INITIATING CUE

The Shift Manager directs you to complete Step F.4.nn of QCGP 1-1 in support of changing the Mode Switch from Startup to Run.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1	Obtain the procedure to be used.	Obtains working copy of QCGP 1-1.	___	___	___
CUE	**Provide working copy of QCGP 1-1 including completed Attachment B.**				
F.4. nn	Refers to Attachment B as required.	Locates Attachment B.	___	___	___
*Att. B	Completes review of surveillance requirements.	Determines surveillance QCOS 250-01 not completed within last 31 days (33 days).	___	___	___
*2	Makes notifications (possibly schedules completion of the surveillance).	Informs SM that Mode change must be delayed for surveillance completion or initiates actions to use the surveillance grace period.	___	___	___
CUE	**The Shift Manager acknowledges the report and will complete the checklist.**				

CUE: This JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Verify Mode Change TS Surveillances

JPM Number: ADM-A.1.1-SRO Revision Number: 00

Task Number:

Learning Objective S-US-012/013

K/A Number and Importance:

K/A 2.1.23 **IMP** 3.9/4.0

Suggested Testing Environment: Any Classroom Environment

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ■ Yes ❑ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

References: QCGP 1-1, Normal Unit Startup, Revision 31
QCGP 1-1, Attachment B, Mode 2 to Mode 1 Transition, Revision 31
QCAP 0200-30, Technical Specification Surveillance Program Administrative Control, Rev. 0

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

____

____

____

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at 10% reactor power during a plant startup.

INITIATING CUE

You are directed to review and approve Attachment B of QCGP 1-1 in support of changing the Mode Switch from Startup to Run.

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Job Performance Measure

Update and Interpret Core Thermal Limits

JPM Number: _ADM-A.1.2-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swegle
Operations Representative

2-3-00
Date

Approved By: [signature]
Training Department

2-3-00
Date

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC-21.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide the candidate a copy of OD-20 with MFLPD greater than 1 (outside thermal limits) when directed by the cue.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

You are the Unit Supervisor. Using the plant computer, refresh the screen or print out the current Core Performance Calculations. Review the results and inform the SM of acceptability and any required actions.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: ______

ELEMENT

			SAT	UNSAT	Comment Number
1	May obtain procedure to be used.	May obtain QOP-9900-20	___	___	___
*F.1	Initiates program	Type "20" and press return	___	___	___
CUE	**When update is complete, provide the operator with pre-printed Core Performance Readout.**				
*2	Reviews the Core Performance data.	Identify the MFLPD is >1.000. (1.003). May reference QCOS 0005-03 or QCOS 0005-S01.	___	___	___
3	Perform immediate notifications.	Notify the QNE.	___	___	___
*4	Reviews Tech Specs for applicability.	Determine the correct TS actions for the conditions (T/S 3/4.11.D): a. initiate corrective actions within 15 minutes. b. restore the LHGR to W/I limits within 2 hours.	___	___	___

Job Performance Measure (JPM)

ELEMENT

			SAT	UNSAT	Comment Number
5	Inform SM that MFLPD is outside the limits.	Communicate MFLPD issue to shift management.	___	___	___
CUE	**The SM acknowledges MFLPD above the limit.**				

CUE: The JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Update and Interpret Core Thermal Limits

JPM Number: ADM-A.1.2-SRO Revision Number: 00

Task Number:

Learning Objectives S-SM-002, S/R-9900-TP001

K/A Number and Importance:

K/A 2.1.25 **IMP** 2.8/3.1

Suggested Testing Environment: Simulator or control room

Actual Testing Environment: ☐ Simulator ☐ Plant ☐ Control Room

Testing Method: ☐ Simulate ■ Perform

Faulted: ■ Yes ☐ No

Alternate Path: ☐ Yes ■ No

Time Critical: ☐ Yes ■ No

Estimated Time to Complete: 15 minutes **Actual Time Used:** ____ minutes

References: QOP 9900-20, Core Performance Calculation, Revision 5
QOS 0005-S01, Operations Department Weekly Summary of Daily Surveillances, Revision 93, Step 19.H
QOS 0005-03, Unit Operator's Daily Surveillance of Nuclear Units, Revision 17, Step F.6.a-c, F.10.a-d
QAP 0300-02, Conduct of Shift Operations , Revision 57, Step 8.a

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: ______________________

____

____

Evaluator's Name: ______________________ (Print)

Evaluator's Signature: ______________________ Date: ________

Job Performance Measure (JPM)

QUAD-1 WK-0750 27MAR00-12.32.44 4180 MWD/MTU TRIGR=USER REV=DEC94

CORE PERFORMANCE LOG --- SHORT EDIT

TBLNAM : DUAL LOOP OPERATION - OLMCPR=1.36

CTP CALCULATION : HEAT BALANCE SYMMETRY : FULL

STATE CONDITIONS		FLOW RATES / CORE PARAMETERS		NUCLEAR LIMITS		LOCATION
GMWE	814.5	WT	95.8 MLB/HR (97.7%)	CMPF	0.000	00-00-00
GMWT	2475.9 (98.0%)	WTSUB	91.5 MLB/HR	MFLCPR	0.873	43-18
EFF	32.9 %	WTFLAG	2	MAPRAT	0.874	43-19-19
PR	1003.8 PSIA	WFW	9.70 MLB/HR	FDLRX	0.781	43-19-19
DHS	24.5 BTU/LB	WD	31.93 MLB/HR	FDLRC	0.779	43-19-19
				MFLPD	1.003	43-19-19

ER	1.10	AVG VOID FRACTION	0.33		
ERATIO	.99	AVG POW DENSITY	42.2 KW/L	FCL	99.5%
TARGET	1.11				
KEFF	1.0024	PRESS DROP (MEAS)	18.0 PSIA	XE NON-EQ	.0%
		PRESS DROP (CALC)	0.1 PSIA		

CYCLE EXPOSURE 4180.0 MWD/MTU CAVEX 19298. MWD/MTU

LOCATION	1	2	3	4	5	6	7	8
RING REL POWER	1.20	1.21	1.14	1.02	0.97	0.91	0.81	0.41

************* CONTROL ROD DATA *************

	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--	*					59
55				--	--	--	--	06	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	00	--	--	--	00	--	--	--	--		47
43		--	--	--	--D	--	--	--	--	--	--	--	--	--		43
39	--	--	--	00	--	--	--	00	--	--	--	00	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	06	--	--	--	00	--	--	--	00	--	--	--	06	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	00	--	--	--	00	--	--	--	00	--	--	--	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	--	--	00	--	--	--	00	--	--	--	--		15
11			--	--	--	--	--	--	--	--	--	--	--			11
07				--	--	--	--	06	--	--	--	--				07
03						--	--	--	--	--						03
	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	

DISPLAY KEY
R = MFLCPR
M = MAPRAT
X = FDLRX
C = FDLRC
P = PRECOND
D = MFLPD
* = MULTPL.

CONTROL RODS SYMMETRIC, C.R. SEQUENCE:A-2, C.R. DENSITY: 0.088

SUBST. RODS:

APRM	1	2	3	4	5	6
READING	99.8%	100.8%	100.6%	100.0%	99.6%	99.4%
AGAF	0.993	1.002	1.001	0.995	0.991	0.989
AGAF	0.993	1.002	1.001	0.995	0.991	0.989

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

You are the Unit Supervisor. Using the plant computer, refresh the screen or print out the current Core Performance Calculations. Review the results and inform the SM of acceptability and any required actions.

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Job Performance Measure

JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: _ADM-A.2-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swezle 2-3-00
Operations Representative **Date**

Approved By: Gary Hemmer 2-3-00
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC __N/A __.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.
3. This completes the setup for this JPM.

Provide the candidate with:

QCOS 0202-06 completed to provide for review (no problems).

QCOS 0202-07 completed with failure of the #4 jet pump IAW initial conditions. However the step must be checked as satisfactory even though it failed.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

xxx = failed sensor

INITIATING CUE

The Unit Supervisor directs you to review QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation, and determine surveillance acceptability and jet pump operability.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: ________

ELEMENT

	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1.	Requests QCOS 0202-06.	Obtains QCOS 0202-06.	___	___	___
CUE	**Provide the candidate with completed copies of QCOS 0202-06.** **NOTE -only provide QCOS 0202-07 if requested.**				
2.	Reviews QCOS 0202-06.	Determines QCOS 0202-06 completed Satisfactorily.	___	___	___
*3.	Determines QCOS 0202-07 must be reviewed in conjunction with QCOS 0202-06.	Obtains completed copy of QCOS 0202-07.	___	___	___
CUE	**Provide QCOS 0202-07 if requested.**				
*4.	Reviews QCOS 0202-07.	Determines Jet pump 4 failed to meet acceptance criteria but was marked incorrectly.	___	___	___
*5.	Reviews surveillance performance criteria.	Reviews performance criteria G.1. Determines a. and b. pass, c. fails and surveillance is SAT as no two failed simultaneously.	___	___	___
CUE	**Unit Supervisor understands the Jet pump problem and that the surveillance is SAT.**				

CUE: The JPM is completed.

JPM Stop Time: ________

Job Performance Measure (JPM)

Operator's Name: ______________________________
Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: JP/Shroud Access Hole Cover Test for Dual Loop Operation
JPM Number: ADM-A.2-SRO Revision Number: 00
Task Number:
Learning Objective S-SM-002, S/R-0202-EK032

K/A Number and Importance:
K/A: 2.1.33 **Rating:** 3.4/4.0

Suggested Testing Environment: Simulator/Control room

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform
Faulted: ■ Yes ❑ No
Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** ____ minutes

References: QCOS 0202-06, Revision 12 , Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation,
QCOS 0202-07, Revision 9, Jet Pump Flow Distribution Comparison

EVALUATION SUMMARY:
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: ________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

xxx = failed sensor

Job Performance Measure (JPM)

INITIATING CUE

The Unit Supervisor directs you to review QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation, and determine surveillance acceptability and jet pump operability.

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Job Performance Measure

Determine Radiation Exposure

JPM Number: _ADM-A.3-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative Date

Approved By: [signature] 2-3-00
Training Department Date

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide the candidate with:

A completed RWP for "A" RWCU pump room. Ensure dose rate on the survey map is >70 mr/hr in the work area. Also, the RWP exposure limit for the job must be 50 mrem. Expected time to complete the task is 30 min.

A list of workers and their exposure history.

Job Performance Measure (JPM)

INITIAL CONDITIONS

The unit is at 100 percent reactor power on December 29. The "A" RWCU pump must be manually isolated due to a seal leak. The electronic dose tracking system is currently down for repair.

INITIATING CUE

The Shift Manager directs you to review the RWP, area survey maps, and exposure histories of crew personnel and determine which personnel may complete the task without exceeding any QCNPS Administrative Limits.

This is a NON EMERGENCY situation.

It is expected that the task will take 30 minutes to complete.

The following is a list of the operators that are available to perform the task and their exposure histories.

	Annual NON-QCNP TEDE Dose	Annual QCNP TEDE Dose	Todays Dose DDE(1)
Operator A -	1920 mrem	1050 mrem	195 mrem
Operator B-	0 mrem	1940 mrem	265 mrem
Operator C-	825 mrem	1975 mrem	70 mrem
Operator D-	1100 mrem	1840 mrem	180 mrem

(1) Dose from RWPs other than 000003.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Evaluator: Correct answer is Operator D. Operator A will exceed the Combined exposure limit of 3000 mrem. Operator B will exceed the daily exposure limit of 300 mrem. Operator C will exceed the site annual exposure limit of 2000 mrem.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtains RWP and maps.	Obtains RWP and maps.	___	___	___
CUE	**Provide a copy of the RWP.**				
2	Obtains procedure to be used(if necessary) and reviews RWP and area survey maps.	May refer to QCAP 0630-06. Completes review.	___	___	___
*3	Determines which operator can complete the task.	Determines that only Operator D has exposure remaining to complete the task.	___	___	___
4	Informs SM that operator D can complete the task.	Informs SM that only Operator D can complete the task.	___	___	___
CUE	**The SM understands that operator D can complete the task.**				

Evaluator: This JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Determine Radiation Exposure

JPM Number: ADM-A.3-SRO   Revision Number: 00

Task Number:

Learning Objective S-RPS-001

K/A Number and Importance:

K/A 2.3.10 **IMP** 2.9/3.3

Suggested Testing Environment: Simulator , Control Room, or Plant

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ❑ Yes ■ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** ____ minutes

References: QCAP 0630-06, Exposure Authorization and Control, Rev. 5, Step D.1.b
QCAP 0600-06, Radiation Work Permit Program, Rev. 8
QCAP 0650-06, Unescorted Access to RCA, Rev. 3, Step D.2.c

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: ________

Job Performance Measure (JPM)

INITIAL CONDITIONS

The unit is at 100 percent reactor power on December 29. The "A" RWCU pump must be manually isolated due to a seal leak. The electronic dose tracking system is currently down for repair.

INITIATING CUE

The Shift Manager directs you to review the RWP, area survey maps, and exposure histories of crew personnel and determine which personnel may complete the task without exceeding QCNPS Administrative Limits.

This is a NON EMERGENCY situation.

It is expected that the task will take 30 minutes to complete.

The following is a list of the operators that are available to perform the task and their exposure histories.

	Annual NON-QCNP TEDE Dose	Annual QCNP TEDE Dose	Todays Dose DDE(1)
Operator A -	1920 mrem	1050 mrem	195 mrem
Operator B-	0 mrem	1900 mrem	265 mrem
Operator C-	825 mrem	1975 mrem	70 mrem
Operator D-	1100 mrem	1840 mrem	180 mrem

(1) Dose from RWPs other than 000003.

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Job Performance Measure

Determine EAL and PARs

JPM Number: _ADM-A.4-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative **Date**

Approved By: [signature] 2-3-00
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. The simulator will be placed in freeze at the completion of NRC scenario #4.
2. Run immediately following Scenario #4. Tell simulator operator to freeze the simulator and not change any switches or controls until the JPM is finished. Ensure a NARS form is available in the simulator.
3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.
4. This completes the setup for this JPM.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Plant conditions are as indicated.

INITIATING CUE

As the Shift Manager, you are to determine the appropriate Emergency Action Level (EAL) and the Protective Action Recommendations (PARs)for the current plant conditions including properly filling in step 9. on the NARS form. You may request any specific plant information from the NSOs. Inform the station director of the PARS determination once completed. Portions of this JPM are time critical.

The time clock starts when the candidate acknowledges the initiating cue. **Start the time critical time clock as soon as the Examinee makes the EAL determination.**

Job Performance Measure (JPM)

EVALUATOR: **PATH 1: The candidate may refer to the "Acting Station Director Implementing Procedure" (QEP 100-1) which will refer him to the "GSEP Emergency Procedures Implementation Guide" (QEP 100-T01). The "GSEP Implementation Guide" will direct him to QEP 0200-01 for GSEP EAL classification and QEP 100-T02 for PARs determination. The outline for these steps begin at 1. of this JPM.**

PATH 2: Alternatively, following declaration of the EAL, the candidate may refer to QEP 300-01, which will refer him to the NARS form (QEP 300-S4) and the NARS form instructions (QEP 300-T1). The NARS form instruction sheet will refer him to QEP 100-T02. The outline for these steps begin at 2. of this JPM.

JPM Start Time: _______

ELEMENT

	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
	PATH 1				
1.	Obtains procedure to be used.	Obtains QEP 100-1.	___	___	___
F.1	**QEP 100-1** Implements GSEP Emer. Proc.Implementation Guide.	Refers to QEP 100-T01.	___	___	___

Job Performance Measure (JPM)

	ELEMENT		SAT	UNSAT	Comment Number
*A.4	**QEP 100-T01** Refers to "Quad Cities Emergency Action Levels (EAL)" (QEP 0200-01 and -T01)	Refers to QEP 0200-01 and -T01 Determines EAL: SAE: MS3 and/or FS-1 if Torus does not reach 110F. Or GAE: MG3 if Torus reaches 110F.	___	___	___
NOTE	**Start time for time critical portion time________**				
*A.4.c.	Refers to "Predetermined PARS from the Control Room" (QEP 0100-T02	Refers to QEP 0100-T02. Determines PAR and circles on NARS form. SAE: 9C, D, F, G GAE: 9C, H, J, G if < 166" 9C, H, F, G if>166"	___	___	___
	Critical Stop Time_________				
*1.a	Informs station director of PARS completion.	Informs station director of PARS completion within 15 minutes.	___	___	___
CUE	**The station director understands that the PARS determination is complete.**				
CUE	**The JPM is complete.** JPM Stop Time ____________				

Job Performance Measure (JPM)

	ELEMENT		SAT	UNSAT	Comment Number
	PATH 2				
2	Obtain procedure to be used.	Obtains QEP 0300-1.	___	___	___
F.1.b	**QEP 0300-01** Refers to; "NARS Form Instructions For Use" (QEP 0300-T01).	Refers to QEP 0300-T01.	___	___	___
9.	**QEP 0300-T01** Refers to; "Predetermined PARS From The Control Room" (QEP 100-T02)	Refers to QEP 0100-T02.	___	___	___
*3.	**QEP 0100-T02** Determines EAL classification column.	Determines EAL: SAE: MS3 and/or FS-1 if Torus does not reach 110F. Or GAE: MG3 if Torus reaches 110F.	___	___	___

NOTE **Start time for time critical portion time________**

Job Performance Measure (JPM)

	ELEMENT		**SAT**	**UNSAT**	**Comment Number**
*4.	Determines PARS from highest severity level and completes NARS form, Step 9.	Refers to QEP 0100-T02. Determines PAR and circles on NARS form. SAE: 9C, D, F, G GAE: 9C, H, J, G if < 166" 9C, H, F, G if >166"	___	___	___
	Critical Stop Time ________				
*9.a	Informs station director of PARS completion.	Informs station director of PARS completion within 15 minutes.	___	___	___
CUE	**The station director understands that the PARS determination is complete.**				

CUE: The JPM is complete.

JPM Stop Time: ________

Job Performance Measure (JPM)

Operator's Name: ______________________________
Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Determine EAL and PARs
JPM Number: ADM-A.4-SRO Revision Number: 00
Task Number:
L/O S-GSEP-TP001/2

K/A Number and Importance:
K/A: 2.4.38 **Rating:** 4.0

Suggested Testing Environment: Simulator

Actual Testing Environment: ■Simulator ❑Plant ❑Control Room

Testing Method: ❑ Simulate ■ Perform
Faulted: ❑ Yes ■ No
Alternate Path: ❑ Yes ■ No

Time Critical: ■ Yes ❑ No

Time to Complete Time Critical Portion: 15 minutes
Actual Time Used: ___minutes

References:

QEP 0300-01 Rev. 24	NOTIFICATION FOR GSEP EMERGENCIES
QEP 0300-Tl Rev. 19	NARS FORMS INSTRUCTIONS FOR USE NARS FORM
QEP 0100-01 Rev. 9	ACTING STATION DIRECTOR IMPLEMENTING PROCEDURE
QEP 0100-T0l Rev. 17	GSEP EMERGENCY PROCEDURE IMPLEMENTATION GUIDE
QEP 0100-T02 Rev. 11	PREDETERMINED PARS FOR THE CR
QEP 0200-01 Rev. 13	CLASSIFICATION OF GSEP CONDITION
QEP 0200-T01 Rev. 25	CLASSIFICATION OF EMERGENCIES

EVALUATION SUMMARY:
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory
Comments: ______________________________
Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Plant conditions are as indicated.

INITIATING CUE

As the Shift Manager, you are to determine the appropriate Emergency Action Level (EAL) and the Protective Action Recommendations (PARs)for the current plant conditions including properly filling in step 9. on the NARS form. You may request any specific plant information from the NSOs. Inform the station director of the NARS determination once completed. Portions of this JPM are time critical.

Administrative Topics Outline		Form ES-301-1

Facility: Quad Cities

Date of Examination: 3/27/00

Examination Level : RO

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Reactor Mode Change	JPM No. ADM-A.1.1-RO(New) K/A 2.1.23 Rating 3.9 JPM Title: Reactor Mode Change Given plant conditions, determine if those conditions satisfy the procedural requirements to transfer the Reactor Mode Switch from STARTUP to RUN.
	Core Thermal Limits	JPM No. ADM-A.1.2-RO (New) K/A 2.1.25 Rating 2.8 JPM Title: Update and Interpret Core Thermal Limits Demonstrate the ability to update and interpret the Core Performance Calculation (OD-20).
A.2	Surveillance Test	JPM No. ADM-A.2-RO (New) K/A 2.2.12 Rating 3.0 JPM Title: JP/Shroud Access Hole Cover Test for Dual Loop Operation Perform JP/Shroud Access Hole Cover Test for Dual Loop Operation (Identify failed jet pump)
A.3	Radiation Work Permit	JPM No. ADM-A.3-RO (new) K/A 2.3.10 Rating 2.9 JPM Title: Review a Radiation Work Permit Given a RWP, determine the the maximum stay time and determined the completion of a task would result in exceeding the administrative limits.
A.4	EALs	JPM No. ADM-A.4-RO (New) K/A 2.4.47 Rating 3.4 JPM Title: Determine if Chimney Radiation Levels Exceed EAL Values Determine if Chimney Radiation Levels Exceed EAL Values.

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Job Performance Measure

Reactor Mode Change

JPM Number: ADM-A.1.1-RO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative Date

Approved By: Gary Kleiner 2-3-00
Training Department Date

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 15, just prior to transferring the Mode Switch to RUN.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Need to fail APRM #4 downscale light ON.

   ior LOIL107004x3 ON - Panel 901-37 APRM #4 light ON.

   ior LOIL1070043 ON - Panel 901-5 APRM #4 light ON.

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Provide to Candidate:

Copy of QCGP 1-1 completed up to Step F.4.oo.(2).

Job Performance Measure (JPM)

INITIAL CONDITIONS

The Unit is being started up following a planned maintenance outage. All systems have performed as expected.

INITIATING CUE

The Unit Supervisor directs you to review plant conditions to ensure they support transferring the Reactor Mode Switch to RUN and complete QCGP 1-1, Step F.4.oo.(2) through (7). The Nuclear Engineer has satisfactorily completed QCTS 0910-07.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: ________

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtain QCGP 1-1, Step F.4.oo.	Obtains copy of procedure.	___	___	___
CUE	**Provide copy of QCGP once requested.**		___	___	___
(2)	Verify APRMs are indicating correctly on both panels.	Determines all APRMs indicating correctly.	___	___	___
*(3)	Verify all APRM downscale lights are clear.	Identifies #4APRM downscale light not clear but APRM does not indicate downscale.	___	___	___
2	Candidate may verify that the #4 APRM downscale light on Panel 901-37 is also on.	Verify panel 901-37 #4 APRM downscale light agrees with the panel 901-5 #4 APRM light.	___	___	___
*3	Candidate should inform the US that step is not met. Critical that this occurs prior to mode switch change.	Informs US that mode switch cannot be changed as APRM downscale lights are not all clear.	___	___	___
CUE	**Unit Supervisor will initiate actions for repair of the light. This JPM is complete.** **Note: remaining steps are incorporated if the candidate does not identify the APRM light issue or continues and verifies through (6).**				

Job Performance Measure (JPM)

ELEMENT

			SAT	UNSAT	Comment Number
(4)	Verify Main Condenser backpressure is < 7 in Hg.	Determines main condenser backpressure is < 7 in Hg.	___	___	___
(5)	Verifies low vacuum alarm clear.	Determines low vacuum alarm clear.	___	___	___
(6)	Place one IRM/APRM recorder on each RPS channel to APRM.	Places one recorder on each channel to APRM	___	___	___
(7)	Transfer RX Mode Select switch to Run position and record time.	Transfer Rx mode switch to RUN. THIS SHOULD NOT OCCUR.	___	___	___

CUE (IF NECESSARY) **This JPM is complete.**

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Verification of Plant Parameters for Reactor Mode Change

JPM Number: ADM-A.1.1-RO Revision Number: 00

Task Number:

L.O. S/R-0002-TP001b

K/A Number and Importance:

K/A 2.1.23 Importance Rating 3.9

Suggested Testing Environment: Simulator

Actual Testing Environment: ■ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ■ Yes ❑ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

References: QCGP 1-1, Normal Unit Startup, Revision 31, Step F.4.oo

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

The Unit is being started up following a planned maintenance outage. All systems have performed as expected.

INITIATING CUE

The Unit Supervisor directs you to review plant conditions to ensure they support transferring the Reactor Mode Switch to RUN and complete QCGP 1-1, Step F.4.oo.(2) through (7). The Nuclear Engineer has satisfactorily completed QCTS 0910-07.

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Job Performance Measure

Update and Interpret Core Thermal Limits

JPM Number: _ADM-1.1.2-RO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative **Date**

Approved By: [signature] 2-3-00
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC-21.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide to candidate: When cued give the copy of OD20 with MFLPD above requirements.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

Using the plant computer, update the screen or print out the current Core Performance Calculations and review the results for acceptability.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: ______

ELEMENT

			SAT	UNSAT	Comment Number
1	May obtain procedure to be used.	May obtain QOP-9900-20	___	___	___
*F.1	Initiates program	Type “20” and press return	___	___	___
CUE	**When printout or screen update is complete, provide the operator with pre-printed Core Performance Readout.**				
***2**	Reviews the Core Performance data.	May review against criteria in QCOS 0005-S01 or 0005-03. Identifies MFLPD is > 1.000. (1.003)	___	___	___
3	Communicate Review Results	Inform US that MFLPD is above limits and that the QNE should be notified.	___	___	___
CUE	**The Unit Supervisor acknowledges MFLPD is 1.003 which is above the limits and will contact the QNE.**				

CUE - The JPM is complete.

JPM Stop Time: ______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Update and Interpret Core Thermal Limits

JPM Number: ADM-1.1.2-RO Revision Number: 00

Task Number:

Learning Objectives S/R-9900-TP001

K/A Number and Importance:

K/A 2.1.25 **IMP** 2.8/3.1

Suggested Testing Environment: Simulator or control room

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ■ Yes ❑ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** ____ minutes

References: QOP 9900-20, Core Performance Calculation, Revision 5
QCOS 0005-01, Operations Department Weekly Summary of Daily Surveillance, Revision 69, Step 19
QCOS 0005-03, Unit Operator's Daily Surveillance of Nuclear Units, Revision 17

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

____

____

____

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: ________

Job Performance Measure (JPM)

QUAD-1 WK-0750 27MAR00-12.32.44 4180 MWD/MTU TRIGR=USER REV=DEC94

CORE PERFORMANCE LOG --- SHORT EDIT

TBLNAM : DUAL LOOP OPERATION - OLMCPR=1.36
CTP CALCULATION : HEAT BALANCE SYMMETRY : FULL

STATE CONDITIONS		FLOW RATES / CORE PARAMETERS		NUCLEAR LIMITS		LOCATION
GMWE	814.5	WT	95.8 MLB/HR (97.7%)	CMPF	0.000	00-00-00
GMWT	2475.9 (98.0%)	WTSUB	91.5 MLB/HR	MFLCPR	0.873	43-18
EFF	32.9 %	WTFLAG	2	MAPRAT	0.874	43-19-19
PR	1003.8 PSIA	WFW	9.70 MLB/HR	FDLRX	0.781	43-19-19
DHS	24.5 BTU/LB	WD	31.93 MLB/HR	FDLRC	0.779	43-19-19
				MFLPD	1.003	43-19-19

ER	1.10	AVG VOID FRACTION	0.33		
ERATIO	.99	AVG POW DENSITY	42.2 KW/L	FCL	99.5%
TARGET	1.11				
KEFF	1.0024	PRESS DROP (MEAS)	18.0 PSIA	XE NON-EQ	.0%
		PRESS DROP (CALC)	0.1 PSIA		

CYCLE EXPOSURE 4180.0 MWD/MTU CAVEX 19298. MWD/MTU

LOCATION	1	2	3	4	5	6	7	8
RING REL POWER	1.20	1.21	1.14	1.02	0.97	0.91	0.81	0.41

************* CONTROL ROD DATA *************

```
    02 06 10 14 18 22 26 30 34 38 42 46 50 54 58
59                 -- -- -- -- --  *              59
55           -- -- -- -- 06 -- -- -- --           55
51        -- -- -- -- -- -- -- -- -- -- --        51
47     -- -- -- -- 00 -- -- -- 00 -- -- -- --     47
43     -- -- -- --D -- -- -- -- -- -- -- -- --    43
39  -- -- -- 00 -- -- -- 00 -- -- -- 00 -- -- -- 39
35  -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- 35
31  -- 06 -- -- -- 00 -- -- -- 00 -- -- -- 06 -- 31
27  -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- 27
23  -- -- -- 00 -- -- -- 00 -- -- -- 00 -- -- -- 23
19     -- -- -- -- -- -- -- -- -- -- -- -- --     19
15     -- -- -- -- 00 -- -- -- 00 -- -- -- --     15
11        -- -- -- -- -- -- -- -- -- -- --        11
07           -- -- -- -- 06 -- -- -- --           07
03                 -- -- -- -- --                 03
    02 06 10 14 18 22 26 30 34 38 42 46 50 54 58
```

DISPLAY KEY
R = MFLCPR
M = MAPRAT
X = FDLRX
C = FDLRC
P = PRECOND
D = MFLPD
* = MULTPL.

CONTROL RODS SYMMETRIC, C.R. SEQUENCE:A-2, C.R. DENSITY: 0.088
SUBST. RODS:

APRM	1	2	3	4	5	6
READING	99.8%	100.8%	100.6%	100.0%	99.6%	99.4%
AGAF	0.993	1.002	1.001	0.995	0.991	0.989
AGAF	0.993	1.002	1.001	0.995	0.991	0.989

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

Using the plant computer, update the screen or print out the current Core Performance Calculations and review the results for acceptability.

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Job Performance Measure

JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: ADM-A.2-RO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative Date

Approved By: [signature] 2-3-00
Training Department Date

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide candidate with:

QCOS 0202-07 with prerequisite steps completed.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

RR pump speed indication operating normally.

xxx = failed sensor

INITIATING CUE

QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation has been completed. The US directs you to complete QCOS 0202-07, Jet Pump Flow Distribution Comparison to support jet pump operability determination.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtains QCOS 0202-07.	Obtains QCOS 0202-07.	___	___	___
CUE	**Provide the candidate with copies of QCOS 0202-07.**				
*2.	Completes QCOS 0202-07, including Attachment A.	Determines Jet pump 4 failed to meet acceptance criteria.	___	___	___
*3	Completes QCOS 0202-07, Attachment A additional lines.	Determines Jet pumps 5 and 6 fail to meet the tightened tolerances	___	___	___
4.	Informs the US of the possible failure of #4 jet pump and the failure of Jet pumps 5 and 6 to meet the tightened tolerances.	Notifies Unit Supervisor of possible jet pump failures.	___	___	___
CUE	**Unit Supervisor understands the jet pump problems and will initiate the required paperwork.**				

CUE: The JPM is completed.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ____________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: ADM-A.2-RO Revision Number: 00

Task Number:

Learning Objective S/R-0202-EK032
S/R-0202-JP001

K/A Number and Importance:
K/A: 2.2.12 **Rating:**3.0/3.4

Suggested Testing Environment: Plant, Control Room, or Simulator

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ■ Yes ❑ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

References: QCOS 0202-06, Revision 12 , Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation,
QCOS 0202-07, Revision 9, Jet Pump Flow Distribution Comparison

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ____________________

____

____

____

____

Evaluator's Name: ____________________ (Print)

Evaluator's Signature: ____________________ Date: ________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

RR pump speed indication operating normally.

xxx = failed sensor

Initiating Cue:

QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation has been completed. The US directs you to complete QCOS 0202-07, Jet Pump Flow Distribution Comparison to support jet pump operability determination.

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Nuclear Generation Group

Job Performance Measure

Review a Radiation Work Permit

JPM Number: ADM-A.3-RO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle **2-3-00**
Operations Representative **Date**

Approved By: Gary [illegible] **2-3-00**
Training Department **Date**

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide examinee with a copy of the RWP (same as the SRO RWP). Ensure dose rate on the survey map is >70 mr/hr in the work area.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is operating at 100% reactor power.

Your exposure history is:

Annual Non-QCNP TEDE Dose (from Dresden Station) – 1920 mrem

Annual QCNP TEDE Dose – 1050 mrem

Previous 24 hours DDE dose at QCNP from RWPs other than 000003 -195 mrem

INITIATING CUE

You have been directed to manually valve out the 1A RWCU pump. It is expected that the task will take 30 minutes. You are to review the RWP and area maps to determine if you are able to complete the task and inform the Unit Supervisor. This is a NON EMERGENCY situation.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtain RWP and area maps.	Obtain RWP and maps.	___	___	___
CUE	**Provide the RWP and maps when requested.**				
*2	Review RWP and applicable survey map.	Review RWP and applicable survey map.	___	___	___
*3	Determines max. stay time.	Determines that candidate would have 18-20 min stay time and would exceed administrative limit of 3000 mrem for total dose to complete the job.	___	___	___
4.	Informs US.	Informs US that he would exceed adm exposure limits to complete the job and can not complete the task.	___	___	___

CUE: The JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________
Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Review a Radiation Work Permit
JPM Number: ADM-A.3-RO   Revision Number: 00
Task Number:
Learning Objective : R-RPS-001
RWTLL G4

K/A Number and Importance:
K/A 2.3.10   IMP 2.9/3.3

Suggested Testing Environment: Control Room , Simulator, Plant , or Classroom

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform   **Faulted:** ■ Yes ❑ No
Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes   **Actual Time Used:** _____ minutes

References: QCAP 0600-06, Radiation Work Permit Program, Revision 8
QCAP 0650-06, Unescorted Access to RCA, Rev. 3 Step D.2.c
QCAP 0630-06, Exposure Authorization and Control, Rev. 5, Step D.1.b

EVALUATION SUMMARY:
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is operating at 100% reactor power.

Your exposure history is:

Annual NON-QCNP TEDE Dose (from Dresden Station) – 1920 mrem

Annual QCNP TEDE Dose – 1050 mrem

Previous 24 hours DDE dose at QCNP from RWPs other than 000003 -195 mrem

INITIATING CUE

You have been directed to manually valve out the 1A RWCU pump. It is expected that the task will take 30 minutes. You are to review the RWP and area maps to determine if you will be able to complete the task and inform the Unit Supervisor. This is a NON EMERGENCY situation.

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Nuclear Generation Group

Job Performance Measure

Determine if Chimney Radiation Levels Exceed EAL Values

JPM Number: _ADM-A.4-RO_

Revision Number: _0_

Date: 02/01/00

Approved By:	Mike Swegle	2-3-00
	Operations Representative	**Date**
Approved By:	[illegible signature]	2-3-00
	Training Department	**Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A__).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Initial conditions provide candidate with the specific Chimney radiation levels and Chimney flow. The values are such that the release is just below the Unusual Event value.

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 was shutdown to hot shutdown 1 hour ago. Core damage is present and an offsite gaseous release is in progress.

Chimney flow is 310,000 cfm.

SPING low range reading is 5.2 E-4 micro ci/cc.

INITIATING CUE

The Unit Supervisor directs you to use QCCP 0400-25, Attachment A, to determine if chimney radiation level is above or below the EALs. The US informs you that all prerequisites have been satisfied.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: ________

ELEMENT

	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1.	Obtains copy of QCCP 0400-25, Attachment A.	Obtains procedure.	___	___	___
CUE	**Provide copy of QCCP 0400-25, Attachment A once located or requested.**				
2.	Completes attachment A.	Performs calculations on Attachment A.	___	___	___
*3.	Determines equivalent emergency action level value.	Determines value to be 4.19 E-4micro ci/cc (+/- .01 E-4)	___	___	___
*4	Determines EAL level.	Determines below Unusual Event Level.	___	___	___
5	Informs US of the EAL level.	Informs US the chimney radiation release rate below the UE level.	___	___	___
CUE	**The US understands that the chimney radiation release rate is below the UE level.**				

CUE: This JPM is complete.

JPM Stop Time: ________

Job Performance Measure (JPM)

Operator's Name: ________________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Determine if Chimney Radiation Levels Exceed EAL Values

JPM Number: ADM-A.4-RO Revision Number: 00

Task Number:

S/R-1702-EK028

K/A Number and Importance:

K/A 295038EA2.01	IMP 3.3/4.3
K/A 2.4.47	IMP3.4/3.7

Suggested Testing Environment: Simulator or the Control Room

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ❑ Yes ■ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 12 minutes **Actual Time Used:** _____ minutes

References: QCCP 0400-25, Main Chimney and Reactor Vent Noble Gas Release Rate Action Levels, Revision 4

LF-1702, Chimney Radiation Monitoring, Rev. 3

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments:________________________________

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Evaluator's Name: ________________________ (Print)

Evaluator's Signature: ________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 was shutdown to hot shutdown 1 hour ago. Core damage is present and an offsite gaseous release is in progress.

Chimney flow is 310,000 cfm.

SPING low range reading is 5.2 E-4 micro ci/cc.

INITIATING CUE

The Unit Supervisor directs you to use QCCP 0400-25, Attachment A, to determine if chimney radiation level is above or below the EALs. The US informs you that all prerequisites have been satisfied.

INITIAL SUBMITTAL OF THE WALKTHROUGH JPMS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Control Room Systems and Facility Walk-Through Test Outline		Form ES-301-2

Facility: Quad Cities Date of Examination: 3/27/00
Exam Level: RO/SRO

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. 217000 NRC JPM-01 K/A 217000 A210 Rating 3.1/3.1 JPM Title: Control Reactor Pressure with RCIC Initiate RCIC for RPV Pressure Control. Failure of the RCIC controller to establish and maintain flow.	A, S, M	II
b. 209001 NRC JPM-02 K/A 209001 A404 Rating 2.9/2.9 JPM Title: Perform Monthly Core Spray Surveillance for Core Spray Pump B with Failure of the Minimum flow valve failure.	A, S, D	IV
c. 288000 NRC JPM-03 K/A 288000 A201 Rating 3.3/3.4 JPM Title: Bypass the Reactor Building Ventilation Isolation Bypassing Group 2 and RB Ventilation Isolations (Unit Two)	C, D	IX
e. 201003 NRC JPM-04 K/A 201003 A202 Rating 3.7/3.8 JPM Title: Uncoupled Control Rod During Reactor Startup to Crit. Withdraw Control Rods to Make the Reactor Critical Uncoupled control rod during rod withdrawal	A, L, S, M	I
d. 223001 NRC JPM-05 K/A 223001 A211 Rating 3.6/3.8 JPM Title: Transfer Torus Water to the Main Condenser Via the Condensate Demineralizers	S, D	V
f. 262001 NRC JPM-06 K/A 262001 A402 Rating 3.4/3.4 JPM Title: Transfer Auxiliary Power From Xfmr 11 to Xfmr 12	S, D	VI
g. 201006 NRC JPM-07 K/A 201006 A302 Rating 3.5/3.4 JPM Title: Bypass the Rod Worth Minimizer	S, D	VII

B.2 Facility Walk-Through

System / JPM Title	Type Code*	Safety Function
a. 206000 NRC JPM-08 K/A 206000 2.1.30 A210 Rating 3.9/3.4 JPM Title: Locally Start the HPCI System to Control RPV Level	D, R	II
b. 218000 NRC JPM-09 K/A 218000 A206 Rating 4.2/4.3 JPM Title: De-energize ADS Valves to Prevent Spurious Operation by Removing Fuses.	D	III
c. 264000 NRC JPM-10 K/A 264000 2.1.30 Rating 3.9/3.4 JPM Title: Locally Start-up a Diesel Generator with a Failure of Vent Fan to Start	A, D	VI

* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name: ______________________________
(print)

JPM: LS-019-I-F Rev: 15 Revision by: G. Thennes

Task Title: Control Reactor Pressure with RCIC.

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swezle Date: 2-3-00

Task References: S/R-1300-TP003 **K/A:**217000 A2.10 **Rating:**3.1/3.1

License: RO/SRO **Suggested Testing Environment: Simulator**
(Circle One)

Actual Testing Environment: Simulator x Plant ___ CR ___

Testing Method: Simulate ____ Perform x

Estimated Time to Complete: **12 min.** **STOP Time:** __________
START Time: __________
Time Critical? NO X YES ___ **ACTUAL Time:** __________

References: QCOP 1300-2 Rev. 16 RCIC SYSTEM MANUAL START-UP (INJECTION/PRESSURE CONTROL)

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Significantly modified JPM to incorporate failure of RCIC controller to control flow in auto. NOTE: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-019-I

IC#: Use IC-92 (ZIP Disk)

Must copy IC from zip disc to IC filer directory in RIS. MST must then be shutdown and restarted for it to recognize new IC-92.

Can use IC-21 with the following modification.

IC Description: Full power, normal plant lineup

Manual Actuations:Reset the simulator, then take the simulator to run. Scram the reactor, place the mode switch in shutdown, and stabilize Reactor water level at +30" with the low flow feedwater regulator in auto.

Insert a Group I isolation using malfunction rp05a and rp05b(simulator command imf rp05a and imf rp05b)

Start the "A" Loop of Torus Cooling IAW QCOP 1000-9 and QCOP 1000-04.

Malfunctions: Controller fails to operate properly in auto. Will only provide 200 gpm in auto. Will respond and regulate flow at 400 gpm in manual.

Need imf RC06 50% severity No Ramp.

Note to Simulator Operator: Will have to control Rx pressure 900-1000 psig as NSO.

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The unit has been SCRAMMED due to a spurious Group I isolation.
- QGA 100 is being executed and relief valves are being used to control reactor pressure by other NSO.
- The U. S. has ordered reactor pressure to be controlled with RCIC.
- RCIC is in standby IAW QCOP 1300-1 with suction from the CCSTs.
- The unit is not in EGC control.
- Torus cooling is on "A" Loop.
- This JPM is NOT time critical

Initiating Cue: The Unit Supervisor directs you to manually start-up RCIC, in the pressure control mode, with suction from the CCSTs using QCOP 1300-02. Establish approximately 400 gpm flow and a discharge pressure of greater than 100 psig above reactor pressure and less than 1250 psig above reactor pressure.

Start Time:________

Provide examinee with: NA

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains copy of QCOP 1300-2.	[]	[]	
	Verify ECCS Initiation Signal is NOT present.	Determines DW press. < 2.5 psig & RPV level > -59" using available ind.	[]	[]	[]
*F.6.a.	Open HPCI Test Return Vlv.	Positions MO-2301-15 CS to open - Open light lit.	[]	[]	
*F.6.b.	Throttle open CCST Test Bypass Vlv.	Positions 1301-53 CS to open - Open light lit.	[]	[]	
*F.6.c.	Start Vacuum Pmp.	Positions Vacuum pmp. CS to start. - ON light lit.	[]	[]	
*F.6.d.	Open Turb. Clg. Wtr. Vlv.	Positions 1301-62 CS to open. - Open light lit.	[]	[]	
F.6.e.	Verify Pmp Disch Vlv Closed.	Verifies 1301-49 vlv closed. – Closed light lit.	[]	[]	[]
*F.6.g.	Open Min Flow Vlv.	Positions 1301-60 CS to open. - Open light lit.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6.h.	Open Stm. To Turb. Vlv.	Positions 1301-61 CS to open. - Open light lit.	[]	[]	

NOTE: Operator may place controller in manual and increases to 400 gpm as required in Step F.6.k.

F.6.i.	Verify flow indication.	Identifies flow at approximately 200 gpm. If manual control of FIC is selected, operator may increase flow to 400 gpm on FIC 1-1340-1.	[]	[]	[]
F.6.j	Verify close MIN FLOW VALVE.	Verifies MO 1-1301-60 closed. -CLOSED light lit.	[]	[]	
*F.6.k.(1) or (2)	Adjust to proper disch. flow/pressure.	Adjusts **FLOW** by: FIC 1-1340-1 in MAN and adjusts manual adjustment lever to achieve approx. 400 gpm. **AND** Throttles 1301-53 CS closed as necessary until pmp. disch. press. 100 psig > RPV press and < 1250 psig.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.6.1.(1) - (4)	Monitor RCIC for proper operation.	Verifies;			
		Turbine speed 2250 to 4500 rpm. (SI 1-1340-501, Turb. speed)	[]	[]	[]
		Pmp Disch Press ≤ 1250 psig. (PI 1-1340-7, Pmp disch Press)	[]	[]	[]
		Pmp Suction Press 0 to 25 psig. (PI 1-1340-2, Pmp Suct Press)	[]	[]	[]
		Exhaust Press 1 to 20 psig. (PI 1-1340-3, Turb Exh Press)	[]	[]	[]
	The candidate informs the US RCIC is operating in the pressure control mode with suction from the CCSTs.	The candidate informs the US that task is complete.	[]	[]	[]
CUE	**The US understands that the RCIC is operating in the pressure control mode with suction from the CCSTs.**				

CUE: The JPM is complete.

Stop Time:____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The unit has been SCRAMMED due to a spurious Group I isolation.
- QGA 100 is being executed and relief valves are being used to control reactor pressure by other NSO.
- The U. S. has ordered reactor pressure to be controlled with RCIC.
- RCIC is in standby IAW QCOP 1300-1 with suction from the CCSTs.
- The unit is not in EGC control.
- Torus cooling is on "A" Loop.
- This JPM is NOT time critical

Initiating Cue: The Unit Supervisor directs you to manually start-up RCIC, in the pressure control mode, with suction from the CCSTs using QCOP 1300-02. Establish approximately 400 gpm flow and a discharge pressure of greater than 100 psig. above reactor pressure and less than 1250 psig above reactor pressure.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ____
(print)

JPM: LS-003-I-F Rev. 4 Revision by: G. Thennes

Task Title: Perform the Monthly Core Spray Pump Operability Test for Core Spray Pump B With Failure of Minimum Flow Valve

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R-1400-TP005 K/A: 209001 A4.04 Rating: 2.9/2.9
K/A: 209001 A4.11 Rating:3.7/3.6
K/A: 209001 A4.12 Rating:3.6/3.5

License: RO/SRO Suggested Testing Environment: **Simulator**
(Circle One)

Actual Testing Environment: Simulator X Plant ____ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **16.5 min.** **STOP Time** ________
START Time ________
Time Critical? NO X YES____ **ACTUAL Time** ________

References: QCOS 1400-4, MONTHLY CORE SPRAY PUMP OPERABILITY TEST, Rev. 6

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMMENTS/REMEDIATION: Minor editorial revision to procedure. Does not change the performance of this JPM. The Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:____

Signature:____ Date:____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP REQUIREMENTS

JPM: LS-003-I-F

IC#: IC-21
IC Description: Normal steady state operations or plant shutdown may be used for this JPM.

Manual Actuations: NONE

Malfunctions: Insert malfunction CS06B, Core Spray Minimum Flow Valve Fails to Auto Close

(imf cs06b)

Override 38B hs to neutral: ior zdihs1140238b norm

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Monthly Core Spray System Motor Operated Valve Test was performed last shift and the operability of MO-1-1402-4B has been proven and recorded on QCOS 1400-02.
- The Monthly Core Spray Pump Operability Test is required to be performed this shift.
- An Equipment Attendant is standing by to vent the core spray piping.

Initiating Cue: The Unit Supervisor directs you to perform the Monthly Core Spray Pump Operability Test for the "B" Core Spray Pump IAW QCOS 1400-4.

Start Time:_________

Provide examinee with: QCOS 1400-4 (Evaluator: Ensure step D.1., PREREQUISITES, portion of QCOS is filled in. Reason = Partial for "B" Loop Step D.1 and D.2.) N/A steps as needed.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*H.1.b.	Verify 1B CS disch. hdr filled and vented.	Directs operator to open 1B CS inbrd & outbrd vents (1-1402-17B & 18B, and verify flow from vent, and close inbrd & outbrd vent valves.	[]	[]	

CUE: The NLO reports that water issued from the vents within 1 (one) second and the vents are closed.

H.1.b.(3)/ (4)	Initials QCOS 1400-04 steps H.1.b.(3),(4) (NLO/NSO) **or** directs NLO to initial upon return to control room.	Properly initials QCOS 1400-04 steps H.1.b.(3),(4) (NLO/NSO) or directs upon return to control room.	[]	[]	

CUE: Once asked by NSO: The EA reports he will complete prestart checks on 1B CS pump. Report back to NSO: The EA reports that the prestart checks are satisfactory and he is standing by for pump start.

*H.3.b.(1)	Start 1B CS pump.	Positions CS to on-on light lit.	[]	[]	

CUE: EA reports 1B CS pump is operating satisfactorily.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.3.b.(2)	Verify MO 1-1402-38B opens.	Verifies MO 38B open light lit.	[]	[]	
*H.3.b.(3)	Open MO 1-1402-4B	Positions 4B CS to fully open 4B valve-open light lit.	[]	[]	
H.3.b.(4)	Verify MO 1-1402-38B closes.	Verifies 38B closed light lit.	[]	[]	
H.3.b.(4)	Report the Min. Flow valve did not close.	Informs US that 38B did not close.	[]	[]	

CUE: I understand that the 38B did not close. Shutdown the "B" Core Spray system IAW the procedure.

*H.3.c.(1)	Close MO 1-1402-4B.	Positions CS to close-closed light lit.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*H.3.c.(3)	Stop 1B CS pump.	Positions CS to stop-off light lit.	[]	[]	
H.3.c.(5)	Close MO 1-1402-38b.	Positions CS to close-OPEN light lit.	[]	[]	

CUE: I understand that the 38B will not close. I will write an Action Request and report this to the SM.

EVALUATOR: **Steps H.3.d & e. will only be performed if the core spray discharge pressure cannot be maintained between 40 and 90 psig. If pressure is greater than 90 psig step H.3.d. will be performed. If pressure is reduced to less than 40 psig step H.3.e. will be performed. These steps will become critical if they must be performed.**

H.3.d.(1)	Reduce discharge press. < 90 psig. Crack open MO-1-1402-4B	Cracks open MO-4B to slowly reduce discharge press-dual indication.	[]	[]	[]
H.3.d.(2)	Close MO-1-1402B-4B	Positions CS to close when disch. press. < 90 psig-closed light lit.	[]	[]	[]
H.3.e.(1)	Open MO 1-1402-4B.	Open MO 4B valve (Open light lit).	[]	[]	
H.3.e.(2)	Close MO 1-1402-4 B.	Closes MO 4B valve (closed light lit).	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.3.e.(3)	Fill and vent 1B CS system.	Informs US and/or the EA that the CS system requires filling and venting per QCOP 1400-01.	[]	[]	

CUE: IF requested to fill and vent the system report that it has been completed per QCOP 1400-01.

H.4.	Perform independent verification.	Informs US independent verification required.	[]	[]	

CUE: US understands, he will delegate a man to verify 1B CS system line-up.

	Candidate informs US that the task is complete with the reported deficiencies.	Informs US of task completion.	[]	[]	

CUE: The US understands that the task is complete with noted exceptions.

CUE: The JPM is complete.

Stop Time: __________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

-The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
-The Monthly Core Spray System Motor Operated Valve Test was performed last shift and the operability of MO-1-1402-4B has been proven and recorded on QCOS 1400-02.
-The Monthly Core Spray Pump Operability Test is required to be performed this shift.
-An Equipment Attendant is standing by to vent the core spray piping.

Initiating Cue: The Unit Supervisor directs you to perform the Monthly Core Spray Pump Operability Test for the "B" Core Spray Pump IAW QCOS 1400-4.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-037-I Rev: 10 Revision by: G. Thennes

Task Title: Bypass the Reactor Building Ventilation Isolation

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/A-1600-TP025

K/A: 288000 A2.01 Rating:3.3/3.4
K/A: 223002 A2.09 Rating:3.6/3.7
K/A: 223002 A4.03 Rating:3.6/3.5

License: RO/SRO (Circle One) Suggested Testing Environment: **CR**

Actual Testing Environment: Simulator ___ Plant ___ CR X

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **5.0 min.**

Time Critical? NO X YES ___

STOP Time __________
START Time __________
ACTUAL Time __________

References: QCOP 1600-17 Rev. 3 BYPASSING THE GROUP II ISOLATION AND REACTOR BUILDING VENTILATION ISOLATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedure revision. No change to JPM technical content. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ________________

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE	STANDARDS	SAT UNSAT N/A

EVALUATOR: **ASK THE SHIFT MANAGER ON WHICH UNIT HE WOULD PREFER YOU TO PERFORM THIS JPM PRIOR TO READING THE INITIAL CONDITIONS TO THE CANDIDATE. UNIT 2 IS THE PREFERRED UNIT.**

INITIAL CONDITIONS

- A small leak inside the U-(1)2 Drywell has caused the pressure to creep to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor would like to restart the Reactor building ventilation per QGA 300.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to install the jumpers necessary to bypass the Reactor building ventilation isolation on U-(1)2 IAW QCOP 1600-17 so that ventilation can be restarted.

Start Time:________

Provide examinee with: QCOP 1600-17 when directed by cue.

EVALUATOR: **Do NOT allow the candidate to open the packet of jumpers!!**

EVALUATOR: **Disregard above statement if JPM is being performed in simulator.**

			SAT	UNSAT	
C.2.	Obtains procedure & jumpers.	Locates packet for QCOP 1600-17 in QGA equip. storage cabinet in CR.	[]	[]	C

CUE: You have jumpers & procedure. (Provide candidate with copy of QCOP 1600-17).

			SAT	UNSAT
C.1.	Document procedure requiring installation.	Completes QCOP 1600-17 step C.1.	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.1.a.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts 49 & 50 on terminal board "B".	[]	[]	

**CUE: The jumper is installed on TB "B" pts. 49 & 50.
The jumper has been independently verified.**

*F.1.b.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts. 38 & 39 on terminal board "E".	[]	[]	

**CUE: The jumper is installed on TB "E" pts. 38 & 39.
The jumper has been independently verified.**

F.3.	File QCOP 1600-17.	Places QCOP 1600-17 in jumper log OR Gives to US or SM.	[]	[]	
	Informs the US that the jumpers have been installed.	Informs the US the jumpers have been installed.	[]	[]	

CUE: The Unit Supervisor understands the jumpers have been installed.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- A small leak inside the U-(1)2 Drywell has caused the pressure to creep to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor would like to restart the Reactor building ventilation per QGA 300.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to install the jumpers necessary to bypass the Reactor building ventilation isolation on U-(1)2 IAW QCOP 1600-17 so that ventilation can be restarted.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name____
(print)

JPM: LS-052-I Rev.1 Revision by: G. Thennes

Task Title: **Uncoupled Control Rod During Reactor Startup to Criticality**

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swezle Date: 2-3-00

Task References: L.O. S/R-0300-TP024 **K/A:** 201003A2.02 **Rating:**3.7/3.8
S/R-0302-EK026

License: RO/SRO **Suggested Testing Environment:**
(Circle One)

Actual Testing Environment: Simulator X Plant_ CR_

Testing Method: Simulate_ Perform X

Estimated Time to Complete: 20 **min.** **STOP TIME** ____________
START TIME:__________
ACTUAL TIME:_________

Time Critical? NO X YES__

References: QCGP 1-1 Rev. 18 QCAN 901(2)-5 A-2 Rev. 0 QCOS 0207-01
QCGP 4-1 Rev. 16 QCOA 0300-03 Rev 8 QCOP 0300-07

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory_ Unsatisfactory_

COMMENTS/REMEDIATION: Significantly modified startup JPM to add Uncoupled control rod failure. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name______________________________
Signature______________________________ Date:____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-052-I

IC#: 91 (on Zip Disk)

Must copy IC from ZIP disc to IC file directory in RIS. MST must then be shut down and restarted for it to recognize new IC-91.

IC Description: BOL, Reactor S/U in progress, subcritical just below criticality

Reset the Simulator to IC#91
Take the simulator to RUN and verify Fast 1 is loaded in the RWM
Verify the RWM is initialized and correctly latched to the rod step.
Verify the correct insequence rod step is selected, then FREEZE the simulator until the evaluator cue.
Verify the Rod Sequence book is updated to the correct rod. Rod F-15 next rod out.
Keep the simulator in freeze until the candidate is ready to start this JPM.

Manual Actuation:

Place the SRM Recorder Selector Switches to monitor the highest 2 reading SRMs.

Place the SRM Recorder Speed Switch in FAST.

Once the candidate is ready to start the JPM, take the simulator to run.

Malfunctions: First rod withdrawn travels to the uncoupled position.
RD01R2259, control rod uncoupled 22-59, F-15.

Remotes: None

Overrides: None

Sim Operator: Need to verify rod moves as extra NSO.

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

-Reactor startup is in progress per QCGP 1-1 step F.2.a and QCGP 4-1 step F.2.
-Reactor is subcritical.
-The QNE predicts the Reactor will go critical on Rod Step 6 with Rod H-13 @18 at a temperature of 182°F.
-All required briefings for the Reactor Startup have been completed.
-SRMs counts have doubled 3 times the initial count rate.
-An NSO is present and verifying the rod moves (QIV).

Initiating Cue: The Unit Supervisor directs you to continue the U-1 Reactor Startup and take the U-1 Reactor Critical on a period of 50 to 150 seconds. I am the acting NSO until you are ready to take the shift.

NOTE: When the candidate accepts the shift, take the simulator to RUN and start the JPM timeclock.

START TIME:_______________

Provide examinee with: QCGP 1-1 signed off through step F.1 and a REMA for the Reactor Startup.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.2	Withdraw Control Rods per QCGP 4-1.	Verifies correct control rod selected per control rod (F-15) seq. Sheet, QCIP 0930-07, Att. D..	[ ]	[ ]	[ ]
	Consults QIV for control rod verification.	Receives QIV.	[ ]	[ ]	[ ]
	Re-verifies correct control rod selected.	Re-verifies rod.	[ ]	[ ]	[ ]
	Withdraws selected control rod to desired position.	Withdraws rod F-15. Single notch from position 4-24 per rod seq. Sheet.	[ ]	[ ]	[ ]
	Monitors SRMs during Reactor Startup	Monitors period in attempt to establish SRM period of 50-150 seconds.	[ ]	[ ]	[ ]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

Evaluator: JPM steps may occur in slightly different order due to procedure overlap between the QCOA and QCOS. The critical tasks are to enter the QCOA, enable the RWM, insert and disarm the control rod.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*B.1.	Responds to annunciator 901-5 A2, rod OVTRVL, using QCAN 901(2)-5 A2. May also respond to expected ann. A3 and B3. **NOT** a part of the critical task.	Verifies control rod F-15 position and determines at position 49 using Panel 901(2)-5, RWM main display screen, or OD-7, option 2.	[]	[]	[]
B.2.	Determines control rod F-15 is uncoupled and enters QCOA 0300-03.	Enters QCOA 0300-03.	[]	[]	[]
CUE (if necessary)	**The US will contact the lead nuclear engineer to determine previous history of rod uncoupling.**				
*D.1. (1.a)	Responds to uncoupled rod IAW QCOA 0300-03.	Enable RWM "Rod out-of-Service" option per QCOP 0207-01, step F.6.	[]	[]	[]
*F.6	Steps to enable OOS option.				
	a. Select secondary function	a. Selects sec. funct	[]	[]	[]
	b. Select Rod OOS	b. Selects rod OOS	[]	[]	[]
	c. Select rod F-15	c. Selects rod F-15	[]	[]	[]
	d. Verify F-15 in blue box.	d. Rod F-15 in blue box	[]	[]	[]
	e. Enter request for OOS	e. Request OOS	[]	[]	[]
	f. Drive F-15 to 00	f. Drive F-15 to 00	[]	[]	[]
CUE(if necessary)	**The US directs rod F-15 be driven to 00 IAW the QCOA.**				
CUE(if necessary)	**The QNE will generate a Special Manuver Sheet,**				

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	QCTP 0930-07, Att. G., when he arrives.				
F.6	Continue in QCOP 0207-01, step F.6.				
	g. Select exit function	Select exit function after F-15 at 00.	[ ]	[ ]	[ ]
	h. Verify F-15 is in light blue and has insert and withdraw blocks.	F-15 has insert and withdraw blocks.	[ ]	[ ]	[ ]
D.1 *(1.b)	Continue to respond to uncoupled rod IAW QCOA 0300-03.	Insert control rod F-15 to position 00 (should occur in QCOP 0207-01).	[ ]	[ ]	[ ]
*(1.c)	Electrically disarms rod F-15.	Electrically disarm rod F-15 per QCOP 0300-07.	[ ]	[ ]	[ ]

CUE: Unit Supervisor has initiated actions to have the auxiliary operator disarm the rod.

1.d	Contact QNE for guidance in adjusting the rod pattern.	Contact QNE or inform US of need to contact QNE.	[ ]	[ ]	[ ]

CUE: Unit Supervisor will contact the QNE.

1.e	Perform QCOS 0300-14.	Inform US of the need to complete QCOS-14.	[ ]	[ ]	[ ]

CUE: Unit Supervisor has initiated QCOS 0300-14 and directs you to hold the startup until the outage report is completed. He will ensure the TS action time is not exceeded.

EVALUATOR: The JPM is complete.

Stop Time: ___________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

-Reactor startup is in progress per QCGP 1-1 step F.2.a and QCGP 4-1 step F.2.
-Reactor is subcritical.
-The QNE predicts the Reactor will go critical on Rod Step 6 with Rod H-13 @18 at a temperature of 182°F.
-All required briefings for the Reactor Startup have been completed.
-SRMs counts have doubled 3 times the initial count rate.
-An NSO is present and verifying the rod moves (QIV).

Initiating Cue: The Unit Supervisor directs you to continue the U-1 Reactor Startup and take the U-1 Reactor Critical on a period of 50 to 150 seconds. I am the acting NSO until you are ready to take the shift.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name:____
(print)

JPM: LS-012-I Rev. 7 Revision by: G. Thennes

Task Title: Transfer Torus Water to the Main Condenser via the Condensate Demineralizers

Station Approval: Gary Thennes (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R-1000-TP012 **K/A:** 223001 A2.11 **Rating:** 3.6/3.8

License: RO/SRO (Circle One) **Suggested Testing Environment:** Simulator

Actual Testing Environment: Simulator X Plant___ CR___

Testing Method: Simulate_____ Perform X

Estimated Time to Complete: **11.5 min.** **STOP TIME:**________
START TIME:_______

Time Critical? NO x YES________ **ACTUAL TIME:**_____

References: QCOP 1000-10 Rev. 10, TORUS WATER TRANSFER TO THE MAIN CONDENSER VIA THE CONDENSATE DEMINERALIZERS

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory________ Unsatisfactory_______

COMMENTS/REMEDIATION: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________
Signature:______________________________ Date:____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-012-I

IC#: 21

IC Description: EOC, 100%, QCGP 1-1 complete, all rods full out.

Manual Actuation:
-Start "B" and "C" RHR Service Water Pumps and establish 270 to 280 psig discharge pressure IAW QCOP 1000-4.
-Ensure torus level is at 0 inches.

Malfunctions: NONE

Remotes: When requested by the evaluator, insert remote function RH11R (irf RH11R open) to open the 919B valve. (RHR to "B" condensate pump)

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Both units are operating at near rated conditions.
- The Torus water level needs to be lowered to the lower operating limit prior to performing the HPCI Monthly surveillance.
- Chemistry has been notified of the upcoming water transfer.
- Q-HLA briefing has been conducted.
- The RHR System is filled and vented IAW QCOP 1000-2.
- No water is being transferred on Unit Two and all valve line-ups are normal.
- The "B" & "C" RHR Service Water pumps are running per QCOP 1000-04.
- The S.M. has authorized pumping the Torus to the U-1 Main Condenser via the Cond. Demins due to the Floor Drain Collector Tank being full.
- The Radwaste operator has verified the following valves are CLOSED;
  - -2-2001-833, UNIT 2 TORUS TO HOTWELL XTIE VLV
  - -½-2001-82, TORUS AND CONDENSER XTIE TO RDT VLV
  - -½-2001-85, TORUS CONDENSER XTIE TO WASTE COLLECTOR TK VLV
  - -½-2001-84, TORUS AND CONDENSER XTIE TO FDCT VLV
  - -AO 1-2001-175, DISCHARGE TO HOTWELL
  - -½-2099-60, RADWASTE TO RHR SYS XTIE VLV
  - -1-3399-441, COND TO RW
  - -1-2001-918, COND DECANT PMP TO 2A CONDENSER VLV
- The following valves have been verified closed and locked via the EWCS OOS program:
  - 1-1001-128A, 1A RHR Loop to drain valve
  - 1-1001-128B, 1B RHR Loop to drain valve
  - 2-1001-128A, 2A RHR Loop to drain valve
  - 2-1001-128B, 2B RHR Loop to drain valve
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to line-up and begin reducing the Torus level by transferring water from the Torus to the U-1 Main Condenser via the Condensate Demineralizers, using the 1C RHR Pump. The Unit NSO will maintain condenser water level IAW QCOP 3300-05.

START TIME:______________

Provide examinee with: NA

Additional Questions/Comments:____

____

____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains procedure QCOP 1000-10.	[ ]	[ ]	
F.1.a - d	Verify RHR Loop drn vlvs closed.	Verifies closed & locked from initial conditions the following valves;			
		1-1001-128A (1A RHR Loop to drain vlv)	[ ]	[ ]	[ ]
		1-1001-128B (1B RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
		2-1001-128A (2A RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
		2-1001-128B (2B RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
F.2.a - d	Verify closed in Main Control Room:	MO 1-1001-20, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
		MO 1-1001-21, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
	Ask U-2 for indication on MO 2-1001-20 and 21.	MO 2-1001-20, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
		MO 2-1001-21, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]

CUE: U-2 1001-20 & 21 valves are closed.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

NOTE: Steps F.3.a through F.3.f.1 are accomplished via the set up. If the examinee asks respond that all the valves are closed.

*F.3.f2	Open U-1 torus to hotwell Xtie vlv.	Directs operator to open 1-2001-833 vlv. (U-1 torus to hotwell Xtie vlv.)	[ ]	[ ]	[ ]

CUE: (Simulator Operator) U-1 2001 833 is open.

NOTE: Steps F.4.a and F.4.b are accomplished via the set up. If the examinee asks respond the valves are closed.

*F.4.c	Throttle open B or C Cond pump suct. from RW.	Directs operator to open 1-2001-919B or 919C 3 turns.	[ ]	[ ]	[ ]

NOTE:: Simulator operator to open the 919B valve, RHR to "B" condensate pump. (irf RH11R open)

CUE: (Simulator Operator) 919B is open 3 turns. (No sim. operator action needed, just report valve open.)

F.5	Verify RHR pp. suction from torus.	Verifies MO 1-1001-7C open light lit.	[ ]	[ ]	[ ]
F.6	Verify RHR Xtie vlvs open.	Verifies open light lit for;			
		MO 1-1001-19A (North Xtie Vlv)	[ ]	[ ]	[ ]
		MO 1-1001-19B (South Xtie Vlv)	[ ]	[ ]	[ ]
F.7	Verify RHR SW pumps running.	Verifies "B" & "C" RHR SW pumps run light lit.	[ ]	[ ]	[ ]
*F.8	Open torus test or spray valve.	Positions MO 1-1001-34B to open -open light lit.	[ ]	[ ]	[ ]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

EVALUATOR: **The candidate may dispatch an operator to perform the pre-start checks of the 1C RHR pump. If he does, provide the following cue;**

CUE: 1C RHR pump is ready for start.

*F.9	Start "C" RHR pump.	Positions "C" RHR pump CS to start. -Pump light lit.	[]	[]	[]
*F.10	Immediately open torus water test valve.	Positions MO 1-1001-36B CS to open -open light lit & throttles to establish 3000-3500 gpm on "RHR Flow Ind" (1-1040-7)	[]	[]	[]
*F.13 & 14	Open RHR to RW Disch valves.	Positions CS to open for the following valves;			
		MO 1-1001-20 (RHR to RW Disch Vlv)	[]	[]	[]
		MO 1-1001-21 (RHR to RW Disch Vlv)	[]	[]	
CUE (If necessary)	**If candidate reads reactor conductivity off recorder and gets readings greater than 1.0 micro mho/cm, inform the candidate that Reactor coolant conductivity from pts. 1 and 2 are both .08 micro mho/cm .**				
F.15	Adjust transfer flowrate.	Throttles MO 1-1001-36B to establish 3000-3500 gpm on "RHR Flow Ind" (1-1040-7)	[]	[]	[]
	Candidate informs the US that torus water is being transfered to the U-1 main condenser via the condensate demineralizers, using the 1C RHR pump.	Informs the US that the transfer is in progress.			

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE	STANDARDS	SAT UNSAT N/A

CUE: The Unit Supervisor understands the transfer is in progress.

CUE: The JPM is complete.

Stop Time: ___________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- Both units are operating at near rated conditions.
- The Torus water level needs to be lowered to the lower operating limit prior to performing the HPCI Monthly surveillance.
- Chemistry has been notified of the upcoming water transfer.
- Q-HLA briefing has been conducted.
- The RHR System is filled and vented IAW QCOP 1000-2.
- No water is being transferred on Unit Two and all valve line-ups are normal.
- The "B" & "C" RHR Service Water pumps are running per QCOP 1000-04.
- The S.M. has authorized pumping the Torus to the U-1 Main Condenser via the Cond. Demins due to the Floor Drain Collector Tank being full.
- The Radwaste operator has verified the following valves are CLOSED;
  - -2-2001-833, UNIT 2 TORUS TO HOTWELL XTIE VLV
  - -½-2001-82, TORUS AND CONDENSER XTIE TO RDT VLV
  - -½-2001-85, TORUS CONDENSER XTIE TO WASTE COLLECTOR TK VLV
  - -½-2001-84, TORUS AND CONDENSER XTIE TO FDCT VLV
  - -AO 1-2001-175, DISCHARGE TO HOTWELL
  - -½-2099-60, RADWASTE TO RHR SYS XTIE VLV
  - -1-3399-441, COND TO RW
  - -1-2001-918, COND DECANT PMP TO 2A CONDENSER VLV
- The following valves have been verified closed and locked via the EWCS OOS program:
  - 1-1001-128A, 1A RHR Loop to drain valve
  - 1-1001-128B, 1B RHR Loop to drain valve
  - 2-1001-128A, 2A RHR Loop to drain valve
  - 2-1001-128B, 2B RHR Loop to drain valve
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to line-up and begin reducing the Torus level by transferring water from the Torus to the U-1 Main Condenser via the Condensate Demineralizers, using the 1C RHR Pump. The Unit NSO will maintain condenser water level IAW QCOP 3300-05.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name:______________________________
(print)

JPM: LS-005-II Rev: 12 Revised by: G. Thennes

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task Title: Transfer Aux. Power from XFMR 11 to XFMR 12

Task References: S/R-0002-TP002 **K/A:** 262001 A4.02 **Rating:**3.4/3.4
K/A: 262001 A4.04 **Rating:**3.6/3.7

License: RO/SRO
(Circle One)

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator X Plant ___ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **4 min.**

STOP Time:____________
START Time:___________
ACTUAL Time:_________

Time Critical: NO X YES____

References: QCGP 2-1 Rev. 28 NORMAL UNIT SHUTDOWN
QCOP 6500-09 Rev.3 ENERGIZING 4KV SWITCHGEAR AND TRANSFERRING AUXILIARY POWER

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedures in use to transfer aux. power. No change of conduct of JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________

Signature:______________________ Date______________________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-005-II

IC#: 21 (or any other that will support this task.)

IC Description: The unit is operating at near rated power.

Manual Actuations: NONE

Malfunctions: NONE

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The unit is operating at 100% power.
- Normal Unit Shutdown has just been directed.
- Shift Manager has directed Aux. Power transferred.
- Load Dispatcher (BPO) has given permission to transfer auxiliary power from XFMR 11 to XFMR 12.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to transfer Aux. power from Transformer 11 to Transformer 12.

START TIME ______________

Provide examinee with: Synchroscope key

Additional Questions/Comments:____

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QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains procedure QCGP 2-1 or QCOP 6500-09.	[]	[]	

EVALUATOR NOTE: The step numbers referenced in this JPM are found in QCGP 2-1. If the trainee uses QCOP 6500-09 the task completion is the same, however, the step numbers will be different.

EVALUATOR: **The order in which the busses are transferred is insignificant. The examinee may do steps F.3.b.(1) through F.3.b.(5). or step F.3.b.(6). through F.3.b.(10). first.**

F.3.b.(1)	Turn on synchroscope switch for XFMR 12 to Bus 11.	Insert synch key and rotate to on.	[]	[]	
F.3.b.(2)	Verify: XFMR 11 and XFMR 12 are in phase.	Verify: Synch scope at 12 o'clock and synch lights out.	[]	[]	[]
	Voltages are equal.	Running/incoming voltage equal.	[]	[]	[]
*F.3.b.(3)	Close XFMR 12 to Bus 11 ACB.	Positions bkr control switch to close.	[]	[]	
F.3.b(3)(a)	Verify breaker close indication.	Closed light lit.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.b(3)(b)	Verify alarm 901-8 D-1 Bus 11 Main & reserve ACB parallel lit.	901-8 D-1 "Bus 11 Main and Reserve ACB Parallel" alarm lit.	[]	[]	[]
F.3.b(3)(c)	Verify Amp indication XFMER 12 to Bus 11.	Amps indicated on the XFMER 12 to Bus 11 breaker ammeter on 901-8 panel.	[]	[]	
*F.3.b.(4)	Open XFMR 11 to Bus 11 breaker.	Position bkr control switch to trip.	[]	[]	
F.3.b(4)(a)	Verify breaker open indication.	Open light lit.	[]	[]	[]
F.3.b(4)(b)	Verify alarm 901-8 D-1 Bus 11 Main & Reserve ACB parallel resets.	Reset 901-8 D-1 "Bus 11 Main and Reserve ACB parallel" alarm.	[]	[]	[]
F.3.b(5)	Turn synchroscope switch off for XFMR 12 to Bus 11.	Rotate synch switch to off remove synch key.	[]	[]	
F.3.b(6)	Turn synchroscope switch on for XFMR 12 to Bus 14.	Insert synch key and rotate to on.	[]	[]	
F.3.b(7)(a)	Verify: XFMR 11 and XFRM 12 are in phase.	Verify: Synch scope at 12 o'clock and synch lights out.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.3.b.(8)	Close XFMR 12 to Bus 14 ACB.	Positions bkr control switch to close.	[]	[]	
F.3.b(8)(a)	Verify breaker close indication.	-Closed light lit.	[]	[]	[]
F.3.b(8)(b)	Verify alarm 901-8 B-5 Bus 14 Main and Reserve GCB parallel lit.	901-8 B-5 "Bus 14 Main and Reserve ACB Parallel" alarm lit.	[]	[]	[]
F.3.b(8)(c)	Verify amps indicated on XFMR 12 to Bus 14	Amps indicated on the XFMER 12 to Bus 14 breaker ammeter on the 901-8 Panel	[]	[]	[]
*F.3.b(9)	OPEN XFMR 11 to Bus 14 breaker.	Positions bkr control switch to trip.	[]	[]	
F.3.b(9)(a)	Verify breaker open indication.	-Open light lit.	[]	[]	[]
F.3.b(9)(b)	Verify alarm 901-8 B-5 Bus 14 Main & Reserve ACB parallel resets.	Reset 901-8 B-5 "Bus 14 Main and Reserve ACB Parallel" alarm.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.b(10)	Turn synchroscope switch off for XFMR 12 to Bus 14.	Rotate synch switch to off remove synch key.	[]	[]	
F.3.c.	NOTIFY the Bulk Power Operation (BPO) that transfer of auxiliary power from XFRM 11 to XFMR 12 is complete.	BPO notified.	[]	[]	

CUE: Acting as the Bulk Power Office respond you understand that the power transfer is complete.

	Candidate notifies US that transfer of auxiliary power from XFRM 11 to XFMR 12 is complete.	US notified.	[]	[]	

CUE: The US understands that the transfer of auxiliary power from XFRM 11 to XFMR 12 is complete

CUE: The JPM is complete.

Stop Time: __________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The unit is operating at 100% power.
- Normal Unit Shutdown has just been directed.
- Shift Manager has directed Aux. Power transferred.
- Load Dispatcher (BPO) has given permission to transfer auxiliary power from XFMR 11 to XFMR 12.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to transfer Aux. power from Transformer 11 to Transformer 12.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-016-II Rev: 6 Revision by: G. Thennes

Station Approval: Gary Thennes Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task Title: Bypass the Rod Worth Minimizer

Task References: S/R-0207-TP003 K/A:201006 A3.02 Rating:3.5/3.4
K/A:201006 A4.01 Rating:3.2/3.4

License: RO/SRO Suggested Testing Environment: **Simulator**
(Circle One)

Actual Testing Environment: Simulator X Plant ___ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **20.0 min.**

STOP Time __________
START Time __________
ACTUAL Time __________

Time Critical: NO X YES _____

References: QCOP 207-2 Rev. 5 ROD WORTH MINIMIZER BYPASS CONTROL

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Procedure revision does not change the content of this JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: __________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP REQUIREMENTS

JPM: LS-16-II

IC#: 21 (or any other that will support this task.)

IC Description: The unit is operating at near rated power.

Manual Actuations: -Prepare a Caution Card IAW QOP 207-2 step F.2.a.
-Verify RWM blocks enabled to full.

Malfunctions: RD 19; FAILURE OF ALL RPIS INPUTS TO THE RWM
(imf rd19)

Remotes: NONE

Overrides: "A" and "B" RWM ready light.
(ior zlohs10207ardy off)
(ior zlohs10207brdy off)

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Reactor power is 100% percent of rated and in the process of a normal unit shutdown.
- RWM MODE SWITCH is in NORMAL.
- RWM TRANSFER SWITCH is selected to "A", with the "A" ON LINE light lit.
- Both RWM "A READY" and "B READY" lights are extinguished.
- Annunciator 901-5-B-3, ROD WORTH MIN BLOCK is illuminated.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to bypass the Rod Worth Minimizer IAW QCOP 0207-02, due to failed RPIS inputs.

START TIME ______

Provide examinee with: QCOP 0207-02, now, and a caution card when requested.

Additional Questions/Comments:____

____

____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.1.a.	Determines that both RWM computers are inoperable.	Initials the blank provided for step F.1.a.	[]	[]	
F.2.a.	Prepare a Caution Card to read, "RWM IN BYPASS."	Candidate attaches Caution Card to Rod Movement Control Switch.	[]	[]	

CUE: Provide the prepared Caution Card to the Examinee when actions are initiated to generate the caution card or if requested.

*F.2.b.	Place the RWM switch in bypass.	Moves the RWM Mode Select Switch to bypass.	[]	[]	
F.2.b.	Sign off step as complete.	Enters date and time in the blank provided.	[]	[]	
*F.3.(a)(1)	Demands OD-7 Option 2 from the process computer.	Obtains OD-7 and determines that it is not displaying position.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.3.(a)(2)	Enters rod positions on Attachment A.	Completes Attachment A.			
F.3.b.	Verifies rod pattern is correct.	Compares rod positions in the previous group moved **and** the present group **and** the next group to be moved to Attachment A. **and** initials step F.3.b.	[]	[]	
	Informs US that the rod positions are correct and the rod worth minimizer has been bypassed.	Informs US.	[]	[]	

CUE: The US understands that the rod positions are correct and the rod worth minimizer has been bypassed.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- Reactor power is 100% percent of rated and in the process of a normal unit shutdown.
- RWM MODE SWITCH is in NORMAL.
- RWM TRANSFER SWITCH is selected to "A", with the "A" ON LINE light lit.
- Both RWM "A READY" and "B READY" lights are extinguished.
- Annunciator 901-5-B-3, ROD WORTH MIN BLOCK is illuminated.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to bypass the Rod Worth Minimizer IAW QCOP 0207-02, due to failed RPIS inputs.

QCNPS – JOB PERFORMANCE MEASURE (JPM)

Operator's Name ____
(print)

JPM: LP-001-I Rev: 14 Revised by: G. Thennes

Task Title: Locally Start-up the HPCI System to Control RPV Level

Station Approval: Gary Thennes Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/B-2300-TP012 K/A:206000 2.1.30 Rating:3.9/3.4
K/A:206000 2.1.20 Rating:4.3/4.2

License: RO/SRO **Suggested Testing Environment:** Plant
(Circle One)

Actual Testing Environment: Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **20 min.**

STOP Time:____________
START Time:____________
ACTUAL Time:__________

Time Critical: NO X YES_

References: QCOP 2300-08 Rev. 12 HPCI LOCAL MANUAL OPERATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Updated reference procedure number, minor change (to referenced) procedure step. Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name________________________________
Signature:________________________________ Date:______________

QCNPS – JOB PERFORMANCE MEASURE (JPM)

INITIAL CONDITIONS

- The need exists to utilize U-2 HPCI for level control per QGA 100 but, none of the Control Room controls are responding.
- The HPCI system is available and in standby per QCOP 2300-01 with suction from the CCST's.
- MO-2-2301-6 has been verified open and MO-2-2301-35 & 36 have been verified closed.
- The unit has scrammed.
- Drywell pressure is 1.3 psig.
- Reactor level is +15" decreasing at approximately 1"/min.
- The Shift Manager has ordered local operation of HPCI to add water to the vessel.
- You have a radio for communicating with the Control Room.
- The Control Room will be communicating with the TSC and an EO stationed at the 5 & 6 racks.
- HPCI turbine trips and isolations are cleared.
- All local valve control stations are available.
- An Equipment Operator has been dispatched to the D heater bay to open the HPCI pump discharge valve, MO-2-2301-8, when requested.
- The Diesel Generator Cooling water pump is ON.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to locally start-up the U-2 HPCI system to control reactor level IAW QCOP 2300-08.

Note: Do not start the clock until the candidate is in the HPCI Room.

Start Time:__________

Provide examinee with: None, a local procedure is available in the HPCI room. (copy of QCOP 2300-08 enclosed if the candidate asks for a copy)

Additional Questions/Comments:____
____
____

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
C.3	Obtain key for local vlv control stations. (Will be N/A if candidate chooses to break glass)	Obtains key for local vlv control stations from work execution center	[]	[]	[]

CUE: (if they choose to obtain the key)You have obtained the local vlv control station key.

F.4.d.(1)	Close HPCI stm line drn to mn cond.	Closes air supply to AO 2301-29 & 30 and opens air bleed petcock to AO-29 & 30.	[]	[]	

CUE: (Vlvs fail closed) Both air supplies have been rotated clockwise until they won't turn anymore, the petcocks have been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward vlv seat and has now stopped.

F.4.d.(2)	Open drn trap to drn pot vlv.	Closes air supply to AO 2301-28 and opens air bleed petcock to AO-28.	[]	[]	

CUE: (Vlv fails open) The air supply vlv has been rotated clockwise until it wouldn't turn anymore, the petcock has been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward the air operator and has now stopped.

F.4.e.	Start the GSL blower.	Depresses the GSL blower start pushbutton.	[]	[]	

CUE: The red light is lit.

QCNPS – JOB PERFORMANCE MEASURE (JPM)

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.4.f.	Decrease MSC to LSS.	Rotates MSC handwheel clockwise to LSS (in front standard)	[]	[]	[]

CUE: The attempt is made to rotate the MSC handwheel clockwise but it will not move. (NOTE: Normally at LSS so won't turn)

CAUTION:	Locate air supply to drn valves.	Locates air supply to AO-64 & 65 vlvs.	[]	[]	[]
*F.4.g.	Open HPCI turb. stm supply vlv.	Uses key or breaks glass and depresses MO-2301-3 open PB.	[]	[]	

CUE: The red light is lit. *The trainee should indicate that he is watching the sump for steam.* After several seconds indicate that steam is issuing from the sump.

*F.4.h.	Close above seat drn to sump vlvs.	Closes air supply to AO 2301-64 & 65 and opens air bleed petcock to AO-64 & 65	[]	[]	

CUE: (Vlvs fail closed) Both air supplies have been rotated clockwise until they won't turn anymore, the petcocks have been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward vlv seat and has now stopped.

F.4.i.	Verify open min flow byp vlv.	Verifies MO 2301-14 vlv open light lit.	[]	[]	

CUE: The red light is lit.

QCNPS – JOB PERFORMANCE MEASURE (JPM)

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.4.j.	Start the aux oil pmp.	Depresses the aux. oil pp. start pushbutton.	[]	[]	

CUE: The red light is lit.

*F.4.k.	Reset HPCI turbine and verify STOP valve opens.	Pulls turbine reset handle and verifies the stop valve opens (stem moves up).	[]	[]	

CUE: You have pulled reset handle. Indicate the stem is moving upward.

F.4.o.(1)	Verify open HPCI pmp discharge vlv.	Verified MO 2301-9 vlv open light lit or he may assume vlv is open from initial conditions.	[]	[]	[]

CUE: If candidate verifies open - the red light is lit.

*F.4.o.(2)	Open HPCI pmp disch vlv.	Contacts CR to have EO open MO 2301-8 vlv outside "D" htr bay.	[]	[]	

CUE: CR reports MO 2301-8 vlv is open.

	PERFORMANCE OBJECTIVE	**STANDARDS**	**SAT**	**UNSAT**	**N/A**
*F.4.o.(3)	Start and increase turbine speed.	Rotates MSC handwheel counter-clockwise until turb. speed $\leq$ 4000 rpm & $\leq$ 1250 disch press. (Ind. on 2201(2)-29 rack)	[]	[]	

CUE: You have rotated the MSC counter-clockwise. (When candidate verifies indication) HPCI speed is ≈ 3800 rpm, disch press. is 1020 psig & CR reports that RPV level is -5" and slowly increasing.

F.4.o.(5)	Verify closed HPCI min flow byp vlv.	Verifies MO 2301-14 closed light is lit.	[]	[]	[]

CUE: The green light is lit.

F.4.o(6)	Stop aux. oil pmp.	Depresses aux. oil pmp stop PB.	[]	[]	

CUE: The green light is lit.

F.4.o.(7)	Verify emer. oil pmp off.	Verifies emergency oil pmp is off.	[]	[]	[]

CUE: The green light is lit. CR reports RPV level is +34". You need to decrease HPCI flow.

QCNPS – JOB PERFORMANCE MEASURE (JPM)

PERFORMANCE OBJECTIVE		STANDARDS	SAT	UNSAT	N/A
*F.4.o.(4) (b)	Decrease HPCI flow.	Rotates MSC handwheel clockwise. Any decrease in HPCI flow is adequate.	[]	[]	

CUE: RPV level is now holding steady at +35".

EVALUATOR: **The candidate should inform you that the task is complete. If the candidate does not stop at this point, the next step in the procedure, F.4.p.(8) & (9) is to monitor parameters. Provide the following cues for the desired indication.**

CUE:
-HPCI speed is 3750 rpm.
-Disch Press is 1000 psig.
-Suction pressure is 15 psig.
-Exhaust pressure is 25 psig.

			SAT	UNSAT	N/A
	The candidate should inform the US that U-2 HPCI has been locally started and is controlling reactor level.	Informs the US.	[]	[]	

CUE: The US understands that U-2 HPCI has been locally started and is controlling reactor level.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS – JOB PERFORMANCE MEASURE (JPM)

CANDIDATE'S COPY

INITIAL CONDITIONS

- The need exists to utilize U-2 HPCI for level control per QGA 100 but, none of the Control Room controls are responding.
- The HPCI system is available and in standby per QCOP 2300-01 with suction from the CCST's.
- MO-2-2301-6 has been verified open and MO-2-2301-35 & 36 have been verified closed.
- The unit has scrammed.
- Drywell pressure is 1.3 psig.
- Reactor level is +15" decreasing at approximately 1"/min.
- The Shift Manager has ordered local operation of HPCI to add water to the vessel.
- You have a radio for communicating with the Control Room.
- The Control Room will be communicating with the TSC and an EO stationed at the 5 & 6 racks.
- HPCI turbine trips and isolations are cleared.
- All local valve control stations are available.
- An Equipment Operator has been dispatched to the D heater bay to open the HPCI pump discharge valve, MO-2-2301-8, when requested.
- The Diesel Generator Cooling water pump is ON.
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to locally start-up the U-2 HPCI system to control reactor level IAW QCOP 2300-08.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name____
(print)

JPM: LP-026-I Rev. 5 Revision by: G. Thennes

Task Title: De-energize ADS Valves to Prevent Spurious Operation by Removing Fuses

Station Approval: Gary Thennes (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: L.O. S/R/A/B-4100-TP021 K/A: 218000 A2.06 Rating: 4.2/4.3

License: RO/SRO Suggested Testing Environment: **Plant**
(Circle One)

Actual Testing Environment: Simulator_____ Plant X CR_____

Testing Method: Simulate X Perform_____

Estimated Time to Complete: **10.0 min.** **STOP TIME** ________
Maximum Time to Complete: **10.0 min.** **START TIME** ________
Time Critical? NO____ YES X **ACTUAL TIME**________

References: QCARP 500-01, Rev. 3 UNIT TWO INJECTION WITH SSMP, Att. D, (pg. 1of 18)
QCARP 0000-01, Rev.8 IMPLEMENTING PROCEDURE FOR APPENDIX R SAFE SHUTDOWN, E.18

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: This revision brings the JPM up to the procedure revision. The JPM actions have not been changed. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:________________________________
Signature:________________________________ Date:____________

QCNPS-JOB PERFORMANCE MEASURE

OBTAIN STA APPROVAL, THEN CHECK OUT A KEY FOR THE 902-32 PANEL, FROM THE COMMUNICATION CENTER, PRIOR TO THIS JPM!

EVALUATOR: **Start this JPM in the vicinity of the CR or WEC.**

INITIAL CONDITIONS

- The U-2 Cable spreading room has experienced a severe fire. The fire area is SB-I.
- The U-2 NSO has just scrammed the reactor and is performing all the IMMEDIATE OPERATOR ACTIONS of QCARP 0000-01.
- The Fire Brigade has suppressed the fire but the Shift Manager has determined that normal operating procedures are inadequate to bring the unit to a cold shutdown and that QCARP 0500-01 is the appropriate procedure to utilize for this condition.
- **This JPM is time critical**

Initiating Cue: The Unit Supervisor directs you as the U2 Admin. NSO to perform your block 1 (one) actions of QCARP 0500-01.

EVALUATOR: **Start the clock as soon as you have provided the candidate with the key and procedure.**

START TIME:_______________

Provide examinee with: QCARP 0500-01, ATTCH D and a key for the 902-32 panel.

Additional Questions/Comments:____

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QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
1.	Reports to the appropriate location.	Reports to aux. electric room panel 902-32 3E@ TBFF.	[]	[]	
*1.a.	Prevent relief vlv operation by pulling fuse.	Unlocks panel 902-32 & removes fuse F18.	[]	[]	
CUE	**"The" fuse is removed (point to the fuse indicated by the candidate).**				
*1.b.	Prevent relief vlv operation by pulling fuse.	Removes fuse F22	[]	[]	
CUE	**"The" fuse is removed (point to the fuse indicated by the candidate).**				
*1.c.	Prevent relief vlv operation by pulling fuse.	Removes fuse F23	[]	[]	
CUE	**"The" fuse is removed (point to the fuse indicated by the candidate).**				
*2.	Notify U2 US.	Notifies U2 US that U-2 Admin NSO block 1 actions are complete. This is critical as the US can not continue actions until being informed that block 1 actions have been completed.	[]	[]	

CUE: The Unit Supervisor understands that your block 1 actions have been completed.

CUE: The JPM is complete.

STOP TIME:__________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The U-2 Cable spreading room has experienced a severe fire. The fire area is SB-I.
- The U-2 NSO has just scrammed the reactor and is performing all the IMMEDIATE OPERATOR ACTIONS of QCARP 0000-01.
- The Fire Brigade has suppressed the fire but the Shift Manager has determined that normal operating procedures are inadequate to bring the unit to a cold shutdown and that QCARP 0500-01 is the appropriate procedure to utilize for this condition.
- **This JPM is time critical.**

Initiating Cue: The Unit Supervisor directs you as the U2 Admin. NSO to perform your block 1 (one) actions of QCARP 0500-01.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name: ______________________________
(print)

JPM: LP-003-I-F Rev: 10 Revision by: G. Thennes

Task Title: Locally start-up a Diesel Generator with a Failure of the Vent Fan to Start

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/A-6600-TP004 **K/A:**264000 2.1.30 **Rating:**3.9/3.4
K/A:600000 AA2.17 **Rating:**3.1/3.6

License: RO/SRO (Circle One) **Suggested Testing Environment:** Plant

Actual Testing Environment Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **10.0 min.** **STOP Time:**__________
START Time:__________

Time Critical? NO X YES __ **ACTUAL Time:**__________

References: QCOP 6600-11 Rev. 13 DIESEL GENERATOR LOCAL OPERATION
LN-6600.R04, Emergency Diesel Generator, Rev. 4, pg. 18,62

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name:______________________________

Signature:______________________________ Date:__________________

QCNPS-JOB PERFORMANCE MEASURE
INITIAL CONDITIONS

- A loss of off-site power has occurred on U-1. The U-1 Diesel failed to start.
- A fire in the plant has damaged fire detection cabling as indicated by control room alarms.
- A manual start from the Control Room was attempted but was not successful due to a faulty control switch.
- QCOA 6600-1 has been entered and other operators are taking action directed by that procedure.
- Electricians are investigating the cause of the failure to start.
- The Shift Manager has directed that the U-1 Diesel be started locally.
- The Diesel is in its normal standby line-up with the output breaker open as verified by the Control Room and an Equipment operator, locally.
- The Equipment Operator will standby to verify that the output breaker closes after the Diesel is up to speed, block the Auto- Start Relay as directed by QCOA 6600-1, and locally load the diesel as directed by the Control Room.
- Diesel day tank level is 90% and the storage tank level is 95%.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to locally start the U-1 Diesel Generator in accordance with QCOP 6600-11 and ensure the Diesel is operating properly.

Start time:________

EVALUATOR: Do not start clock until the candidate is in the Diesel Generator Room.

Provide examinee with: None, a local procedure is available in the DG room.

Additional Questions/Comments____

____

____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains copy of QCOP 6600-11 (available in DG Room)	[]	[]	[]
F.2.	Verify maint. switch in "REMOTE AUTO START".	Verifies maint. switch in "up" position. (Engine panel)	[]	[]	[]

CUE: Point to the maintenance switch and state, "This switch is in the "up" position.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.5.	Verifies "SPEED DROOP" set to "0".	At governor, ensures "SPEED DROOP" knob set on "0". (Top left knob)	[]	[]	[]

CUE: Point to "0" position on the speed droop knob and state, "This knob is here."

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6.	Isolate diesel controls.	Positions "Transfer switch" to "LOCAL" at the 2251-10 panel.	[]	[]	[]

CUE: Point to the local position on the transfer switch and state," This switch is in this position. Point to annunciator C-1 on the 2251-10 panel and state. "This annunciator is alarming."

F.7.	Notify plant personnel of Starting the engine.	Notifies the CR to announce the impending engine start, or uses page to announce it to the plant.	[]	[]	[]

CUE: As appropriate state, "I understand you are about to start the engine, I will make an announcement." or the announcement has been delivered to the plant via the page.

*F.8.	Start the engine.	Depresses "START" PB. (Engine panel)	[]	[]	

CUE: The diesel is rumbling and indicates 900 rpm. The E.O. at the bus reports that the output breaker has closed.

EVALUATOR: **In the following step, the red ind. light for the vent fan should be on, however this JPM simulates a trip of the Vent Fan Breaker therefore, when the operator looks at the fan indication both lights will be out.**

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.9.	Verify vent fan on.	Verifies fan red run light lit (on 37 panel) OR senses flow of air as exhaust dampers open.	[]	[]	[]

CUE: **As appropriate state, "Both the red and green fan indicating lights are out" and "You DO NOT feel increased air flow."**

EVALUATOR: **According to the procedure, the operator will identify that the room fan is locked out due to cable damage per step E.3 of QCOP 6600-11. FP Bypass SW is moved to Bypass - Refer to QCOA 6600-08.**

CUE: **If the operator places the DG-1 Vent Fan on ALT FD per E.2 of QCOP 6600-11, the yellow alt. power light will not light and the fan will not start. Inform the candidate that "The yellow light is NOT lit and you DO NOT feel increased air flow."**

CUE: **Following actions by the candidate to get the key, inform the candidate he has the key to the lock box PNL 2251-37. The candidate may choose to simulate breaking the plexiglass to move the switch. If so, inform the candidate that the plexiglass is broken.**

*E.3	Start Vent Fan.	Position the D.G. 1 Vent Fan Fire Prot. Bypass switch to Bypass (QCOA 6600-08, D.2.b.).	[]	[]	

CUE: **As appropriate state, "The DG-1 Fan on FP Bypass red light is lit and you can feel air flow."**

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.10.	Verify DGCWP on.	Verifies DGCWP red run light lit (on 37 panel) OR Verifies pressure on DG htx SW gauges. OR Observes flow meter outside DG room > 900 gpm.	[]	[]	[]

CUE: **As appropriate state, "The DGCWP red light is lit" OR, "The Diesel heat exchanger pressure gauges indicate 60 psig OR, "The flow meter indicates ≈950 gpm."**

CUE: **At the 2251-10 panel POINT to the following indications when the information is requested by the candidate.**

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.11.	Verify DG Frequency at 60hz.	Checks DG frequency meter	[]	[]	[]

CUE: **Point to 60HZ on the gauge and state "Frequency is here".**

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.12.	Verify DG Voltage at 4160.	Checks DG Voltage meter	[]	[]	[]

CUE: **Point to 4160 on the gauge and state "Voltage is here".**

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Report DG status to CR.	Reports to CR to provide them with the current status of the DG.	[]	[]	

CUE: **Provide cues as necessary depending on what the candidate reports to the CR. Inform the candidate that the US will not require any more load to be placed on the Diesel at this time.**

CUE: **The JPM is complete.**

STOP TIME: ________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- A loss of off-site power has occurred on U-1. The U-1 Diesel failed to start.
- A fire in the plant has damaged fire detection cabling as indicated by control room alarms.
- A manual start from the Control Room was attempted but was not successful due to a faulty control switch.
- QCOA 6600-1 has been entered and other operators are taking action directed by that procedure.
- Electricians are investigating the cause of the failure to start.
- The Shift Manager has directed that the U-1 Diesel be started locally.
- The Diesel is in its normal standby line-up with the output breaker open as verified by the Control Room and an Equipment operator, locally.
- The Equipment Operator will standby to verify that the output breaker closes after the Diesel is up to speed, block the Auto- Start Relay as directed by QCOA 6600-1, and locally load the diesel as directed by the Control Room.
- Diesel day tank level is 90% and the storage tank level is 95%.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to locally start the U-1 Diesel Generator in accordance with QCOP 6600-11 and ensure the Diesel is operating properly.

INITIAL SUBMITTAL OF THE SCENARIOS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Simulation Facility Exam Date:	Quad Cities 03-27-00	Scenario No.:1 Exam 1		Op Test No.: 1	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will continue rod withdrawal for heat up and pressurization. The BOP Operator will initiate chest warming. They will respond to a Refuel floor ARM failure and refer to TS. A CRD hydraulic pump trip will occur requiring the RO to start the standby CRD pump. The ECCS Keep Fill pump will trip. The crew will respond IAW the QCOA. They will respond to a IRM failure, reset the half scram and refer to TS. A steam leak will develop in the DW causing DW/P to rise to above 2.5 psig. ECCS injection will occur soon afterwards. All rods will not insert due to a hydraulic ATWS. The DG cooling water pump fails to start when the DG starts. ECCS injection will be terminated. The DG will be tripped due to loss of cooling and rods will be inserted per QCOP 0300-28. Boron injection will not be required.
Initial Conditions:	IC-94 412 psig Sequence Step 9.
Turnover:	Plant startup in progress. QCGP 1-1 is to be continued at step F.4.aa. Control rod withdrawal is to continue to raise reactor pressure to 950 psig. Startup of the first feed pump has been completed and turbine chest warming is to be initiated per QCOP 5600-04. (No relief valve, RCIC or HPCI testing required.) Drywell inerting is in progress IAW QCOP 1600-20 at step F.12.g (1).

Event No.	Malf. No.	Event Type*		Event Description
1	None	R	RO SRO	Continue rod withdrawal to maintain reactor pressurization.
2	None	N	BOP SRO	Initiate turbine chest warming.
3	RM02M	I	BOP SRO	Fuel Pool Channel 'A' Rad Monitor fails downscale
4	RD07A	C	RO SRO	CRD Hydraulic Pump 'A' Trip
5	Console Override RMCS04R	C	BOP SRO	ECCS Keep Fill Jockey Pump trip
6	NM05C Severity 100%	I	RO SRO	IRM 13 High High, half scram
7	MS04C Severity 3%, Ramp 15:00	M	All SRO	Steam leak in the DW (Ramp slow enough that AOP is entered.)
8	DGCWP #1 Trip	C	BOP SRO	DG Cooling Water Pump fails to automatically start.
9	RD13A, Severity 100% RD13B, Severity 100%	M	All SRO	Reactor fail to scram, Hydraulic ATWS

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-01 Outline

1. Scenario will begin with a reactor startup in progress. Control rods are to be withdrawn to maintain reactor pressurization.

2. Per QCGP 1-1 step F.4.j. the BOP operator will initiate main turbine chest warming.

3. A Refuel Floor ARM fails down scale. The crew will respond and declare the instrument INOP and the SRO will refer to Technical Specifications.

4. CRD Hydraulic Pump 'A' will trip. The crew will respond IAW QCAN 901-5, B-2 and QCOA 0300-01. The standby pump will be started.

5. The ECCS Keep Fill Pump trip will require the crew to take actions IAW QCAN 901-3 B-15, QCAN 901-3 B-16, QCAN 901-3 C-8 header high/low pressure alarms and QCOP 1400-03 and crosstie the Condensate Transfer System to keep the systems filled and vented. Crew enters QCOA 1000-01 for RHR header low pressure. If Core Spray pressure drops below 40 psig, then the crew orders the system vented per QCOP 1400-01.

6. IRM 13 will fail High High resulting in a half scram. The IRM will be declared INOP and the SRO will refer to Technical Specifications. The crew will bypass the IRM and reset the half scram.

7. A steam leak develops in the DW. DW/P will slowly rise above the Primary Containment High Pressure Alarm setpoint (1.55 psig). The crew will respond IAW QCAN 901-3, A-16 and QCOA 0201-01. When drywell pressure exceeds 2.5 psig, the crew will enter QGA 100 and 200. Torus and drywell sprays will be initiated to control containment parameters and RHR flow controlled to prevent overfilling the reactor when all LP ECCS injection valves automatically open at 325 psig.

8. The DG Cooling Water Pump fails to start when it's respective DG starts. Cooling water flow cannot be established and the DG will be tripped.

9. Control rods do not insert due to a hydraulic ATWS and QGA 101 will be entered. Rods will be inserted per QCOP 0300-28 and when power falls below range 7 on IRMs the power leg is exited and QCGP 2-3 entered. Boron injection is not required.

The scenario will be terminated when the crew has control of RPV level and control rods are being inserted.

Based on the outline, the critical tasks are:
- Initiating Drywell Sprays.
- Inserting control rods following the ATWS IAW QCOP 0300-28 or QCGP 2-3.
- Controlling injection into the RPV to prevent fuel damage from a power excursion and overfilling the RPV.

References

QCAN 901(2)-3 B-15	Rev. 2	QCOP 0250-02	Rev. 4	QCOP 1400-01	Rev. 7
QCAN 901(2)-3 B-16	Rev. 4	QCGP 1-1	Rev. 31	QCOP 1400-03	Rev. 7
QCAN 901(2)-3 C-8	Rev. 8	QCOA 1000-01	Rev. 8	QCOP 0500-03	Rev 6
QCAN 901(2)-3 A-16	Rev. 5	QCOS 1700-01	Rev. 5	QCOP 0700-02	Rev 7
QCAN 901(2)-3 C-16	Rev. 2	QCOA 0201-01	Rev. 11	QGA 100	Rev. 4
QCOP 0300-28	Rev 14	QGA 200	Rev. 6	QCGP 2-3	Rev. 32
QCOP 5600-04	Rev. 2	QCGP 4-1	Rev. 16	QCOP 1600-20	Rev. 12

I. SIMULATOR SETUP

A. Initialize the simulator to IC94

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment Out Of Service

Hang a caution card on the 1A drywell/torus purge fan and ensure no light indication (breaker racked out, lights should be out)

2. Power Level

a.	Recirc Pump Speed	32%
b.	MegaWatts Electric	0
c.	Reactor Power	0.8%

3. Miscellaneous Setup

a. Initial off steps in rod sequence book up to step 9, rod H-11.

b. Have copy of QCOP 5600-04 signed off up to step F.1.o.

c. Have copy of QCOP 1600-20 signed off up to step F.12.g (1).

d. Have copy of QCGP 1-1 signed off up to step F.4.aa.

e. Have copy of QCOS 0201-02 Attachment "A" "Heat up rate plot" filled out for 4 readings showing a slow heat up rate (5 degrees every 15 minutes).

f. Perform an OD-22 to show heat up rate #44 on monitor screen #2.

g. Have a prepared start-up REMA for use by the crew.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Copy IC94 from zip disc to IC files in RIS at instructor station. Shutdown MST and restart MST to allow the computer to read the new IC94. Reset simulator to IC 94.	**rst 94** **run**	
Hydraulically block both scram discharge volumes using malfunction RD13.	**imf RD13A 100** **imf RD13B 100**	
Prevent the unit 1 emergency diesel generator cooling water pump from autostarting upon an initiation signal.	**irf SW10R PTL**	
Set up turbine metal temperatures on recorder 5640-61 as follows: **In the action lists**, choose the "meters" tab, select "AOTR1564061F" and fill in "ramp start value" as 281, "override value" as 289, and "ramp time" as 60:00 (60 minutes). This overrides the initial metal temperature for point #6 to 281 and simulates a gradual increase due to shell warming.	**In the action list,** select meters tab and type: **AOTR1564061F** **Ramp start value = 281** **Override value = 289** **Ramp time = 60:00**	
Check load set @ zero.		
Check pressure set @ ~75 greater than reactor pressure to keep alarm clear.		
Check RWM is initialized and the sequence is "FAST1"		
Sign steps in rod sequence book up to step 9, rod F-3.		
Have copies of the following procedures: QCOP 5600-04 signed off up to step F.1.o. QCOP 1600-20 signed off up to step F.12.g (1). QCGP 1-1 signed off up to step F.4.aa. QCOS 0201-02 Attachment "A" "Heat up rate plot" filled out for 4 readings showing a slow heat up rate (5 degrees every 15 minutes).		
Perform an OD-22 to show heat up rate #44 on monitor screen #2.		
Have a start-up REMA prepared for use by crew.		
Ensure the White Board on the 901-55 panel is clean.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

   a. Unit 1 is starting up following a short maintenance outage and is currently at 0 MWe; Rod Step 9 is partially withdrawn; QCGP 1-1 is in progress at Step F.4.aa. Shell warming and containment inerting is in progress.

   b. Unit 2 is at approximately 100% power.

   c. Normal electric plant lineup.

   d. Tech Spec limitations:

      (1) Unit 1: NONE

      (2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

   a. Continue with unit startup IAW QCGP 1-1, @ Step F.4.aa, The HLA brief is complete for the start-up. Establish a heat up rate of less than 100 degrees/hour. Maintain pressure set 50 psig greater than reactor pressure IAW QCGP 1-1 F.4.w.(3) A QNE is standing by in the control room. (The surrogate STA or the Simulator Operator may fill the role of the QNE)

   b. Transfer from shell to chest warming per QCOP 5600-04. (No relief valve, HPCI or RCIC testing is required.)

   c. Inerting in progress IAW QCOP 1600-20 at step F.12.g.(1)

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1	Scenario No.: 1	Event No.: 1

Event Description: Pulls rods to establish a heat-up rate of <100^{o}/hour and maintains reactor vessel pressurization during chest warming.- QCGP 1-1, Step F.4.

Time	Position	Applicant's Actions or Behavior
	SRO	• Briefs crew on upcoming evolutions. • Reviews REMA
	RO	• Pulls control rods to establish a heat-up rate of less than 100 degrees/hour IAW QCGP 4-1. • Monitors reactor during shell/chest warming for proper operation. • Maintain pressure regulator setpoint 50 psig > Reactor pressure using the "A" pressure regulator
	BOP	• Secures shell warming by pressing the decrease pushbutton on CHEST/SHELL WARMING SELECTOR to stop steam flow. • When MAIN STOP VALVE POSITION DEMAND FOR CHEST/SHELL WARMING meter indicates 0% • Press the OFF pushbutton on CHEST/SHELL WARMING SELECTOR and verifies OFF pushbutton is lit • Verifies that Main Stop Valve #2 Closed, all CONTROL VALVE POSITION indicates zero, and ISV's OPEN after a period of time • Logs time shell warming secured and point #2 & #6 values from TR 1-5640-61
	SRO	• Verfies operator actions and concurs or directs subsequent actions.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: During validation, approximately a one degree per minute heat-up rate was established after pulling 6 rods. **<u>WHEN</u>** performing Shell/Chest Warming, **<u>THEN</u>** steam should be admitted slowly and/or should be changed in small increments for the duration of the Chest Warming to avoid excessive Reactor pressure transients.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 2

Event Description: Initiate turbine chest warming.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs chest warming. Verifies operator actions and concurs or directs subsequent actions.
	BOP	• Verifies MAIN STOP VLV POS DEMAND FOR CHEST/SHELL WARMING meter is at zero. • Verifies ALL VALVES CLOSED is selected on SPEED SET RPM selector. • Verifies Main Turbine reset. • Verifies Main Turbine remains on Turning Gear **OR** **NOT** at rest. • Presses OFF pushbutton on CHEST/SHELL WARMING SELECTOR. • Momentarily presses INCREASE pushbutton as necessary on CHEST/SHELL WARMING SELECTOR to admit steam. • Verifies MSV2 begins to OPEN. • Verifies STEAM CHEST temperature rises. • Adjusts steam flow to maintain the following as indicated on TR 1(2)-5640-61: • Verifies Point #4, STEAM CHEST INNER surface heatup rate less than 150°F/hr. • Verifies differential temperature between Point #4, STEAM CHEST INNER surface temperature **AND** Point #5, STEAM CHEST OUTER surface temperature in accordance with Attachment B.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: Either the surrogate STA or the Simulator Operator may role play as the QNE as needed.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 3
Event Description: Fuel Pool Channel "A" Rad Monitor fails downscale

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Annunciator 901-3 C-16 alarms • Refers to annunciator procedure. • Monitors REFUEL FLOOR RAD MONITOR CHANNNEL "A" unit for downscale indications. • Verifies that power is available to the radiation monitor by dispatching an NLO to check RPS bus 1A breaker#5 on, fuse in 901-40 terminal board BB fuse 1701-703F. • Determines that radiation monitor is inoperative and performs QCOS 1700-01
	SRO	• Determines that the channel must be returned to operable status within two hours or take the action required. Establish secondary containment integrity, isolate reactor building and control room ventilation systems, and have SBGTS operating within one hour. • Verifies immediate operator actions and concurs with or directs subsequent actions • Contacts maintenance to effect repairs. • Verifies operator actions and concurs or directs subsequent actions.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event # 3, insert a Fuel Pool Rad Monitor failure downscale using RM02M. ROLE PLAY: If dispatched as NLO to check RPS bus 1A breaker#5 report back 3 minutes later that the breaker is ON. If dispatched as NLO to check fuse in 901-40 terminal board BB fuse 1701-703F in Aux. Electric room, report that the fuse is intact.	**Imf RM02M 0**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 4

Event Description: CRD Hydraulic Pump "A" Trip

Time	Position	Applicant's Actions or Behavior
	RO	• References QCAN 901-5 B-2 for CRD pump trip • Closes or verify closed MO 1(2)-301-2A/B 1(2) A/B PMP DISCH VLV for the standby pump. • Starts the standby pump. • Verify steady-state current is <34 amps on 1(2)-302-1A/B. • Throttle MO 1(2)-301-2A/B, 1(2)A/B PMP DISCH VLV to maintain 1400-1500 psig discharge pressure. • Closes MO 1(2)-301-2A/B, 1(2)A/B CRD PMP DSCH VLV on the tripped pump. • Dispatches an operator to verify proper operation of the running pump/cause of "A" pump trip. • Refers to QCOA 0300-01.
	SRO	• Verifies operator actions and concurs or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the radiation monitor failure to allow the RO to receive credit for a component failure.		
When directed by the Chief Examiner to insert event #4, insert a trip of the 1A CRD pump using RD07A	**Imf RD07A**	
ROLE PLAY: As NLO dispatched to investigate the 1A CRD pump trip, report back in 5 minutes that the pump is very hot and the breaker has a timed overcurrent target up. If asked to check out the 1B pump, after it is started wait 2 minutes and report that it appears to be operating normally.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 5

Event Description: ECCS Keep Fill Jockey Pump Trip

Time	Position	Applicant's Actions or Behavior
	BOP/RO	• Refers to annunciator procedures (several applicable) • Monitors Core Spray/RHR header discharge pressure on PI 1(2)1450-1A/B, CS HEADER PRESS/PI 1(2)-1040-2A/B RHR PMP DISCH PRESS. • Refers to QCOA 1000-01 if unable to maintain RHR header pressure above 57 psig. • Verifies ECCS FILL SYSTEM is in operation per QCOP 1400-03 by dispatching NLO to the pump. • Determines which source of water is feeding the ECCS Fill System. • Requests permission from Unit Supervisor to valve in Condensate Transfer System. • Directs NLO to valve in Condensate Transfer System and secure 1(2)-1402-57, Jockey Pump per QCOP 1400-03.
	SRO	• Checks Technical Specifications (12 hour shutdown LCO due to inoperability of RHR and Core Spray systems until alternate keep fill system valved in and systems are filled and vented) • Verifies operator actions and concurs or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, insert a trip of the ECCS keep fill (jockey pump) using remote function CS04R	**Irf CS04R trip**	
ROLE PLAY: As NLO dispatched to the jockey pump or breaker, report back in 4 minutes that the pump is not running and the breaker is tripped.		
As NLO dispatched to valve in Condensate Transfer System and secure 1(2)-1402-57,Jockey Pump per QCOP 1400-03, after 5 minutes insert the remote function for the norm operation of the jockey pump and report back that the condensate transfer system is valved in.	**irf CS04R norm**	
If directed to perform a fill and vent of either or both Core Spray and RHR systems, report back after 10 minutes that both systems are filled and vented and solid water flow was observed approximately 1 or 2 seconds after valves were opened in both systems.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 6		
Event Description: IRM 13 High High, Half Scram		
Time	**Position**	**Applicant's Actions or Behavior**
	RO/BOP	• Verifies that Automatic Actions occur, half scram on "A" channel. • Monitors IRM indicating lights on 901(2)-5 panel and determines if alarm was caused by IRM high-high or IRM INOP. • Verifies IRMs at proper range per QCOP 0700-02. • Notifies Instrument Maintenance. • Positions appropriate IRM joy stick to • bypass IRM channel. • Verifies white BYPASS light is on for • Resets ½ scram IAW QCOP 0500-03.
	SRO	• Checks Technical Specifications and determines that minimum number of operable channels of IRMs met. • Directs RO to bypass the failed IRM and to reset the ½ scram. • Verifies operator actions and concurs or directs subsequent actions.

Comments: ____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the keep fill pump failure to allow the RO to receive credit for an instrument failure.		
When instructed by the Chief Examiner to insert event #6, fail IRM 13 upscale using malfunction NM05C.	**Imf NM05C 100**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 7

Event Description: Steam Leak in the DW

Time	Position	Applicant's Actions or Behavior
	SRO	• Verifies immediate operator actions and concurs with or directs subsequent actions of QCOA 0201-01. • Sets scram criteria • Enters QGA 100 and 200 if drywell pressure reaches 2.5 psig. • Orders the 7th drywell cooler started • Monitors torus water temperature and initiate torus cooling at >90°F in the torus.
	BOP/RO	• Investigates the cause of increasing drywell pressure IAW QCOA 0201-01. • Starts the 7th drywell cooler. • Notifies RP of increasing drywell pressure. • Verifies proper line-up for inerting drywell.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #7, insert a steam leak in the "C" main steam line using malfunction MS04C.	**Imf MS04C 3 15:00**	

Op-Test No.: 1	Scenario No.: 1	Event No.: 8 & 9

Event Description: Reactor Fail to Scram, Hydraulic ATWS, & U-1 EDGCWP fails to autostart.

Time	Position	Applicant's Actions or Behavior
	RO	• Scrams reactor, places Mode Switch in SHUTDOWN, activates ARI, rods do not insert, reports failure to scram to US, runs recirculation pumps to minimum
	SRO	• Directs actions of QGA 100 and QGA 101. • Orders ADS inhibited, Core Spray injection prevented • Orders isolations and automatic actions verified for +8" and 2.5 psig. • Orders performance of QCOP 0250-02. • Orders reactor level maintained between 166" and +48" with condensate/feedwater.
Critical Task		• Orders control rods inserted IAW QCOP 0300-28 or with QCGP 2-3 when power leg is exited. • Exits power leg when reactor power below IRM range 7
Critical Task	RO/BOP	• Inhibits HPCI injection • Inhibits ADS. • Places core spray pumps in PTL. • Verifies isolations and automatic actions for +8" and 2.5 psig, reports that unit 1 EDGCWP did not autostart and dispatches an operator. • Reports recirc pumps tripped.
Critical Task		• Performs QCOP 0300-28 actions, or QCGP 2-3 to insert control rods. • Directs NLO to close CRD 25 valve if necessary. • Ranges IRMs and informs US power below IRM range 7.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: Can't enter QGA 101 unless QGA 100 entered first. During validation, US had to wait until 2.5 psig was reached in drywell due to low initial power.		
ROLE PLAY:		
As U-2, when directed, install QGA jumpers per QCOP 0250-02 to bypass isolations in QGA 101 using QG09R. Wait 3 minutes before reporting that the jumpers are installed.	**Irf qg09r**	
As U-2, when directed, install QGA jumpers per QCOP 0300-28 to bypass automatic scram signals using QG08R. Wait 3 minutes before reporting that the jumpers are installed.	**Irf qg08r**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 9 con't

Event Description: Reactor Fail to Scram, Hydraulic ATWS continued…

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Directs recirc pumps and drywell coolers tripped.
Critical Task		• Directs drywell sprays.
		• Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Verifies CAMS started.
	RO/BOP	• Initiates torus sprays • Verifies recirc pumps tripped. • Verifies drywell coolers tripped.
Critical Task		• Initiates drywell sprays.
Critical Task		• Controls RHR flow to maintain contaiment pressure decrease while preventing injection if not needed.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
The scenario will be terminated when the crew has control of RPV level and control rods are being inserted.		

Simulation Facility Exam Date:	Quad Cities 3/27/00	Scenario No 2 Exam 1		Op Test No 1	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will respond to a controller failure during performance of the SBGTS monthly surveillance. A APRM fails hi resulting in a half-scram. The crew bypasses the APRM and resets the half-scram. High vibration will be indicated on the "A" RR pump. Reactor power will be reduced with flow. The vibrations will cause gross seal degradation and eventually a RR suction line break. Actions taken to isolate the seal will be unsuccessful and DW/P will rise to above 2.5 psig. All LP and HP ECCS systems will receive an initiation signal. HPCI will not inject due to a controller failure until the crew takes manual control of the HPCI controller. QGA 100 and 200 will be entered. The first loop of torus spray selected will not operate, the second loop will operate. One set of SDV drain valves will not autoclose when the scram occurs. The RO will close the valves from the 901-5 panel.
Initial Conditions:	IC 21, 100 % power. "C" Reactor Feed Pump is tagged OOS.
Turnover:	Plant is presently at 100% power. "C" Reactor Feed Pump is tagged OOS for a bearing inspection. Monthly operability test (QCOS 7500-05) for "B" SGT train is to be performed following shift turnover.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Perform monthly SBGTS operability surveillance.
2	NM08A.100	I	RO SRO	APRM Channel "A" fails high/high
3	PC11B 40	I	BOP SRO	SBGTS flow controller fails to allow required system flow.
4	ANO9014C3 Alarm_on	R	RO SRO	Reduces core flow in response to high recirculation pump vibrations.
5	RR06A 100 5: RR07A 100 6:	C	BOP SRO	Recirculation pump seal failure
6	RR10B 5 10:00	M	BOP RO SRO	Recirculation pump suction line break. Increase failure to 5% over a 10 minute ramp time.
7	RD23A	C	RO SRO	Scram discharge volume drain valve sticks open. Removed by event trigger when close pushbutton is depressed.
8	Batch file for MO 1001-37A&B	C	BOP SRO	The selected torus spray valve fails to open(breaker trips), however the other loop valve will operate.
9	HP09 40	I	BOP SRO	HPCI controller failure prevents injection into the RPV in automatic. Manual operation possible. Inserted on a trigger on HPCI speed >0.5rpm.

*(N)ormal, (R)eactivity (I)nstrument, (C)omponent, (M)ajor Transient

Scenario 2000-02 Outline

1. Scenario will begin with the reactor at 100% power. "B" SBGT monthly operability surveillance is to be completed per QCOS 7500-05.

2. An APRM 'A' will fail hi resulting in a half-scram. The reactor operator will bypass the APRM and reset the half-scram. The SRO will refer to and comply with Technical Specifications for loss of one APRM.

3. A failure of the SBGT controller prevents satisfactory surveillance and the "B" SBGT system will be shutdown and declared inoperable. The SRO will refer to and comply with Technical Specifications for SBGTS inoperative.

4. High vibration is annunciated on recirculation pump "A". The alarm cannot be reset and reactor power is lowered with RRC flow as directed by QCAN 901-4 C-3 and IAW QCGP 3-1.

5. As flow/power is being lowered RRC seal failure is indicated on the "A" RRC pump. [The failure degrades rapidly causing DW/T and DW/P to rise.]

6. Excessive vibrations cause a suction line break on the "A" RRC pump. DW/P and DW/T continue to rise. The reactor should be scrammed as a conservative action before DW/P reaches the trip setpoint. QGA 100 and 200 will be entered and executed.

7. Torus sprays will be directed, but the spray valve for the selected loop will not open when the valve is stroked. The other loop can be initiated successfully.

8. A HPCI controller failure will prevent proper initiation and injection. This failure will be identified and reported. Manual operation of HPCI is possible if so desired by the crew.

9. One set of SDV drain valves fails to close on the scram. The Reactor Operator will close the valves from the 901-5 panel IAW QCGP 2-3.

The scenario will be terminated when the crew has stabilized RPV level above TAF, initiated containment sprays and containment parameters are stable.

Based on the outline, the critical tasks are:

- Initiating Drywell Sprays.
- Isolating the SDV drain valves following the scram.
- Maintaining RPV water level above TAF.

References

QCOS 7500-05	Rev. 18	QCOP 0700-04	Rev. 4
QCOP 0500-03	Rev. 6	QCOP 1600-12	Rev. 7
QCAN 901(2)-5 A-6	Rev. 3	QCAP 0230-19	Rev. 8
QCAN 901(2)-4 C-3	Rev. 3	QCOA 0202-04	Rev. 11
QCOA 0202-06	Rev. 11		
QGA 100	Rev. 4		
QGA 200	Rev. 6		
QCGP 2-3	Rev. 32		
QCGP 3-1	Rev. 18		
QCOP 1000-30	Rev. 11		

I. SIMULATOR SETUP

A. Initialize the simulator to IC 21.

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (4)

"C" Reactor Feed Pump
both supply breakers bus 11 & 12 (PTL)
auxiliary oil pump (PTL)
minimum flow valve (CLOSED)

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	820
c.	Reactor Power	100%

3. Miscellaneous Setup

a. Verify no LPRMs are bypassed in 901-37 panel.

b. Provide a copy of QCOS 7500-05 marked up appropriately for the B train of SBGT.

c. Have Caution Cards and Action Request Tags available.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC21.	**rst 21** **run**	
Fail the "B" SBGTS flow controller using malfunction PC11B @ 40% severity.	**imf pc11b 40**	
Fail the HPCI flow controller using malfunction HP09 @ 40% severity and assign to trigger 1	**Select event trigger button.** **Select trigger #1.** **Select HPCI speed > 0.5 rpm from the pulldown menu.** **Enter command imf HP09 40** **Select accept new event.**	
Fail the scram discharge volume drain valves to stick open using malfunction RD23B.	**IMF RD23B**	
Assign trigger 2 to delete malfunction RD23B when the south scram discharge volume drain valve close pushbutton is depressed.	**Trg 2 1030222sdvclose**	
Assign the command to delete malfunction rd23b to trigger 2. NOTE make sure you enclose the command in quotation marks as written	**Trg 2 "dmf rd23b"**	
Copy files "Torusspray37Atrip" & "Torusspray37Btrip" from zip disc to trigger directory in RIS on simulator computer.		
Copy batch file "torusspray17abtrip" from zip disc to batch directory in RIS on simulator computer.		
Trip the breaker on the first selected torus spray valve using batch file torusspray37abtrip	**Bat torusspray37abtrip**	
Assign trigger 3 to trip the 1A Rx feed pump when 2.5 psig is reached in the drywell.	**Select event trigger button.** **Select trigger #3.** **Select drywell pressure greater than 2.5 psig from the pulldown menu.** **Enter command imf fw01A** **Select accept new event.**	
Ensure the White Board on the 901-55 panel is clean.		
Ensure copy of QCOS 7500-05 marked up appropriately for the B train of SBGT is available.		
Verify no LPRMs are bypassed in 901-37 panel.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

    a. Unit 1 is at approximately 100% power at approximately a 98% FCL.

    b. Unit 2 is in day 6 of a 20 day refueling outage.

    c. Normal electric plant lineup.

    d. Tech Spec limitations:

        (1) Unit 1: NONE

        (2) Unit 2: NONE.

2. Significant problems/abnormalities:

    "C" reactor feed pump is OOS for bearing replacement.

3. Evolutions/maintenance for the oncoming shift:

    a. Continue to operate the plant IAW operating procedures.

    b. The monthly operability surveillance for "B" train of SBGTS IAW QCOS 7500-05 following shift turnover.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1 Scenario No.: 2 Event No.: 1 & 3

Event Description: Perform SBGTS Monthly Operability Surveillance IAW QCOS 7500-05

Time	Position	Applicant's Actions or Behavior
	SRO	Approves QCOS 7500-05 for "B" Train Operability Testing of SBGTS
	BOP	• Notifies Radiation Protection of upcoming SBGTS start. • Records run time for "B"SBGTS train from NLO at local panel • Verify 1-7503 U1 RB INLET DMPR TO SBGTS **AND/OR** 2-7503 U2 RB INLET DMPR TO SBGTS are open • Place the 1/2B SBGTS TRAIN MODE SELECTOR SWITCH to B START • Verify the ½-7504B TURB BLDG CLG AIR DMPR closed • Verify the ½-7505B INLET DMPR open • Verify the ½-7506B 1/2B SBGTS FAN on • Verify the ½-7503B SBGTS AIR HTR on. • Verify the ½-7507B, 1/2 SBGTS FAN DISCH DMPR open. • Verify ½-7540-13B SBGTS flow on 1/2B SBGTS FLOW is 3600 to 4400 scfm and record • Recognizes inability to achieve proper flowrate and notifies US.
	SRO	• Refers to Technical Specifications and determines per 3.7.P. action 1 that the plant is in a 7 day LCO and must stop fuel moves, core alterations, and operations that could have the potential to drain the reactor vessel on U-2. • Directs shutdown of the system per the procedure or dispatches maintenance personnel to investigate the problem. • Verifies operator action and concurs with or directs subsequent actions.
	BOP	• Shuts down the system per the procedure or dispatches maintenance personnel to investigate the problem.

Comments:____________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
ROLE PLAY: As NLO at the SBGTS train, when asked for "B" train run time meter reading, report that the meter reads 2468.2 hours. If asked, as NLO, for a local flow indication, report flow @ 3400 scfm. If asked, as NLO, for final run time, report in hours and tenths of hours. One tenth for every six minutes they leave the train run.		

Op-Test No.: 1 Scenario No.: 2 Event No.: 2

Event Description: "A" APRM Fails Upscale Resulting in a ½ Scram

Time	Position	Applicant's Actions or Behavior
	RO	• Refers to QCAN 901-5 A-6 annunciator procedure • Checks for core instabilities (APRMs cycling 2-3 seconds) • Checks for High indications on individual LPRMs for that channel
	SRO	• Determines individual failure of APRM #1 • Checks Technical Specifications 3.1.A.1 & 3.2.E.1. and determines adequate number of operable channels and no LCO. • Directs RO to bypass APRM #1 with QCOP 0700-04 and to reset the ½ scram per QCOP 0500-03. • Initiates QCAP 0230-19 "Outage Report" for tracking purposes.
	RO	• Positions APRM #1 joystick to bypass and verifies the white bypass light illuminates for APRM #1.
	RO	• Resets ½ scram by placing the SCRAM RESET SWITCH to positions group2 and 3, then to group1 and 4 and verifies annunciator 901-5 D10 clears and scram solenoid channel "A" lights illuminate.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the SBGT surveillance to allow the RO to receive credit for an instrument failure.		
When directed by the Chief Examiner to insert event #2, fail the channel 1 "A" APRM upscale using malfunction nm08a @100% severity with no ramp time.	**Imf nm08a 100**	
Provide the crew with a Caution Card or Action Request tag when requested.		

Op-Test No.: 1 Scenario No.: 2 Event No.: 4 Event Description: Recirculation Pump 1A High Vibrations		
Time	Position	Applicant's Actions or Behavior
	RO	• Refers to annunciator procedure QCAN 901-4 C3 • Attempts to reset vibration monitor by depressing PUMP VIBRATION MONITOR RESET pushbutton • Reduces both recirculation pumps speeds to 78%. • Reviews current performance of both recirculation pumps for abnormalities. • Contacts Vibration Engineer to begin evaluating recirculation pump vibration data. • Notifies US of vibration problem and actions taken.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions.

Comments:______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event is the reactivity change for the RO and the BOP should be precluded from adjusting recirculation pump speeds if at all possible to allow the RO to receive credit for a reactivity manipulation.		
When directed by the Chief Examiner to insert event #4, override annunciator 901-4 C3 "recirc pump A high vibration" using malfunction ano9014c3	**Imf ano9014c3 on**	

Op-Test No.: 1 Scenario No.: 2 Event No.: 5 Event Description: Recirculation Pump 1A Seal Failure.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Refers to QCOA 0202-06. • Monitors pump seal pressures and temperatures • Monitors drywell pressure and temperature. • Dispatches NLO to check local seal indication. • When drywell pressure increases, trips the 1A recirculation pump using the generator drive motor control switch. • Verifies the recirculation pump trips. • Closes the 1-202-4A pump suction valve. • Closes the 1-202-5A pump discharge valve. • Refers to QCOA 0202-04.
	SRO	• Verifies operator actions and concurs with or directs subsequent action.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, fail both of the 1A recirc pump seal by inserting the following:		
Fail the inboard reactor recirc pump seal using malfunction RR06a @ 100% severity over a five minute ramp time.	**imf rr06a 100 5:00**	
Fail the outboard reactor recirc pump seal using malfunction RR07a @ 100% severity over a six minute ramp time .	**imf rr07a 100 6:00**	
When "A" recirculation pump is tripped trigger 2 should delete annunciator override on vibration monitor. If the annunciator stays up, manually delete the override using command dor ano9014C3.	**Select event trigger button.** **Select trigger #2.** **Type in .NOT.RR:MTR1020251A in the event.** **Enter command dor ano9014C3** **Select accept new event.** **Select finish.**	
NOTE: If crew isolates the recirculation pump quickly, drywell pressure may not rise to the point that they scram the reactor. The next event breaks the recirculation loop to increase drywell pressure to the point of reactor scram.		

Op-Test No.: 1 Scenario No.: 2 Event No.:6,&,8 Event Description: "A" Recirculation Loop Suction Line Break		
Time	Position	Applicant's Actions or Behavior
	ALL	• Drywell pressure increase noted and reactor scrammed.
	RO	• Reports all rods in, water level recovering, reactor pressure normal, and +8" QGA entry condition.
	SRO	• Directs the actions of QGA 100 at 2.5 psig in the drywell. • Directs performance of QCGP 2-3. • Directs that automatic isolations, ECCS and EDG starts verified. • Directs reactor level be controlled between 8 & 48" with feedwater, may need to transfer to HPCI as hotwell empties. • Directs a band for reactor pressure to be controlled using bypass valves and/or ADS valves if needed. Directs a cooldown at < 100 degrees/hour.
	BOP/RO	• Verifies automatic isolations, ECCS & EDG start.
Critical Task	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Verifies/Directs recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Directs torus cooling be initiated to keep torus less than 95 degrees. • Verifies/Directs CAMS started. Directs torus level reduced IAW QCOP 1600-12 when level is greater than +2".

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
***When directed by the Chief Examiner to insert event #6, fail the "A" recirc pump suction line @ 5% severity over a 10:00 minute ramp time using malfunction rr10a.	**imf rr10a 5 10:00**	
Trigger 3 should trip the 1A reactor feed pump trips @ 2.5 psig in the drywell. If it doesn't trip, manually trip it using malfuntion fw01A	**Imf fw01A**	

Op-Test No.: 1 Scenario No.: 2 Event No.:6,&,8 continued Event Description: "A" Recirculation Loop Suction Line Break continued.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Attempts to initiate torus spray. • Reports that torus spray isolation valve does not open. • Attempts to initiate torus spray on other loop. • Reports that torus spray initiated on other loop.
Critical Task	BOP/RO	• Trips recirc pumps. • Trips drywell coolers • Initiates drywell sprays. • Terminates drywell spray prior to drywell pressure dropping to 0 psig. • Terminates torus spray prior to torus pressure dropping to 0 psig. • Initiates torus cooling. • Reduces torus level IAW QCOP 1600-12.
	SRO	• Verifies operator action and concurs with or directs subsequent actions.

Comments:_______________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1 Scenario No.: 2 Event No.: 7,& 9

Event Description: Scram Discharge Volume Drain Valve Sticks Open, HPCI Flow Controller Failure.

Time	Position	Applicant's Actions or Behavior
	RO	• Enters QCGP 2-3 and performs scram checklist.
		• Reports 1A Reactor feedpump trip and S/B is OOS, level lowering.
Critical Task		• Discovers that one set of scram discharge volume drain valve did not autoclose on the scram and closes them with the pushbutton.
		• Reports automatic isolation failure to US.
Critical Task **		• Injects with preferred or alternate systems as directed to restore reactor level.
	BOP	• Reports to US that HPCI is not developing adequate discharge pressure.
		• Switches HPCI flow controller to manual and injects as hotwell is depleted to maintain reactor water level.
Critical Task **		• Injects with preferred or alternate systems as directed to restore reactor level.
	SRO	• Verifies operator action and concurs with or directs subsequent actions.
Critical Task		• Directs other preferred injection systems to restore reactor level, may utilize alternate systems as needed.
		• Directs that ADS be inhibited when determines that reactor level can't be maintained above –59".

** NOTE that either RO or BOP can perform critical task of injecting to restore level, both do not need to perform task.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When the NSO attempts to close the scram discharge volume drain valves they should go closed(malfunction #7). Delete malfunction RD23B as necessary to ensure that they close when the pushbutton is pressed.	**dmf RD23B**	
The HPCI flow controller failure should prevent injection in automatic (malfunction #9), however if selected to manual, they should be able to inject with HPCI.		
NOTE: ***If HPCI failure not detected early enough and reactor pressure falls to within the capability of HPCI injection with the current degradation of the flow controller, it may be necessary to increase the severity of the flow controller failure to less than 40%.***		
The scenario will be terminated when the crew has stabilized RPV level above TAF, initiated containment sprays and containment parameters are stable.		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No.3		Op Test No	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will swap reactor building ventilation fans. The crew will then raise reactor power to rated with RRC flow. After power has been raised ≈ 5% a control rod drift will occur. Following recovery from the rod drift, RRC pump 'B' will suffer a speed signal failure. All of the following will ultimately result in using Alternate Injection systems to restore RPV/L. An over current condition will exist on Bus 13-1, which supplies bus 18. The crew will respond to a loss of Bus 13-1 and crosstie bus 18 to bus 19. The B feed header will rupture in the drywell causing lowered RPV/L and elevated DW/T and DW/P. Feed, Condensate, HPCI and SSMP will be unavailable to restore RPV/L. RCIC will be available. RHR pump "D" breaker fails to close and Core Spray 'B' fails to automatically initiate. Core Spray Pump 'B' can be started manually, but Core Spray injection valve 25 'B' will not open from the Control Room. The crew will blowdown and inject with alternate injection systems. Core Spray valve 25B can be manually opened WHEN such action is directed by the US.
Initial Conditions:	IC-21, with reactor power lowered with RRC flow to 90% power. "B" RHR pump tagged OOS for breaker repair.
Turnover:	Reactor Building Ventilation fans are to be swapped IAW QCOP 5750-02 following turnover. Reactor power was lowered to 90% at the request of the load dispatcher. Power is to be returned to rated. "B" RHR pump is tagged OOS for coupling replacement. A 5.9 magnitude earthquake has occurred near Keokuk, Iowa. The previous shift has implemented QCOA 0010-09, "Earthquake". The IMs are gathering information from the seismographs and operators are inspecting the plant for leaks.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Swap Reactor Building Ventilation Supply/Exhaust Fans.
2	None	R	RO SRO	Raise reactor power with RRC flow.
3	RD03R0619	C	RO SRO	Control rod 06-19 (B-5) drifts in
4	RR09B Severity 0%, Ramp 1:00	I	RO SRO	Recirc Pump 'B' Speed Signal Fails Low
5	ED03D	C	BOP SRO	4160V Bus 13-1 overcurrent trip.
6	FW09B Severity 100%, Ramp 5:00	M	ALL	FW header 'B' ruptures in the drywell. (Takes out HPCI and SSMP)

7	Console override on FW Isolation Valve MO 3205B DIHS13205B N_A_ OPEN	C	RO SRO	MO-1-3205B fails to close when switch is taken to CLOSE.
8	CS04B	I	BOP SRO	Core Spray Logic 'B' fails to initiate.
9	CS injection valve 25'B' binding CS07B 0	C	BOP SRO	Core Spray Injection Valve'B' fails to open from the Control Room.
10	RR10 Severity 3%, Ramp 10:00	M	ALL	RRC suction break (Small LOCA) 3%, 10 min.
11	RHO1D	C	BOP SRO	RHR Pump D breaker fails to close. (Overcurrent Trip)

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-03 Outline

1. Scenario will begin with the BOP swapping RB Ventilation fans per QCOP 5750-02.

2. RO will raise reactor power from 90% to 100% with RRC flow.

3. RO will respond to drifting control rod IAW QCOA 0300-11

4. The crew will respond to a failure of RRC Pump ‘B’ speed signal. SRO refers to and complies with Technical Specifications for RRC pump speed mismatch. The simulator operator, acting as an in-plant operator will give the control room indications of a failing MG set. The crew should secure RRC Pump ‘B’ and enter single loop operation.

5. A bus fault creates an overcurrent condition on Bus 13-1. The 1/2 DG will auto start and be stopped as an immediate action of QOA 6500-05. All associated LP ECCS systems are inoperable. The SRO will refer to Technical Specifications. The crew will take actions IAW QOA 6500-05 and QOA 6700-04 to restore bus 18.

6. The crew will restore RPS Bus ‘A’ and RBCCW as part of their response to the loss of buses 13-1 and 18. When complete, the feedwater header rupture malfunction is entered.

7. The “B” feedwater header ruptures in the drywell before the check valve. All feedwater is directed into the drywell. RPV/L lowers and DW/P and DW/T rise. MO-1-3205B will fail to close (QCOA 201-1), preventing isolation of the feedwater header leak. The feed and condensate systems should be secured. In addition to the loss of feed capability, loss of the “B” feedwater header prohibits use of HPCI and the SSMP. QGA 100 and 200 will be entered.

8. RHR D breaker fails to close when ECCS initiation signal is received. This will be identified and reported to the US.

9. Core Spray ‘B’ initiation logic fails and Core Spray Pump ‘B’ must be started manually. Core Spray injection valve 25 ‘B’ can’t be opened from the Control Room. An operator sent to locally open the valve can open it.

10. When the crew has stabilized RPV water level with RCIC and started DW sprays to control DW pressure, a small RRC suction header break occurs. RPV/L will slowly lower to the point where alternate injection systems (SBLC) are used and reactor Blowdown is required. QGA 500-1 will be entered.

The scenario will be terminated when RPV Blowdown has been complete RPV water level is being restored with available injection systems, and primary containment pressure and temperature are being controlled with available RHR.

Based on the outline, the critical tasks are:

- Operate Drywell Sprays to control containment parameters.
- Manually start Core Spray ‘B’ and direct manual operation of injection valve.
- Initiate RPV Blowdown when either RPV water level reaches -166 inches, PSP limits are reached, or unable to restore drywell temperature less than 280.
- Restore RPV water level above TAF.

References:

QCGP 3-1	Rev. 18	QOA 6700-04	Rev. 15	QCOA 0300-04	Rev. 6
QCAN 901-5 A-3	Rev. 1	QOA 6500-05	Rev. 8	QCOS 0300-14	Rev. 6
QCOA 0300-11	Rev. 6	QCOP 0300-07	Rev. 3	QCOP 5750-02	Rev. 9
QCOA 0202-03	Rev. 4	QCOA 0202-04	Rev. 11	QCGP 2-3	Rev. 32
QCOP 1600-12	Rev. 7	QGA 100	Rev. 4	QGA 200	Rev. 6
QGA 500-1	Rev. 8	QCOA 0201-1	Rev. 11	QOA 4700-01	Rev. 12
QCOA 0202-02	Rev. 7	QCOA 0400-01	Rev. 8	QCOA 0202-07	Rev. 7
QCOA 0400-02	Rev. 6	QOA 7000-01	Rev. 22	QOA 6800-01	Rev. 10
QOA 6800-03	Rev. 18	QOA 6800-04	Rev. 8		

I. SIMULATOR SETUP

A. Initialize the simulator to IC 21 .

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (1)

"B" RHR Pump in PTL.

Pull NWR tag on 1B Reactor Building Exhaust Fan is one is present.

2. Power Level

a.	Recirc Pump Speed	80%
b.	MegaWatts Electric	742
c.	Reactor Power	90%

3. Miscellaneous Setup

a. Prepare REMA for load increase to 100% with recircs

b. Prepare an Attachment "B" from QCGP 3-1.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
SIMULATOR SETUP Dial both recirculation pump speeds to approximately 80% speed demand to obtain approximately 90% reactor power.		
Take the 1B RHR pump OOS by placing the control switch in PTL and hanging an OOS card on the switch.		
Fail control switch for the MO-1-3205B valve open using override	**Ior dihs13205b N_A_OPEN**	
Fail the "B" Core Spray logic from initiating using malfunction cs04b	**Imf CS04B**	
Fail the "B" Core Spray injection valve from opening with the control room switch using malfunction CS07	**Imf CS07b 0**	
Trip the "D" RHR pump to prevent it from autostarting using malfunction RH01D.	**Imf RH01D**	
On the White Board on the 901-55 panel write "Unit 1 30 day LCO (3.5.A.2.a.) for "B" RHR pump OOS.		
Provide crew with a REMA and Attachment "B" from QCGP 3-1.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is at approximately 90% power on a 100% flow control line.

b. Unit 2 is at approximately 100% power.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: 30 day LCO (3.5.A.2.a.) for "B" RHR pump OOS.

(2) Unit 2: NONE.

2. Significant problems/abnormalities:

a. "B" RHR pump is OOS for coupling replacement

b. A 5.9 magnitude earthquake has occurred near Keokuk Iowa. The previous shift has implemented QCOA 0010-09, "Earthquake". All steps in the procedure have been completed with the exception of completing the in plant inspections. IM's are gathering information form the seismograph and operators are inspecting the plant for leaks and damage.

3. Evolutions/maintenance for the oncoming shift:

a. 1C reactor building supply and exhaust fans are to swapped to 1B IAW 5750-02 for upcoming maintenance.

b. Provide crew with REMA and Attachment "B" from QCGP 3-1.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

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Op-Test No.1 Scenario No.3 Event No.1 Event Description: Swap Reactor Building Ventilation Supply and Exhaust Fans.		
Time	Position	Applicant's Actions or Behavior
	BOP	Swaps 1C supply and exhaust fans to 1B • Notifies radiation protection and chemistry of changing status of reactor building ventilation. • Starts 1B exhaust fan and holds control switch in "start" for at least 5 seconds to allow sufficient air flow to develop to prevent low flow trip. • Shuts down the 1C exhaust fan. • Monitors reactor building D/P between –0.1 and -0.25" H_2O. • Starts 1B supply fan and holds control switch in "start" for at least 5 seconds to allow sufficient air flow to develop to prevent low flow trip. • Shuts down the 1C supply fan. • Monitors reactor building D/P between –0.1 and -0.25" H^2O.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions.

Comments:________________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
If contacted as radiation protection or chemistry, and asked if the reactor building ventilation particulate sample pump is in operation, inform them that it is. If contacted to determine outside air temperature, inform them that air temperature is 70 degrees farenheit. If contacted to determine if any reactor building ventilation fan regulating air dampers are inoperable, inform them that all are operable.		

Op-Test No.1 Scenario No.3 Event No.2 Event Description: Raises reactor power with recirculation flow.		
Time	Position	Applicant's Actions or Behavior
	SRO	• Directs that reactor power be increased to 100% per the REMA. • Provides RO with QCGP 3-1 Attachment "B" with ramp rate. • Verifies operator actions and concurs with or directs subsequent actions.
	RO	• Raises reactor power with recirculation flow IAW QCGP 3-1, REMA, and Attachment "B". • Checks REMA, Attachment "B" and verifies initial conditions. • Increases recirculation pumps speeds to increase reactor power. • Monitors power increase on APRMs. • Monitors thermal limits • Maintains load set 10% above main generator load. • Monitors drywell pressure and adjusts containment pressure controller as needed. • Monitors and verifies main generator excitation limits are within hydrogen cooling system capability. • Verifies and adjusts reactor pressure as needed.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 3 Event No.: 3		
Event Description: Control rod 06-19 (B-5) drifts into core.		

Time	Position	Applicant's Actions or Behavior
	BOP	• Recognizes and announces that control rod 06-19 (B-5) drifting into the core and refers to QCAN 901-5 A-3. • Bypasses the RWM and refers to QCOP 0207-2. • Inserts rod to position 00 and enters QCOA 0300-11 & 04. • Notifies Shift Manager, SOS, and Operations Manager. • Contact a Qualified Nuclear Engineer. • Verifies blue scram light not lit on core display. • Checks for indications of low instrument air pressure. • Checks CRD cooling water and drive water pressures. • Dispatches NLO to check scram outlet valve discharge line temperature. • Directs NLO to close the charging water valve at the CRD module and monitor accumulator for decreasing pressure. • Directs NLO to close insert and withdraw valves if accumulator pressure decreases and to perform QCOP 0300-07 to electrically diarm the control rod and finally close the scram discharge valve.
	SRO	• Refers to QCOA 0300-11 & 04. • Notifies Shift Manager, SOS, Operations Manager, and QNE. • Fills out QCOS 0300-14 "Outage Report." • Refers to Technical Specifications 3.3.C.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event # 3, use malfunction RD03 to drift control rod 06-19 (B-5) into the core.	**Imf RD03R0619**	
IAW QCOA 0300-11, As NLO dispatched to check scram outlet valve discharge line temperature, report back in 3 minutes that the line is the same temperature as the rest of the CRD modules scram outlet valve discharge lines.		
As NLO dispatched to close the charging water valve at the CRD module and monitor accumulator for decreasing pressure, report pressure is lowering slowly.		
As NLO, if directed to close insert and withdraw valves, disarm the control rod, and close the scram discharge valve, report back in 5 minutes that the task is complete		

Op-Test No.: Scenario No.: 3 Event No.: 4
Event Description: "B" Recirculation pump speed signal failure

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Recognizes "B" recirculation pump speed, reactor power, or megawatts increasing. • Checks thermal power < 2511 • Refers to QCOA 0202-02 and QCOA 0400-01. • Attempts to adjust recirculation pump speed to within 10% of each other. • Notifies US that "B" pump will not respond to controls. • Dispatches Operations personnel and/or maintenance personnel to investigate problem. • Refers to QCOA 0202-04 if decision made to trip pump. • Drives all CRAM rods and control rods in sequence to target-in into core to lower FCL <70% if pump tripped.
	SRO	• Refers to Technical Specifications. • Determines per 3.6.C that speeds must be with 10% of each other within 2 hours or the pump must be tripped. • US verifies immediate operator actions and concurs with or directs subsequent actions. • Refers to 3.6.A. for single loop operation if decision made to trip pump. • Contacts a QNE.
	BOP/RO	If decision made to trip the "B" recirculation pump then: • Trips the malfunctioning pump • Refers to QCOA 0202-04 • Refers to QCOP 0202-07 to determine total core flow. • Verifies pump discharge valve closed (reopens after 5 minutes) and monitors idle recirculation loop temperature. • Refers to QCOA 0400-02

Comments____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #4, fail the "B" reactor recirculation pump speed signal low using malfunction rr09b.	**Imf RR09B 0 1:00**	
If dispatches to manually lock up the recirc pump scoop tube and change recirc pump speed report that you will start ASAP. DO NOT TAKE ANY ACTIONS TO CHANGE PUMP SPEED!		
If dispatched to the 1B MG set, report after 3 minutes that there is heavy vibrations and noise coming from the MG set and drive motor.		

Op-Test No.: Scenario No.: 3 Event No.: 5
Event Description: Bus 13-1 trips on overcurrent with subsequent loss of bus 18.

Time	Position	Applicant's Actions or Behavior
	BOP	• Recognizes and reports that Bus 13-1 tripped on overcurrent and refers to QOA 6500-05. • Reports that bus 18 is de-energized due to the loss of bus 13-1 and refers to QOA 6700-04. • Crossties bus 18 to bus 19 and reports bus 18 energized. • Dispatches NLOs & maintenance to investigate reason for bus failure. • Refers to QOA 6800-03 for loss of Essential Service bus, QOA 6800-01 for loss of the Instrument bus, and QOA 6800-04 for loss of Analog Trip system as time permits
	BOP/RO	• Refers to QOA 7000-01 for "A" RPS bus failure. • Monitors main condenser vacuum and holds SJAE suction valve open as necessary to maintain condenser vacuum. May need to hold open SJAE suction valve to maintain condenser vacuum. • Dispatches operators to line up ½ RBCCW pump to U-1 or restarts 1A pump when bus 18 restored. • Dispatches NLO to investigate RPS trip and restore RPS "A" from alternate power or normal power if bus 18 restored. • Verifies automatic actions occurred: Rx building vents trip/SBGTS starts, group II & III. • Resets the 15 minute Off-Gas timer, if it started. • Resets ½ group II & III from the 901-5 panel and reopens SJAE suction. • Resets the ½ scram if possible when RPS A restored. • Resets ½ group I from the 901-5 panel and gives each inboard MSIV an open signal. • Continues to restore RPS as time permits per QOA 7000-01.

Comments____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5 insert an overcurrent trip on bus 13-1 using malfunction ED03D.	**Imf ED03D**	
As NLO dispatched to bus 18, report back 3 minutes later that no targets are up on the bus and all appears normal.		
As NLO dispatched to bus 13-1, report back 3 minutes later that an overcurrent target is up on the bus.		
As NLO dispatched to investigate and restore RPS "A" call back in 3 minutes and report that the normal EPAs have tripped on undervoltage and you are ready to repower RPS "A".		
Restore RPS "A" using alternate power using rp02r	**Irf rp02r alt**	
Restore RPS "A" using normal power using rp29r	**Irf rp29r reset**	
If dispatched to line-up ½ RBCCW wait 5 minutes and report lined up.		

Op-Test No.: Scenario No.: 3 Event No.: 5 continued Event Description: 4160V bus 13-1 overcurrent trip continued.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Verifies that the ½ EDG autostarts, but does not load to the bus due to the overcurrent indication annunciator 901-8 F-3. • Places the ½ EDG control switch to stop. • Notifies Unit Supervisor and/or phones Shift Manager about potential GSEP classification condition.
	SRO	• Refers to Technical Specifications 3.5A, 3.9A, 3.9E. (Based on 3.5.A. Action 2c), the unit must be in Hot Shutdown in 12 hours due to loss of bus 13-1 and consequently 2 RHR pumps (LPCI) and a Core Spray pump. • Refers to QOA 6500-05, QOA 6700-04, QOA 7000-01, QOA 6800-03, QOA 6800-01,and QOA 6800-04 as time permits • Notifies Shift Manager about potential GSEP classification condition. • US verifies immediate operator actions and concurs with or directs subsequent actions.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.:3 Event No.: 6, 8, & 11		
Event Description: "B" Feedwater Header rupture in the drywell.		

Time	Position	Applicant's Actions or Behavior
	ALL	• Drywell pressure increase noted and reactor scrammed.
	RO	• Reports all rods in, +8" QGA entry
	SRO	• Directs the actions of QGA 100 at + 8" and/or 2.5 psig in the drywell. • Directs QCGP 2-3 • Directs that automatic isolations, ECCS and EDG starts verified. • Directs reactor level be controlled between 8 & 48" with available injection systems. • Directs a band for reactor pressure to be controlled using bypass valves and/or ADS valves if needed. • Directs a cooldown at < 100 degrees/hour.
Critical Task	RO/BOP	• Verifies automatic isolations, ECCS & EDG start. • Reports that "B" Core Spray pump failed to autostart and "D" RHR pump has tripped. Dispatches NLO to the pump breaker and pump to investigate. • Manually starts 1B Core Spray pump. • Verifies HPCI running @ 2.5 psig(injection not able due to "B" feedwater header rupture) • Starts RCIC for injection.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #6, insert a feedwater break in the drywell using malfunction fw09b.	**imf FW09B 100 5:00**	
If directed to "D" RHR pump to investigate, call back 3 minutes later and inform them that the breaker has an overcurrent target up on it.		
NOTE: HPCI will run and pressure will fluctuate due to shared injection line with feedwater.		

Op-Test No.: Scenario No.:3 Event No.: 6, 8,& 11 (continued)		
Event Description: "B" Feedwater Header rupture in the drywell.(continued)		

Time	Position	Applicant's Actions or Behavior
Critical Task	SRO	Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Verifies recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Verifies CAMS started. • Directs torus level reduced IAW QCOP 1600-12 when level is greater than +2".
Critical Task	RO/BOP	• Initiates torus spray. • Trips or verifies tripped both recirc pumps. • Trips or verifies tripped all drywell coolers • Initiates drywell sprays and operates sprays to control containment parameters. • Starts RHRSW pumps to maximize containment • Terminates drywell and torus spray prior to drywell pressure dropping to 0 psig.

Comments:____

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B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 3 Event No.: 7		
Event Description: MO-1-3205B fails to close when switch taken to close.		
Time	**Position**	**Applicant's Actions or Behavior**
	RO/BOP	• Attempts to isolate the feedwater header leak by isolating each feedwater header isolation valve one at a time. • Reports that the "B" feedwater header isolation valve will not operate from the control room. • Contacts maintenance to investigate problem.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
If contacted as electrical maintenance tell them you will assemble a work crew and report ASAP.		

Op-Test No.: Scenario No.: 3 Event No.: 10		
Event Description: Small reactor recirculation line break.		
Time	**Position**	**Applicant's Actions or Behavior**
	RO/BOP	• Reports that drywell pressure starting to increase quickly
		• Reports that reactor level is dropping quickly.
		• Reports that reactor pressure decreasing.
		• Inhibits ADS.
		• Monitors reactor level for top of active fuel
		• Monitors containment parameters for PSP limits and/or drywell temperature limits.
Critical Task		• When directed to blowdown, opens all 5 ADS valves and checks for open indication.
Critical Task		• Identifies and reports that Core Spray "B" injection valve failed to open at 325 psig and will not open from control room, dispatches operators to manually open valve.
		• Attempts to restore reactor level to above top of active fuel with remaining RHR pump, secures sprays until above TAF.
Critical Task		• When local operators open the Core Spray "B" loop injection valve, injects and injects fully to restore reactor water level above TAF.
Critical Task		• Diverts some RHR flow to containment sprays once above TAF to control containment parameters.
	US	• Directs that ADS be inhibited when determined unable to maintain level above -59".
		• Monitors reactor level for top of active fuel
		• Monitors torus pressure and level for PSP
		• Monitors drywell temperature for ability to restore below 280.
Critical Task		• Directs blowdown.
		• Directs reactor vessel level restoration with low pressure systems.
Critical Task		• Directs containment sprays once reactor level is above TAF.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #10, insert a 3% recirc line break in the "A" loop with a 10 minute ramp time using malfunction RR10a.	**Imf RR10A 3 10:00**	
When dispatched as NLO to manually open the Core Spray "B" injection valve wait 1 minute and simulate opening the valve breaker by overriding the lights off.	**Ior LOHS1140225B1 OFF** **Ior LOHS1140225B2 OFF**	
When directed by the Chief Examiner, report as NLO that you are ready to open the Core Spray "B" injection valve 1-1401-25B. Simulate opening the valve manually by first deleting malfunction CS07 then overriding the control switch open.	**Dmf CS07B** **Ior DIHS1140225B OPEN**	
The scenario can be terminated when RPV Blowdown has been complete RPV water level is being restored with available injection systems, and primary containment pressure and temperature are being controlled with available RHR.		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 4		Op Test No 2	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The second feed pump will be started without incident. Rod withdrawal will continue to raise power. During rod withdrawal, the CRD FCV will fail closed and manual control will be taken or the standby FCV will be placed in service. The crew will then respond to a Rx. Bldg. Radiation Monitor failure. A trip of a Service Water Pump occurs and the BOP operator starts the standby Service Water Pump. While the BOP Operator is responding to the failed Service Water Pump, the 'A' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump. Following response and TS declaration for the failed radiation monitor, a small leak in the steam tunnel will cause a MSIV isolation and reactor scram. A full hydraulic ATWS will exist. SBLC will be initiated. Reactor level will be lowered intentionally and rods will be inserted IAW QOP 0300-28.
Initial Conditions:	IC 93 @ 42% power. QCGP 1-1 @ step F.7.r. Ready to startup second RFP. Rod step 29 @ target out ready to pull rods to raise power per QCGP 3-1 @ step F.3.
Turnover:	Plant startup in progress. Start the second RFP with QCGP 1-1 at step F.7.r. Control rod withdrawal is to continue to raise reactor power per QCGP 3-1 at step F.3 to the 75% FCL All prerequisites for pump start are satisfied and operators is standing by. Zinc injection has been valved in and is in operation.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Start the second RFP.
2	None	R	RO SRO	Rod withdrawal to raise power to 75% FCL.
3	RD11 Severity 0%	I	RO SRO	In-service CRD FCV fails closed. (NOTE insert during rod pulls).
4	RM02K Severity 100%	I	BOP SRO	Reactor Bldg. Vent Radiation Monitor Ch. 'A' fails high.
5	SW01A	C	BOP SRO	Service Water Pump 'A' trip.
6	FW17B	C	RO SRO	Condensate/Condensate Booster Pump 'A' Trip.
7	Console override DIHS13302 2D_OFF	C	RO SRO	Failure of Selected Condensate/Condensate Booster Pump to start.
8	MS09B 5% Severity, 5:00 Ramp	M	ALL	MSIV isolation due to MST high temperature.
9	RD13A and B 100% severity	M	ALL	Hydraulic ATWS
10	Console override open	C	BOP SRO	Failure of 1-220-44 and 45 to close on Group I isolation

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-04 Outline

1. Scenario will begin with the second reactor feed pump being placed in service without incident

2. Control rods are to be withdrawn to establish 75% FCL.

3. During rod withdrawal, the CRD FCV fail closed. This will be recognized and manual control may be taken or the standby FCV will be placed in service IAW QCOA 0300-06.

4. When the plant is stable, the 'A' Reactor Building Ventilation Radiation Monitor will fail high. The crew will respond IAW QCAN 901-3 A-3 and QCOS 1700-05. The SRO will refer to and comply with Technical Specifications.

5. After the Rad Monitor response, the 'A' Service Water Pump will trip. The crew will respond IAW QCAN 912-1-A-3 and start the standby pump.

6. The 'A' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump.

7. A small steam leak develops in the main steam tunnel. A scram may be manually initiated as a conservative action as temperatures will eventually reach the point of MSIV isolation. Ultimately, the MSIV's will isolate on a Group I signal. Valves 1-220-44 and 45 will fail to close automatically on the Group I and the operators must manually close the valves to complete the isolation.

8. A hydraulic ATWS prevents rod insertion. QGA 101 will be entered. RPV/P will be controlled with the SRVs and RPV/L will be intentionally lowered to reduce reactor power. Rods will be inserted IAW QCOP 0300-28.

The scenario will be terminated when the crew has established torus cooling and control rods are be inserted per QCOP 0300-28.

Based on the outline, the critical tasks are:

- Intentionally lower RPV water level to reduce reactor power during the ATWS.
- Control RPV pressure after the initial lifting of the safety valves as directed by QGA 101, RPV Control (ATWS).
- Inject SBLC IAW QGA 101, RPV Control (ATWS).
- Individually insert control rods following the ATWS IAW QCOP 0300-28.

<u>References</u>

QGA 200	Rev. 6	QCGP 1-1	Rev. 31
QGA 101	Rev. 7	QCAN 901(2)-3 A-3	Rev. 3
QGA 100	Rev. 4	QCAN 901(2)-6 F-5	Rev. 0
QGA 4-1	Rev. 16	QCGP 3-1	Rev. 19
QCOP 0300-28	Rev. 14	QCOP 0300-03	Rev. 4
QCOA 0300-06	Rev. 2	QOA 5750-07	Rev.8
QOP 3200-03	Rev. 14	QCOA 7500-01	Rev.10
QCOS 1700-05	Rev. 6	QOA 900-4 C-18	Rev.3
QCAN 912-1 A-3	Rev. 2	QOA 900-3 H-2	Rev. 3
QCAN 901(2)-3 G-3	Rev. 5		

I. SIMULATOR SETUP

A. Initialize the simulator to IC93

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment Out Of Service

NONE

2. Power Level

a. Recirc Pump Speed ~44% with flows balanced

b. MegaWatts Electric 325 MWE

c. Reactor Power 42%

3. Miscellaneous Setup

a. Prepare REMA for load increase to 75% FCL with rods

b. Prepare an Attachment "B" from QCGP 3-1.

c. Have copy of QCGP 1-1 signed off up to step F.7.r.

d. Have a copy of QCOP 3200-03 signed off up to step F.2.b.

e. Have a copy of QCOS 7500-05 ready for use by the crew.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Copy IC93 from zip disc to IC files in RIS at instructor station. Shutdown MST and restart MST to allow the computer to read the new IC93.	**rst 93**	
Reset simulator to IC93.	**run**	
Hydraulically block both scram discharge volumes using malfunction RD13.	**imf RD13A 100** **imf RD13B 100**	
Ensure 5 condensate demins online.		
The following series of commands will prevent the 1-220-44 & 45 valves from indicating closed following a group I isolation. The triggers allow the overrides to be deleted when the control switches are taken to the close position:		
Using expert commands set trigger 10 to be true when hand switch for the 1-0220-44 valve is taken to close: (Must use "" to make command work.)	**Trgset 10 "zdihs1022044(1)"**	
Using expert commands set trigger 11 to be true when hand switch for the 1-0220-45 valve is taken to close: (Must use "" to make command work.)	**Trgset 11 "zdihs1022045(1)"**	
Override all light associated with the 1-0220-44 & 45 valves in their normal position on the 901-4 & 3 panels: Overrides all red lights on and green lights off until the control switch is moved to the close position.	**Ior LOHS10220441 off** **Ior LOHS10220442 on** **Ior LOHS10220451 off** **Ior LOHS10220452 on** **Ior LOIL10220441 off** **Ior LOIL10220442 on** **Ior LOIL10220451 off** **Ior LOIL10220452 on**	
Copy batch files scenario4grp1failure44, and scenario4grp1failure45 from zip disc to batch directory in RIS on the simulator computer.		
Assign batch file command to delete light overrides for the 1-0220-44 valve to trigger 10 using expert command.	**Trg 10 "bat scenario4grp1failure44"**	
Assign batch file command to delete light overrides for the 1-0220-44 valve to trigger 11 using expert command.	**Trg 11 "bat scenario4grp1failure45"**	
Ensure the White Board on the 901-55 panel is clean.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is raising power following a start up after a short maintenance outage and is currently at ~ 325 MWe; Rod Step 29 @ target out; QCGP 1-1 is in progress at Step F.7.r.

b. QCGP 3-1 is at step F.3.

c. Unit 2 is at approximately 100% power.

d. Normal electric plant lineup.

e. Tech Spec limitations:

(1) Unit 1: NONE

(2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

a. Continue with unit startup IAW QCGP 1-1, @ Step F.7.r.

b. Following turnover, start the second reactor feed pump. The 1B feedpump and 1C condensate pump are to be started.

c. Pull rods to 75% rod line. A QNE is present in the control room.

d. Operators are present in the plant at the condensate and feed pumps and fill and venting is complete per QCOP 3200-01 and all have been briefed on the feed and condensate pumps startup.

e. No maintenance has been performed on either the condensate, condensate booster pumps or reactor feedpumps and zinc injection has been valved in with the startup of the first feedpump.

f. The RFP manual recirculation valve at the main condenser has been verified open.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

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Op-Test No.: Scenario No.: 4 Event No.: 1 Event Description: Start up of the second reactor feed pump.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Refers to QCOP 3200-03 • Verifies that the pump discharge valve is open. • Checks with in-plant NLO that step F.2. of the procedure has been completed. • Deselects the standby condensate pump by placing the selector switch to OFF. • Starts the third condensate pump. • Selects the non-running condensate pump as standby with the selector switch. • Checks pumps suction and discharge pressures. • Deselects the standby feed pump by placing the selector switch to OFF. • Verifies the recirculation valve is in AUTO. • Verifies auxiliary oil pump operating on pump to be started. • Checks with in-plant NLO that step F.8. of the procedure has been completed. • Starts the second feed pump • Checks auxiliary oil pump auto-trips and pump amperages. • Selects the non-running feed pump as standby with the selector switch. • Verifies the auxiliary oil pump operating for the selected standby pump. • Checks with in-plant NLO that step F.13 & 14 of the procedure has been completed. •
	SRO	• Verifies operator actions and concurs with or directs subsequent actions

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
As NLO at the condensate pump report that you have completed step F.2. of QCOP 3200-03. If asked for a follow up report after the start of the condensate pump, report that all is satisfactory.		
As NLO at the reactor feed pump report that you have completed step F.8. of QCOP 3200-03		
As NLO at the reactor feed pump report that you have completed step F.13 & 14 of QCOP 3200-03 following the start of the feed pump and all items are satisfactory. If asked about zinc injection, report that step F.15 is N/A since you valved in zinc injection when the first feed pump was started earlier.		
NOTE: The following 3 commands are necessary for event #6 and couldn't be inserted in the intial setup. They must be done AFTER the startup of the second feedpump.		
After the second feedpump is started and the 1D condensate pump has been selected as the standby, Override the standby light on the condensate pump 1D ON.	**ior LOHS13302D4 ON**	
Prevent the standby condensate/condensate booster pump from autostarting by overriding the selector switch to OFF using switch override DIHS13302.	**ior DIHS13302 P2D_OFF**	
Assign trigger #1 to delete the override on the 1D condensate pump standby light when the 1D pump is manually started.	**Select event trigger button.** **Select trigger #1.** **Enter event: ZDIHS13302D(4)** **Enter command:** **Dor LOHS13302D4** **Select accept new event.**	

Op-Test No.: Scenario No.: 4 Event No.: 2 & 3

Event Description: Rod withdrawal to raise reactor power and the in-service CRD flow control valve fails closed.

Time	Position	Applicant's Actions or Behavior
	SRO	• Reviews REMA and Attachment A. • Briefs crew on upcoming reactivity evolution. • Directs that rods be pulled to the 75% flow control line. • Supervises the reactivity change.
	RO	• Reviews REMA and Attachment A. • Determines that RWM is operable. • Selects the desired control rod on the select matrix. • Verifies the selection of the proper control rod and its position on the RWM. • Communicates maneuver to QIV. • Self checks rod selection and moves the rod to desired position. • Initials the sequence book for the rod moved. • Performs coupling check on rods withdrawn to position 48.
	RO	• Notices that rod fails to move or quits moving during withdrawal. • Checks charging water and drive water pressures. • Recognizes flow controller failure and refers to QCOA 0300-06 • Places the flow controller to manual and adjusts flow to 40 - 60 gpm • Dispatches NLO and/or maintenance to investigate failure, may direct NLO to switch over to the standby flow control valve IAW QCOP 0300-03
	SRO	• Refers to QCOA 0300-06 and notifies Shift Manager. • Verifies operator actions and concurs with or directs subsequent actions

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
STA should act as QIV/QNE for the rod pulls.		
When directed by the Chief Examiner to insert event #3, fail the CRD FCV closed using malfunction RD11	**IMF RD11 0**	
If dispatched as NLO to change over the CRD FCV, IAW QCOP 0300-03, ask them if step G.1. has been completed. Then delete the malfunction after 5 minutes and call in and report that task is complete up to step G.2.n.	**DMF RD11**	
NOTE: During validation, 5 rods raised the FCL from ~60 to 75%.		

Op-Test No.: Scenario No.: 4 Event No.: 4

Event Description: Reactor building vent radiation monitor channel "A" fails upscale.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Refers to QCAN 901(2)-3 A-3 & QCAN 901(2)-3 G-3 • Determines reading on indicator on 912-10 panel on back panel for "A" channel is upscale, "B" channel reading is normal • Notifies Chemistry and Radiation Protection departments. • Notifies IM department to investigate failure and effect repairs. • Refers to QCOS 1700-05. • Verifies automatic actions occur, refers to QOA 5750-07, QCOA 7500-01.
	SRO	• Refers to Technical Specifications 3.2.A. • Determines that channel must be returned to operable within 2 hours or secondary containment integrity established, SBGTS started, reactor building and control room ventilation isolated within the following hour. • Refers to QCOS 1700-05. • Verifies operator actions and concurs with or directs subsequent actions

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #4, insert an upscale failure of the "A" Rx Bldg. Vent rad monitor using malfunction RM02K. If called as IM, report that you will start a work package and start ASAP.	**Imf RM02K 100**	

Op-Test No.: Scenario No.: 4 Event No.: 5 & 6 & 7		
Event Description: Service water pump 1A trip. 1A Condensate pump trips with failure of standby pump to autostart.		
Time	**Position**	**Applicant's Actions or Behavior**
	BOP	• Refers to QCAN 912-1 A-3. • Determines that the 1A service water pump tripped. • Starts the standby service water pump. • Dispatches operators to tripped motor and to the supply breaker. • Contacts maintenance to investigate standby pump failure to autostart.
	RO	• Refers to QCAN 901(2)-6 F-5. • Determines that the 1A pump tripped and that the standby pump did not autostart. • Starts the standby condensate pump. • Verifies condensate pump discharge and reactor feed pump suction pressures. • Monitors reactor water level. • Dispatches operators to tripped motor and to the supply breaker.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: Event 6 should be inserted while the BOP operator is occupied with the service water pump trip to allow the RO to achieve credit for a component failure.		
When directed by the Chief Examiner to insert event #5, insert an trip of the 1A service water pump using malfunction SW01A.	**imf SW01A**	
As NLO dispatched to investigate the tripped motor on the 1A service water pump, wait 5 minutes and report that the motor is hotter than the other running pumps but no damage is evident.		
As NLO dispatched to the supply breaker for the 1A service water pump, wait 3 minutes and report that an overcurrent target is up.		
When directed by the Chief Examiner to insert event #6, insert an trip of the 1A condensate/condensate booster pump using malfunction FW17A.	**imf FW17A**	
Pull up drawing FW2 to monitor status of the 1D condensate pump to delete standby light override when the pump is started.		
Trigger #1 should delete the override on the 1D condensate pump standby light. If it doesn't, delete the override manually.	**dor LOHS13302D4**	
As NLO dispatched to investigate the tripped motor on the 1A condensate pump, wait 4 minutes and report that the motor is hotter than the other running pumps but no damage is evident.		
As NLO dispatched to the supply breaker for the 1A condensate pump, wait 3 minutes and report that an overcurrent target is up.		
If dispatched as NLO to swap H2 injection points, report back 5 minutes later that injection is lined up to 1D and 1A is secured.		

Op-Test No.: Scenario No.: 4 Event No.: 8 & 9 & 10

Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure.

Time	Position	Applicant's Actions or Behavior
	ALL	• Refers to QCAN 901-3 H-2 and determines that the high area temperature is in the MSIV room. • Attempts to detemine the cause of the high temperature. • May scram the reactor in anticipation of a group 1 isolation on high temperture in the MSIV room or as an attempt to isolate the discharge into the area per QGA 300.
	SRO	• Enters QGA 300 on area temperature above alarm setpoint. • Directs isolation of the discharge into the area (completed when MSIVs close)
	RO	• Scrams reactor, places Mode Switch in SHUTDOWN, reports hydraulic ATWS to US (this can be done without direction by the US) • Activates ARI, runs recirculation pumps to minimum, starts inserting CRAM rods into the core. (this can be done without direction by the US)
   Critical Task Critical Task Critical Task Critical Task	SRO	• Enters QGA 100 and transitions into and directs actions of QGA 101. • Directs ADS inhibited, Core Spray injection prevented • Directs isolations and auto-starts verified for QGA entry conditions. • Directs reactor level intentionally lowered to reduce reactor power. • Directs control rods inserted IAW QCOP 0300-28. • Directs injection of SBLC from boron tank • Directs reactor pressure maintained 800 to 1000 psig with ADS valves.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #8, insert a 5% break in a main steam line in the MSIV room ramped over 5 minutes using malfunction MS09B.	**imf MS09B 5 5:00**	

Op-Test No.: Scenario No.: 4 Event No.: 8 & 9 & 10 continued

Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure continued

Time	Position	Applicant's Actions or Behavior
Critical Task	RO	• Terminates and prevents injection except for Boron, CRD, and RCIC to lower level.
		• Monitors indications for power <3%, level is –142", or all ADS valves are closed and drywell pressure is < 2.5 psig and reports to US if any met.
Critical Task		• Injects SBLC from boron tank when directed.
		• Performs or directs actions of QCOP 0300-28.
		• Bypasses scram discharge volume high level trip and attempts to reset scram.
		• Directs another operator to insert jumpers to bypass all reactor scram signals and de-energize ARI if necessary @ -59".
		• Resets scram and attempts another scram
		• Resets scram and directs another operator to individually scram rods.
Critical Task		• Continues to individually insert control rods, CRAMS first, then spiralling out from center.
	BOP	• Inhibits HPCI injection
		• Inhibits ADS.
		• Places core spray pumps in PTL.
Critical Task		• Maintians reactor pressure 800 to 1000 psig with ADS valves
	SRO	• Directs the actions of QGA 200.
		• Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus.
		• Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig.
		• Directs recirc pumps and drywell coolers tripped.
		• Directs drywell sprays.
		• Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
As another control room operator, when directed to insert jumpers to bypass all reactor scram signals, wait 2 minutes and insert remote function QG08R and report that jumpers are installed.	**IRF QG08R**	
As another control room operator, when directed to de-energize ARI, wait 3 minutes and insert remote function QG14R and report that fuses for ARI are removed.	**IRF QG14R**	
As another operator, when directed to individually scram rods, select panel view from simulator menu and select 901-16 panel. Select one scram switch and override the switch to the scram position, check to see if it inserts,(it won't) then return the switch to normal position. Repeat this three more times, choosing a rod from each of the four quadrants. Report to the RO that none of the rods inserted from any quadrant.		

Op-Test No.: Scenario No.: 4 Event No.: 8 & 9 & 10 continued

Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure continued

Time	Position	Applicant's Actions or Behavior
	BOP	• Verifies all automatic actions have taken place for 2.5 psig in drywell, 1060 psig in reactor, and +8" reactor level. • Finds 1-0220-44 & 45 valves failed to reposition during group 1 isolation and closes them. • Initiates torus sprays. • Verifies recirc pumps and drywell coolers are tripped. • Initiates drywell sprays • Controls RHR flow to maintain containment pressure decrease while preventing injection if not needed.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
The scenario can be terminated when the crew has established torus cooling and control rods are be inserted per QCOP 0300-28. **NOTE!!** **Freeze the simulator when directed by the Chief Examiner and do not change any switches or settings so that SRO candidate may perform a JPM based on GSEP classification following the end of the scenario.**		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 5		Op Test No 2	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will take the shift at 100% power and perform a test of the Turbine BPVs. Position indication for one of the BPVs fails to respond during the test. The 'A' GEMAC reactor level indicator fails high requiring the RO to swap level detectors to control RPV water level. When RPV water level is recovered, '1A3' feedwater heater develops a tube rupture. During the subsequent power reduction one control rod sticks requiring the RO to raise drive pressure to insert the rod. TR-12 trips and the SRO refers to and complies with Tech Specs. A turbine bearing vibration results in a main turbine trip resulting in a LOOP. HPCI fails and RCIC is started to control RPV water level. A subsequent steam leak in the RCIC steam line and a failure of the Group Five Isolation requires the BOP Operator to isolate RCIC. SSMP, and potentially SBLC, are used to restore and maintain RPV water level.
Initial Conditions:	IC-21, 100% power. APRM "3" bypassed and tagged OOS. A copy of QOS 5600-05 to perform BPV testing. Make sure LT 1-646A is selected for FWLC
Turnover:	Plant is at rated conditions. APRM "C" bypassed and OOS for power supply replacement. An operability test of Turbine Bypass Valves is to be completed using QOS 5600-05.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Test BPVs
2	Console Override AOZI 15650507	I	BOP SRO	#7 BPV position indication failure during test.
3	RR15A Severity 100%, Ramp 20:00	I	RO SRO	FW Level Control Level Transmitter 'A' Failure high
4	FW14C Severity 100%, Ramp 5:00	C	BOP SRO	FW Heater '1A3' Tube Rupture (Loss of FW Heating)
5	None	R	RO SRO	Power reduction because of loss of FW heating.
6	RDO2, 42-11 (Rod L-3) Event Trigger to DMF at Drive Pressure of 300 psig	C	RO SRO	Stuck Control Rod. (Rod moves when drive pressure is raised to 300 psig.)
7	ED02	C	BOP SRO	Trip of TR-12(LOOP)

8	TU02E Severity 50% Ramp 2: 00	M	All	#5 Bearing high vibration with turbine trip
9	HP01	C	BOP SRO	HPCI Turbine Trip
10	RC11 Severity 50%	C	BOP SRO	RCIC Steamline Rupture at Turbine Inlet
11	RC13	I	BOP SRO	Group Five Isolation Fails to Actuate

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

- Scenario 2000-05 Outline

1. Scenario will begin with the reactor at rated conditions. A special test of several BPV will be performed IAW QOS 5600-05.

2. BPV #7 position indication will fail to respond during BPV testing, all other parameters indicate that the valve is opening. This is reported and investigated.

3. The 'A' GEMAC RPV level indicator fails high, resulting in a lowering RPV water level. The RO will swap level detectors to regain RPV water level control and restore level to the normal band.

4. A tube rupture will occur in FW heater '1A3'. Power will be reduced with RRC flow and control rods.

5. During the reactor power reduction, one control rod sticks. The rod moves when drive pressure is raised to 300 psig.

6. TR-12 trips and SRO refers to and complies with Tech Specs. A vibration develops on the main turbine resulting in a main turbine trip. (LOOP)

7. HPCI fails to start and cannot be started. RCIC is started to control RPV water level.

8. A steam leak develops on the RCIC steam line with the subsequent failure of the Group Five Isolation Logic. Temperatures rise in the RCIC room resulting in an alarm and manual isolation of RCIC by the crew.

9. The crew uses SSMP, and potentially SBLC, to restore and maintain RPV water level.

10. The scenario will be terminated when RCIC is isolated and RPV water level is being restored with the SSMP.

Based on the outline, the critical tasks are:

- Reduce reactor power following the loss of feedwater heating.
- Maintain RPV water level above TAF using available high pressure system(s).
- Isolate RCIC following indication of the RCIC steam line leak.

References

QCOA 0201-09	Rev. 7	QOS 5600-05	Rev. 16
QCOA 0300-02	Rev. 8	QCOA 0600-04	Rev. 6
QCOA1300-01	Rev. 6	QCGP 2-3	Rev. 32
QCOA1800-01	Rev. 5	QGA 100	Rev. 4
QCOA 3500-01	Rev. 11	QGA 300	Rev. 9
QOA 6100-01	Rev. 9	QCOP 0600-16	Rev. 4
QCOA 6100-03	Rev. 8	QCAN901(2)-4 A-15	Rev. 2
QCAN901(2)-3 A-9	Rev. 2	QCAN901(2)-3 H-2	Rev. 2

SIMULATOR SETUP

A. Initialize the simulator to IC 21 .

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Information Cards Needed (1)

APRM "3" bypassed and INFO card hung

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	820
c.	Reactor Power	100%

3. Miscellaneous Setup

a. Prepare a blank copy of QOA 5600-05.

C. Verify the initial conditions are met and bring the crew into the Simulator.

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B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC21.	**rst 21** **run**	
Override bypass valve #7 position to zero using override AOZI15650507.	**ior AOZI15650507 0.0**	
Stick control rod 42-11 (L-3) at approximately 70% out, until drive pressure is raised to 300 psig using malfunction RD02 (this is a cram rod)	**imf RD02R4211 70**	
Copy file "drivewtrpgt300" from the zip disc to the trigger file in RIS on the simulation computer.		
Assign trigger #1 to go true when drive water pressure is raised to 300 psig. Assign command to delete stuck rod malfunction rd02r4211 to trigger #1.	**Select event trigger button.** **Select trigger #1.** **Enter event: drivewtrdpgt300** **Enter command:** **dmf rd02r4211** **Select accept new event.**	
Prevent the HPCI turbine from operating by inserting a trip using malfunction HP01	**Imf HP01**	
Fail the group 5 isolation from actuating using malfunction RC13	**Imf RC13**	
Have a copy of QOS 5600-05		
Ensure the White Board on the 901-55 panel is clean.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is at approximately 100% power.

b. Unit 2 is at approximately 100% power.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: NONE

(2) Unit 2: NONE.

2. Significant problems/abnormalities:

a. APRM "3" is OOS for power supply replacement.

3. Evolutions/maintenance for the oncoming shift:

a. Perform operability test of turbine bypass valves IAW QOS 5600-05

b. BPO has been notified of the upcoming test and the expected changes in MWE output.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 5 Event No.: 1

Event Description: Perform testing of turbine bypass valves IAW QOS 5600-02.

Time	Position	Applicant's Actions or Behavior
	SRO	• Reviews and gives permission to start QOS 5600-02 for bypass valves. • Briefs the surveillance with the crew. • Verifies operator actions and concurs with or directs subsequent actions.
	BOP	• Verifies the unit is in manual recirc control. • Selects each valve to be tested with the selector switch on the 901-7 panel. • Pushes the TEST BYPASS VALVE test button and verifies the selected bypass valve opens in about 10 seconds. • Releases the test button and verifies the bypass valve closes in about 10 seconds. • Monitors generator output during valve testing. • Identifies that bypass valve number 7 position indication does not move although all other indications show that the valve opened. • Places selector switch on the 901-7 panel to OFF.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Bypass valve position on bypass valve #7 light indications will work as expected, but the analog indicator will not move.		

Op-Test No.: Scenario No.: 5 Event No.: 2 Event Description: Feedwater level control transmitter "A" fails high.		
Time	**Position**	**Applicant's Actions or Behavior**
	RO	• Notices that reactor level on the controlling GEMAC indicator is rising while the other 3 narrow range indicators are lowering. Reactor power and megawatt output is lowering. • May take manual control of feedwater regulators and control reactor level manually. • Swaps to the "B" GEMAC controller per QCOA 0600-04. • Notifies IM department to effect repairs on the feedwater level control system.
	SRO	• If manual control of feedwater is taken, then, assigns one operator to monitor and control reactor water level. • Verifies operator actions and concurs with or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #3, insert a 100% upscale failure of the feedwater level control transmitter failure over a 20 minute ramp time using malfunction RR15A	**Imf RR15A 100 20:00**	
If contacted as Instrument Maintenance department, report that you will start a work package and start ASAP on the repairs.		
If contacted to investigate the condensate demin trouble alarm, wait 2 minutes and acknowledge the alarm using remote function FW29R.	**Mrf FW29R**	

Op-Test No.: Scenario No.: 5 Event No.: 4 & 5 & 6
Event Description: Feedwater heater 1A3 tube rupture with power reduction due to loss of feedwater heating, stuck control rod while driving rods to reduce flow control line.

Time	Position	Applicant's Actions or Behavior
	BOP	• Alarms 901-6 D-7, HEATER 1B1 NORMAL DRAIN VALVE CLOSED and 901-6 F-1, HEATER 1A1 FLASH TANK HIGH LEVEL, actuate. • Reports alarm to US, refers to annunciator procedure. • Reports 1A1 flash tank level is off scale high. • Directs SS and/or NLOs to investigate cause of heater trip. • Alarm 901-6 G-1, HEATER 1A1 HIGH LEVEL, actuates. reports "C" LP heater string is isolating, string bypass valve is opening. • Refers to QCOA 3500-01 • Determines lowest feed temperature by process computer and reports to US. Adds 2% to OD76 or calculates FCL using APRMs vs. Core Flow. • Contacts QNE for verification of core thermal limits and BPWS requirements. • Contacts Chemistry department for RETS sample.
Critical Task Critical Task	RO	• Reduces recirc pump speeds by at least 20%. • Bypasses RWM or selects power reduction mode. • Drives CRAM rods in to 00, then inserts rods in sequence to Target In until power stops increasing and FCL < 100%. • Reports rod 42-11(L-3) will not insert, refers to QCOA 0300-02. • Throttles CRD drive water pressure control valve to increase drive water header pressure • Drives rod in when drive water pressure is greater than 300 psig. • Monitors reactor power and level.
Critical Task	SRO	• Refers to and directs actions of QCOA 3500-01. • Directs actions to reduce reactor power following the loss of feedwater heating. • Verifies operator actions and concurs with or directs subsequent actions.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #4,5,&6, insert a 100% tube rupture in the 1A3 heater using malfunction FW114C ramped over 5 minutes	**imf fw14c 100 5:00**	
If dispatched as SS or NLO, wait 5 minutes, report many string "3" valves have tripped, the other two strings are normal.		
If dispatched to investigate the Condensate Demin Control Panel Trouble alarm, wait 2 minutes and acknowledge it using remote function FW29R:	**mrf fw29r**	
As QNE, report you will obtain an OD-7 option 2 in the New Computer Room and have a corrected rod pattern to the Control Room within an hour. If they did not violate the rod sequence book, during the rod insertion, report that no thermal limits were violated		
Rod 42-11 (L-3) a cram rod, should stick @ approximately 2/3 out, but will be able to be driven once drive water pressure is increased above 300 psig by trigger # 1. If the trigger doesn't go true @ 300 psig, delete the stuck rod malfunction using RD02R4211	**Dmf RD02R4211**	

Op-Test No.: Scenario No.: 5 Event No.: 7

Event Description: Trip of Transformer 12.

Time	Position	Applicant's Actions or Behavior
	BOP	• Recognizes and reports loss of transformer 12. • Verifies automatic bus transfer. • Dispatches operators and/or maintenance to investigate reason for transformer trip. • Directs operators to transfer dual feed MCCs to unaffected unit. • Transfers ½ equipment to unaffected unit from control room.
	SRO	• Refers to Technical Specifications of 3.9.A. and notifies S.M (7 day LCO) and directs performance of QCOS 0005-08 within 1 hour. • Briefs crew on LOOP if unit would scram or needs to be taken off-line. • Verifies operator actions and concurs with or directs subsequent actions

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #7, insert a trip of transformer 12 using malfunction ED02	**Imf ED02**	
If directed as NLO or maintenance to investigate the transformer trip, report back 10 minutes later that T-12 appears discolored and that you have contacted OAD for assistance in determining the cause of the trip.		

Op-Test No.: Scenario No.: 5 Event No.: 8

Event Description: Turbine bearing # 5 high vibration resulting in turbine trip and a loss of off-site power.

Time	Position	Applicant's Actions or Behavior
	RO	• May scram reactor if malfunction detected early enough • Gives scram report. (all rods in, level will be unknown between time of generator trip and when EDGs close in to bus) • Performs QCGP 2-3.
	BOP	• May recognize turbine bearing #5 high vibration alarm light on recorder 1-5640-60 and report to US. • May scram reactor and trip turbine if malfunction detected early enough. • Verifies both EDGs autostart and emergency buses are energized per QCOA 6100-03. • Obtains the key for the ½ EDG output breaker keylock and aligns to unit 1. • Dispatches operators to both EDGs to perform post start checks. • Places 4KV feed breakers in PTL • Verifies reactor building ventilation system is isolated. • Verifies generator hydrogen emergency seal oil pump running. • Verifies turbine emergency bearing oil pump running if turbine bearing oil pressure <125 psig. • Back feeds bus 13 from bus13-1, and bus 14 from 14-1. • Monitors EDG loading. • Restores 480 VAC buses as needed and time permits.
Critical Task	SRO	• Refers to and directs actions of QCOA 6100-03. • Enters and directs actions of QGA 100. • Orders QCGP 2-3 performed. • Orders auto starts and isolations verified. • Orders reactor level maintained with HPCI, RCIC, or SSMP. • Orders reactor pressure controlled with HPCI, RCIC, or ADS valves. • Orders a cooldown at <100 degrees/hour.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #8, insert high vibrations on turbine bearing #5 using malfunction TU02E @ 50% severity over a 2 minute ramp.	**Imf TU02E 50 2:00**	
ROLE PLAY: To silence the fire alarm use batch file: bat fire, and reporting as U-2 NSO, notify the US that alarm due to low fire header pressure and both fire diesels have autostarted.	**Bat fire**	
As U-2 NSO if asked for the ½ EDG output breaker control key, provide it to them from the instructors station.		
As NLO dispatched to both EDGs to perform post start checks IAW QCOA 6100-03, report back after 5 minutes that both EDGs are operating properly and step D.4. of QCOA 6100-03 is complete.		
When directed to restore RPS, restore one bus at a time. Wait 3 minutes and report back that you are ready to restore the first bus.		
To restore RPS "A" from the MG set(normal power)	**Irf RP29R reset**	
To restore RPS "B" from the MG set(normal power)	**Irf RP28R reset**	

Op-Test No.: Scenario No.: 5 Event No.: 9 & 10 & 11 Event Description: HPCI turbine trip and RCIC steam line rupture with failure of group 5 to activate.		

Time	Position	Applicant's Actions or Behavior
	BOP/RO	• Attempts to manually start HPCI for level and pressure control.
		• Receives a HPCI turbine trip annunciator 901-3 A-9.
		• Attempts to determine reason for HPCI turbine trip and dispatches operators to investigate.
**		• Manually starts RCIC for level and pressure control.
Critical Task		• Annunciator 901-4 A-15 HIGH RCIC STEAMLINE FLOW , followed by 901-3 H-2 AREA HI TEMP STEAM LEAK DETECTION alarms. Recognizes that an isolation condition exists but neither isolation valve closed and manually closes the valves.
		• Checks area temperatures and radiological conditions on 901-21 panel.
		• Reports high temperatures and radiation in the RCIC room to US.
		• Refers to QCOA 1800-01 and notifies Rad protection and evacuates the effected area
		• Dispatches operator with a Rad Tech to investigate steam leak in RCIC.
Critical Task		• Starts SSMP to restore reactor water level.
	SRO	• Enters and directs actions of QGA 300.
Critical Task		• Orders RCIC isolated.
		• Verifies operator actions and concurs with or directs subsequent actions

** Starting RCIC is not considered critical as it will become inoperable due to steam line break later in scenario.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: If RCIC steamline break is initiated prior to the operators restoring and resetting RPS due to the loss of power, several alarming annunciators in the general area of the RCIC annunciators may result in the RCIC steamline break annunciators being masked. This may delay the operators recognition of the steamline break and subsequent identification of the failed isolation.		
When directed by the Chief Examiner to insert event #10, insert an RCIC steamline break at the turbine inlet using malfunction RC11 @ 50%	**Imf RC11 50**	
As NLO dispatched to RCIC room to investigate steam leak, report back 5 minutes later, **provided they have successfully isolated RCIC by closing either the MO-1301-16 or 17 valve,** that the room is full of steam but it is dissipating.		
The scenario can be terminated when RCIC is isolated and RPV vessel level is being restored with SSMP.		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 6		Op Test No 2	
Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	Torus cooling will be secured following shift turnover. The crew will then raise reactor power following MSIV testing. They will respond to a FWLC valve lock up..A recirc loop flow transmitter fails high requiring insertion of a half-scram. A small steam leak in the DW will cause DW/T and DW/P to rise. The leak will require a reactor scram. When DW/P reaches 2.5 psig bus 14-1 will trip when RHR pump C starts. RHR Loop B spray logic fails such that RHR Loop B containment spray valves cannot be opened. DW spray valve 23A breaker trips when the valve is stroked open and blowdown will be performed when DW/T cannot be maintained below 280°F. RPV saturation conditions will be reached following the blowdown and RPV Flooding will be performed.
Initial Conditions:	IC 20, with minor modification. Raise reactor power to ≈ 75% with flow. Place torus cooling in service. "B" Core Spray pump tagged OOS
Turnover:	Reactor power is presently at 75% to support weekly MSIV timing testing which has been completed satisfactorily. A special test of RCIC has also just been completed satisfactorily. RCIC is operable and in standby. Torus cooling, which was in service for the special RCIC test, is to be secured following turnover. Power is to be raised back to 100% once torus cooling is secured. In addition, "B" Core Spray Pump is OOS for motor winding inspection

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Secure Torus Cooling.
2	None	R	RO SRO	Raise reactor power with RRC flow.
3	FW08A	C	RO SRO	Feedwater Level Control Valves Lock Up
4	RR14A Severity 100%	I	RO SRO	Recirc Loop Flow Transmitter Failure High
5	MS04 Severity 1%, Ramp 10:00	M	ALL	Small steam leak in DW (Slow rise in DW/T and DW/P)
6	ED03E	C	BOP SRO	Bus 14-1 OC trip when RHR Pump C auto starts.
7	DIHS11001S17B	I	BOP SRO	Spray Logic Failure on RHR Loop 'B'
8	Drywell Spray valve 23A breaker trip	C	BOP SRO	RHR Spray valve 23A breaker trips when attempt is made to open valve.
9	Bat flashing	M	ALL	RPV water level indicators saturate.

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-06 Outline

1. Torus cooling will be shut down as directed in the shift turnover.

2. Reactor power will be raised from 75% following MSIV testing.

3. A momentary lockup occurs on both Feedwater Level Control Valves. At this point the simulator operator will clear the malfunction The operators respond IAW QCAN 901-5, G-7, H-9, and QCOA 0600-01 and reset both FRVs. When the crew sends someone to investigate, lockup was due to a position error which has cleared and has been reset. Im's investigated and tightened a loose connection.

4. Recirc Loop Flow Transmitter FT-1-261-6A fails high resulting in an APRM Flow Reference Off Normal alarm. The operators respond IAW QCAN 901-5, D-6. The crew will send an operator to check the Flow Converter Power Supply. When this is done, cue the SRO that the flow bias signal is upscale. A half-scram is inserted by the RO and the SRO will refer to and comply with Technical Specifications.

5. A steam leak develops in the DW causing a slow but continuous rise in DW/P. A scram and ECCS initiation will be initiated at 2.5 psig. QGA 100 and 200 will be entered.

6. Bus 14-1 will trip when the 'C' RHR pump start rendering RHR pumps 'C' and 'D' inoperable.

7. RHR Loop 'B' Spray Logic fails preventing operation of RHR Loop 'B' containment spray and cooling valves.

8. DW spray valve 23A breaker fails to open when the valve switch is placed in OPEN and DW temperature continues to rise. When DW temperature cannot be maintained below 280°F reactor blowdown will be initiated. Following blowdown, RPV saturation conditions will be reached and RPV flooding will commence as directed in QGA 500-4. When RPV flooding is started, the scenario is terminated.

9. The scenario will be terminated when the crew has commenced RPV Flooding.

Based on the outline, the critical tasks are:

- Initiate an RPV Blowdown when unable to restore drywell temperature <280, PSP limits are reached, and/or as part of RPV Flooding.
- Initiate actions to restore adequate core cooling following the loss of all RPV water level indication IAW QGA 500-4, RPV Flooding.

References:

QCGP 3-1	Rev.19	QCOP 1000-02	Rev 12
QCAN 901(2)-5 G-7	Rev 3	QCOA 0201-01	Rev 11
QCAN 901(2)-5 H-8	Rev 3	QOA 6500-06	Rev 11
QCAN 901(2)-5 D-6	Rev 2	QCOA 0600-01	Rev 4
QCOP 1000-09	Rev 12	QGA 100	Rev 4
QCOP 0500-04	Rev 6	QGA 200	Rev 6
QGA 500-1	Rev 8	QGA 500-4	Rev 10
QCAP 0230-19	Rev 8	QCGP 2-3	Rev 32

SIMULATOR SETUP

A. Initialize the simulator to IC 20 .

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (1)

"B" Core Spray Pump PTL

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	625
c.	Reactor Power	75%

3. Miscellaneous Setup

a. Torus cooling in operation on "A" loop IAW QCOP 1000-09 and QCOP 1000-04.. Procedure QCOP 1000-09 out and signed off to step F.2. Procedure QCOP 1000-04 out and signed off to step F.1.c.

b. Prepare a REMA and Attachment "B".

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC20.	**rst 20** **run**	
Assign trigger #1 to go true when drywell pressure > 2.5 psig and assign malfunction ED03E to trigger 1 to trip bus 14-1 when ECCS pumps start at 2.5 psig in the drywell.	**Select event trigger button.** **Select trigger #1** **Select drywell pressure greater than 2.5 psig from the pulldown menu.** **Enter command imf ed03e** **Select accept new event.**	
Fail the "B" loop of RHR spray logic by overriding the containment spray permissive S-17 switch to "OFF"	**Ior dihs11001s17b OFF**	
Override switch for 1-1001-23A closed using override dihs1100123a.	Ior DIHS1100123A CLOSE	
Assign trigger #2 to trip the breaker for the 1-1001-23A valve when the control switch is taken to open.	**Select event trigger button.** **Select trigger #2** **Enter event: ZDIHS1100123A(2)** **Enter command:** **irf RH19AR OPEN** **Select accept new event.**	
Ensure torus cooling is in operation on the "A" loop and RHRSW on both loops.		
On the White Board on the 901-55 panel write 3.5.A.1 Action 1 7 day LCO for "B" Core Spray OOS.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is at approximately 75% power.

b. Unit 2 is at approximately 100% power.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: 3.5.A.1 Action 1 7 day LCO for "B" Core Spray OOS.

(2) Unit 2: NONE.

2. Significant problems/abnormalities:

a. "B" Core Spray Pump is OOS for motor winding inspection.

3. Evolutions/maintenance for the oncoming shift:

a. Torus cooling, in service to support earlier surveillances, needs to be secured following turnover. Power is then to be returned to 100% following turnover with recirculation flow.

b. Electrical Maintenance will continue inspection on the "B" Core Spray motor windings.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 1

Event Description: Secure torus cooling.

Time	Position	Applicant's Actions or Behavior
	BOP	Refers to QCOP 1000-09. Throttles closed MO 1-1001-36A When RHR pump discharge pressure increases to within 25 psig of RHRSW pressure, stops running RHR pump and fully closes MO 1-1001-36A. Closes MO 1-1001-34A. Opens MO 1-1001-16A. Shuts down the RHRSW system by stopping the operating RHRSW pump and closing MO 1-1001-5A. Verifies "A" RHR loop in standby lineup IAW QCOP 1000-02 step F.3.
	SRO	• US verifies operator actions and concurs with or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 2 Event Description: Raise reactor power with reactor recirculation flow.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	• Directs that reactor power be increased to 100% per the REMA and Attachment B. • US verifies operator actions and concurs with or directs subsequent actions.
	RO	• Raises reactor power with recirculation flow IAW QCGP 3-1, REMA and Attachment B. • Increases recirculation pumps speeds to increase reactor power at less than 100 MWE/hour. • Monitors power increase on nuclear instrumentation. • Monitors thermal limits. • Maintains load set 10% above main generator load. • Monitors drywell pressure and directs adjustments to containment pressure controller as needed. • Monitors and verifies main generator excitation limits are within hydrogen cooling system capability. • Verifies and adjusts reactor pressure as needed.

Comments:____

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B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 3

Event Description: Feedwater level control valves “A” & “B” lock up.

Time	Position	Applicant's Actions or Behavior
	RO	• Refers to annunciator 901-5 G-7 & H-8. • Determines that neither feedwater regulating valve is controlling level and depresses the reset button for either or both valves. • Refers to QCOA 0600-01. • Dispatches operators and/or maintenance personnel to investigate the lockup.
	SRO	• Refers to QCOA 0600-01. • US verifies operator actions and concurs with or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #3, insert, then immediately delete, feedwater regulating valve lockups for both "A" & "B" feed reg valves using malfunction FW08.	**IMF FW08A** **IMF FW08B** **DMF FW08A** **DMF FW08B**	
If directed as operators or maintenance to investigate the cause of the feed reg valves lock up, report back 4 minutes later that the NEMATRON indicated that a "position error" occurred on both the "A" & "B" feed reg valves and has cleared. FIN team members are looking into the problem.		
Report back 10 minutes after event #3 that FIN team found and repaired a loose connection in the NEMATRON cabinet and all checks out satisfactorily.		

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Op-Test No.: Scenario No.: 6 Event No.: 4

Event Description: Recirculation loop “A” flow transmitter failure.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Refers to annunciator 901-5 D-6. • Verifies Rod Block and stops power ascent • Contacts QNE and/or maintenance for assistance • Monitors lights on 901-37 panel to determine if failure is upscale, inop, or comparator. • Reports that flow converter output appears to have failed high(non-conservative) • Informs US that annunciator procedure requires a ½ scram on “A” channel. • Inserts ½ scram on “A” RPS channel IAW QCOP 0500-04, and verifies reactor power, and recirculation loop and total core flow are within operating limits and adjusts if necessary. • Informs the US to refer to QCAP 0230-19.
	SRO	• Refers to Technical Specifications 3.1 A-1, determines that 1 channel of flow biased neutron flux-high instrumentation is inoperable and must be tripped within 1 hour. • Refers to Technical Specifications 3.2 E-1, determines that 1 channel of control rod block actuation is less conservative and declares RBM #7 inop. • Refers to Technical Specifications 3.3 M., verifies that reactor is not in a limiting control rod pattern and determines 24 hours to repair or trip the channel in the next hour if not repaired. Satisfied when ½ scram inserted on “A” RPS channel. • Refers to QCAP 0230-19 equipment operability. • US verifies operator actions and concurs with or directs subsequent actions.

Comments:____

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B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #4, insert an upscale failure of the "A" loop recirculation flow transmitter using malfunction RR14A.	**Imf RR14A 100**	
If contacted as QNE, tell them you will comply with their wishes ASAP.		
If contacted as maintenance, tell them will develop a work package and begin repairs ASAP.		

Op-Test No.: Scenario No.: 6 Event No.: 5 Event Description: Small steam leak in drywell.		
Time	Position	Applicant's Actions or Behavior
	BOP	• Investigates the cause of increasing drywell pressure IAW QCOA 0201-01. • Starts the 7th drywell cooler. • Notifies RP of increasing drywell pressure.
	SRO	• Verifies immediate operator actions and concurs with or directs subsequent actions of QCOA 0201-01. • Sets scram criteria • Enters QGA 100 and 200 if drywell pressure reaches 2.5 psig. • Orders the 7th drywell cooler started • Monitors torus water temperature and initiate torus cooling at >90°F in the torus.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, insert a 1% leak in the B steam line in the drywell ramped over 10:00 minutes using malfunction MS04B.	**Imf MS04B 1 10:00**	

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) & 6

Event Description: Small steam leak in drywell (continued) and bus 14-1 overcurrent trip at 2.5 psig in drywell ECCS start signal.

Time	Position	Applicant's Actions or Behavior
	RO	• Reactor scrammed when scram criteria met. • Reports all rods in, water level recovering, reactor pressure normal, and +8" QGA entry condition.
	SRO	• Directs the actions of QGA 100 at 2.5 psig in the drywell. • Directs performance of QCGP 2-3. • Directs that automatic isolations, ECCS and EDG starts verified. • Directs that bus 19 be crosstied to bus 18 to restore power and RPS "B". • Directs reactor level be controlled between 8 & 48" with a preferred injection system. • Directs a cooldown at < 100 degrees/hour with bypass valves.
	RO	• Performs QCGP 2-3. • Maintains reactor level between 8 & 48" with a preferred injection system. • Starts a cooldown at < 100 degrees/hour with bypass valves.
	BOP	• Verifies automatic isolations, ECCS & EDG starts. • Verifies that the Unit 1 EDG autostarts, but does not load to the bus due to the overcurrent indication on bus 14-1 via annunciator 901-8 F-3. • Places the Unit 1 EDG control switch to stop. • Reports to US that bus 14-1 is de-energized and refers to QOA 6500-06. • Crossties bus 19 from bus 18 and directs operators to restore power to RPS "B". • Notifies Unit Supervisor and/or phones Shift Manager about potential GSEP classification condition.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE Bus 14-1 should trip upon ECCS initiation signal when trigger #1 goes true @ 2.5 psig in the drywell. If bus 14-1 doesn't trip at 2.5 psig, trip it using malfunction ED03E	**Imf ED03E**	
If dispatched as NLO or maintenance to bus 14-1, report back 4 minutes later that there is an overcurrent target up and no visual damage.		
If directed to restore power to RPS "B" report back 4 minutes later and state that you are ready to repower the bus.		
Restore to normal power using RP28R	**Irf RP28R reset**	
Restore to alternate (dirty) power using RP29R	**Irf RP03R alt**	

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) 7 & 8

Event Description: Small steam leak in drywell (continued) Drywell spray logic failure on "B" loop, breaker trip on "A" loop drywell spray valve.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Directs recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Directs torus cooling be initiated to keep torus less than 95 degrees. • Verifies CAMS started.
	BOP	• Attempts to initiate torus spray.("B" loop will not initiate due to failed logic) • Trips recirc pumps. • Trips drywell coolers • Attempts to initiates drywell sprays. • Reports that drywell spray isolation valves do not open on "B" loop and that the breaker for the MO 1-1001-23A tripped when the attempt was made to open the valve • Dispatches an operator to the MO 1-1001-23A valve breaker. • Terminates torus spray prior to torus pressure dropping to 0 psig. • Initiates torus cooling. • Reports that drywell temperature rising

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
If dispatched as NLO to reset breaker for the 1-1001-23A valve, report back 4 minutes later that the breaker will not reset. If dispatched as NLO to manually open the 1-1001-23A valve, do not report back. If contacted about status, tell them that you are having trouble opening the valve by yourself and have called other operators for assistance.		

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) & 9		
Event Description: Small steam leak in drywell (continued) and reactor level indicators saturate.		
Time	**Position**	**Applicant's Actions or Behavior**
	SRO	• Transitions to QGA 500-1 when unable to lower or restore drywell temperature < 280 or reaches PSP limit.
		• Verifies that drywell pressure > 2.5 psig.
		• Direct that Core Spray and LPCI not needed for core cooling be prevented.
		• Verifies torus level is above 5'.
Critical Task		• Directs all 5 ADS valve opened.
		• Directs that reactor water level instruments be monitored for saturation due to high drywell temperature and lowering reactor pressure.
		• Transitions into QGA 500-4 when reports that all reactor level instruments have flashed.
		• Directs closure of MSIVs, main steam line drains, and RCIC isolation valves.
Critical Task		• Directs injection to control reactor pressure 59 psig above torus pressure, but as low as possible.
	RO/ BOP	• Prevents Core Spray and LPCI injection not needed for core cooling.
Critical Task		• Opens all 5 ADS valves, leaves switches in manual and checks position indications.
		• Monitors for saturation conditions and reports when conditions reached, then monitors reactor level indications for signs of flashing
		• Reports when all reactor level instruments flash and none are usable.
Critical Task		• Injects to control reactor pressure 59 psig above torus pressure, but as low as possible.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #9, insert a batch file to flash all reactor level indicators using bat flashing.	**Bat flashing**	
If directed to bypass reactor feed pump high level trips for flooding, wait 3 minutes and insert remote function QG13R	**Irf QG13R**	
The scenario can be terminated when the crew has commenced RPV Flooding as directed by the Chief Examiner.		

INITIAL SUBMITTAL OF THE WRITTEN EXAMINATION

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Question Topic Operator responsibility for failure of automatic action.

Given the following conditions:

- The plant is operating at 100% power
- A feedwater level control malfunction has resulted in lowering reactor water level
- Reactor water level has reached +5 inches
- There has been NO response from the Reactor Protection System (RPS)

Which of the following are the EXPECTED NSO actions for these conditions?

a. Inform the Unit Supervisor of the condition and insert a manual reactor scram when directed.

b. Insert a manual reactor scram and inform the Unit Supervisor of the condition and the action taken.

c. Place feedwater level control system in Manual, raise reactor level to greater than +20", and notify the Unit Supervisor.

d. Perform an immediate power reduction to raise reactor water level to 12" greater than narrow range instrument zero.

Answer b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.1 Knowledge of conduct of operations requirements. 3.7 3.8

Explanation of Answer b) correct answer a, c, d) operators are required to initiate a manual scram when automatic fails.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Operation Department Roles and Responsibilities	OP-AA-101-102		7	1	S/R/A/B/C/FH-0000-K006

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Conduct of temporary shift turnover.

The Unit NSO has to be relieved by an extra NSO so he can meet with the Shift Manager for about I/2 hour in the Shift Manager's office.

Which of the following describes the minimum required turnover?

a. The relief NSO must review the current Shift Turnover Sheet and be updated on any deviations of plant status/activities from the sheet by the off-going NSO.

b. All NSO actions for the turnover, including the Shift Turnover Sheet, MUST be completed.

c. The relief NSO MUST read the Control Room logs and tour the control boards with the off-going NSO.

d. All NSO actions for the turnover, including the Shift Turnover Sheet, must be completed AND the Unit Supervisor is required to initial the Turnover Sheet.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.3 Knowledge of shift turnover practices. 3.0 3.4

Explanation of Answer a) is correct. b) Completion of Turnover Sheet is not required for an relief less than 1 hour. c) reading control room logs vs. review shift turnover sheet and d) identifies more than the required actions for a turnover.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Shift Turnover and Relief	OP-AA-101-401		3	1	S/R/A/B/C/FH-0000-K006

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic: scram initiation based on indication of core oscillations.

Unit Two was operating normally at rated conditions when a single Recirculation Pump tripped.

Which of the following identifies the conditions that will require the operator to initiate a MANUAL scram?
ASSUME THE FCL PRIOR TO THE TRIP WAS 99%

a. LPRMs are oscillating on irregular intervals(1.0 to 6.0 seconds) and with irregular magnitude (between 0% and 2%).

b. Indicated core flow at 43% of rated core flow.

c. Indicated core flow at 35% of rated core flow.

d. LPRMs are oscillating at regular intervals (1.5 to 2.5 seconds) and the magnitude of the oscillations are 5% to 6% and rising.

Answer: d **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.1 Conduct of Operations

2.1.7 Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. 3.7 4.4

Explanation of Answer: d is correct. a) is NOT an indication of core oscillations per QCOA 0400-02. b) both flow and rod line are within acceptable limits. c) Flow is low but the initial FCL was not above 100%.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Trip of a Single Recirculation Pump	QCOA 0202-04		3	11	S/R-0202-EK022j
Core Instabilities	QCOA 0400-02		1	6	

Material Required for Examination:

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Given specific conditions, identify if Safety limitis exceeded.

Which of the following resulting combinations of reactor power and pressure indicate violation of a Safety Limit?

a. Reactor power -- 38%
Reactor pressure -- 850 psig

b. Reactor power -- 30%
Reactor pressure -- 820 psig

c. Reactor power -- 28%
Reactor pressure -- 770 psig

d. Reactor power -- 20%
Reactor pressure -- 750 psig

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.10 Knowledge of conditions and limitations in the facility license. 2.7 3.9

Explanation of Answer Safety Limit violation if power above 25% with pressure less than 785 psig c. - only correct combination of conditions a. - pressure above 800 psig b. - pressure above 800 psig d. - power below 25%

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Fuel	LF-0800		App. D page 6	2	S/R-0800-EK030
Technical Specifications	TS 2.1.A, Safety Limits				

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: VY Exam Bank

Comment Type **Comment**

Question Topic: Use of generator capability curve

Given a copy of the Generator Cooling Capability Curve:

Which of the following identifes the set of Main Generator parameters where generator operating limits are EXCEEDED?

	Power	Reactive Load	H2 Pressure	H2 Temperature
a.	600 MWe	+200 MVARs	60 psig	42 C
b.	700 MWe	+300 MVARs	45 psig	42 C
c.	800 MWe	+250 MVARs	45 psig	36 C
d.	820 MWe	+350 MVARs	60 psig	36 C

Answer: c Exam Level: B Cognitive Level: Comprehension Facility: Quad Cities ExamDate: 03/27/2000

Tier: Generic Knowledge and Abilities RO Group: 1 SRO Group: 1

GENERIC

2.1 Conduct of Operations

2.1.25 Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data. 2.8 3.1

Explanation of Answer: c.) identifies parameters which EXCEED limits. Operation is outside of the curve bounded by 45 psig gas pressure. All other distractors are within limits.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Main Generator	LIC 6000		54 and 56	1	S/R-6600-EK-34
Adjusting VARS on the Main Generator	QCOP 6000-02		Att. A	1	

Material Required for Examination: Need copy of Generator Capability Curve, QCOP 6000-02, Attachment A, Rev. 1

Question Source: Facility Exam Bank Question Modification Method: Direct From Source

Question Source Comments: Question 9859 - Not Used During Program

Comment Type | Comment

Question Topic Given plant conditions, identify correct system valve lineup.

A loss of feed transient on Unit One has caused reactor level to drop to -70 inches. Neither HPCI or RCIC have responded as designed and the Safe Shutdown Makeup Pump (SSMP) has been placed in service to automatically restore reactor level. Reactor level is now -5 inches and recovering.

Which of the following describes the SSMP indications on the SSMP panel 912-8 as reactor level rises to above +48 inches?
ASSUME NORMAL SYSTEM RESPONSE WITHOUT ANY OPERATOR ACTIONS

	Safe Shut Down Pump 1/2-2901	Flow Control Valve 1/2-2601-6	Unit Supply valve 1-2901-8
a.	RED Light on	400 gpm	RED light on
b.	RED Light on	400 gpm	GREEN light on
c.	GREEN light on	Zero gpm	GREEN lght on
d.	AMBER light on	Zero gpm	RED light on

Answer a **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.1 Conduct of Operations

2.1.31 Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup. 4.2 3.9

Explanation of Answer Only a can be correct. There are no automatic actions associated with the SSMP. The system will remain in the injection lineup until operator action is taken.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Safe Shudown System	LIC-2900		52	3	S/R-2900-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Given specific conditions, determine action to be taken to correctly operate the CRD system. (Notch vs. co

Unit Two is operating at rated power with an Initial License Candidate (ILC) under instruction as NSO on Unit Two.

A loss of feedwater heating occurs, the flow control line is rising slowly and it is determined that the "CRAM Rods" must be inserted. The Unit Two NSO is involved in restoring a normal feedwater heater linup. The Unit 2 Admin. NSO is recording APRM readings from the 902-37 panel.

Under these "Abnormal" conditions, who may perform the task of rod insertion?

a. The Unit Two NSO.

b. The Shift Technical Advisor (STA).

c. The Initial License Candidate.

d. The Unit Two Unit Supervisor.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.2 Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. 4.0 3.5

Explanation of Answer c) NSO must provide direct supervison. b and d)US and STA assume position of oversight and are not allowed to move CRs.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Watch Standing Practices	OP-AA-101-104		2	0	S/R-0000-K006

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Given conditions, identify temp. mod.

Which of the following is considered to be a T-Mod as described in NSP-CC-AA-112?

a. The removal of RHR pump motor control power fuses as part of an OOS for repair of the motor.

b. A charging hose with a pressure guage attached when charging a SBLC accumulator IAW QCOP 1100-10.

c. A pressure guage installed on an engineered test point tap.

d. A strip chart recorder installed due to the failure of the installed component.

Answer d **Exam Level** B **Cognitive Level** Memory **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.11 Knowledge of the process for controlling temporary changes. 2.5 3.4

Explanation of Answer d.) correct due to no engineering test points. b. and c.) configuration changes controlled as part of an approved procedure or OOS are not considered Temp. Mods. A.) Test equipment installed on engineered test points are not Temp. Mods.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Temporary Modifications	NSP-CC-AA-112	Exhibit F	39-41	0	S/R-0000-K009

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Significantly Modified

Question Source Comments: 1998 SRO, Question 81 modified stem and three distractors.

Comment Type	Comment

Question Topic Related to precaution, limitation or requirement of the procedure.

Which of the following identifies a task that requires Shift Authorization To Start Work?

a. Fire hose and extinguisher inspections.

b. Interim Radwaste Storage Facility (IRSF) overhead crane inspection by Mechanical Maintenance.

c. In-shop fabrication of a part to be used in a Safety Related system.

d. IM surveillance requiring opening of the 901-32 panel in auxiliary electric room.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.2 Equipment Control

2.2.19 Knowledge of maintenance work order requirements. 2.1 3.1

Explanation of Answer a. and c.) exempted from Shift authorization by procedure b.) not a T.S. related crane (exempted) d.) correct due to vital equip in power block.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Work Execution	MA-AA-AD-6-03009		9	0	S/R-0000-K006

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Determine if quarterly or annual administrative limits have been exceeded.

This year you have accumulated 10 REM Shallow Dose Equivalent, Whole Body.

What's the maximum external dose whole body skin exposure that you can receive before you exceed the Legal Federal Annual limit?

a. 5 Rem

b. 10 Rem

c. 40 Rem

d. 65 Rem

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.1 Knowledge of 10 CFR 20 and related facility radiation control requirements. 2.6 3.0

Explanation of Answer Annual limit is 50. Only c can be correct.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Exposure Authorization and Control	QCAP-0630-06	Attachment D	17	5	
Nuclear-General Emp. Training Study Guide			59	22	RWTLL G2

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Direct From Source

Question Source Comments: RO Question 56 from 1996 NRC exam

Comment Type **Comment**

Question Topic Approval for Emergency Exposures.

Extraordinary circumstances require a task to be performed which will result in excessive radiation exposure. Which of the following is accurate regarding an EMERGENCY EXPOSURE?

a. Approval MUST be granted by the Rad Chem Superintendent, Station Manager and Site Vice President.

b. Approval MUST be granted by the Station Manager, Site Vice President and the ComEd Medical Director.

c. Approval SHOULD be granted by the Rad Chem Superintendent and the Station Manager but the exposure is voluntary and approval is NOT mandatory.

d. Approval SHOULD be granted by the Rad Chem Superintendent, Station Manager and ComEd Medical Director but the exposure is voluntary and approval is NOT mandatory.

Answer: d Exam Level: B Cognitive Level: Memory Facility: Quad Cities ExamDate: 03/27/2000

Tier: Generic Knowledge and Abilities RO Group: 1 SRO Group: 1

GENERIC

2.3 Radiological Controls

2.3.2 Knowledge of facility ALARA program. 2.5 2.9

Explanation of Answer: d is correct. Approval shoud be obtained IF possible and is therefore NOT mandatory. If approval is granted it must be from RC Sup, Sta Mgr, and ComEd Med Dir. This combination is only identified in distractor d.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Exposure Authorization and Control	QCAP 0630-06	D.4.e.	11	5	S/R-0000-K006

Material Required for Examination

Question Source: New

Question Modification Method:

Question Source Comments:

Comment Type | Comment

Question Topic Related to precaution, limitation or requirement of the procedure.

QGA 200-5, Hydrogen Control, initial steps to control hydrogen direct venting and purging containment. Prior to venting, an evacuation is directed for the SBGT area.

The evacuation is necessary to protect personnel from the potential for . . .

a. a hydrogen explosion.

b. high area temperatures.

c. changing radiological conditions.

d. a nitrogen rich, oxygen deficient atmosphere.

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.9 Knowledge of the process for performing a containment purge. 2.5 3.4

Explanation of Answer a) low hydrogen level in the initial steps of the procedure do not present an explosion hazard, b) area temperatures should not be greatly affected and d) the potential for an oxygen deficient atmosphere is nil.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Post Accident Venting of Primary Containment	QCOP 1600-13		4	11	
Primary Containment Control	LP-QGA200			8	S/R-0001-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Waiver of verification for hi radiation areas.

A Rad Waste valve is being returned to service. The restoration requires Independent Verification (IV). The second operator is expected to receive five (5) mrem whole body during performance of the IV. Which of the following describes how the IV should be addressed?

a. A waiver for the IV should be granted and the IV should not be performed.

b. Allow the IV to be performed, follow up with written justification for the exposure.

c. Allow the operator to perform the IV, the radiation exposure is within the prescribed guidelines.

d. Re-verify component status with the operator that performed the task and note the conversation on the clearance sheet.

Answer c **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.3 Radiological Controls

2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure. 2.9 3.3

Explanation of Answer c is correct, a waiver should be considered for any exposure GREATER than 10 mrem. a) the waiver is not required. b) there is NO requirement of written justification and d) does not describe any acceptable method of second verification.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Verification Practices	OP-AA-101-106		4	0	S/R-0000-K010

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Any of the EOP terms or definitions.

Which of the following describes the plant conditions that assure Adequate Core Cooling?

a. No injection flow; reactor water level unknown; reactor pressure 75 psig; torus pressure 35 psig; 1 SRV open.

b. No injection flow; reactor water level at the 2/3 core height; reactor pressure 100 psig; torus pressure 25 psig; 5 SRVs open.

c. Injection flow; reactor water level at the 2/3 core height; reactor pressure 95 psig; torus pressure 35 psig; and 4 SRVs open.

d. Injection flow; reactor water level at 21" below the top of the fuel; reactor pressure 100 psig; torus pressure 25 psig; 5 SRVs open.

Answer: d **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.17 Knowledge of EOP terms and definitions. 3.1 3.8

Explanation of Answer: d correct, the statement identifies RPV Flood conditions, minimum dp with 5 SRVs open. a) is incorrect, level unknown flooding required but minimum # of SRV is not satisfied. b) is incorrect, level is below the Minimum Zero Injection RPV Water level requirement. c) is incorrect, level is below TAF with injection and 5 SRVs are not open.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
QGA Introduction	LP-QGAINTRO		31, 33, 35	0	S/R-0001-EK002
QGA 100, RPV Control	L-QGA100		47	0	
QGA Details	L-QGADET		60	0	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Duane Arnold Exam Bank

Comment Type **Comment**

Question Topic Operator response to complete loss of RBCCW.

The following containment parameters exist as a result of a loss of Reactor Building Closed Cooling Water (RBCCW) during a LOCA.

- Drywell Temperature 275 Degrees F.
- Drywell Pressure 14 psig

Which of the following identifies and explains the concerns IF RBCCW flow is re-established to the drywell under these conditions?

a. Damage to the RBCCW Pump seals due to high temperature water.

b. Excessive reduction in drywell pressure due to high RBCCW flow.

c. Damage to the RBCCW pumps due to runout.

d. Damage to RBCCW components due to water hammer.

Answer d **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group** 1 **SRO Group** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.24 Knowledge of loss of cooling water procedures. 3.3 3.7

Explanation of Answer d is correct, these components are not designed for the hydrodynamic effects of water hammer. a) RBCCW passes through the heat exchangers prior to entering the pumps which will moderate the temperature. b) DW/P reduction would be slow under these conditions. c) starting procedures will minimize runout.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Buillding Closed Cooling water	LF-3700		50a	3	S/R-3700-EK028
RBCCW System Startup and Operation	QCOP 3700-02		4	9	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic HPCI and RCIC are inop, identify reportability requirements.

An inadvertent HPCI initiation occurs during normal full power operation. HPCI injection into the reactor was confirmed and HPCI was secured. The unit continues to operate at full power.

Which of the following identifies the actions that must be taken for described conditions.

a. Within 15 minutes, notify state and local government agencies.

b. Within one (1) hour notify the NRC Operation Center via the ENS.

c. Within four (4) hours notify the NRC Operation Center via the ENS.

d. No notifications must be made.

Answer c **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies. 2.2 3.6

Explanation of Answer c is correct, this was ESF actuation due to an invalid signal. a) is required for GSEP classifications. b) is for valid ESF actuations. d) just not true or correct.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reportability Manual		SAF 1.7	1	5	S/L-Rept-EK003
		SAF 1.12	1	6	

Material Required for Examination Copy of the Reportability Manual

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic: SPDS Indication when a valve fails to isolate.

A valid Group One (1) isolation signal has been received. All MSIVs responded as designed except Outboard MSIV 203-2A which failed to close. Which of the following identifies the SPDS indications for the described condition(s)?

The PCIS box will be . . .

a. Solid RED.

b. RED with a smaller white box stating "OPEN".

c. Solid GREEN.

d. GREEN with a smaller white box stating "CLOSED".

Answer: c **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Generic Knowledge and Abilities **RO Group:** 1 **SRO Group:** 1

GENERIC

2.4 Emergency Procedures and Plan

2.4.46 Ability to verify that the alarms are consistent with the plant conditions. 3.5 3.6

Explanation of Answer: a.) RED- not true due to one valve closed in line b.) CYAN= input invalid or inop.. c.)correct answer is GREEN due to at least one isol valve closed in the line d.) YELLOW = Alert condition not applicable to PCIS

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Operation of SPDS	LIC-9900		58 and 60	1	S/R-9900-EK005
SPDS	QOP 9900-102		2,4,6	6	

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Concept Used

Question Source Comments: 1998 SRO, Question 56 Stem and all distractors were modified.

Comment Type	Comment

Question Topic Ability to cool the drive.

During normal full power operation which of the following is an immediate result of the loss of CRD hydraulics?

a. Multiple rod drifts will occur.

b. Control rod scram times will NOT be met.

c. Accumulator charging pressure at the CRD hydraulic unit will be lost.

d. CRD drive temperatures will increase.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201001 Control Rod Drive Hydraulic System

K3. Knowledge of the effect that a loss or malfunction of the CONTROL ROD DRIVE HYDRAULIC SYSTEM will have on following:

K3.03 Control rod drive mechanisms 3.1 3.2

Explanation of Answer a) Excessive drive pressure, not loss of pressure can cause drifts. b) At rated pressure scram times are assured and c) a check valve in the charging line to each HCU assures that charging pressure will be maintained. d.) w/o cooling water, temps will increase.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Control Rod Blade and Drive Mechanisms	LF-0301		36, 54	2	S/R-0301-EK22e S/R-0301-EK002
CRD Hydraulics	LF-0302		37	2	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments: Loss of CRD results in same condition as a plugged orifice (S/R-0301-EK022e)

Comment Type	Comment

Question Topic Initiation of rod blocks based on status of refuel bridge, grapple or hoist.

With the Mode Switch in REFUEL, which of the following will cause a rod block?

a. A control rod is selected.

b. The bridge is over the core with the main grapple full up and loaded.

c. The bridge is over the core with the frame hoist loaded.

d. The bridge is over the fuel pool with the main grapple loaded.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201002 Reactor Manual Control System

K1. Knowledge of the physical connections and/or cause- effect relationships between REACTOR MANUAL CONTROL SYSTEM and the following:

K1.08 Refueling interlocks: Plant-Specific 3.2 3.6

Explanation of Answer a). One rod can be out in REFUEL, b). No rod block as long as grapple is full up unloaded, d). No rod blocks over the fuel pool.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Manual Control System	LF-0280		18	5	S/R-0280-EK014 b5

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Given a specific RMCS, determine if rods can be moved.

The Reactor Manual Control (RMC) Auxiliary Timer will generate a Select Block if the Master Timer malfunctions during a . . .

a. notch in cycle.

b. notch out cycle.

c. continuous insert evolution.

d. continuous withdraw evolution.

Answer b **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

201002 Reactor Manual Control System

K3. Knowledge of the effect that a loss or malfunction of the REACTOR MANUAL CONTROL SYSTEM will have on following:

K3.01 Ability to move control rods 3.4 3.4

Explanation of Answer Auxiliary timer only functions during Notch out evolutions.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Manual Control System	LF-0280		6	5	S/R-0280-EK015

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 787

Comment Type **Comment**

Question Topic: Fast period during approach to critical.

A caution in QCGP 1-1 states that NOTCH OVERRIDE shall NOT be used between positions 04 and 24 from the time half the Control Rods are fully withdrawn UNTIL at least one bypass valve is partially open.

Adherence to this caution . . .

a. minimizes the potential for inadvertent short periods.

b. ensures that the reactor heatup rate will not be exceeded.

c. ensures NO "double notching" will occur during approach to criticality.

d. provides the Nuclear Engineer adequate time to calculate reactor period.

Answer: a **Exam Level:** R **Cognitive Level:** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 3

201003 Control Rod and Drive Mechanism

K5. Knowledge of the operational implications of the following concepts as they apply to CONTROL ROD AND DRIVE MECHANISM:

K5.07 How control rod movements affect core reactivity 3.3 3.6

Explanation of Answer: a is correct. b) Heatup is not occurring during approach to critical, c) double notching is associated with rod speed and may or may not occur during single notch withdrawal and d) time for period calculation is not a factor.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Normal Unit Startup	QCGP 1-1		12	31	S/R 0002-PK004

Material Required for Examination:

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Initiation of the RWM.

The earliest time that the Rod Worth Minimizer(RWM) rod blocks will automatically ENABLE is . . .

a. as soon as either steam flow OR feedwater flow decrease to less than 20%.

b. one (1) minute after steam flow AND feedwater flow are both less than 20%.

c. as soon as steam flow AND feedwater flow have both increased to more than 20%.

d. when steam flow OR feedwater flow has been above 20% for more than one (1) minute.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group:** 2 **SRO Group** 2

201006 Rod Worth Minimizer System (RWM) (Plant Specific)

K1. Knowledge of the physical connections and/or cause- effect relationships between ROD WORTH MINIMIZER SYSTEM (RWM) and the following:

K1.03 Reactor water level control (feed flow): P-Spec(Not- BWR6) 3.1 3.2

Explanation of Answer RWM becomes operable as power is lowering, not rising as described in c and d. There is no time delay associated with the enabling of the RWM.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Rod Worth Minimizer	LIC-0207		62, 70	4	S/R-0207-EK015e

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 1672 - Not Used During Program

Comment Type	Comment

Question Topic Given specific conditions determine if/when EOC/RPT will occur.

Plant operation is stable with the following parameters following a failure of the "A" recirc pump controller.

- Reactor Power	78% of rated.
- Reactor Level	Stable in the normal range.
- A Recirc Pump Speed	64% of rated.
- B Recirc Pump Speed	100% of rated.

Which of the following should be taken for the conditions that now exist?

a. Immediately trip the "A" recirculation pump.

b. Locally raise "B" pump speed to 74% of rated.

c. Lower "B" pump speed to 79% of rated.

d. Immediately place the reactor Mode Switch in SHUTDOWN.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

202001 Recirculation System

K4. Knowledge of RECIRCULATION System design feature(s) and/or interlocks which provide for the following:

K4.11 Limitation of recirculation pumps flow mismatch: Plant-Specific 3.1 3.5

Explanation of Answer a and d) Plant conditions do not require a pump trip or scram. b) Mismatch described is if reactor power is >80%.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Technical Specifications		3.6.C			S/R-0202-EK029 S/R-0202-EK032

Material Required for Examination Provide copy of T.S. 3.6.C

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic What will initiate a scop tube lockup and how will RRC be affected.

Given the following conditions:

- The plant is operating at 55% power
- A speed signal failure on the "A" Recirculation Pump has resulted in a Scoop Tube Lock up.
- Preparations are in progress to take local manual control of the "A" Scoop Tube Positioner
- Prior to taking local manual control, a reactor scram occurs

Which of the following are REQUIRED for these conditions?

a. Trip the "A" Recirculation Pump immediately.

b. Place the local Disconnect Switch to "OFF", then trip the "A" Recirculation Pump.

c. Direct an Equipment Operator to manually position the "A" Recirculation Pump scoop tube to "minimum" speed.

d. If the difference in recirculation loop flows is greater than 5% at the time of the scram, then trip the "A" Recirculation Pump.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

202002 Recirculation Flow Control System

A2. Ability to (a) predict the impacts of the following on the RECIRCULATION FLOW CONTROL SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.05 Scoop tube lockup: BWR-2, 3, 4 3.1 3.1

Explanation of Answer There is no protection against pump cavitation under these conditions. The procedure has two options, depress the POWER RESET P/B and reduce speed or immediately trip the pump. The first option is not listed and possibly not do to a signal failure therefore only a is correct.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RRC System MG Scoop Tube Lockup and Manual Operation	QCOP 0202-12		2	12	S/R-0202-EK013c, S/R-0202-EK022a

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Operation and system response to manual initiation.

A LOCA is in progress. RHR Loop Select Logic has determined that there is NO difference between "A" and "B" Jet Pump Riser pressures.

MO-1001-29B failed to automatically open when the reactor low pressure premissive was satisfied.

Which of the following describes the minimum action(s) necessary to initiate RHR LPCI flow into the RPV?

(Assume that RPV level remains below -59" and injection valve 1001-29B cannot be opened.)

a. Reset the LPCI Loop Select Logic, the RHR injection valves 1001-28A and 1001-29A will then open automatically.

b. Reset the LPCI Loop Select Logic, then open RHR injection valves 1001-28A and 1001-29A using the control switches on 90X-3.

c. Wait for the 5 minute Loop Select Timer to time out, then open RHR injection valves 1001-28A and 1001-29A using the control switches on 90X-3.

d. Manually open RHR injection valves 1001-28A and 1001-29A locally.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier Plant Systems **RO Group** 1 **SRO Group** 1

203000 RHR/LPCI: Injection Mode (Plant Specific)

A4. Ability to manually operate and/or monitor in the control room:

A4.02 System valves 4.1 4.1

Explanation of Answer a and b are incorrect, Loop Select Logic cannot be reset when level is below the setpoint (-59"). c is incorrect as the 28 and 29 valves in the unselected loop are interlocked closed until logic is reset. d is only correct answer.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Residual Heat Removal System	LF-1000		15, 43, 44	5	S/R-1000-EK013
Post Accident RHR Operation	QCOP 1000-30		8	11	

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 10087, minor editorial changes in the distractors

Comment Type **Comment**

Question Topic RWCU response to high system temperature.

Unit One is recovering from a reactor scram. Reactor Water Cleanup (RWCU) blowdown flow has been maximized to the main condenser to maintain proper reactor water level. CU SYSTEM AFTER NON REG HX HIGH TEMP is annunciated.

Which of the following will occur as a DIRECT result of the temperature rise IF prompt action is NOT taken by the operator?

a. Automatic isolation of both filter demineralizers.

b. Automatic isolation of all blowdown to the main condenser.

c. Automatic isolation of RWCU primary containment isolation valves.

d. Automatic bypass of all RWCU flow around the filter demineralizers.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

204000 Reactor Water Cleanup System

A3. Ability to monitor automatic operations of the REACTOR WATER CLEANUP SYSTEM including:

A3.04 Response to interlocks and trips designed to protect system components 3.4 3.5

Explanation of Answer a and b) occur but only as a result of parameters not identified in the stem. d) There are no automatic functions associated with the F/D bypass valve.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Water Cleanup System	LF-1200		24	3	S/R-1200-EK006
CU SYSTEM AFTER NON REG HX HIGH TEMP	QCAN 901(2)-4 F12		1	4	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic SDC drain down interlocks.

Shutdown Cooling (SDC) is being placed in service IAW QCOP 1000-5 using Recirculation Loop A and RHR Pump B.

Which of the following identifies the interlocks that minimize the potential for inadvertent vessel draindown as the task is performed?

a. BOTH RHR cross-tie valves, 19A AND 19B, must be closed before SDC suction valve, 43B, can be opened.

b. Torus suction valve, 7B, must be closed before SDC suction valves, 47 AND 50, can be opened.

c. Torus spray valve, 37A, must be closed before EITHER SDC suction valves, 47 OR 50, can be opened.

d. Torus spray/test return valve, 34A, must be closed before SDC suction valve, 43B, can be opened.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

205000 Shutdown Cooling System (RHR Shutdown Cooling Mode)

K5. Knowledge of the operational implications of the following concepts as they apply to SHUTDOWN COOLING SYSTEM/MODE:

K5.02 Valve operation 2.8 2.9

Explanation of Answer a) Only the associated 19 valve must be closed, b) the interlock is between valve 7 and 43 not 47 and 50, c) valve 37 is not included in any of the SDC interlocks.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Residual Heat Removal System	LF-1000		14	5	S/R-1000-EK013

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Sequence of valve positioning during swap.

A loss of feed event occurred resulting in RPV level dropping to -65 inches. HPCI was in normal standby line up and has responded as designed.

Which of the following describes HPCI system response if torus level rises to +6"?

a. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke closed.
HPCI CCST suction valve (2301-6) will remain open, HPCI injection is not interrupted.

b. HPCI CCST suction valve (2301-6) will stroke closed, HPCI turbine will trip.
HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open, HPCI will start and inject.

c. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open.
HPCI CCST suction valve (2301-6) will stroke closed, HPCI will continue to inject during the transfer.

d. HPCI turbine will trip. Suppression Pool suction (2301-35 and 36) will stroke closed and CCST suction (2301-6) valves will stroke open simultaneously. HPCI will start and inject after suction is realigned.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

206000 High Pressure Coolant Injection System

K4. Knowledge of HIGH PRESSURE COOLANT INJECTION SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.19 Automatic transfer of HPCI pump suction: BWR-2, 3, 4 3.7 3.8

Explanation of Answer a) all valves will not remain open at the same time, b) Position of 2301-6 is based on position of both 2301-35 and 36, and d) low suction trip of HPCI is bypassed on auto initiation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
High Pressure Coolant Injection	LIC-2300		17	6	S/R-2300-EK020
HPCI Automatic Initiation	QCOA 2300-04		5	9	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Operation of MSC and MGU or response if either fails during system initiation.

A LOCA has occurred. The following conditions exist:

- Reactor Level	-40 inches, rising slowly
- Reactor Pressure	600 psig, steady
- HPCI	Injecting at rated flow, in AUTO

Which of the following describes HPCI operation if HPCI Flow Controller, FIC 2340-1, fails such that it senses high flow?

a. HPCI speed will rise and continue to rise until the mechanical trip setpoint is reached.

b. HPCI speed will rise until the Motor Gear Unit (MGU) takes control to maintain speed at 4000 RPM.

c. HPCI speed will lower to 2000 RPM at which time speed will be maintained by the Motor Gear Unit (MGU).

d. HPCI speed will lower until the Motor Speed Changer (MSC) takes control to maintain speed at the MSC High Speed Stop (HSS).

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate** 03/27/2000

Tier Plant Systems **RO Group** 1 **SRO Group** 1

206000 High Pressure Coolant Injection System

K5. Knowledge of the operational implications of the following concepts as they apply to HIGH PRESSURE COOLANT INJECTION SYSTEM:

K5.05 Turbine speed control: BWR-2, 3, 4 3.3 3.3

Explanation of Answer Upon initiation the MSC is set at the HSS. High flow would cause speed to lower as controlled by the MGU. When speed drops below the HSS of the MSC it would have sole control at 4000 RPM.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
High Pressure Coolant Injection	LIC-2300		64	6	S/R-2300-EK022 a

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Which power supply loss will affect system initiation or component response.

The following annunciator has been received on Unit One, CORE SPRAY SYS 1 BUS/LOGIC PWR FAILURE.

The loss of logic power can be attributed to a loss of . . .

a. 125 VDC Main Bus 1B-1.

b. 120/240 VAC Instrument Bus.

c. 125 VDC Distribution Panel 1A-1.

d. 120/240 VAC Essential Service Bus.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

209001 Low Pressure Core Spray System

K2. Knowledge of electrical power supplies to the following:

K2.03 Initiation logic 2.9 3.1

Explanation of Answer Logic is from 125 VDC power and its source is Division 1, therefore only c can be correct. Others provide similar functions in different systems.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Core Spray	LF-1400		38	3	S/R-1400-EK018a
CORE SPRAY SYS 2 BUS LOGIC PWR FAILURE	QCAN 901(2)-3 C5		2	2	
Core Spray Loss of 125 VDC Auto Initiation Control Power	QCOA 1400-02		4	4	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic System response as C/S is positioned to OPERATE..

The plant is in an ATWS condition. The keylock switch for the Standby Liquid Control (SBLC) system is placed in SYS 1.

Aside from starting the "A" SLC pump, what else will this switch movement initiate?

a. ONLY RWCU inboard isolation valve, MO-1201-2 will close.

b. BOTH primer assemblies in the System 1 squib valve will energize.

c. ALL squib primer assemblies circuits for BOTH System 1 AND System 2 will energize.

d. ONLY RWCU inboard isolation valve, MO-1201-2, AND outboard isolation valve, MO-1201-5, will close.

Answer b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

211000 Standby Liquid Control System

A3. Ability to monitor automatic operations of the STANDBY LIQUID CONTROL SYSTEM including:

A3.08 System initiation: Plant-Specific 4.2 4.2

Explanation of Answer b is correct. a and d are incorrect because all three RWCU isolation valves close. c) only SYS 1 components are affected when the switch is placed in SYS 1.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Standby Liquid Control System	LIC-1100		18	5	S/R-1100-EK021

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Nine Mile 1999 Cert exam.

Comment Type **Comment**

Question Topic Receipt of half scram and appropriate isolation, identify the loss of power. (Normal AC to MG set)

The plant is operating at 75% power with all systems in their normal lineup when numerous annunciators and changes in indication are received including:

- Channel B half scram
- Control rod withdrawl block
- Numerous Division 2 Isolation valves close including RWCU valves 1201-5 (RWCU Isolation) and 1201-80 (RWCU return).

Which of the following accounts for the described conditions?

a. Loss of MCC 15-2

b. Loss of MCC-18-2.

c. Loss of MCC 19-2

d. Loss of Turbine Building 125 VDC Bus 1B1

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

212000 Reactor Protection System

K2. Knowledge of electrical power supplies to the following:

K2.01 RPS motor-generator sets 3.2 3.3

Explanation of Answer 15-2 is backup supply, 18-2 feeds "A" RPS MG Set and 125 Bus 1B1 does not affect Power to the B RPS Bus.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Reactor Protection	LF-0500		37	4	S/R-0500-EK023 c
480 V Bus 19(29) Failure	QCOA 6700-05		2	11	S/R-0500-EK018
125 VAC RPS Bus Failure	QOA 7000-01		3, 4	22	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Given one failure, determine which other failure will result in half or full scram.

Unit One startup is in progress and Mode 1 was just entered. Plant operation is now stable following a loss of RPS "B". No operator action has been taken except to silence and acknowledge alarms.

Which of the following will initiate a full reactor scram?

a. IRM Channel 14 fails upscale.

b. APRM Channel 2 fails downscale.

c. Reactor high pressure transmitter to RPS, 1-263-55-D, fails upscale.

d. Reactor low level transmitter to RPS, 1-263-57-A, fails downscale.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

212000 Reactor Protection System

K5. Knowledge of the operational implications of the following concepts as they apply to REACTOR PROTECTION SYSTEM:

K5.02 Specific logic arrangements 3.3 3.4

Explanation of Answer d is correct. a) IRM trips are bypassed, b) APRM downscale has no RPS input and c) RPV/P transmitter is in same logic as B RPS which is already tripped.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Instrumentation	LIC-0263		52	3	S/R-0263-EK024

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Reed switchs and their input to the RPIS/RMCS systems.

Which of the following describes the Full Core Display indications that will alert the Unit NSO that a control rod is inserted beyond the FULL-IN position?

a. GREEN LED with " - -" indication.

b. AMBER LED with "00" indication.

c. WHITE LED with "00" indication.

d. RED LED with "--" indication.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

214000 Rod Position Information System

A4. Ability to manually operate and/or monitor in the control room:

A4.02 Control rod position 3.8 3.8

Explanation of Answer There is NO position indication for a rod past "full-in", a single reed switch (S51) provides a full in light. Other distractors are plausible indications.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Manual Control and RPIS Systems	LF-0280		7, 10	5	S/R-0280-EK014 a3 S/R-0280-EK020 b

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic TIP response to PCI signals.

Traversing In-Core Probe (TIP) operation is in progress on Unit Two for required LPRM calibration. A feedwater transient has caused reactor level to lower.

If reactor level drops below +8 inches . . .

a. ALL TIP shear valves will fire.

b. power to the TIP system will be load shed.

c. ALL TIP motion will stop where it is and the ball valves will close.

d. ANY TIP NOT in it's shield chamber will transfer to "reverse" operating mode.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 3 **SRO Group** 3

215001 Traversing In-Core Probe

K4. Knowledge of TRAVERSING IN-CORE PROBE design feature(s) and/or interlocks which provide for the following:

K4.01 Primary containment isolation: Mark-I&II(Not-BWR1) 3.4 3.5

Explanation of Answer d is correct. a) shear valves must be manually fired. b) load shed would prevent withdrawal of TIP upon isolation. c) does not isolate the affected penetration.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Trtaversing In Core Probe (Unit 2)	LIC-704A		15	5	S/R-0704-EK012 S/R-0704-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Operation/function of Push to Setup button.

Power ascension in progress. Rods are being withdrawn to set the rod pattern. The following parameters are sensed by the LPRM/RBM circuitry when a control rod is selected for withdrawal.

- Reactor Power 64% as indicated by APRMs.
- Core Flow 50% of rated as driven by the recirculation system.
- Local Average Power 62% as detected by LPRMs and sent to the averaging circuit.

Which of the following describes the indications AND response of the RBM as control rod withdrawal is initiated?

a. The RBM INOP light should be illuminated indicating that the RBM will not allow any control rod motion.

b. The RBM TRIP SET HIGH light will illuminate to indicated that the RBM will allow unrestricted control rod motion until local power reaches the High Trip Set Point (HTSP).

c. At 68% power, the PUSH SETUP and OK TO SET HI lights will illuminate. When the SETUP pushbutton is depressed local power can rise to the High Trip Set Point (HTSP).

d. When local power reaches 74% the PUSH SETUP and OK TO SET HI HI lights will illuminate. When the SETUP pushbutton is depressed local power can rise as high as the High Clamp at 106%

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

215002 Rod Block Monitor System

K4. Knowledge of ROD BLOCK MONITOR SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.02 Allows stepping up of rod block setpoint: BWR-3, 4, 5 2.9 3.0

Explanation of Answer c is correct, the intermediate region is initially entered, therefore all indication and actions will be to traverse through the intermediate region to the high region. a) No condition exists to initiate an INOP trip. d) Under the described conditions the last trip setpoint is 74% not 106%.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Rod Block Monitor System	LIC-700-5		34	2	S/R-0704-EK021 c
Rod Block Monitor	QOP-700-05		2	9	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments: Information directly from student text given as an example.

Comment Type **Comment**

Question Topic INOP causes half scram and procedural response to these conditions.

Reactor startup is in progress. Control rods are being withdrawn to establish reactor heatup. All IRMs are reading approximately 45 on Range 6.

A DOWNSCALE failure on IRM Channel 12 occurs, immediately followed by an INOP failure on IRM Channel 17.

Which of the following describes the appropriate operator actions for the stated conditions?

a. Bypass the Channel 17 INOP condition, then reset the half scram.

b. A scram has been initiated automatically, take the immediate actions for a scram.

c. Downrange Channel 12 to clear the DOWNSCALE condition, then reset the half scram.

d. Plant conditions require initiation of a manual scram, place the reactor mode switch in SHUTDOWN.

Answer: a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

215003 Intermediate Range Monitor (IRM) System

A2. Ability to (a) predict the impacts of the following on the INTERMEDIATE RANGE MONITOR (IRM) SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.02 IRM inop condition 3.5 3.7

Explanation of Answer Half scram exists due to INOP, full scram has not been initiated nor is it required. Downscale does not initiate a half scram.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Intermediate Range Monitoring System	LP-LIC-0702		30	3	S/R-0702-EK026 a
RPS Channel B IRM Hi HI or INOP	QCAN 901(2)-5 C-15		1	2	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Given specific conditions, determine if a rod block should occur.

Conditions:

- Plant startup in progress.
- The heating range has been reached.
- IRMs 13, 14, and 16 are on range 7.
- IRMs 11,12, 15, 17, and 18 are on range 8.

Which of the following will initiate a ROD BLOCK?

a. SRM INOP.

b. SRM Downscale.

c. SRM Detector Not Full In.

d. Shorting links are removed.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

215004 Source Range Monitor (SRM) System

A3. Ability to monitor automatic operations of the SOURCE RANGE MONITOR (SRM) SYSTEM including:

A3.04 Control rod block status 3.6 3.6

Explanation of Answer a is correct, at least one associated IRM for the SRMs is not on Range 8 which bypasses the INOP Rod Block. b and c are bypassed on IRM Range 3 and shorting link status has the potential to initiate a Scram.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Source Range Monitor System	LP LIC-0701		16 and 17 and App. 1 pages 4&5	4	S/R-0701-EK022
SRM High or INOP	QCAN 901(2)-5 A4		1	2	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Given a set of core parameters, determine if AGAF is satisfactory.

A heat balance has just been completed and core power has been calculated to be 95.5% of rated. The Weekly APRM Flow Biased High Flux Calibration Test, QCOS-0700-06, is in progress with the following results.

-	APRM	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6
-	Meter Reading	95.0	98	93.0	95.5	92.5	96.0

Which of the following describes required action(s), if any, based on the APRM surveillance results?

a. Immediately, place the Reactor Mode Switch in SHUTDOWN.

b. Initiate action to adjust the gain on APRM Channels 2, 3 and 5.

c. All APRM readings are within limits, no action is required at this time.

d. Reduce power with flow to less than 75% as indicated on the highest APRM (CH. 2).

Answer b **Exam Level** B **Cognitive Level** Memory **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

215005 Average Power Range Monitor/Local Power Range Monitor System

2.1 Conduct of Operations

2.1.19 Ability to use plant computer to obtain and evaluate parametric information on system or component status. 3.0 3.0

Explanation of Answer APRM is INOP if APRM is +2% or -2% from calculated core power. Adjustment must be made within 2 hours. No other action is required.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
LPRM/APRM Monitoring Systems	LIC-0703		63	5	S/R-0703-EK026e
Technical Specifications			Table 4.1 A-1		S/R-0703-EK029
PRM Flow Biased High Flux Calibration Tes	QCOS-0700-06		2, 5, and 6	15	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Determine ACTUAL vs. INDICATED water level.

During normal full power operation, INDICATED water level in the reactor vessel downcomer region is . . .

a. LOWER than ACTUAL level inside the dryer skirt due to high recirculation suction flow in the downcomer.

b. LOWER than ACTUAL level inside the dryer skirt due to the increased void content in the core at full power.

c. HIGHER than ACTUAL level inside the dryer skirt due to the pressure drop across the steam dryer.

d. HIGHER than ACTUAL level inside the dryer skirt due to the subcooling effect from feedwater in the downcomer.

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

216000 Nuclear Boiler Instrumentation

A3. Ability to monitor automatic operations of the NUCLEAR BOILER Instrumentation including:

A3.01 Relationship between meter/recorder readings and actual parameter values: Plant-Specific 3.4 3.4

Explanation of Answer Pressure drop across the dryer at rated steam flow is 7 in. of water causing a differential level of 7". (Actual LOWER than indicated)

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Vessel Instrumentation	LIC-0263		62	3	S/R-0263-EK020 S/R-0263-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Effect of a loss of 125 VDC power on system operability.

A loss of feed event has occurred. Reactor level dropped to -65 inches and all systems responded as designed. HPCI has been secured. Level is now being restored with RCIC delivering 400 gpm in AUTO.

Which of the following describes the impact that a loss of 125 VDC Bus 1A will have on the operation of RCIC?

a. The governor will fail open resulting in an RCIC mechanical trip.

b. RCIC will fail to isolate if a valid isolation signal were received.

c. The RCIC flow controller will fail to zero resulting in a loss of RCIC flow.

d. The RCIC flow controller will fail full scale resulting in an RCIC electrical overspeed trip.

Answer: b **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

217000 Reactor Core Isolation Cooling System (RCIC)

K2. Knowledge of electrical power supplies to the following:

K2.02 RCIC initiation signals (logic) 2.8 2.9

Explanation of Answer: All RCIC logic is DC powered. RCIC flow controller is powered from an AC power source. The governor is positioned by a signal from the controller. B is only possible response.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Core Isolation Cooling	LIC-1300		64	5	S/R-1300-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments: Question 11852 was used as basis but this is essentially a NEW question.

Comment Type	Comment

Question Topic Response to high level.

RCIC has responsed as designed to a valid initiation signal. Reactor level has risen to +50 inches.

Which of the following describes present system status AND manipulations, if any, that may be necessary if reactor level drops to -65 inches?

a. The RCIC steam supply valve is closed, at -59 inches it will automatically reopen to allow injection.

b. The RCIC turbine is tripped. RCIC will inject after the trip throttle linkage is reset locally at the turbine.

c. The RCIC injection valve is closed, RCIC is operating on minimum flow. At -59" the injection valve will reopen.

d. The RCIC steam supply valve is isolated. The reset pushbutton on panel 901-4 must be depressed to allow injection.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

217000 Reactor Core Isolation Cooling System (RCIC)

K4. Knowledge of REACTOR CORE ISOLATION COOLING SYSTEM (RCIC) design feature(s) and/or interlocks which provide for the following:

K4.02 Prevent over filling reactor vessel 3.3 3.3

Explanation of Answer a) correct, b and d) System will automatically realign to inject and c) injection valve remains open following initiation signal.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Core Isolation Cooling	LIC-1300		40	5	S/R-1300-EK009

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic How is initiation affected by timer reset pushbutton.

Given the following conditions on Unit One.

- RPV level -90" lowering slowly
- Drywell pressure 3.0 psig rising slowly

All systems have responded as expected.

Fifteen (15) seconds ago the operator acknowledged annunciator AUTO BLOWDOWN TIMER START and depressed and released the TIMER RESET pushbutton. Which of the following describes the operation of the Safety Relief Valves in the ADS Mode?

Under these conditions the ADS valves will. . .

a. NOT open under any circumstances.

b. only open if their respective control switches are placed in MAN.

c. open 110 seconds after the timer starts regardless of RPV water level.

d. open automatically in 95 seconds provided RPV water level remains below -59".

Answer: d **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

218000 Automatic Depressurization System

K4. Knowledge of AUTOMATIC DEPRESSURIZATION SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.01 Prevent inadvertent initiatior of ADS logic 3.7 3.9

Explanation of Answer: d is correct, after reset of the timer the valves will open after 110 seconds. a & b) the valves remain operable. c) depressing the reset PB resets the 110 second timer.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Automatic Depressurization	LIC-0203		25	21	S/R-0203-EK21

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Seleced LP ECCS system inoperable and that effect on ADS initiation logic (no LP ECCS system running).

A LOCA occurred coincident with several electrical malfunctions. The following conditions existed two minutes ago:

- Drywell pressure	3.5 psig, rising
- Reactor level	-60 inches lowering slowly
- Bus 13-1 de-energized	1/2 DG failed to auto start
- Bus 14-1 de-energized	Over current trip

As the operator attempts to re-energize bus 13-1, ADS valves will open.....

a. 110 seconds after power is restored to the bus.

b. 6.5 minutes after power is restored to the bus.

c. when discharge pressure is sensed from ANY of the Division 1 ECCS pumps.

d. 110 seconds after discharge pressure is sensed from ANY of the Division 1 ECCS pumps.

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

218000 Automatic Depressurization System

K6. Knowledge of the effect that a loss or malfunction of the following will have on the AUTOMATIC DEPRESSURIZATION SYSTEM:

K6.02 Low pressure core spray system pressure: Plant- Specific 4.1 4.1

Explanation of Answer All solenoids will not energize because the pressure input to Channel A and Channel B is divisional. Timer was initiated due to low level and should be timed out therefore Div 2 solenoids should energize when pressure is sensed.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Automatic Depressurization System	LIC-0203		15-17	21	S/R-0203-EK007a S/R-0203-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Interlocks that provide auto closure of non injection flow paths.

Unit One was operating normally at rated power with RHR in Torus Cooling when a LOCA signal was received.

All systems have responded as designed.

Which of the following describes the design feature that will ensure maximum ECCS injection flow?

a. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after RHR injection flow has commenced.

b. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after the LOCA initiation signal.

c. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the LOCA initiation signal.

d. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the open permissive signal (325 psig reactor pressure) has been received.

Answer: b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

219000 RHR/LPCI: Torus/Suppression Pool Cooling Mode

K4. Knowledge of RHR/LPCI: TORUS/SUPPRESSION POOL COOLING MODE design feature(s) and/or interlocks which provide for the following:

K4.03 Unintentional reduction in vessel injection flow during accident conditions: Plant-Specific 3.8 3.8

Explanation of Answer a) Injection flow is maximized to the RPV and cannot be interrupted for one minute after receipt of a LOCA initiation signal. c & d) Spray/Cooling valves are interlocked closed W/O a TD, override switches must be used to open them. d) the 325 psig permissive on affects the injection valve.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Residual Heat Removal System	LP-1000		10-15	5	S/R-1000-EK020 S/R-1000-EK013

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: Duane Arnold Exam Bank

Comment Type **Comment**

Question Topic Failure of RB to SC or SC to DW vacuum breakers.

With Unit One operating at full power, annunciator 901-3-C-14, TORUS VACUUM RELIEF VLV 20A NOT FULL CLOSED, alarms. Which of the following are the implications if this condition is confirmed to be true?

a. Primary Containment integrity will be violated until the Torus to Reactor Building Vacuum Breaker is closed.

b. Drywell to Torus separation CANNOT be ensured until the Drywell to Torus Vacuum Breaker is closed.

c. The check valve in the Torus to Reactor Building Vacuum Breaker line is now providing Primary Containment integrity.

d. The check valve in the Drywell to Torus Vacuum Breaker line is now providing Primary Containment integrity.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

223001 Primary Containment System and Auxiliaries

A2. Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT SYSTEM AND AUXILIARIES; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.09 Vacuum breaker malfunction 3.4 3.6

Explanation of Answer a) the check valve assures PC integrity. b and d) the vacuum breaker in question is from RB to Torus, not Torus to Drywell.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Primary and Secondary Containment	LNF-1601		46	1	S/R-1601-EK006

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Direct From Source

Question Source Comments: 1998 SRO, Question 5

Comment Type **Comment**

Question Topic Relate isolation signals with their respective groups.

Unit 2 is operating at 100% power when a small steam leak develops which causes drywell pressure to rise to 3.0 psig.

The reactor scrams and all immediate scram actions are taken. Reactor water level lowers to + 5" inches before being restored to the normal band.

Which of the following identifies the MINIMUM Primary Containment Isolation System Group(s) that should have isolated?

a. Group I.

b. Group II.

c. Groups I & III.

d. Groups II & III.

Answer: d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

223002 Primary Containment Isolation System/Nuclear Steam Supply Shut-Off

A1. Ability to predict and/or monitor changes in parameters associated with operating the PCIS/NSSSS controls including:

A1.02 Valve closures 3.7 3.7

Explanation of Answer Low level (8") closes Groups II and III and high DW presure (2.5 psig) only cause closure of Group II. No values in the stem are common to Group I isolation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment Isolation System	LN-1603		8, 10	0	S/R-1603-EK010
EOP Expectation Standards	QCAP 0200-10		Att. M and o	22	

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 987 from the bank but also used in the 1998 SRO exam as question 50.

Comment Type **Comment**

Question Topic Continue to spray after 0 psig in the DW/Torus.

QGA 200 directs stopping Drywell and Torus sprays before their respective pressures drop to zero (0) psig.

Continued spray operation past this point will . . .

- **a.** result in dilution of the nitrogen atmosphere in the primary containment.
- **b.** cause "chugging" and subsequent downcomer damage.
- **c.** exceed the capacity of the torus/drywell vacuum breaker system.
- **d.** exceed the capacity of the torus to reactor building vacuum breaker system.

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate** 03/27/2000

Tier Plant Systems **RO Group** 2 **SRO Group** 1

226001 RHR/LPCI: Containment Spray System Mode

A2. Ability to (a) predict the impacts of the following on the RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.19 Low (or negative) suppression chamber pressure during system operation: Mark-I-II 3.5 3.8

Explanation of Answer a) correct, negative pressure will cause outside air to be drawn into the torus and subsequently into the drywell thus diluting the N2 atmosphere. c. and d.) At low pressure flow throught he vacuum breakers is small. b) Chugging is a concern when initiating sprays,

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Primary Containment Control	L-QGA200		29	0	S/R-0001-EK023

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Significantly Modified

Question Source Comments: 1996 NRC SRO question 76

Comment Type **Comment**

Question Topic: Consequence of spray initiation outside DSIL.

What would be the consequences of spraying the drywell with drywell pressure at 35 psig and temperature at 350 degrees F.

a. The capacity of drywell to torus vacuum breakers will be exceeded resulting in a failure of the boundary between drywell and torus (containment).

b. The capacity of torus to reactor building vacuum breakers will be exceeded resulting in the deinerting of the primary containment.

c. The capacity of drywell to torus vacuum breakers will be exceeded resulting in the deinerting of the primary containment.

d. The capacity of torus to reactor building vacuum breakers will be exceeded resulting in damage to the primary containment.

Answer: a **Exam Level:** S **Cognitive Level:** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group:** 2 **SRO Group:** 1

226001 RHR/LPCI: Containment Spray System Mode

K5. Knowledge of the operational implications of the following concepts as they apply to RHR/LPCI: CONTAINMENT SPRAY SYSTEM MODE:

K5.06 Vacuum breaker operation 2.6 2.8

Explanation of Answer: Evaporative cooling is the major concern at higher DW temperatures. Operation of the RB to Torus vacuum breakers is not discussed.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Primary Containment	LP-QGA Details		24	0	S-0001-EK011g

Material Required for Examination: QGA 200, Drywell Spray Initiation Limit Curve (K) only

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Purpose of component.

Which of the following is a function of the fuel pool Skimmer Weirs?

a. Maintain a set fuel pool water level

b. Ensure net positive suction head for the FPCC pumps

c. Evacuate air from directly over the surface of the fuel pools

d. Permit draining of the reactor cavity while maintaining normal fuel pool level

Answer a Exam Level B Cognitive Level Memory Facility: Quad Cities ExamDate: 03/27/2000

Tier: Plant Systems RO Group 3 SRO Group 3

233000 Fuel Pool Cooling and Clean-up

2.1 Conduct of Operations

2.1.28 Knowledge of the purpose and function of major system components and controls. 3.2 3.3

Explanation of Answer NPSH is provided by the surge tanks, the ventilation evacuates air and the weirs are at the surface of the pools, not drains.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Fuel Pool Cooling	LNF-1900		8	3	S/R-1900-EK014

Material Required for Examination

Question Source: Facility Exam Bank Question Modification Method: Direct From Source

Question Source Comments: Question 10172 - Not Used During Program

Comment Type	Comment

Question Topic Torus spray valve response to valid LOCA signal.

Given the following:

- Unit One operating at 100% power.
- Torus Cooling is in operation using RHR pump "A".
- RHR "A" Service Water Pump is running.
- Cooling valve MO-1001-34A is full open and MO-1001-36A is throttled to establish system pressure.
- HX bypass valve MO-1001-16A is throttled to establish temperature reduction.

Which of the following identifies the final status of these components if drywell pressure should rise to 2.7 psig?

	1001-34A	1001-36A	RHR Pump A	RHR SW Pump A
a.	Open	Open	Running	Off
b.	Open	Closed	Running	Off
c.	Closed	Open	Off	Running
d.	Closed	Closed	Running	Off

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

230000 RHR/LPCI: Torus/Suppression Pool Spray Mode

A1. Ability to predict and/or monitor changes in parameters associated with operating the RHR/LPCI: TORUS/SUPPRESSION POOL SPRAY MODE controls including:

A1.10 System lineup 3.7 3.7

Explanation of Answer Valves realign for LPCI mode (maximize injection flow) upon receipt of initiation signal. RHR Pumps running remain in service and RHR SW pumps are tripped. This is only identified in d.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Residual Heat Removal System	LF-1000		49	5	S/R-1000-EK008
LPCI Automatic Initiation	QCOA 1000-04		2	8	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic MSIV closure logic and RPS.

Unit One is operating at 25% of rated power when Main Steam Isolation Valve, 1-203-1A, drifts full closed.

Which of the following describes plant response, if any, if Main Steam Isolation Valve, 1-203-2B, were to close?

a. A full scram will be received.

b. A half scram is received on RPS Channel A.

c. A half scram is received on RPS Channel B.

d. Closure of these two valves will NOT cause a trip of RPS.

Answer: b Exam Level: S Cognitive Level: Comprehension Facility: Quad Cities ExamDate: 03/27/2000

Tier: Plant Systems RO Group: 2 SRO Group: 3

239001 Main and Reheat Steam System

K1. Knowledge of the physical connections and/or cause- effect relationships between MAIN AND REHEAT STEAM SYSTEM and the following:

K1.27 Reactor protection system 4.0 4.1

Explanation of Answer: MSIV Closure logic is arranged such that only b can be correct. B and A or D and C for RPS A and C and A or D and B for RPS B.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Main Steam	LIC-0250		18	4	S/R-0250-EK022

Material Required for Examination:

Question Source: Facility Exam Bank Question Modification Method: Significantly Modified

Question Source Comments: Question 4151, modified stem and all distractors - Not Used During Program

Comment Type Comment

Question Topic Effect of C/S position on future operation.

QCOP 0203-01, Reactor Pressure Control Using Manual Relief Valve Actuation, states that when operating the ADS valves their control switches should NOT be placed in OFF.

If the control switch is placed in OFF, the valve will . . .

a. open on setpoint pressure, but NOT on an ADS signal.

b. open on an ADS signal, but NOT on setpoint pressure.

c. NOT open on setpoint pressure OR an ADS signal.

d. open on setpoint pressure OR an ADS signal once it has been closed for 10 seconds.

Answer: b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

239002 Relief/Safety Valves

2.1 Conduct of Operations

2.1.32 Ability to explain and apply system limits and precautions. 3.4 3.8

Explanation of Answer Relief pressure switch is disabled when C/S is not in AUTO, ADS logic is separate from relief logic.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Pressure Control Using Manual Relief Valve Actuation	QCOP 0203-01		1	8	
Automatic Depressurization System	LIC-0203		25	6	S/R-0203-EK016

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 540 with very minor editorial change

Comment Type	Comment

Question Topic Source of main steam pressure signal.

Steam pressure utilized by the EHC logic is sensed . . .

a. at the equalizing header.

b. in the reactor steam dome.

c. at the reference leg for the YARWAY wide range level detectors.

d. at the reference leg for the GEMAC narrow range level detectors.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

241000 Reactor/Turbine Pressure Regulating System

K1. Knowledge of the physical connections and/or cause- effect relationships between REACTOR/TURBINE PRESSURE REGULATING SYSTEM and the following:

K1.02 Reactor pressure 3.9 4.1

Explanation of Answer b.) There is no direct pressure measurement at the steam dome. c. and d.) neither level detector ref. leg senses steam pressure.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
EHC Logic System	LIC-5652		4	4	S/R-5652-EK005

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 5324 - Not Used During Program

Comment Type	Comment

Question Topic: Response to loss of Stator Cooling.

Given the following information regarding operation of Unit One:

-	13:00:00	Steady state power at 50% of rated.
-	13:05:00	Total loss of stator cooling, load reduction initiated.
-	13:06:00	Load reduction in progress, 13,100 Stator Amps.
-	13:07:00	Load reduction in progress, 9,200 Stator Amps.
-	13:08:00	Load reduction terminated, 7375 Stator Amps.
-	13:09:00	Determination is made the stator cooling WILL be restored within 15 minutes.
-	13:09:00	Conductivity before the loss of flow is determined to have been 1.75 micro mhos/cm.

Based upon this information, what will be the status of the main turbine/generator and the electrical distribution system at 13:30:00?
ASSUME ALL AUTOMATIC ACTIONS OCCUR AND REQUIRED OPERATOR ACTIONS ARE TAKEN.

a. The main generator load is being returned to normal, all electrical distribution remains in a normal alignment.

b. The main generator is operating at reduced load, all electrical distribution systems are in their normal alignment.

c. The main generator automatically tripped at 13:08:00, Aux power transferred to the Reserve Auxiliary Transformer.

d. The main generator will be manually tripped at or before 13:12:00, Aux power transferred to the Reserve Auxiliary Transformer.

Answer: d **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

245000 Main Turbine Generator and Auxiliary Systems

K3. Knowledge of the effect that a loss or malfunction of the MAIN TURBINE GENERATOR AND AUXILIARY SYSTEMS will have on following:

K3.01 A.C. electrical distribution 3.4 3.7

Explanation of Answer Stator amps are in acceptable range following the runback, action must be taken manually as dictated by conductivity. >0.5 requires a manual trip within 3 minutes as identified in d.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Generator Auxiliaries	LIC-5300		8-11	4	S/R-5300-EK026/28

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Plant conditions requiring auto start of condensate pump.

Unit 1 is at full power with all systems aligned in their normal line up when one of the running condensate pumps is inadvertently turned off.

Which of the following will complete the statement?

The standby Condensate Pump will start automatically when the (1) and the running Reactor Feed Pumps will trip if the (2) .

a. (1) running condensate pump is turned off,
(2) feed pump suction header pressure drops to 145 psig.

b. (1) running condensate pump is turned off,
(2) feed pump discharge header pressure drops to 1000 psig.

c. (1) feed pump suction header pressure drops to 145 psig,
(2) feed pump discharge pressure drops to 1000 psig.

d. (1) feed pump suction header pressure drops to 145 psig,
(2) feed pump suction header pressure drops to 125 psig.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 3

256000 Reactor Condensate System

A3. Ability to monitor automatic operations of the REACTOR CONDENSATE SYSTEM including:

A3.02 Pump starts 3.0 2.9

Explanation of Answer d is correct. The pump did not trip therefore the auto start is a function of pressure as described in c and d. Feed pump start is a function of suction pressure as described in d. Discharge pressure <1040 is a permissive to start.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Feed and Condensate	LIC-3200		52	2	S/R-3200-EK022
Startup of the First RFP	QOP 3200-02		3	15	
Cond/Cond Booster Pump Changeover	QOP 3300-11		2	11	

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 9743 with very minor editorial modifications - Not Used During Program

Comment Type **Comment**

Question Topic Interlocks that initiate scoop tube runback.

Reactor power is being raised from 98% to 100% with core flow when annunciators RECIRC LOOP A FLOW LIMIT and RECIRC LOOP B FLOW LIMIT are received.

Which of the following describes the condition that initiated these annunciators AND the expected operator response?

a. These are expected alarms when loop flows reach 100%, no operator action is required.

b. Total feed flow has dropped below 20% of rated, the operator should verify recirc runback to 32%.

c. Total steam flow has dropped below 20% of rated, the operator must reduce total core flow to <45%.

d. Loop flows have reached their maximum allowable value, the operator must reduce flow until the alarms clear.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 2

259001 Reactor Feedwater System

K4. Knowledge of REACTOR FEEDWATER SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.11 Recirculation runbacks: Plant-Specific 3.5 3.5

Explanation of Answer b is correct, the FLOW LIMIT is referenced to low feed flow which will initiate a runback.There are no alarms indicating rated flow, steam flow is not an input to the runback logic, there are no alarms for maximum flow

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Recirculation System	LF-0202		42	7	S/R-0202-EK006

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Failure of steam/feed signal and it's effect on FWLC.

Rx Power is 100% with the FWLC system in 3 element control. The breaker for the 1C reactor feed pump has been racked out in preparation for pump maintenance. While implementing the OOS procedure the operator incorrectly isolates the flow transmitter for the 1C RFP such that it outputs an upscale flow signal.

Which of the following describes the effect, if any, this will have on the reactor feed water system?

- a. Feedwater reg valves rapidly close, the reactor will scram on low level.
- b. No effect on the system as the feed pump breaker has already been racked out.
- c. Feedwater reg valves rapidly open, the feed pumps and main turbine will trip on high level.
- d. Loss of flow signal will initiate a FW reg valve lockup, feed flow to the vessel remains constant.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate:** 03/27/2000

Tier Plant Systems **RO Group** 1 **SRO Group** 1

259002 Reactor Water Level Control System

A1. Ability to predict and/or monitor changes in parameters associated with operating the REACTOR WATER LEVEL CONTROL SYSTEM controls including:

A1.01 Reactor water level 3.8 3.8

Explanation of Answer Error signal initiates false "high" level signal driving the FW reg valves closed. This signal is not disabled when the RFP breaker is racked out.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Feedwater level Control	LIC-0600		Attachment OE936, 50-54	3	S/R-0263-EK022

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments: Event at QC as described in PIF Q1998-04135 and OE936 attached to LP.

Comment Type **Comment**

Question Topic What manual action or automatic signal will reset the RFP runout.

Feedwater level control is in "Runout Flow Control" mode of operation. A second feed pump is started to raise RPV water level. Which of the following describes the effect this will have on the FWLC system?

The feedwater regulating valves (FRV) . . .

a. will automatically return to the "level control" mode when both narrow range YARWAY levels reach +20 inches.

b. will automatically return to the "level control" mode as soon as flow is detected on the second feed pump.

c. can be MANUALLY returned to the "level control" mode provided at least two feed pumps are running and the "flow control mode reset" pushbutton is depressed.

d. can be MANUALLY returned to the "level control" mode provided both narrow range GEMAC instruments reach +20 inches and the "flow control mode reset" pushbutton is depressed.

Answer a **Exam Level** R **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

259002 Reactor Water Level Control System

A4. Ability to manually operate and/or monitor in the control room:

A4.05 Runout flow control reset controls: Plant-Specific 3.8 3.5

Explanation of Answer Level input to the reset circuit is from the YARWAY instrument and is entirely independent of the number of feed pumps running. b, c and d) runout is reset on flow or manually or if level is restored as indicated on both GEMACS.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Feed Water Level Control	LIC-0600		10, 11	3	S/R-0600-EK007

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 1686, very minor editorial modification - Not Used During Program

Comment Type **Comment**

Question Topic Given inoperative equipment, determine if LCO is met.

The "B" SBGT train flow was noted to be 3700 SCFM during a dual unit outage when the monthly surveillance was performed.

Unit 1 is preparing to perform refueling operations, the reactor head is still fully tensioned.
Unit 2 is in Shutdown Cooling with a temperature band of 150 - 180 degrees.

Refueling operations may...

a. NOT take place due to the "B" SBGT being INOP.

b. take place due to both "A" and "B" SBGT trains being operable.

c. NOT take place due to the potential to drain the reactor vessel.

d. take place for the next 7 days only if "A" SBGT train is in operation.

Answer: b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

261000 Standby Gas Treatment System

2.2 Equipment Control

2.2.22 Knowledge of limiting conditions for operations and safety limits. 3.4 4.1

Explanation of Answer No OPDRVs, or fuel handling in progress on U-1 and U-2 is cold shutdown. Two trains not required to be operable. Train B is within 10% of the required flow which meets TS limits.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Standby Gas Treatment System	LF-7500		50	9	S/R-7500-EK029
Technical Specifications		3/4.7.P.2.a		Amend. 175 and 171	

Material Required for Examination Copy of TS 3/4.7.P without basis (Can not give more as other questions will be affected).

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 1696 - Not Used During Program

Comment Type	Comment

Question Topic Identify correct sequence of equipment as it is loaded onto the bus.

Time 04:00:00 Loss of Coolant Accident on Unit One
Reserve Feed Breaker to Bus 13 fails to auto close.
All other actions occur as expected.
Time 04:00:10 DG 1/2 output breaker closes

Given these conditions, which of the following selections identifies when the Unit One RHR Pumps will start?

a. A starts at 04:00:10
B starts at 04:00:15
C starts at 04:00:00
D starts at 04:00:00

b. A starts at 04:00:00
B starts at 04:00:00
C starts at 04:00:10
D starts at 04:00:15

c. A starts at 04:00:15
B starts at 04:00:10
C starts at 04:00:00
D starts at 04:00:00

d. A starts at 04:00:10
B starts at 04:00:15
C starts at 04:00:00
D starts at 04:00:05

Answer a **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 1

262001 A.C. Electrical Distribution

A3. Ability to monitor automatic operations of the A.C. ELECTRICAL DISTRIBUTION including:

A3.04 Load sequencing 3.4 3.6

Explanation of Answer Normal power available to bus 14-1 and pumps C and D, 5 second increments from closure of DG breaker for pumps A and B. b, reversed power supplies, c reversed starting times, d added sequencing to C and D.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Residual Heat Removal System	LF-1000		46	5	S/R-1000-EK008

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Priority of buses during a LOOP/LOCA.

Both Units are operating normally when a loss of off-site power (LOOP) is experienced on Unit One. Three minutes later a LOOP coincident with a LOCA is experienced on Unit Two.

Which of the following describes the status of Unit One and Unit Two electrical distribution five minutes after the initial event on Unit One?

Assume all electrical lineups were normal prior to the loss of power and NO operator action is taken.

a. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 is energized from the 1/2 DG and Bus 23-1 is de-energized.

b. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 and Bus 23-1 are both de-energized.

c. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 is de-energized and Bus 23-1 is energized from the 1/2 DG.

d. Buses 13-1 and 23-1 are powered by their respective DGs.
Bus 14-1 is de-energized and Bus 24-1 is energized from the 1/2/DG.

Answer: c **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 1

262001 A.C. Electrical Distribution

K6. Knowledge of the effect that a loss or malfunction of the following will have on the A.C. ELECTRICAL DISTRIBUTION:

K6.02 Off-site power 3.6 3.9

Explanation of Answer c.) correct, priority for the 1/2 DG is the unit with the LOCA regardless of when the signal is received. a.) identifies the opposite, b.) does not have either bus energized and d.) reverses Division 1 and Division 2 buses.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Emergency Diesel Generators	LN-6600		44-46	4	S/R-6600-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Loss of DC powerECCS systems.

The Unit 1 250 VDC system has just failed.

Which of the following identifies the systems effected by this failure?

a. Unit 1 HPCI and Unit 2 RCIC.

b. Unit 1 HPCI and Unit 1 RCIC.

c. Unit 2 HPCI and Unit 1 RCIC.

d. Unit 2 HPCI and Unit 2 RCIC.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

263000 D.C. Electrical Distribution

K3. Knowledge of the effect that a loss or malfunction of the D.C. ELECTRICAL DISTRIBUTION will have on following:

K3.03 Systems with D.C. components (i.e. valves, motors, solenoids, etc.) 3.4 3.8

Explanation of Answer Reliability of unit operability is assurred by powering the HPCI from its unit and RCIC from the opposite unit 250 VDC systems as described in a.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
DC	LN-6900		35, 36	3	S/R/A-6900-EK022

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 578

Comment Type	Comment

Question Topic SBO operation effect on start of ECCS pumps.

A LOCA has occurred on Unit One simultaneously with a loss of off-site power. Both the #1 and the #1/2 Diesel Generator have failed to start.

Which of the following describes the response of the Station Blackout (SBO) Diesels #1 and #2 to these events?

a. Both SBO Diesel Generators must be manually started. All bus loading must be performed by the operator.

b. Both SBO Diesel Generators will start when the LOCA signal is received. All bus loading must be manually performed by the operator.

c. Both SBO Diesel Generators must be manually started. Bus loads will automatically sequence on when voltage is detected on their respective buses.

d. Both SBO Diesel Generators will start 60 seconds after their respective buses are de-energized. Bus loads will automatically sequence on at five (5) second intervals

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 1 **SRO Group** 1

264000 Emergency Generators (Diesel/Jet)

K3. Knowledge of the effect that a loss or malfunction of the EMERGENCY GENERATORS (DIESEL/JET) will have on following:

K3.01 Emergency core cooling systems 4.2 4.4

Explanation of Answer a is correct, all actions associated with start and loading of SBO are performed manually. LOCA signals initiate trip signals to breakers associated with the SBO.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
SBO System	LN-6620		6, 12	4	S/R/A-6620-EK015 a and h

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Effect of integrator and ability to determine leakage.

The average Drywell Equipment and Floor Drain sump pump flowrates were determined on Sunday (first shift) this work week. On Wednesday (first shift) the DW Floor Drain Sump integrator malfunctioned and was declared inoperable.

Which of the following describes the effect of this malfunction on plant operation?

a. A plant shutdown must be commenced because Identified leakage cannot be determined.

b. A plant shutdown must be commenced because Unidentified leakage cannot be determined.

c. Operation can continue provided the DRYWELL FL DR PUMPS HIGH DISCHARGE FLOW annunciator is NOT received.

d. Operation can continue, as flow rates can be calculated using the previously established flow rate and timing pump operation.

Answer: d **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 3 **SRO Group** 3

268000 Radwaste

A4. Ability to manually operate and/or monitor in the control room:

A4.01 Sump integrators 3.4 3.6

Explanation of Answer a and b incorrect, Unidentified leakage can be determined. c is incorrect, the annunciator has nothing to do with calculation of leakage. Only d can be correct.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Radioactive Waste Processing	LIC-2000		78-80	1	S/R-2000-EK026
Reactor Coolant Leakage in the Drywell	QCOS 1600-07		10	12	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Given conditions, determine which system isolation valves should be closed.

Given the following parameters and trends:

- MSL Rad monitors at 12 X Normal, rising slowly.
- Steam supply to Primary SJAE's at 125 psig, steady.
- SJAE rad monitors reading normal and steady.
- Holdup line inlet pressure at 6 psig, lowering slowly.
- Holdup line inlet temperature at 160 degrees F, rising slowly.

Which of the following describes how Off-gas components HAVE responded or WILL respond?

a. SJAE suction valves should already be closed.

b. Off-gas to stack (AO-5406) will isolate in 15 minutes.

c. Mechanical Vacuum pump should already be interlocked off.

d. Pressurized drain tank discharge valve, AO-5437, should close immediately.

Answer a **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

271000 Offgas System

K4. Knowledge of OFFGAS SYSTEM design feature(s) and/or interlocks which provide for the following:

K4.08 Automatic system isolation 3.1 3.3

Explanation of Answer a correct, temperature is already above the trip setpoint. Values to isolate OFF Gas or trip vacuum pumps has not been reached and pressurizer drain tank valve position is a function of the closure of AO-5406.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Off Gas	LN-5400		41,42,43	6	S/R-5400-EK020
	QCAN 901(2)-7 A13			2	

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Question 4081 with modified stem and distractors - Not Used During Program

Comment Type **Comment**

Question Topic Will monitors fail Upscale, downscale or inop and that effect on its' respective system if RPS power is lost.

The plant is operating at 25% power. The "B" MSL Radiation Monitor is inoperative and has been placed in the "TRIPPED" condition.

Which of the following identifies plant AND operator response if a loss of RPS Bus "B" were to occur?

a. The reactor will scram, perform the immediate scram actions.

b. Reactor operation is unaffected, perform the actions for a loss of RPS.

c. The reactor will scram and the MSIVs will isolate, take action for scram and isolation.

d. Reactor operation is unaffected but the turbine will trip, take action for loss of RPS and a turbine trip.

Answer b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

272000 Radiation Monitoring System

A2. Ability to (d) predict the impacts of the following on the RADIATION MONITORING SYSTEM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.02 Reactor protection system power failure 3.3 3.6

Explanation of Answer a and c) MSL rad monitors are powered from either RPS A (Ch A and C) or ESS (Ch B and D) therfore no scram signal is initiated. d) No signals or conditions are described that will initiate a turbine trip. B MSL inputs to B RPS channel.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Process Radiation Monitoring	LF-1701		20	2	S/R-1701-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Lowering header pressure and when fire diesel starts.

Which of the following identifies ALL the Diesel Driven Fire Pump indications that are available in the Control Room?

a. Diesel Fire Pump discharge valve position indications and individual diesel day tank levels.

b. Diesel Fire Pump run status lights and header pressure.

c. Diesel Fire Pump run status lights and BATT 1/BATT 2 power available lights.

d. Diesel Fire Pump discharge valve position indications and BATT 1/BATT 2 power available lights.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

286000 Fire Protection System

A4. Ability to manually operate and/or monitor in the control room:

A4.06 Fire diesel 3.4 3.4

Explanation of Answer b describes the only indications available. All distractors offer plausible choices.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Fire Protection	LN-4100	IV.A.1	50	5	S/R-4100-EK005

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Editorially Modified

Question Source Comments: Question 5361 with minor distractor modifications - Not Used During Program

Comment Type **Comment**

Question Topic How will various dampers respond to loss of air.

Upon a loss of Instrument Air the East and West Turbine Building Supply Fan dampers will . . .

a. fail closed.

b. fail open.

c. fail as-is.

d. NOT be affected.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 3 **SRO Group** 3

288000 Plant Ventilation Systems

K6. Knowledge of the effect that a loss or malfunction of the following will have on the PLANT VENTILATION SYSTEMS

K6.03 Plant air systems 2.7 2.7

Explanation of Answer Only b is correct, all ventilation system dampers that have a failure mode will fail open on loss of air.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Plant Ventilation	LNF-5750		61	0	S/R/B-5750-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Isolation signal and its' effect on system lineups.

A malfunction has caused one of the Reactor Building Outlet Isolation Dampers to close.

Which of the following describes ALL the response(s) of Secondary Containment systems to this event?

a. SGBT will automatically start.

b. Reactor Building Exhaust fans trip.

c. Reactor Building Supply AND Exhaust fans trip.

d. Reactor Building Supply fans trip AND SBGT automatically starts.

Answer c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 1

290001 Secondary Containment

A1. Ability to predict and/or monitor changes in parameters associated with operating the SECONDARY CONTAINMENT controls including:

A1.01 System lineups 3.1 3.1

Explanation of Answer Closure of any damper will trip fans. No initiation signal to SBGT is initiated under these conditions.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Plant Ventilation Systems	LNF-5750		22, 30	0	S/R/B-5750-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic How does SGT maintain RB dp.

Which of the following describes how SBGT system flow and/or reactor building differential pressure are maintained when the system is operating normally?

- **a.** The inlet vanes on the SBGT fan are automatically adjusted to maintain the reactor building at -0.25 in. of water.
- **b.** An orifice at the SBGT train outlet maintains 4000 scfm flow through the train.
- **c.** An air operated damper on the fan inlet is automatically adjusted to maintain 4000 scfm flow at the inlet of the train.
- **d.** A flow control valve on the SBGT common discharge header is automatically adjusted to maintain the reactor building at -0.25 in. of water.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 1

290001 Secondary Containment

K1. Knowledge of the physical connections and/or cause- effect relationships between SECONDARY CONTAINMENT and the following:

K1.04 SBGT 3.7 3.9

Explanation of Answer RB DP is a result of system flow not the controlling parameter, flow is sensed at the train inlet and the fans have no controllable vanes.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Standby Gas Treatment System	LF-7500		2, 12, Fig. 1	9	S/R-7500-EK015c

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Pump response to a LOCA signal.

Unit One is at power with the following RBCCW system alignment.

- 1A RBCCW Pump is OOS
- 1/2 RBCCW feed from bus 19 is OOS
- 1B RBCCW Pump operating normally
- 1/2 RBCCW Pump lined up to Unit 1 and operating normally powered from Bus 29

Which of the following identifies the RBCCW system response to a valid LOCA signal on Unit One?

a. Both running RBCCW pumps will trip, all system isolation valves remain open.

b. Both running RBCCW pumps will trip and the non-containment loads will automatically isolate.

c. Both running RBCCW pumps will continue to run, the non-containment loads will automatically isolate.

d. 1B RBCCW Pump will trip, 1/2 RBCCW pump will continue to run, all system isolation valves remain open.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Plant Systems **RO Group** 2 **SRO Group** 2

400000 Component Cooling Water System (CCWS)

K6. Knowledge of the effect that a loss or malfunction of the following will have on the CCWS:

K6.05 Motors 2.8 2.9

Explanation of Answer Loads are isolated by manual action. Pumps will trip based on receipt of a LOCA signal from its respective logic. 1/2 pump is powered from U-2 and will therefore only trip if a LOCA signal is sensed by the U-2 Core Spray logic.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Building Closed Cooling Water System	LF-3700		26	3	S/R-3700-EK009

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Calculation of core flow with one loop in operation.

During Single Loop Operation, Total Core Flow as indicated by FR-1(2)-263-110 (Digital Flow Indicating Recorder for total core flow and core plate DP on the 901 5 panel) is . . .

a. inaccurate because the flow through the idle recirculation pump is reversed.

b. inaccurate because a portion of the indicated flow is being bypassing through the idle jet pumps.

c. accurate because total core flow is unaffected by the number of recirculation pumps in operation.

d. accurate because an averaging circuit automatically subtracts all jet pump flow through the idle loop.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295001 Partial or Complete Loss of Forced Core Flow Circulation

AK2. Knowledge of the interrelations between PARTIAL OR COMPLETE LOSS OF FORCED CORE FLOW CIRCULATION and the following:

AK2.07 Core flow indication 3.4 3.4

Explanation of Answer b is correct. a incorect, Core flow is a measurement of jet pump flow not recirc pump flow. c and d incorrect because total core flow is not accurate.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Recirculation System	LF-0202		62	7	S/R-0202-EK020c

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Limitation on BPV operation with reduced vacuum.

Which of the following vacuum readings corresponds to the lowest condenser vacuum at which the bypass valves will remain effective in reducing reactor pressure?
(Consider ONLY actual plant setpoints per QOA 3300-02, Loss of Condenser Vacuum for your answer)

a. 1 inch Hg vacuum (29 inches backpressure).

b. 8 inches Hg vacuum (22 inches backpressure).

c. 20 inches Hg vacuum (10 inches backpressure).

d. 21 inches Hg vacuum (9 inches backpressure).

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295002 Loss of Main Condenser Vacuum

AK1. Knowledge of the operational implications of the following concepts as they apply to LOSS OF MAIN CONDENSER VACUUM:

AK1.03 Loss of heat sink 3.6 3.8

Explanation of Answer BPVs close at 7 inches Hg Vacuum, therefore 8 inches is as low as possible W/O automatic closure.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Loss of Condenser Vacuum	QOA 3300-02		1	18	

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified

Question Source Comments: 1998 SRO, Question 42 with minor changes

Comment Type	Comment

Question Topic Conditions that will cause the DG to auto start and load.

Unit One was operating at rated power when a transient occurred resulting in the following electrical distribution alignment.

- Bus 13-1 energized from Bus 13.
- 1/2 Diesel Generator is running unloaded.
- Unit 1 Diesel Generator running, loaded to Bus 14-1.

Which of the following identifies the condition(s) that caused the described alignment?

a. Loss of off-site power.

b. LOCA and loss of Bus 14.

c. LOCA and loss of off-site power.

d. Turbine/generator trip and a LOCA.

Answer b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295003 Partial or Complete Loss of A.C. Power

AA1. Ability to operate and/or monitor the following as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER:

AA1.02 Emergency generators 4.2 4.3

Explanation of Answer a and c) both DGs would be loaded to their buses, d) no signal for Unit 1 EDG to load to bus 14

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Diesel Generators	LN-6600		29	4	S/R/A-6600-EK007

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Effect of undervoltage.

A 4KV voltage transient has occurred causing Bus 13 voltage to drop to 2900 volts. With regard to Bus 13, which of the following identifies the action(s) that will occur to maintain plant electrical integrity?

a. All load breakers on Bus 13 will trip.

b. The supply breaker and all load breakers on Bus 13 will trip.

c. The supply breaker to Bus 13 will trip, all other breakers remain closed.

d. All load breakers on Bus 13 will automatically trip EXCEPT the feed breaker to Bus 13-1.

Answer: a **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295003 Partial or Complete Loss of A.C. Power

AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF A.C. POWER:

AK3.03 Load shedding 3.5 3.6

Explanation of Answer a) all loads on the bus, including the ECCS bus, are shed to attempt to preserve bus integrity. b and c) supply breakers are unaffected.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
4KV/480 Distribution	LN-6500		86, 88, 106	1	S/R-6500-EK06 S/R/A-6500-EK015

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic: Equipment affected by DC loss.

Which of the following describes the effect of a total loss of Safety related 250 VDC during normal operation?

a. Loss of power to HPCI valve MO-2301-4.

b. All inboard MSIV solenoids will de-energize.

c. Alternate power supply to the ESS inverter is unavailable.

d. Automatic trip capability for Main Turbine/Generator is lost due to loss of protective relaying.

Answer: c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295004 Partial or Complete Loss of D.C. Power

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF D.C. POWER:

AA2.04 System lineups 3.2 3.3

Explanation of Answer: a) is an AC powered valve, b and d) are powered by 125 VDC.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
DC Distribution	LN-6900		35	3	S/R-6900-EK022
Safety Related 250 VDC Battery and System Failure	QOA 6900-01		1	13	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Bus swap from normal to startup power.

Unit Two was operating at rated conditions when a spurious turbine trip occurred.

Which of the following describes the status of the Unit Two electrical distribution system assuming all systems and components responded as designed?

a. Buses 21, 22, 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

b. Buses 21 and 22 are energized from Reserve Aux. Transformer 22.
Bus 23 is energized from Bus 21.
Bus 24 is energized from Bus 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

c. Buses 21 and 22 are energized from Unit Aux. Transformer 21.
Buses 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

d. Buses 21, 22, 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from 1/2 the Diesel Generator.
Bus 24-1 is energized from the Unit 2 Diesel Generator.

Answer a **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 2

295005 Main Turbine Generator Trip

AA1. Ability to operate and/or monitor the following as they apply to MAIN TURBINE GENERATOR TRIP:

AA1.07 A.C. electrical distribution 3.3 3.3

Explanation of Answer Only transfer is from the Unit TR to the Reserve TR without loss of auxiliary power. All buses remain energized as they were before the trip.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
4KV/480 V Distribution	LN-6500		314	1	S/R/A-6500-EK023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Given parameters, determine cause of scram.

Initial Conditions:

- Plant startup is ongoing with reactor and main turbine heat up in progress.
- Reactor Level +35", stable
- Reactor Pressure 750 psig, rising slowly
- Reactor power 5% on the APRMs
- MSIV's Open
- Main Turbine Reset

Which of the following describes plant response if the Reactor Mode Switch were placed in RUN at this time?

a. Plant status would remain the same, all parameters are within limits.

b. A direct scram signal would be initiated from reactor low pressure conditions.

c. A rod block would be initiated from APRM downscale conditions.

d. A direct scram signal would be initiated from MSIV position indication.

Answer d **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295006 SCRAM

AA2. Ability to determine and/or interpret the following as they apply to SCRAM:

AA2.06 Cause of reactor SCRAM 3.5 3.8

Explanation of Answer Reactor low pressure in RUN causes MSIV closure, MSIV closure in RUN initiates SCRAM.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Reactor Protection	LF-0500		28	4	S/R 0500-EK21

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic RCIC response as pressure rises with system in MANUAL.

An ATWS condition exists. RCIC is in AUTO, injecting at rated flow to maintain reactor water level. SRVs are being cycled to maintain reactor pressure.

Which of the following describes the RCIC system FINAL parameters as reactor pressure rises from 800 to 1000 psig.

	Turbine Speed	Pump Flow	Pump Discharge Pressure
a.	Lower	Remain the same	Higher
b.	Remain the same	Lower	Lower
c.	Higher	Remain the same	Higher
d.	Higher	Higher	Remain the same

Answer c **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295007 High Reactor Pressure

AK3. Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE:

AK3.03 RCIC operation: Plant-Specific 3.4 3.5

Explanation of Answer In AUTO the system will attempt to maintain flow. As reactor pressure rises flow will lower and turbine speed and pump discharge pressure must be higher to maintain flow as described in c.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Reactor Core Isolation Cooling	LIC-1300		10	5	S/R-1300-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Lift setpoints or sequence of SRVs.

During a reactor pressure transient in which reactor pressure rises and peaks at 1145 psig, over pressure protection is assured by the opening of . . .

a. ALL relief valves AND TWO safety valves.

b. ALL relief valves AND ALL safety valves.

c. TWO relief valves ONLY.

d. ALL relief valves ONLY.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

·295007 High Reactor Pressure

AK3. Knowledge of the reasons for the following responses as they apply to HIGH REACTOR PRESSURE:

AK3.04 Safety/relief valve operation: Plant-Specific 4.0 4.1

Explanation of Answer Highest Relief valve setting is 1135 psig and the lowest Safety Valve setting is 1240 psig.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Automatic Depressurization System	LIC 0203		3,8	21	S/R 0203-EK007 a
Main Steam	LIC 0250		8	4	S/R 0250-EK14

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Immediate actions, precautions or lmitations associated with high level.

A transient occurred resulting in a loss of normal feedwater. The reactor was scrammed and RCIC and HPCI were manually initiated to restore RPV level. Level dropped to -44 inches and is now +50 inches and rising rapidly.

The operator should immediately.....

a. Stop injection from HPCI and RCIC.

b. Initiate RWCU reject to lower RPV level.

c. Stop injection from HPCI, allow RCIC injection to continue.

d. Throttle HPCI and RCIC discharge flow to maintain current level.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295008 High Reactor Water Level

2.4 Emergency Procedures and Plan

2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. 4.0 4.0

Explanation of Answer Both HPCI and RCIC have auto. trips at +48". Operator action is required and both, not one injection system must be secured. RWCU reject would be a subsequent action.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
High Reactor Level	QCOA 0201-08		2	6	
Ops. Dept. Roles and Responsibilities	OP-AA-101-102	4.8.7.4	7	1	S/R/A/B/C/FH-0000-K006

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic

A LOCA has occurred coincident with an ATWS. The following conditions have just been established.

- Reactor power 17% of rated, steady.
- Reactor pressure 1210 psig peak pressure, lowering
- Reactor level -60 inches, lowering.
- Drywell pressure 1.95 psig, rising.
- Drywell temperature 200 deg. F, rising.

Which of the following describes the automatic response of the Recirculation System to the stated parameters and trends?

Both Recirculation Pump Field Breakers . . .

a. will trip in approximately 9 seconds.

b. should have tripped due high reactor pressure.

c. should have tripped due to power greater than 3%.

d. will trip if drywell pressure rises an additional 0.25 psig.

Answer: a Exam Level: S Cognitive Level: Comprehension Facility: Quad Cities ExamDate: 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions RO Group: 1 SRO Group: 1

295009 Low Reactor Water Level

AA1. Ability to operate and/or monitor the following as they apply to LOW REACTOR WATER LEVEL:

AA1.03 Recirculation system: Plant-Specific 3.0 3.1

Explanation of Answer: a is the only choice that identifies an ATWS trip (-59 inches with 9 second TD)

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Recirculation System	LF-0202		Appendix A, pg 2	7	S/R-0202-EK009

Material Required for Examination

Question Source: New Question Modification Method:

Question Source Comments:

Comment Type	Comment

Question Topic Coincidental signals that will cause a trip or scoop tube runback.

The plant was operating at 97% power when a transient occurred. After conditions stabilized the Unit NSO noted the recirculation pump drive motor breakers AND generator field breakers were tripped on both recirculation pumps.

The existing status of the Recirculation System was a direct result of . . .

a. a reactor pressure spike to 1210 psig.

b. drywell pressure rising and peaking at 2.1 psig.

c. reactor water level lowering to -65 inches.

d. reactor feed flow lowering below 1.5E6 lbm/hr.

Answer c **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295009 Low Reactor Water Level

AK2. Knowledge of the interrelations between LOW REACTOR WATER LEVEL and the following:

AK2.03 Recirculation system 3.1 3.2

Explanation of Answer These breakers trip coincidentially on receipt of a low level ATWS signal. Only c identifies this trip. a) pressure is LT the ATWS trip of 1250, b) DW/P is LT the trip od 2.5 psig and d) feed flow initiates a runback, not a trip.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
reactor Recirculation System	LF-0202		Appendix A pg 2	7	S/R-0202-EK009

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Which EOPs will be entered when high DW/P conditions exist.

The plant was operating at 99% power. The following conditions now exist:

- Reactor power	All rods fully inserted except one at position 24
- Reactor level	+13 inches
- Drywell pressure	2.68 psig
- Suppression Pool level	+1.8 inches
- Rx Building Pressure	- 0.12 inches H2O

Which of the following procedures are entered DIRECTLY based on the stated conditions?

a. QGA 100 (RPV Control) and QGA 101 (RPV Control ATWS).

b. QGA 100 (RPV Control) and QGA 200 (Primary Containment Control).

c. QGA 200 (Primary Containment Control) and QGA 300 (Secondary Containment Control).

d. QGA 100 (RPV Control), QGA 101 (RPV Control ATWS) and QGA 200 (Primary Containment Control).

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295010 High Drywell Pressure

2.4 Emergency Procedures and Plan

2.4.1 Knowledge of EOP entry conditions and immediate action steps. 4.3 4.6

Explanation of Answer Entry conditions exist for QGA 100 and 200, QGA 101 entry is directed from QGA 100 and has parameter entry conditions.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment Control Flow Chart	L-QGA 200		7, 9	0	S/R-0001-EK021
RPV Control	L-QGA 100		7, 9	0	S/R-0001-EK015

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments: WNP-2 Exam bank

Comment Type **Comment**

Question Topic Instruments used to determine DW temp.

A steam line break has occurred on Unit One. Which of the following provides a valid entry condition to QGA 200, Primary Containment Control?

a. Any area high temperature as indicated by AREA HI TEMP STEAM LEAK DETECTION on panel 901-3.

b. Report from the EO that steam is coming from beneath the Steam Tunnel Door and the door is hot to the touch.

c. Hi temperature in the area of the MSIV solenoids as indicated by annunciator UNIT 1 DRYWELL TEMP HI on panel 912-7.

d. Hi temperature on the return air to to DW coolers as indicated on 1-TR1-2340-9, HPCI and Drywell Air Temperature Recorder.

Answer d **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295012 High Drywell Temperature

AA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE:

AA2.01 Drywell temperature 3.8 3.9

Explanation of Answer a) temperature indication in area of MSIVs and provide input to DW air temp, b) detects area temperature outside the drywell, c) is the common annunciator associated with the environs rack.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment	LNF-1601		72	1	S/R/B-1600-EK-022b

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Actions taken to prevent localized heating.

A transient has occurred resulting in an MSIV closure. QGA 100 has been entered and present plant status is such that direction has been given to "Stabilize RPV pressure below 1060 psig using main turbine bypass valves".

Actions taken by the NSO should be to . . .

a. monitor automatic operation of the SRVs while attempting to re-open the MSIVs.

b. cycle SRVs in preferred sequence to stabilize pressure and equalize torus temperature.

c. cycle a single SRV to lower, then stabilize, reactor pressure.

d. open several SRVs in preferred sequence to lower pressure to 325 psig, close the SRVs and monitor the pressure rise.

Answer b **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295013 High Suppression Pool Temperature

AK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SUPPRESSION POOL TEMPERATURE:

AK1.03 Localized heating 3.0 3.3

Explanation of Answer MSIV reopening is not directed at this time, single SRV operation will not equalize heating, pressure drop to 325psig will exceed the cooldown limit.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control	L-QGA100		61, 63, 65	0	S/R-0001-EK017
Rx Pressure Control Using Manual Relief Valve Actuation	QCOP 0203-01	F	4	8	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Condition(s) that required SP cooling to be placed into service. Tech Spec temperature limits.

The plant is recovering from a reactor scram and MSIV isolation. QGA 200 has been entered. The PRIMARY steps to initiate Torus cooling in the Torus Temperature Leg are taken to . . .

a. ensure ECCS pump NPSH/Vortex limits are not exceeded.

b. maintain torus temperature below the Heat Capacity Limit.

c. maintain torus temperature below the Technical Specification limit.

d. maintain torus temperature below the Boron Injection Temperature (BIT).

Answer: c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295013 High Suppression Pool Temperature

AK3. Knowledge of the reasons for the following responses as they apply to HIGH SUPPRESSION POOL TEMPERATURE:

AK3.01 Suppression pool cooling operation 3.6 3.8

Explanation of Answer First or primary step is to hold temperature below 95 degrees (the TS limit), all other parameters are at temperatures well above this limit.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment Control	LP-QGA200		49, 53	0	S/R-0001-023

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Consequence of rapid injection during ATWS events.

An ATWS has occurred and RPV injection was prevented to intentionally lower RPV level. Injection is now required to maintain RPV level between -142 inches and -166 inches.

Which of the following describes the potentially adverse effect(s) of injection under these conditions.

- a. Fuel cladding may be damaged as cold water is sprayed onto hot exposed fuel.
- b. Rapid injection of cold water may cause RPV metal temperature limits to be exceeded.
- c. Rapid injection of water into the RPV could cause a large reactor power excursion which could result in core damage.
- d. Addition of cold water may affect the density of the variable instrument leg and therefore the accuracy of RPV level instruments.

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295014 Inadvertent Reactivity Addition

2.4 Emergency Procedures and Plan

2.4.20 Knowledge of operational implications of EOP warnings, cautions, and notes. 3.3 4.0

Explanation of Answer a) Spray systems are not allowed at this time, b) metal temperatures are not considered in the level leg, d) instrument accuracy is predominately affected by reference leg temperature not variable leg temperature.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control (ATWS)	L-QGA101		47	0	S/R-00001-EK060
RPV Control (ATWS)	QGA 101			7	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: Cooper Exam bank

Comment Type **Comment**

Question Topic Consequence of depressurization during ATWS.

The reactor was at 100% power when an ATWS occurred.

- Reactor pressure — 920 psig and stable on the bypass valves.
- Reactor power — All IRMs on Range 6.
- Reactor level — +30 inches and stable with condensate and feed.
- Boron injection has not been initiated.
- Depressurization is allowed and is directed IAW QGA 101.

Which of the following identifies the concerns associated with a depressurization as allowed under the described conditions?

a. Reactor water level may rise rapidly as pressure is reduced.

b. Positive reactivity added may return the reactor to criticality.

c. MSIVs will automatically isolate when reactor pressure is reduced.

d. Depressurization will cause the cooldown limit to be exceeded.

Answer: b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295015 Incomplete SCRAM

AK1. Knowledge of the operational implications of the following concepts as they apply to INCOMPLETE SCRAM:

AK1.02 Cooldown effects on reactor power 3.9 4.1

Explanation of Answer a) Level is controlled by the FWLC system, c) MSIV low pressure isolation is bypass not in RUN, d) exceeding the cooldown limit may occur but is not specifically allowed in this leg of the EOPs.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control ATWS	LP-QGA-101		99	0	S/R-0001-Ek060

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Concept Used

Question Source Comments: WNP-2 Exam Bank

Comment Type **Comment**

Question Topic Determine time and method of depressurization following control room evacuation.

An Appendix R Fire has required evacuation (abandonment) of the control room. All immediate actions have been taken and preparations are now being made to initiate RHR Shutdown Cooling (SDC).

Assuming an initial reactor pressure of 950 psig, which of the following identifies the time required to clear the RHR SDC interlocks at design pressure minus 30 psig?

Attachment B of QCARP 0300-01 may be used as necessary.

a. 149 to 153 minutes

b. 132 to 136 minutes

c. 120 to 124 minutes

d. As rapidly as possible, normal limits are NOT applicable under these conditions.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295016 Control Room Abandonment

AA2. Ability to determine and/or interpret the following as they apply to CONTROL ROOM ABANDONMENT:

AA2.06 Cooldown rate 3.3 3.5

Explanation of Answer SDC interlock is 100 psig -30 psig. Final pressure is 70 psig. Limit of 100 degrees F/hr applies. 2.24 hours =134 min. a) identifies correct temperature drop but at an 80 cooldown rate, c) is pressure drop to 100 vs. 70 and exceeding cooldown limits is not allowed.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Vessel and Internals	LF-0201		2, 25	7	S/R-0201-EK028
UnitT 1 Torus and Shutdown Cooling Using Div I RHR	QCARP 0300-01		Att. B	11	

Material Required for Examination Copy of Attachment B of QCARP 0300-01 Revision 10.

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Why disable components or systems.

QCARP-0000-01, Implementing Procedure for Appendix R Safe Shutdown, has been entered due to a fire and evacuation (abandonment) of the control room. Actions are directed to disable specific plant equipment.

Complying with these directions . . .

a. will prevent spurious system initiation and limit inventory loss.

b. ensures that the fire cannot spread to the opposite unit.

c. will prevent unnecessary primary containment isolations.

d. ensures that operator action will not cause cooldown limits to be exceeded.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295016 Control Room Abandonment

AK3. Knowledge of the reasons for the following responses as they apply to CONTROL ROOM ABANDONMENT:

AK3.03 Disabling control room controls 3.5 3.7

Explanation of Answer b) actions taken are to ensure safe shutdown of the plant not for fire containment, c) reactor mode switch is left in RUN to assure isolations will occur as designed and d) nothing can physically prevent exceeding the cooldown limit.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Implementing Procedure for Appendix R Safe Shutdown	QCARP-0000-01		8 and the attachments	8	S/R/A/B-QCARP-K001
QCARP	CREW QCARP		8, 20, 21	2	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Relate EOP entry to Emergency classification.

An accident has occurred and a reactor BLOWDOWN has been performed IAW QGA 400, Radioactivity Release Control.

At the very least, release rates must be in excess of the values associated with . . .

a. an UNUSUAL EVENT.

b. an ALERT.

c. a SITE AREA EMERGENCY.

d. a GENERAL EMERGENCY.

Answer b **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295017 High Off-Site Release Rate

AK2. Knowledge of the interrelations between HIGH OFF-SITE RELEASE RATE and the following:

AK2.06 Site emergency plan 3.4 4.6

Explanation of Answer QGA entry is at the ALERT level and blowdown should take place before GE level. SAE levels are not mentioned in QGA 400. Least value is the entry condition at ALERT.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Radioactivity Release Control	QGA 400		Flow Chart	4	S/R-0001-EK033
Radioactivity Release Control	L-QGA-400		3	0	

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Significantly Modified

Question Source Comments: 1998 SRO, Question 51, new stem

Comment Type	Comment

Question Topic Basis of Scram when in QGA 400.

QGA 400, Radioactivity Release Control, requires a Reactor Scram before the offsite release rate reaches a specific Emergency Plan level.

Initiation of a scram will . . .

a. stop any fuel damage in the reactor core and thus reduce the rate of release outside of the containment.

b. lower reactor pressure and allow low pressure systems to inject into the reactor, limiting the release to the environment.

c. reduce the energy that the reactor may be discharging outside of primary and secondary containment to decay heat levels.

d. reduce the boil-off rate of inventory which raises reactor water level thereby reducing the discharge to the environment.

Answer c **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295017 High Off-Site Release Rate

AK3. Knowledge of the reasons for the following responses as they apply to HIGH OFF-SITE RELEASE RATE:

AK3.04 Power reduction 3.6 3.8

Explanation of Answer a) scram will not STOP fuel damage or slow release through a leak to containment, b) low pressure injection does not limit the release, d) additional level will not affect discharge to environment.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Radioactivity Release Control	LP-QGA400		7	0	S/R-0001-EK035

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type	Comment

Question Topic Identify failure that initiates loss of CCW.

The plant is operating normally at rated power when the operator notes that drywell pressure and recirculation pump and motor temperatures are rising slowly.

Which of the following identifies the cause of these rising trends?

a. Service Water leak inside containment.

b. Service Air leak outside containment.

c. RBCCW leak inside containment.

d. TBCCW leak outside containment.

Answer c **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295018 Partial or Complete Loss of Component Cooling Water

AA2. Ability to determine and/or interpret the following as they apply to PARTIAL OR COMPLETE LOSS OF COMPONENT COOLING WATER:

AA2.03 Cause for partial or complete loss 3.2 3.5

Explanation of Answer a) There are no SW flow paths in the DW, b) air operated RBCCW components are controlled with instrument air not service air, d) TBCCW has no relationship to DW equipment or components.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RBCCW Leak Inside Containment	QCOA 3700-06		1	3	S/R-3700-EK022 b
Reactor Building Closed Cooling Water	LF-3700		40	3	S/R-3700-EK018
Reactor Building Closed Cooling Water	LF-3700		3	3	S/R-3700-EK019

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Automatic valve operation associated with SA to IA crosstie or emergency backup.

Instrument Air header pressure on Unit One has dropped to 85 psig and is now stable.

Which of the following describes the expected configuration of the plant air system at this time?

a. Instrument Air Compressors 1A and 1B will be running and loaded, all dryer bypass valves will be open, and the Unit One Service Air Backup (Little Joe) Valve will be open.

b. Instrument Air Compressors 1A and 1B will be running and loaded, all dryer bypass valves will be closed, and the Unit One Service Air Backup (Little Joe) Valve will be open.

c. Instrument Air Compressors 1A and 1B will be running and loaded, all dryer bypass valves will be open, and the Unit One Service Air Backup (Little Joe) Valve will be closed.

d. Instrument Air Compressor 1B will be running and loaded, Instrument Air Compressor 1A will be running unloaded, all dryer bypass valves will be closed, and the Unit One Service Air Backup (Little Joe) Valve will be closed.

Answer b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295019 Partial or Complete Loss of Instrument Air

AK3. Knowledge of the reasons for the following responses as they apply to PARTIAL OR COMPLETE LOSS OF INSTRUMENT AIR:

AK3.01 Backup air system supply: Plant-Specific 3.3 3.4

Explanation of Answer b. is correct as all running compressors will be loaded at 95 psig, the Unit One Service Air Backup valve opens at 88 psig. and dryer bypass valves are closed as they do not open until header pressure decreases to 80 psig.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Instrument Air Low Pressure	QOA 4700-01		1	12	
Air Systems	LF-4600/4700		21, 24, 25, 42	5	S/R-4700-EK015

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Determine cause of MSIV isolation.

RPS "A" MG set tripped during a plant startup. The following parameters now exist.

- Reactor MODE switch STARTUP
- MSIVs Open
- Reactor power 9%
- Reactor pressure 920 psig
- RPS Bus "A" de-energized

Which of the following describes the response of the MSIVs IF RPS Bus "B" were to be de-energized?

a. All MSIVs will close.

b. All MSIVs will remain open.

c. All Inboard MSIVs will close.

d. All Outboard MSIVs will close.

Answer: b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295020 Inadvertent Containment Isolation

AA1. Ability to operate and/or monitor the following as they apply to INADVERTENT CONTAINMENT ISOLATION:

AA1.01 PCIS/NSSSS 3.6 3.6

Explanation of Answer: MSIV solenoids are powered from RPS and a DC source such that both must be lost to cause closure of their respective valves. DC power remains operable in this instance so MSIVs remain open.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L. O.
Primary Containment Isolation System	LN-1603		18 and Figure 1603-2	0	S/R-1603-EK022

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Minimum RPV/L that must be maintained if SDC is lost.

If RHR Shut Down Cooling (SDC) is lost and cannot be restored, operation of at least one recirculation pump will . . .

a. ensure LPCI Loop Select Logic remains operable.

b. preclude reactor water temperature stratification.

c. assure total core flow indication remains accurate.

d. assure there is no back flow conditions through the idle jet pumps.

Answer b **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295021 Loss of Shutdown Cooling

AK2. Knowledge of the interrelations between LOSS OF SHUTDOWN COOLING and the following:

AK2.07 Reactor recirculation 3.1 3.2

Explanation of Answer A single pump ensures adequate core flow to prevent stratification. Loop select operability is not dependent on a specific number of pumps and there will always be back flow through the jet pumps in an idle loop.

Reference Title	Facility Reference Number	Section	Page Numbers(s)	Revision	L.O.
Loss of Shutdown Cooling	QCOA 1000-02		5	8	
Residual Heat Removal System	LF-1000		53	5	S/R-1000-EK024

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Minimum RPV pressure to satisfy TS.

A loss of all CRD pumps has occurred during a reactor startup. The minimum reactor pressure needed that will assure control rods will scram is . . .

a. 625 psig

b. 525 psig

c. 425 psig

d. 325 psig

Answer c **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295022 Loss of CRD Pumps

AK1. Knowledge of the operational implications of the following concepts as they apply to LOSS OF CRD PUMPS:

AK1.01 Reactor pressure vs. rod insertion capability 3.3 3.4

Explanation of Answer Question asks for minimum pressure. 400 psig is absolute minimum, 325 is less than the minimum.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Control Rod Blade and Drive Mechanisms	LF-0301		40	2	S/R-0301-EK029

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic: Safe movement of equipment.

While moving a spent fuel bundle in the Fuel Pool, a Fuel Pool Storage Low Level Alarm is received and Fuel Pool Level is confirmed to be decreasing. Which of the following describes the expected operator action for these conditions?

a. Return bundle to its original location.

b. Suspend bundle movement where it is.

c. Place bundle in the nearest storage location.

d. Lower bundle as far as possible without moving refueling bridge.

Answer: c **Exam Level:** R **Cognitive Level:** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 3 **SRO Group:** 1

295023 Refueling Accidents

AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS:

AA1.03 Fuel handling equipment 3.3 3.6

Explanation of Answer: Procedures required placing the bundle in nearest safe position, only c identifies this action.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Loss of water level in the Fuel Storage Pool or reactor cavity	QCOA 1900-01	D	2	7	S/R-1900-E/K 026

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified

Question Source Comments: 1998 SRO, Question 79 with slightly modified stem.

Comment Type **Comment**

Question Topic SGT response to refuel floor radiation or RB ventilation hi radiation.

Given the following conditions:

- The Standby Gas Treatment System is in operation to support an ongoing HPCI surveillance.
- The Mode Select Switch for the "B" SBGT system is in RUN and the Mode Select Switch for the "A" SBGT system is in STANDBY.
- An event occurs on the refuel floor that causes ONE of the Refuel Floor ARMs to exceed its respective trip setpoint.

The "A" SBGT fan will ONLY start if. . .

a. the logic senses "B" fan breaker open.

b. a low flow condition exists on the "B" fan.

c. the second refuel floor ARM exceeds its trip setpoint.

d. Reactor Building differential pressure is less than -0.25 in. of water.

Answer b **Exam Level** S **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 1

295023 Refueling Accidents

AA1. Ability to operate and/or monitor the following as they apply to REFUELING ACCIDENTS:

AA1.07 Standby gas treatment/FRVS 3.6 3.6

Explanation of Answer a) Auto start is a function of flow, not breaker position. c) High logic is 1 of 2, not 2 of 2. d) DP is a result of fan flow and does not input into the start features.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Standby Gas Treatment	LF-7500		22 and 36	9	S/R-7500-EK020
SBGT Fan Tripped or Failed to Start Automatically	QCOA 7500-02		1	7	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Valve interlock associated with spray valves and DW/P.

A LOCA has occurred. RPV level initially dropped to -225 inches. RHR is now in operation in the LPCI mode and reactor water level is just above top of active fuel and increasing. Drywell spray initiation has been directed by the DW Pressure leg of QGA 200.

Which of the following identifies the RHR manipulation(s) required to initiate Drywell Spray? (Only consider interlocks associated with RHR.)

a. All interlocks are satisfied, open the inboard (23B) and outboard (26B) spray valves.

b. Place the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

c. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE, then open the inboard (23B) and outboard (26B) spray valves.

d. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE and the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295024 High Drywell Pressure

EK2. Knowledge of the interrelations between HIGH DRYWELL PRESSURE and the following:

EK2.11 Drywell spray (RHR) logic: Mark-I&II 4.2 4.2

Explanation of Answer LPCI signal is present and must by bypassed, level is above 2/3 height and does not require action.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Residual Heat Removal System	LF-1000		12, 13	5	S/R-1000-EK013
Post Accident RHR Operation	QCOP 1000-30		4, 5, 7, 8	11	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Expected tail pipe temperature indication when SRV are open to atmospheric conditions.

A reactor Safety Valve has inadvertently opened during normal full power operation.

Which of the following identifies the expected indications available to the operator when this event occurs?

	901(2) 21 Panel Tail Pipe Temperature	901(2) 21 Panel Accoustic Monitor Digital Display	901(2) 21 Panel Valve Position
a.	525 to 540 Deg. F	.01	RED light ON ONLY
b.	525 to 540 Deg. F	.99	RED and AMBER lights ON
c.	310 to 335 Deg. F	.01	RED light ON ONLY
d.	310 to 335 Deg. F	.99	RED and AMBER lights ON

Answer d **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295025 High Reactor Pressure

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH REACTOR PRESSURE:

EK1.03 Safety/relief valve tailpipe temperature/pressure relationships 3.6 3.8

Explanation of Answer This drop across the SRV is isenthalpic and therefore temperature will indicate 310 to 335 deg F. Accoustic monitor indicates .01 as a normal value when valves are closed and approximately 1.0 when valves are open, and the RED and AMBER lights come on when the solenoids energize. ONLY d includes the correct combination of indications.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Main Steam	LIC-0250		28 and 32	4	S/R-0250-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Relationship between the BIIT and Torus temperature

QGA 200 directs that the reactor be scrammed before Torus temperature reaches a value which is equivalent to the Boron Injection Initiation Temperature (BIIT).

The BIIT is defined to be the greater temperature which results from either the Torus temperature at which Technical Specifications require a reactor scram or the highest Torus temperature at which initiation of SBLC will result in . . .

a. injection of the Hot Shutdown Boron Weight before the Torus exceeds pump vortex limits.

b. injection of the Cold Shutdown Boron Weight before the Torus heats to the PSP limit.

c. injection of the Cold Shutdown Boron Weight before the Torus exceeds the PCPL.

d. injection of the Hot Shutdown Boron Weight before the Torus heats to the HCL.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295026 Suppression Pool High Water Temperature

2.4 Emergency Procedures and Plan

2.4.18 Knowledge of the specific bases for EOPs. 2.7 3.6

Explanation of Answer d is the only correct answer, because the limit is based on HCL.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment Control	LP-QGA200	C.1 and 2	53	0	S/R-0001-EK023
RPV Control (ATWS)	LP-QGA101	F.2.d	115	0	S/R-0001-EK058

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: WNP-2 Exam Bank

Comment Type	Comment

Question Topic Bases of BIT or temperature at which SLC must be initiated.

During ATWS conditions, which of the following defines the requirement for boron injection before torus temperature reaches 110 degrees?

a. To prevent reduction of NSPH to ALL ECCS pumps.

b. To minimize the challenge to fuel and reactor integrity.

c. To assure prompt injection of the Cold Shutdown Weight of Boron.

d. To preclude reaching the Heat Capacity Temperature Limit.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295026 Suppression Pool High Water Temperature

EK3. Knowledge of the reasons for the following responses as they apply to SUPPRESSION POOL HIGH WATER TEMPERATURE:

EK3.04 SBLC injection 3.7 4.1

Explanation of Answer Exceeding heat capacity limit requires blowdown. Boron injection at lower torus temperatures lowers power and the sebsequent energy that will be released to containment if blowdown occurs.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
QGA 101 RPV Control (ATWS)	LP QGA 101	F.2.d	115	0	S/R-0001-EK058

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Effect of elevated DW/T on RPV level indication.

QGA Detail A cautions that RPV water level instrumentation MAY be inaccurate if Drywell temperature is at or above RPV Saturation Temperature because . . .

a. the variable leg may flash, causing level to read falsely low.

b. the reference leg may flash, causing level to read falsely high.

c. outgassing of non-condensibles could occur, causing level to read falsely high.

d. both the variable and reference legs could flash, causing level to read falsely low.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295028 High Drywell Temperature

EA2. Ability to determine and/or interpret the following as they apply to HIGH DRYWELL TEMPERATURE:

EA2.03 Reactor water level 3.7 3.9

Explanation of Answer The variable leg is affected by DW tempertature but flashing would result in high pressure in the leg and a false high reading, outgassing is a function of pressure and occurs during depressurization.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
QGA Details	L-QDETAILS		10	0	S/R-0001-EK013
Rx Vessel Instrumentation	LIC-0263		64	3	

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 10068 - Not Used During Program

Comment Type	Comment

Question Topic Limitation on High/Low SP level, damage to SRV quenchers.

Which of the following identifies the possible result of a high level in the suppression pool (greater than 18.5 feet)?

- **a.** The static weight of the column of water in the tailpipes could damage the quenchers, tailpipes, or supports.
- **b.** ADS valves may not function because of water backing up into the ADS valve bodies.
- **c.** Unstable steam condensation outside of the quenchers could damage the quenchers.
- **d.** ADS valve actuation could damage the tailpipes or quenchers when the water is discharged.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295029 High Suppression Pool Water Level

EK2. Knowledge of the interrelations between HIGH SUPPRESSION POOL WATER LEVEL and the following:

EK2.06 SRV's and discharge piping 3.4 3.5

Explanation of Answer Damage is only initiated if SRVs are actuated which is only identified in d. c.) steam condensation is more stable with higher water level in the torus

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
L-QGA200a	QGA 200, Primary Containment Control	VI. Torus Level	59, 65	0	S/R-0001-EK022

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Vortex limitations.

Following the __________ curve will prevent damage due to air entrainment.

a. ECCS Vortex Limit

b. RHR NPSH Limit

c. Heat Capacity Limit

d. Core Spray NPSH Limit

Answer a **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295030 Low Suppression Pool Water Level

EK1. Knowledge of the operational implications of the following concepts as they apply to LOW SUPPRESSION POOL WATER LEVEL:

EK1.02 Pump NPSH 3.5 3.8

Explanation of Answer Only the vortex limit is concerned with air entrainment. Others are viable suppression pool limits.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
QGA Details	L-QGADET		80	0	S/R-0001-EK009

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 5527 - Not Used During Program

Comment Type	Comment

Question Topic Uncovered downcomers.

Which of the following identifies the lowest Torus level at which you can open SRVs without violating procedural guidance?

a. 4 ft.

b. 6.5 ft.

c. 11 ft.

d. 18.5 ft.

Answer b **Exam Level** R **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295030 Low Suppression Pool Water Level

EK2. Knowledge of the interrelations between LOW SUPPRESSION POOL WATER LEVEL and the following:

EK2.08 SRV discharge submergence 3.5 3.8

Explanation of Answer Quenchers are uncovered at less than 5'.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Blowdown	QGA 500-1		1	8	S/R-0001-EK041
RPV Blowdown	L-QGA 500-1		12	0	

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Limitation on HPCI operation.

The plant is operating at rated conditions. A loss of Torus integrity has resulted in a rapid lowering of Torus level.

Which of the following identifies the action to be taken, and why, if Torus level drops to 11 feet?

a. Prevent HPCI operation to prevent direct pressurization of the Primary Containment.

b. Inhibit operation of ADS to prevent direct pressurization of the Primary Containment.

c. Prevent all heat input into the Torus to ensure Heat Capacity Limit is not exceeded.

d. Prevent RCIC operation to prevent direct damage to the pump from inadequate NPSH requirements.

Answer a Exam Level S Cognitive Level Comprehension Facility: Quad Cities ExamDate: 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions RO Group 2 SRO Group 1

295030 Low Suppression Pool Water Level

EK3. Knowledge of the reasons for the following responses as they apply to LOW SUPPRESSION POOL WATER LEVEL:

EK3.02 HPCI operation: Plant-Specific 3.5 3.7

Explanation of Answer a is correct, b) ADS is not uncovered until 5 ft., c.) HCL based on temp and Rx press, not torus level d) RCIC NPSH limits are ensured by a low suction pressure trip, not low level.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment Control	LP QGA 200		67	0	S-0001-EK023

Material Required for Examination

Question Source: New

Question Modification Method:

Question Source Comments:

Comment Type Comment

Question Topic Time delay to ED to allow restoration of any available feed sources.

A failure to scram occurred and available injection systems cannot maintain RPV level above -142 inches.

Which of the following describes why QGA 101 allows the bottom end of the level band to be lowered from -142 inches to -166 inches?

a. Lowered level and power facilitates mixing of boron.

b. Eliminates power oscillations allowing accurate RPV level indication on the fuel zone instruments.

c. Reactor power and the associated steam flow is reduced, allowing available injection systems to maintain level.

d. The covered portion of the core can generate enough steam flow to adequately cool the uncovered portion of the core.

Answer d **Exam Level** R **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions . **RO Group** 1 **SRO Group** 1

295031 Reactor Low Water Level

2.4 Emergency Procedures and Plan

2.4.6 Knowledge symptom based EOP mitigation strategies. 3.1 4.0

Explanation of Answer Only d describes the Minimum Steam Cooling RPV Water Level.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control ATWS	LP-QGA-101	G.2.b	43	0	S/R-0001-EK-61

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: WNP-2 Exam bank

Comment Type **Comment**

Question Topic Bases for ED.

QGA 500-2, STEAM COOLING, directs RPV Blowdown when RPV water level reaches -184 inches and no injection source is available. Which of the following describes why this action is taken?

- **a.** Blowdown increases steam flow up through the core improving heat transfer from the fuel.
- **b.** Blowdown results in significant void formation which reduces reactor power production.
- **c.** At lower pressures, less enthalpy is required to create steam, thus more steam is available for cooling.
- **d.** RPV Blowdown dumps any radioactivity resulting from fuel failure into the torus, preventing uncontrolled release later.

Answer a **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295031 Reactor Low Water Level

EK3. Knowledge of the reasons for the following responses as they apply to REACTOR LOW WATER LEVEL:

EK3.05 Emergency depressurization 4.2 4.3

Explanation of Answer At <-184 inches steam cooling without injection no longer assures adequate core cooling. Action is taken to get the greatest amount of cooling by available means which is RPV blowdown. This is only described in a).

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Steam Cooling	LP QGA 500-2		3	0	S/R-0001-EK046

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Direct From Source

Question Source Comments: Question 9994 - Not Used During Program

Comment Type **Comment**

Question Topic: Access and equipment operability.

All primary system discharges into affected areas have been terminated.
Temperatures in various areas of Unit 2 plant are as follows:

- RWCU Pump Room "A"	149 deg. F
- RWCU HX Area	180 deg. F
- MSIV Room	307 deg. F
- HPCI Room	138 deg. F
- RHR Room "B"	300 deg. F

Based upon the attached Table, Table S from QGA 300, which of the following describes conditions in the plant?

a. The ONLY equipment necessary for the safe shutdown of the unit that can be considered reliable is equipment in the HPCI room.

b. Personnel may safely enter ALL of the areas as necessary for the safe shutdown the plant.

c. Personnel may safely enter the HPCI room, the RWCU Pump Room "A", and the RWCU Hx area for safe shutdown of the plant.

d. Equipment operability necessary for the safe shutdown of the unit is assured in the RWCU Pump Room "A", the HPCI room, and the RHR Room "B".

Answer: d **Exam Level:** S **Cognitive Level:** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 3 **SRO Group:** 2

295032 High Secondary Containment Area Temperature

EA2. Ability to determine and/or interpret the following as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE:

EA2.02 Equipment operability 3.3 3.5

Explanation of Answer: Temp above the MSOV are exceeded in only the MSIV room and the RWCU HX room. Personnel accessability is also based on MSOV so neither of these areas can be entered.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Secondary Containment Control	LP-QGA 300	Att 1	19	0	S/R-0001-EK029
Secondary Containment Control	QGA 300			11	

Material Required for Examination: Copy of Table S from QGA 300. Ensure remaining portion of QGA 300 is NOT provided.

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Response to high temperature alarms.

With Unit 1 at 100% power, annunciator 901-4 C-16, "MAIN STEAM TUNNEL HIGH TEMPERATURE RWCU OUTBOARD ISOLATION VALVE BYPASS" is in alarm. Which of the following describes the impact, if any, this condition will have if a steam leak were to occur in the steam tunnel?

a. None of the RWCU system isolation valves will close automatically.

b. Neither the outboard MSIVs nor the outboard RWCU isolation valves will close automatically.

c. All RWCU valves will respond as designed, but the outboard MSIVs will NOT isolate automatically.

d. All MSIVs will respond as designed, but the outboard RWCU isolation valves will not isolate automatically.

Answer d **Exam Level** R **Cognitive Level** Comprehension **Facility** Quad Cities **ExamDate** 03/27/2000

Tier Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295032 High Secondary Containment Area Temperature

EK1. Knowledge of the operational implications of the following concepts as they apply to HIGH SECONDARY CONTAINMENT AREA TEMPERATURE:

EK1.04 Impact of operating environment on components 3.1 3.6

Explanation of Answer a) this action only affects the RWCU outboard isolation valves, b and c) the MST high temp isolations have no bypass features.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Reactor Water Cleanup	LF-1200		23	3	S/R-1200-EK006
MAIN STEAM TUNNEL HIGH TEMPERATURE RWCU OUTBOARD ISOLATION VALVE BYPASS	QCAN 901-4 C16		1	0	

Material Required for Examination

Question Source New **Question Modification Method**

Question Source Comments

Comment Type	Comment

Question Topic: Response to ARM high.

QGA 300, Secondary Containment Control, directs the installation of jumpers to bypass Reactor Building Ventilation Isolation. Which of the following identifies the signal(s) that will cause Reactor Building Ventilation to isolate AFTER the jumpers have been installed?

a. High radiation signal ONLY.

b. High drywell pressure ONLY.

c. High radiation signal AND high drywell pressure.

d. High drywell pressure AND low reactor vessel level.

Answer: a **Exam Level:** B **Cognitive Level:** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group:** 2 **SRO Group:** 2

295033 High Secondary Containment Area Radiation Levels

EK2. Knowledge of the interrelations between HIGH SECONDARY CONTAINMENT AREA RADIATION LEVELS and the following:

EK2.01 Area radiation monitoring system 3.8 4.0

Explanation of Answer: QCOP 1600-17 bypasses low level and high DW presure. Hi rad isolation provides protection against release. a) is the only selection that identifies radiation ONLY.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Secondary Containment Control	LP-QGA300	IV.A.2 and 3	13	0	S/R-0001-EK029
Secondary Containment Control	QGA 300			9	

Material Required for Examination:

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified

Question Source Comments: 1998 SRO, Question 97, virtually direct from source.

Comment Type	Comment

Question Topic Component response to EOP entry signals.

The plant is operating normally at rated power. A VALID signal results in numerous annunciators and automatic system realignment occurs resulting in the following plant conditions.

- Reactor operation is steady at 100%.
- SBGT system operating, maintaining reactor building differential pressure.
- Control Room is in 100% recirculation mode.
- Reactor Building ventilation is isolated.

Assuming no operator actions have been taken to this point, which of the following identifies the action(s) that should be taken?

a. Enter and execute QGA 300.

b. Enter and execute QGA 400.

c. Initiate a manual scram, enter and execute QGA 100 and QGA 200.

d. Place the reactor mode switch in SHUTDOWN, enter and execute QGA 100.

Answer: a **Exam Level** B **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

295034 Secondary Containment Ventilation High Radiation

2.4 Emergency Procedures and Plan

2.4.2 Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. 3.9 4.1

Explanation of Answer The only signals common to all the conditions stated in the stem are RB vent and Refuel floor high radiation. Both are entry conditions into QGA 300 and neither will initiate a reactor scram. The other initiation signals will cause a reactor scram and or isolation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Plant Ventilation, Control Room Ventilation	LNF-5750, LNF-5752		43, 45	0, 3	
Standby Gas Treatment	LF-7500		36	9	
Secondary Containment Control	LP-QGA 300		7,9	0	S/R-0001-EK027

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic System response to tripped fan(s).

The standby Reactor Building Exhaust fan failed to automatically start following a malfunction which initiated a trip of one of the running exhaust fans.

Assuming a normal system line up before the fan malfunction, which of the following identifies the final status of the Reactor Building Ventilation system?

a. All supply fans will be tripped, the operable exhaust fan will remain running.

b. All fans will continue to operate as they were before the exhaust fan trip.

c. All supply fans and exhaust fans will be tripped.

d. All supply fans and exhaust fans will be tripped, isolation dampers will be closed.

Answer: c **Exam Level** R **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295035 Secondary Containment High Differential Pressure

2.4 Emergency Procedures and Plan

2.4.11 Knowledge of abnormal condition procedures. 3.4 3.6

Explanation of Answer: Supply fans will trip on high pressure, exhaust fan will trip on low pressure. Isolation dampers do not close on hi/low dP.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RX Bldg. Supply/Exhaust fan trip	QOA 5750-05			12	
Plant Building Ventilation	LNF 5750		22	0	S/R 5750-EK020

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic RB HVAC implications.

Unit One is in MODE 5 with refueling underway. Reactor Building Exhaust fans 1B and 1C are out of service for maintenance, when Reactor Building Exhaust fan 1A trips due to an overload. Reactor Building differential pressure is now -0.05" wc and rising toward 0".

Which of the following describes the MINIMUM actions required to satisfy Tech Spec requirements?

a. Restore Secondary Containment to operable within 4 hours.

b. Suspend CORE ALTERATIONS and restore Secondary Containment to operable within 12 hours

c. Immediately suspend movement of irradiated fuel in the secondary containment and close Secondary Containment isolation dampers.

d. Immediately suspend movement of irradiated fuel in the secondary containment, suspend CORE ALTERATIONS, and initiate action to suspend operations with the potential to drain the vessel.

Answer d **Exam Level** S **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295035 Secondary Containment High Differential Pressure

EK1. Knowledge of the operational implications of the following concepts as they apply to SECONDARY CONTAINMENT HIGH DIFFERENTIAL PRESSURE:

EK1.01 Secondary containment integrity 3.9 4.2

Explanation of Answer Reactor building pressure is a requirement for Sec Cont operability. With no reactor building ventilation, pressure increases to 0 inches WC and this TS is not met. In MODE 5 with no Sec Cont Integrity, the actions identified in d are required. a.) action in mode 1,2,3 only. b.) no such requirement. c.) not complete

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary and Secondary Containment	LNF-1601		Appendix B page 23	1	S/R-1601-EK029
Secondary Cont. Integrity	Tech. Specs.	3/4.7.N	23		

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic Entry into EOPs.

A plant transient has occurred and the following plant parameters exist:

- Reactor status — All Rods fully inserted
- Reactor water level — +2 inches, rising slowly
- Reactor pressure — 900 psig, lowering slowly
- Drywell pressure — 2.1 psig, rising slowly
- "A" RHR Room temp — 120 degrees, steady
- "A" RHR Room level — +2 inches, no change

Which of the following identifies ALL the QGAs that should be entered and implemented?

a. QGA 100 (RPV Control)
QGA 200 (Primary Containment Control)
QGA 300 (Secondary Containment Control)

b. QGA 100 (RPV Control)
QGA 200 (Primary Containment Control)

c. QGA 100 (RPV Control)
QGA 300 (Secondary Containment Control)

d. QGA 200 (Primary Containment Control)
QGA 300 (Secondary Containment Control)

Answer c **Exam Level** R **Cognitive Level** Application **Facility** Quad Cities **ExamDate** 03/27/2000

Tier Emergency and Abnormal Plant Evolutions **RO Group** 3 **SRO Group** 2

295036 Secondary Containment High Sump/Area Water Level

2.4 Emergency Procedures and Plan

2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. 4.0 4.3

Explanation of Answer Only Reactor level and RHR Room level exceed QGA entry values.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control	QGA 100			4	S/R-0001-EK027
Secondary Containment Control	QGA 300			9	S/R-0001-EK015

Material Required for Examination

Question Source New **Question Modification Method**

Question Source Comments

Comment Type **Comment**

Question Topic Response to C/S manipulations during initiation.

Which selection identifies the response of the Alternate Rod Insertion (ARI) system AND the Reactor Recirculation system if ONE ARI Manual Initiation Pushbutton in Division 1 and ONE ARI Manual Initiation Pushbutton in Division 2 were to be armed and depressed simultaneously?

Assume the plant is operating at rated power when the actions are taken.

	Division I Solenoids	Division II Solenoids	Reactor Recirculation Pumps
a.	Energized	Energized	Running
b.	Energized	Energized	Tripped
c.	De-energized	De-energized	Tripped
d.	De-energized	De-energized	Running

Answer d **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

EA1. Ability to operate and/or monitor the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:

EA1.03 ARI/RPT/ATWS: Plant-Specific 4.1 4.1

Explanation of Answer Logic specifically requires both PB in either channel to initiate the ARI logic. The RRC pumps are not affected by manual initiation.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
ATWS	LN-0303		22	2	S/R-0303-EK021

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type	Comment

Question Topic Bases for trip or runback.

The plant is in an ATWS condition and QGA 101 requires that the Recirculation Pumps be tripped.

Which of the following completes the statement regarding the reason for this direction?

A Recirc Pump trip provides for . . .

a. reduction in the potential for chugging.

b. more efficient boron mixing.

c. an increase in core cooling.

d. a rapid increase in core voids.

Answer d **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

295037 SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

EK3. Knowledge of the reasons for the following responses as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN:

EK3.01 Recirculation pump trip/runback: Plant-Specific 4.1 4.2

Explanation of Answer b is incorrect because boron will mix w/o core flow, just more effeciently with core flow. a and c are likewise incorrect because a reduction in core flow would not lead to more stable core conditions nor to a reduction in the possibility of chugging.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
RPV Control ATWS	LP-QGA101		109	0	S/R-0001-EK-061
ATWS	LN-0303		44	2	

Material Required for Examination

Question Source: Other Facility **Question Modification Method:** Editorially Modified

Question Source Comments: Cooper Exam Bank

Comment Type **Comment**

Question Topic SWW monitoring system.

Unit Two is shutdown in preparation for refueling outage. A normal river discharge is in progress.

RHR Shutdown Cooling (SDC) is in operation with B RHR pump and B RHR SW pump. The NSO throttles open 2-1001-5A, RHR Heat Exchanger Service Water Discharge Valve, to increase RHR service water flow through the RHR heat exchangers.

Annunciator 902-3, G-1, Liquid Process Rad Monitor Hi Radiation, now alarms, and Service Water effluent high radiation is confirmed to be rising.

Which of the following describes the appropriate operator response for the described conditions?

a. Shut down the RHR SW pump ONLY, and notify Chemistry.

b. Verify RHR Pump B automatically trips and continue to monitor radiation levels.

c. Verify BOTH RHR and RHR SW pumps automaticaly trip then notify chemistry.

d. Shut down operating RHR and RHR SW Pumps and monitor radiation levels.

Answer: d **Exam Level** R **Cognitive Level** Application **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295038 High Off-Site Release Rate

EA1. Ability to operate and/or monitor the following as they apply to HIGH OFF-SITE RELEASE RATE:

EA1.03 Process liquid radiation monitoring system 3.7 3.9

Explanation of Answer d only is correct. b. and c.) there are no RHR/RHRSW automatic trips generated from the process radiation monitoring system. a.) shutting down the RHRSW would not effect the effluent release.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
High Radiation Detected on Eberline Radiation Monitoring System	QCOA-1700-02		4	5	S/R-1701-EK021

Material Required for Examination

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Relationship between rad release and high rad levels in the turbine building.

QGA 400, Radioactivity Release Control, directs "Run Turbine Building Vent per QOP 5750-01".

Which of the following describes the relationship between this action and the radiation levels that may exist in the Turbine Building?

- a. Assures that any radioactivity in the turbine building is being discharged through a ground level release point to limit the dispersion of the radioactivity.
- b. Results in positive pressure inside the turbine building to limit the intrusion of radioactivity from the reactor building.
- c. Results in recirculation of the turbine building atmosphere with a reduction in the amount of radioactivity released.
- d. Assures that any radioactivity in the turbine building is discharged through an elevated and monitored release point.

Answer: d **Exam Level** S **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 1

295038 High Off-Site Release Rate

EA2. Ability to determine and/or interpret the following as they apply to HIGH OFF-SITE RELEASE RATE:

EA2.03 Radiation levels 3.5 4.3

Explanation of Answer A is incorrect because the TB discharge is elevated and not at ground level. B and C are incorrect because TB Ventilation takes a suction from the TB, maintaining the TB at a slightly negative pressure and discharges at an elevate discharge, with out recircing TB air or a positive pressure in the TB. D is correct.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L.O.
Radioactive Release Control	L-QGA400		5	0	S/R-0001-EK035

Material Required for Examination

Question Source: Previous 2 NRC Exams **Question Modification Method:** Editorially Modified

Question Source Comments: 1996 NRC SRO question 72

Comment Type **Comment:**

Question Topic Given conditions, identify why sprays are secured.

QGA 200-5, Hydrogen Control, has been entered and both Drywell and Torus sprays have been initiated. The following conditions now exist:

- DW Temperature — 220 degrees F, lowering slowly
- DW Pressure — 3.5 psig, lowering slowly
- Torus Pressure — 2.0 psig, lowering slowly
- Reactor Water Level — -195 inches steady
- All ECCS systems — Injecting
- DW Oxygen — Unknown
- DW Hydrogen — 7%
- Torus Oxygen — 4%
- Torus Hydrogen — 5%

Which of the following describes: 1) why torus spray must be secured and 2) why drywell spray operation is allowed to continue at this time?

a. 1) Adequate core cooling IS assured and 2) Drywell temperature requires maximizing spray to the Drywell.

b. 1) Adequate core cooling is NOT assured and 2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

c. 1) Adequate core cooling IS assured and 2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

d. 1) Adequate core cooling is NOT assured and 2) Drywell temperature requires maximizing spray to the drywell.

Answer: b **Exam Level** B **Cognitive Level** Comprehension **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 1 **SRO Group** 1

500000 High Containment Hydrogen Concentration

EA1. Ability to operate and monitor the following as they apply to HIGH CONTAINMENT HYDROGEN CONTROL:

EA1.06 Drywell sprays 3.3 3.4

Explanation of Answer b.)core cooling is not assured due to low vessel level and H2 and O2 concentrations are above limits, a and c) core cooling is not assurred due to vessel level, a and d) Drywell temperature is not discussed in QGA 200.

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Primary Containment, Hydrogen Control	L-QGA200		5, 7, 14	0	S/R-0001-EK023
QGA Introduction	L-QGAINTRO		31	0	

Material Required for Examination Copy of QGA 200-5, Hydrogen Control unless combustible limits are expected knowledge items.

Question Source: New **Question Modification Method:**

Question Source Comments:

Comment Type **Comment**

Question Topic Effect of fire on plant operation.

Which of the following actions is NOT required if a valid report of a fire is received from Trackway-1?

a. Direct the Fire Brigade to respond.

b. Evacuate the turbine building.

c. Call the Cordova Fire Department.

d. Sound the plant fire siren.

Answer b **Exam Level** B **Cognitive Level** Memory **Facility:** Quad Cities **ExamDate:** 03/27/2000

Tier: Emergency and Abnormal Plant Evolutions **RO Group** 2 **SRO Group** 2

600000 Plant Fire On Site

AK1. Knowledge of the operation applications of the following concepts as they apply to Plant Fire On Site:

AK1.02 Fire Fighting 2.9 3.1

Explanation of Answer QCOA requires all actions except a.).

Reference Title	Facility Reference Number	Section	Page Number(s)	Revision	L. O.
Fires/Explosions	QCOA 0010-12		1-3	12	S/R/A-4100-EK019

Material Required for Examination

Question Source: Facility Exam Bank **Question Modification Method:** Significantly Modified

Question Source Comments: Question 5393 with changes to stem and one distractor.

Comment Type	Comment

CHANGES TO THE OPERATING TEST - QUAD CITIES

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Job Performance Measure

See comments within

Reactor Mode Change

JPM Number: ADM-A.1.1-RO

Revision Number: 2

Date: 03/07/00

Approved By: ______________________ ________
Operations Representative **Date**

Approved By: ______________________ ________
Training Department **Date**

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtain QCGP 1-1, Step F.6.nn.	Obtains copy of procedure.	___	___	___
CUE	**Provide copy of QCGP once requested.**		___	___	___
(2)	Verify APRMs are indicating correctly on both panels.	Determines all APRMs indicating correctly.	___	___	___
(3)	Verify all APRM downscale lights are clear.	Determines downscale lights clear.	___	___	___
(4)	Verify Main Condenser backpressure is < 7 in Hg.	Determines main condenser backpressure is < 7 in Hg.	___	___	___
*(5)	Verifies low vacuum alarm clear.	Determines low vacuum alarm is lit and not clear.	___	___	___
*2	Candidate should inform the US that step is not met. Critical that this occurs prior to mode switch change.	Informs US that mode switch cannot be changed as APRM downscale lights are not all clear.	___	___	___

<BOLD> NEXT STEP IS FAULTED. SEE EXAMINER CUES ON NEXT PAGE.

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Job Performance Measure

No comments

Update and Interpret Core Thermal Limits

JPM Number: _ADM-1.1.2-RO_

Revision Number: _1_

Date: 03/03/00

Approved By: ____________________
Operations Representative ____________ **Date**

Approved By: ____________________
Training Department ____________ **Date**

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See comments written on Answer Key

Job Performance Measure

JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: ADM-A.2-RO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative Date

Approved By: [signature] 2-3-00
Training Department Date

Key

ATTACHMENT A (Page 1 of 3)

JET PUMP FLOW DISTRIBUTION COMPARISON DATA SHEET

D. PREREQUISITE

1. The Unit Supervisor has completed the following Prerequisites:

   a. Unit: 1 ___ 1(2)

   b. Reason for test (check appropriate item):

   Normal Surveillance (X)

   Post Maintenance ( )

   Partial for ______________ ( )

   Other ______________ ( )

   c. Permission to start test:

   U. Supervisor ___ US Signature

   Today's / Now ___ Date / Time

H. PROCEDURE

H.1 **Record** Total Core Flow:

   a. **IF** in Dual Loop Operation, **THEN** **obtain** flow from 1(2)-263-110, CORE FLOW AND DP. ~~126~~ 95 ___ MLB/HR

   b. **IF** in Single Loop Operation, **THEN** **determine** flow from QCOP 0202-07. NA ___ MLB/HR

H.2. **Record** Recirc Pump Speeds at 1(2)-262-25A/B, PMP A/B SPEED CONTROLLER. 94 ___ A% 94 ___ B%

Document Retention: Life of Plant

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Comments with here

Job Performance Measure

Determine Radiation Exposure

JPM Number: ADM-A.3-SRO

See RO task

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swift 2-3-00
Operations Representative Date

Approved By: [signature] 2-3-00
Training Department Date

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Job Performance Measure

Q - RWP has placement of dosimetry at knee.
max dose is 100 mrem
→ What is required to be used? ⇒ Knee

Review a Radiation Work Permit

JPM Number: ADM-A.3-RO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle 2-3-00
Operations Representative **Date**

Approved By: [signature] 2-3-00
Training Department **Date**

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is operating at 100% reactor power.

Your exposure history is:

Annual Non-QCNP TEDE Dose (from Dresden Station) – 1920 mrem

Annual QCNP TEDE Dose – 1050 mrem

Previous 24 hours DDE dose at QCNP from RWPs other than 000003 -195 mrem

INITIATING CUE

You have been directed to ~~manually valve out the 1A RWCU pump. It is expected that the task will take 30 minutes. You are to review the RWP and area maps to determine if you are able to complete the task and inform the Unit Supervisor. This is a NON EMERGENCY situation.~~

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Support FIN team for maintenance on valve.

Job Performance Measure (JPM)

JPM Start Time: ______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtain RWP and area maps.	Obtain RWP and maps.	___	___	___
CUE	**Provide the RWP and maps when requested.**				
*2	Review RWP and applicable survey map.	Review RWP and applicable survey map.	___	___	___
*~~3~~4	Determines max. stay time.	Determines that candidate would have 18-20 min stay time and would exceed administrative limit of 3000 mrem for total dose to complete the job.	___	___	___
3 ~~4~~	Informs US.	Informs US that he would exceed adm exposure limits to complete the job and can not complete the task.	___	___	___

Cue: (If needed) I need you to do the job. How long can you stay w/o an extension?

CUE: The JPM is complete.

JPM Stop Time: ______

ANS: 1920 + 1050 +50 3020 mr ∴ can't do job.
30 min = 450 mrem
Can receive 30 mrem or 3/5 x 30 = ~~18~~ min.
20

dwg# rev.	1A CLEAN UP PUMP ROOM U-1 RX. BLDG. 2nd floor 623elv.	Date: 01/ Time: 1125 RT: DMBosman RWP#: 97-3006 Reviewed by:	UNIT STATUS MWE: 818	Smears Taken?..(Y) N Beta Taken?.......Y (N) TW Map Updated?..Y N (NA) RWP Cont. Sheet Updated?.......(Y) N NA	GM Inst.# Source Checked DMB D/R Inst.# 4042 Source Checked TD/DMB

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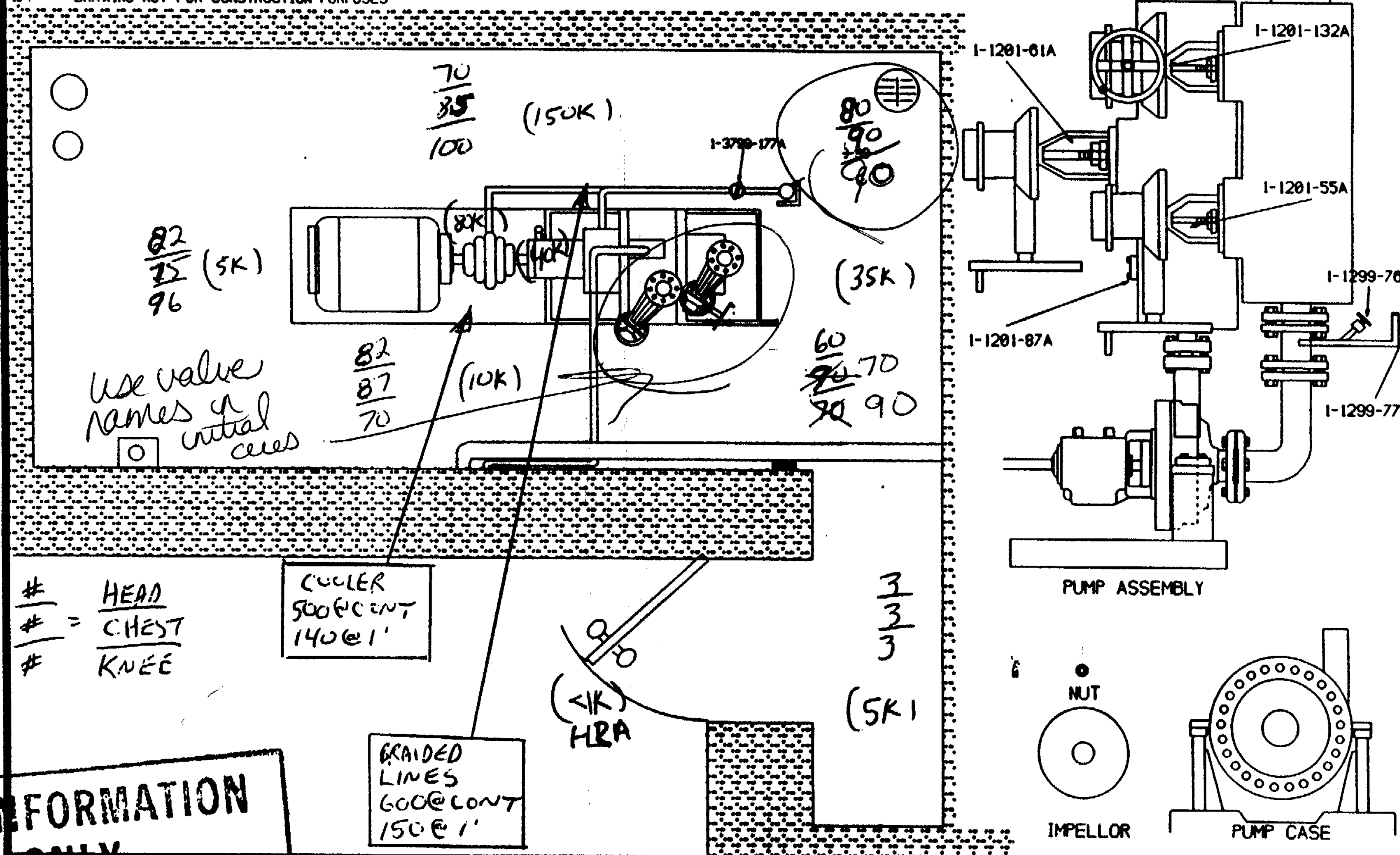
LEGEND
(no.)-DPM/100cm2
no.-dose rates DDE (arem/hr)
(L)-large area smear
▲-air sample location

AIR SAMPLE INFORMATION
AIR SAMPLE TAKEN? Y N (N/A)
N/A uci/DAC
Sampler # N/A
Date/Time pulled N/A

Purpose of Survey: OBTAIN QUARTERLY VIBRATION READINGS

Comments/Legend: RPT ACTED AS S.O.P. Dosimetry Placement: KNEE

DRAWING NOT FOR CONSTRUCTION PURPOSES



OR INFORMATION ONLY

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Job Performance Measure

Determine if Chimney Radiation Levels Exceed EAL Values

JPM Number: ADM-A.4-RO

Revision Number: 0

Date: 02/01/00

Resolve answer

Provide answer key & explanation

Approved By: Mike Swegle 2-3-00
Operations Representative Date

Approved By: [signature] 2-7-00
Training Department Date

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Job Performance Measure

Verify Reactor Mode Change Requirements

JPM Number: _ADM-A.1.1-SRO_

Revision Number: _1_

Date: 03/03/00

See comments within

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at 10% reactor power during a plant startup. QCGP 1-1 is complete to Step F.6.mm.

INITIATING CUE

The Shift Manager directs you to complete Attachment E as required by Step F.6.mm of QCGP 1-1 in support of changing the Mode Switch from Startup to Run.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Today's date is March 7, 2000.

Comment: if we use the date of the JPM (when performed) then we need to modify the dates in the surveillance.

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Job Performance Measure

Update and Interpret Core Thermal Limits

JPM Number: _ADM-A.1.2-SRO_

Revision Number: _0_

Date: 02/01/00

No comments

Approved By: Mike Swezla 2-3-00
Operations Representative Date

Approved By: [signature] 2-3-00
Training Department Date

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See comments within

Nuclear Generation Group

Job Performance Measure

JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: _ADM-A.2-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: Mike Swezle 2-3-00
Operations Representative **Date**

Approved By: [signature] 2-3-00
Training Department **Date**

Job Performance Measure (JPM)

JPM Start Time: _______

Put on previous page please.

	ELEMENT		SAT	UNSAT	Comment Number
1.	Requests QCOS 0202-06.	Obtains QCOS 0202-06.	___	___	___
CUE	**Provide the candidate with completed copies of QCOS 0202-06.** **NOTE -only provide QCOS 0202-07 if requested.**	This is a CRITICAL TASK			
2.	Reviews QCOS 0202-06.	Determines QCOS 0202-06 completed Satisfactorily.	___	___	___
*3.	Determines QCOS 0202-07 must be reviewed in conjunction with QCOS 0202-06.	Obtains completed copy of QCOS 0202-07.	___	___	___
CUE	**Provide QCOS 0202-07 if requested.**				
*4.	Reviews QCOS 0202-07.	Determines Jet pump 4 failed to meet acceptance criteria but was marked incorrectly.	___	___	___
*5.	Reviews surveillance performance criteria.	Reviews performance criteria G.1. Determines a. and b. pass, c. fails and surveillance is SAT as no two failed simultaneously.	___	___	___
CUE	**Unit Supervisor understands the Jet pump problem and that the surveillance is SAT.**				

CUE: The JPM is completed.

JPM Stop Time: _______

ATTACHMENT A (Page 1 of 3)

JET PUMP FLOW DISTRIBUTION COMPARISON DATA SHEET

D. PREREQUISITE

1. The Unit Supervisor has completed the following Prerequisites:

a. Unit: 1 (1(2))

b. Reason for test (check appropriate item):

Normal Surveillance (X)

Post Maintenance ( )

Partial for ______ ( )

Other ______ ( )

c. Permission to start test:

U. Supervisor — US Signature

Today's — Date / Now — Time

H. PROCEDURE

H.1 Record Total Core Flow:

a. IF in Dual Loop Operation, THEN obtain flow from 1(2)-263-110, CORE FLOW AND DP. ~~96~~ 95 MLB/HR

b. IF in Single Loop Operation, THEN determine flow from QCOP 0202-07. NA MLB/HR

H.2. Record Recirc Pump Speeds at 1(2)-262-25A/B, PMP A/B SPEED CONTROLLER. 94 A% 94 B%

Document Retention: Life of Plant

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Job Performance Measure

No comments. (need completed PARs form & blank for candidate)

Determine EAL and PARs

JPM Number: ADM-A.4-SRO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swengle — 2-3-00
Operations Representative — Date

Approved By: [signature] — 2-3-00
Training Department — Date

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name: ______________________________
(print)

JPM: LS-019-I-F Rev: 16 Revision by: G. Thennes

Task Title: Control Reactor Pressure with RCIC.

See comments within

Station Approval: ______________________ Date: __________
(Exam Coordinator)

Operations Review: ______________________ Date: __________

Task References: S/R-1300-TP003 **K/A:**217000 A2.10 **Rating:**3.1/3.1

License: RO/SRO **Suggested Testing Environment: Simulator**
(Circle One)

Actual Testing Environment: Simulator x Plant ___ CR ___

Testing Method: Simulate ____ Perform x

Estimated Time to Complete: **12 min.** **STOP Time:** __________
START Time: __________
ACTUAL Time: __________

Time Critical? NO X YES___

References: QCOP 1300-2 Rev. 17 RCIC SYSTEM MANUAL START-UP (INJECTION/PRESSURE CONTROL)

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Significantly modified JPM to incorporate failure of RCIC controller to control flow in auto. Incorporate minor editorial proc. changes. NOTE: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ______________

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6.g.	Open Stm. To Turb. Vlv.	Positions 1301-61 CS to open. - Open light lit.	[]	[]	

NOTE: Operator may place controller in manual and increases to 400 gpm as required in Step F.6.k.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.6.h.	Verify flow indication.	Identifies flow at approximately 200 gpm. If manual control of FIC is selected, operator may increase flow to 400 gpm on FIC 1-1340-1.	[]	[]	[]
F.6.i.	Verify close MIN FLOW VALVE.	Verifies MO 1-1301-60 closed. -CLOSED light lit.	[]	[]	
*F.6.j.(1) or (2)	Adjust to proper disch. flow/pressure.	Adjusts **FLOW** by: FIC 1-1340-1 in MAN and adjusts manual adjustment lever to achieve approx. 400 gpm. **AND** Throttles 1301-53 CS open/ closed as necessary until pmp. disch. press. 100 psig > RPV press and < 1250 psig.	[]	[]	

Candidate should recognize inability to maintain flow or pressure due to FIC 1-1340-1 failure (Dependent on how far 1301-53 was opened in step F.6.b)

Candidate may choose to reperform F.6.b to obtain more flow

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-003-I-F Rev. 4 Revision by: G. Thennes

Task Title: Perform the Monthly Core Spray Pump Operability Test for Core Spray Pump B With Failure of Minimum Flow Valve

See comments within.

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R-1400-TP005 K/A: 209001 A4.04 Rating: 2.9/2.9
K/A: 209001 A4.11 Rating:3.7/3.6
K/A: 209001 A4.12 Rating:3.6/3.5

License: RO/SRO (Circle One) Suggested Testing Environment: **Simulator**

Actual Testing Environment: Simulator X Plant ____ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **16.5 min.** **STOP Time** ________
START Time ________
Time Critical? NO X YES____ **ACTUAL Time** ________

References: QCOS 1400-4, MONTHLY CORE SPRAY PUMP OPERABILITY TEST, Rev. 6

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMMENTS/REMEDIATION: Minor editorial revision to procedure. Does not change the performance of this JPM. The Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________

Signature: ______________________________ Date: ____________

Question: QAP 0300-02 Step D.19 states throttle valves should be driven closed for a minimum of 25 seconds after receiving closed indication.
If applicant does not hold switch 25 seconds is this a procedural violation? is it critical?

QCNPS-JOB PERFORMANCE MEASURE

Expected alarms 901-4 A4, B16, C15, H5 ~~Hou two~~ were briefed but procedures not reviewed.

INITIAL CONDITIONS

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Monthly Core Spray System Motor Operated Valve Test was performed last shift and the operability of MO-1-1402-4B has been proven and recorded on QCOS 1400-02.
- The Monthly Core Spray Pump Operability Test is required to be performed this shift.
- An Equipment Attendant is standing by to vent the core spray piping.

Initiating Cue: The Unit Supervisor directs you to perform the Monthly Core Spray Pump Operability Test for the "B" Core Spray Pump IAW QCOS 1400-4.

Start Time:________

Provide examinee with: QCOS 1400-4 (Evaluator: Ensure step D.1., PREREQUISITES, portion of QCOS is filled in. Reason = Partial for "B" Loop Step D.1 and D.2.) N/A steps as needed.

The EA has been briefed, ~~and~~ has completed steps H.1.b, and is waiting at the pump room.

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE		STANDARDS	SAT	UNSAT	N/A
*H.1.b.	Verify 1B CS disch. hdr filled and vented.	Directs operator to open 1B CS inbrd & outbrd vents (1-1402-17B & 18B, and verify flow from vent, and close inbrd & outbrd vent valves.	[]	[]	

CUE: The NLO reports that water issued from the vents within 1 (one) second and the vents are closed.

H.1.b.(3)/ (4)	Initials QCOS 1400-04 steps H.1.b.(3),(4) (NLO/NSO) **or** directs NLO to initial upon return to control room.	Properly initials QCOS 1400-04 steps H.1.b.(3),(4) (NLO/NSO) or directs upon return to control room.	[]	[]	

CUE: Once asked by NSO: The EA reports he will complete prestart checks on 1B CS pump. Report back to NSO: The EA reports that the prestart checks are satisfactory and he is standing by for pump start.

Cue: Announcement has been made. The room is clear.

*H.3.b.(1)	Start 1B CS pump.	Positions CS to on-on light lit.	[]	[]	

(If asked)
CUE: EA reports 1B CS pump is operating satisfactorily.

~~Expected alarms: 901-4 A4, B16, C15~~

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.3.b.(2)	Verify MO 1-1402-38B opens.	Verifies MO 38B open light lit.	[]	[]	
*H.3.b.(3)	Open MO 1-1402-4B	Positions 4B CS to fully open 4B valve-open light lit. *Note* Hold for 25 seconds per QAP 0300-02	[]	[]	
H.3.b.(4)	Verify MO 1-1402-38B closes.	Verifies 38B closed light lit.	[]	[]	
H.3.b.(4)	Report the Min. Flow valve did not close.	Informs US that 38B did not close.	[]	[]	

CUE: I understand that the 38B did not close. Shutdown the "B" Core Spray system IAW the procedure.

*H.3.c.(1)	Close MO 1-1402-4B.	Positions CS to close-closed light lit.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*H.3.c.(3)	Stop 1B CS pump.	Positions CS to stop-off light lit.	[]	[]	
H.3.c.(~~5~~ 4)	Close MO 1-1402-38b.	Positions CS to close-OPEN light lit.	[]	[]	

CUE: I understand that the 38B will not close. I will write an Action Request and report this to the SM.

EVALUATOR: **Steps H.3.d & e. will only be performed if the core spray discharge pressure cannot be maintained between 40 and 90 psig. If pressure is greater than 90 psig step H.3.d. will be performed. If pressure is reduced to less than 40 psig step H.3.e. will be performed. These steps will become critical if they must be performed.**

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.3.d.(1)	Reduce discharge press. < 90 psig. Crack open MO-1-1402-4B	Cracks open MO-4B to slowly reduce discharge press-dual indication.	[]	[]	[]
H.3.d.(2)	Close MO-1-1402B-4B	Positions CS to close when disch. press. < 90 psig-closed light lit.	[]	[]	[]
H.3.e.(1)	Open MO 1-1402-4B.	Open MO 4B valve (Open light lit).	[]	[]	
H.3.e.(2)	Close MO 1-1402-4 B.	Closes MO 4B valve (closed light lit).	[]	[]	

7

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-037-I Rev: 10 Revision by: G. Thennes

Task Title: Bypass the Reactor Building Ventilation Isolation

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task References:S/R/A-1600-TP025

K/A: 288000 A2.01 Rating:3.3/3.4
K/A: 223002 A2.09 Rating:3.6/3.7
K/A: 223002 A4.03 Rating:3.6/3.5

See comments within

License: RO/SRO Suggested Testing Environment: **CR**
(Circle One)

Actual Testing Environment: Simulator ___ Plant ___ CR X

Testing Method: Simulate X Perform ___

Estimated Time to Complete: **5.0 min.**

STOP Time ________
START Time ________
ACTUAL Time ________

Time Critical? NO X YES ___

References: QCOP 1600-17 Rev. 3 BYPASSING THE GROUP II ISOLATION AND REACTOR BUILDING VENTILATION ISOLATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedure revision. No change to JPM technical content. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ____________

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.1.a.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts 49 & 50 on terminal board "B".	[]	[]	

CUE: The jumper is installed on TB "B" pts. 49 & 50.
The jumper has been independently verified.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.1.b.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts. 38 & 39 on terminal board "E".	[]	[]	

CUE: The jumper is installed on TB "E" pts. 38 & 39.
The jumper has been independently verified.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.	Return QCOP 1600-17 ~~File QCOP 1600-17.~~ to US/SM.	TAKES ~~Places~~ QCOP 1600-17 ~~in jumper log~~ from applicant ~~OR~~ when reported complete ~~Gives to US or~~ SM.	[]	[]	
	Informs the US that the jumpers have been installed.	Informs the US the jumpers have been installed.	[]	[]	

CUE: The Unit Supervisor understands the jumpers have been installed.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

See comments written

Operator's Name______________________________
(print)

JPM: LS-052-I Rev.2 Revision by: G. Thennes

Task Title: **Uncoupled Control Rod During Reactor Startup to Criticality**

Station Approval:______________________ Date:__________
(Exam Coordinator)

Operations Review:______________________ Date:__________

Task References: L.O. S/R-0300-TP024 **K/A:** 201003A2.02 **Rating:**3.7/3.8
S/R-0302-EK026

License: RO/SRO **Suggested Testing Environment:**
(Circle One)

Actual Testing Environment: Simulator X Plant_ CR_

Testing Method: Simulate_ Perform X

Estimated Time to Complete: **20 min.** **STOP TIME** __________
START TIME:__________
ACTUAL TIME:__________

Time Critical? NO X YES__

References: QCGP 1-1 Rev. 33 QCAN 901(2)-5 A-2 Rev. 0 QCOP 0207-01 Rev. 6
QCGP 4-1 Rev. 16 QCOA 0300-03 Rev 8 QCOP 0300-07 Rev. 3

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory_ Unsatisfactory_

COMMENTS/REMEDIATION: Significantly modified startup JPM to add Uncoupled control rod failure. Minor procedure step changes incorporated. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name______________________
Signature______________________ Date:__________

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

Evaluator: JPM steps may occur in slightly different order due to procedure overlap between the QCOA and QCOS. The critical tasks are to enter the QCOA, enable the RWM, insert and disarm the control rod.

*B.1.	Responds to annunciator 901-5 A2, rod OVTRVL, using QCAN 901(2)-5 A2. May also respond to expected ann. A3 and B3. **NOT** a part of the critical task.	Verifies control rod F-15 position and determines at position 49 using Panel 901(2)-5, RWM main display screen, or OD-7, option 2.	[ ]	[ ]	[ ]
B.2.	Determines control rod F-15 is uncoupled and enters QCOA 0300-03.	Enters QCOA 0300-03.	[ ]	[ ]	[ ]
CUE (if necessary)	**The US will contact the lead nuclear engineer to determine previous history of rod uncoupling.**				
*D.1. (1.a)	Responds to uncoupled rod IAW QCOA 0300-03.	Enable RWM "Rod out-of-Service" option per QCOP 0207-01, step F.6.	[ ]	[ ]	[ ]
*F.6	Steps to enable OOS option.				
	a. Select secondary function	a. Selects sec. funct	[ ]	[ ]	[ ]
	b. Select Rod OOS	b. Selects rod OOS	[ ]	[ ]	[ ]
	c. Select rod F-15	c. Selects rod F-15	[ ]	[ ]	[ ]
	d. Verify F-15 in blue box.	d. Rod F-15 in blue box	[ ]	[ ]	[ ]
	e. Enter request for OOS	e. Request OOS	[ ]	[ ]	[ ]
	f. Drive F-15 to 00	f. Drive F-15 to 00	[ ]	[ ]	[ ]
CUE(if necessary)	**The US directs rod F-15 be driven to 00 IAW the QCOA.**				
CUE(if necessary)	**The QNE will generate a Special Manuver Sheet,**	please make one line to avoid continuance on next page			

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	QCTP 0930-07, Att. G., when he arrives.				
F.6	Continue in QCOP 0207-01, step F.6.				
	g. Select exit function	Select exit function after F-15 at 00.	[ ]	[ ]	[ ]
	h. Verify F-15 is in light blue and has insert and withdraw blocks.	F-15 has insert and withdraw blocks.	[ ]	[ ]	[ ]
D.1 *(1.b)	Continue to respond to uncoupled rod IAW QCOA 0300-03.	N/A Insert control ~~rod F~~-15 to position ~~00~~ (should occur in QCOP 0207-01).	[ ]	[ ]	[ ]
*(1.c)	Electrically disarms rod F-15.	Electrically disarm rod F-15 per QCOP 0300-07.	[ ]	[ ]	[ ]

CUE: Unit Supervisor has initiated actions to have the auxiliary operator disarm the rod. and ~~Unit Supervisor has ad~~ has assigned another operator to complete the remaining tasks

1.d	Contact QNE for guidance in adjusting the rod pattern.	Contact QNE or inform US of need to contact QNE.	[ ]	[ ]	[ ]

CUE: Unit Supervisor will contact the QNE.

1.e	Perform QCOS 0300-14.	Inform US of the need to complete QCOS-14.	[ ]	[ ]	[ ]

CUE: Unit Supervisor has initiated QCOS 0300-14 and directs you to hold the startup until the outage report is completed. He will ensure the TS action time is not exceeded.

EVALUATOR: The JPM is complete.

Stop Time: ___________

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name:______________________________
(print)

JPM: LS-012-I Rev. 7 Revision by: G. Thennes

Task Title: Transfer Torus Water to the Main Condenser via the Condensate Demineralizers

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R-1000-TP012 **K/A:** 223001 A2.11 **Rating:** 3.6/3.8

License: RO/SRO (Circle One) **Suggested Testing Environment:** Simulator

Actual Testing Environment: Simulator X Plant___ CR___

Testing Method: Simulate_____ Perform X

Estimated Time to Complete: **11.5 min.** **STOP TIME:**_______ **START TIME:**_______

Time Critical? NO x YES________ **ACTUAL TIME:**_____

References: QCOP 1000-10 Rev. 10, TORUS WATER TRANSFER TO THE MAIN CONDENSER VIA THE CONDENSATE DEMINERALIZERS

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory________ Unsatisfactory______

COMMENTS/REMEDIATION: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________
Signature:______________________________ Date:__________

See comments other

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Both units are operating at near rated conditions.
- The Torus water level needs to be lowered to the lower operating limit prior to performing the HPCI Monthly surveillance.
- Chemistry has been notified of the upcoming water transfer.
- Q-HLA briefing has been conducted.
- The RHR System is filled and vented IAW QCOP 1000-2.
- No water is being transferred on Unit Two and all valve line-ups are normal.
- The "B" & "C" RHR Service Water pumps are running per QCOP 1000-04.
- The S.M. has authorized pumping the Torus to the U-1 Main Condenser via the Cond. Demins due to the Floor Drain Collector Tank being full.
- The Radwaste operator has verified the following valves are CLOSED;
  - -2-2001-833, UNIT 2 TORUS TO HOTWELL XTIE VLV
  - -½-2001-82, TORUS AND CONDENSER XTIE TO RDT VLV
  - -½-2001-85, TORUS CONDENSER XTIE TO WASTE COLLECTOR TK VLV
  - -½-2001-84, TORUS AND CONDENSER XTIE TO FDCT VLV
  - -AO 1-2001-175, DISCHARGE TO HOTWELL
  - -½-2099-60, RADWASTE TO RHR SYS XTIE VLV
  - -1-3399-441, COND TO RW
  - -1-2001-918, COND DECANT PMP TO ~~2~~1A CONDENSER VLV
- The following valves have been verified closed and locked via the EWCS OOS program:
  - 1-1001-128A, 1A RHR Loop to drain valve
  - 1-1001-128B, 1B RHR Loop to drain valve
  - 2-1001-128A, 2A RHR Loop to drain valve
  - 2-1001-128B, 2B RHR Loop to drain valve
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to line-up and begin reducing the Torus level by transferring water from the Torus to the U-1 Main Condenser via the Condensate Demineralizers, using the 1C RHR Pump. The Unit NSO will maintain condenser water level IAW QCOP 3300-05.

START TIME:_______________

Provide examinee with: NA QCOP 1000-10

Additional Questions/Comments: Verify simulator operator is available prior to starting JPM. The sim operator will be NLO

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

NOTE: Steps F.3.a through F.3.f.1 are accomplished via the set up. If the examinee asks respond that all the valves are closed.

*F.3.f.2	Open U-1 torus to hotwell Xtie vlv.	Directs operator to open 1-2001-833 vlv. (U-1 torus to hotwell Xtie vlv.)	[ ]	[ ]	[ ]

CUE (Examiner) Direct candidate to call NLO (sim op)

CUE: (Simulator Operator) U-1 2001 833 is open.

NOTE: Steps F.4.a and F.4.b are accomplished via the set up. If the examinee asks respond the valves are closed.

*F.4.c	Throttle open B or C Cond pump suct. from RW.	Directs operator to open 1-2001-919B or 919C 3 turns.	[ ]	[ ]	[ ]

2001 B&C or C

NOTE:: Simulator operator to open the 919B valve, RHR to "B" condensate pump. (irf RH11R open)

CUE: (Simulator Operator) 2001 919~~B~~ B or C ~~is~~ open 3 turns. ~~(No sim. operator action needed, just report valve open.)~~

F.5	Verify RHR pp. suction from torus.	Verifies MO 1-1001-7C open light lit.	[ ]	[ ]	[ ]
F.6	Verify RHR Xtie vlvs open.	Verifies open light lit for;			
		MO 1-1001-19A (North Xtie Vlv)	[ ]	[ ]	[ ]
		MO 1-1001-19B (South Xtie Vlv)	[ ]	[ ]	[ ]
F.7	Verify RHR SW pumps running.	Verifies "B" & "C" RHR SW pumps run light lit.	[ ]	[ ]	[ ]
*F.8	Open torus test or spray valve.	Positions MO 1-1001-34B to open -open light lit.	[ ]	[ ]	[ ]

QCNPS-JOB PERFORMANCE MEASURE

Comments within

Operator's Name:______________________________
(print)

JPM: LS-005-II Rev: 12 Revised by: G. Thennes

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task Title: Transfer Aux. Power from XFMR 11 to XFMR 12

Task References: S/R-0002-TP002 **K/A:** 262001 A4.02 **Rating:**3.4/3.4
K/A: 262001 A4.04 **Rating:**3.6/3.7

License: RO/SRO
(Circle One)

Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator X Plant ___ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **4 min.**

STOP Time:____________
START Time:____________
ACTUAL Time:____________

Time Critical: NO X YES___

References: QCGP 2-1 Rev. 28 NORMAL UNIT SHUTDOWN
QCOP 6500-09 Rev.3 ENERGIZING 4KV SWITCHGEAR AND TRANSFERRING AUXILIARY POWER

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedures in use to transfer aux. power. No change of conduct of JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________

Signature:______________________________ Date______________________________

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The unit is operating at 100% power.
- Normal Unit Shutdown has just been directed.
- Shift Manager has directed Aux. Power transferred.
- Load Dispatcher (BPO) has given permission to transfer auxiliary power from XFMR 11 to XFMR 12.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to transfer Aux. power from Transformer 11 to Transformer 12.

START TIME ______________

Provide examinee with: ~~Synchroscope key~~ Copy of QCGP 2-1 / QCOP 6500-09

Additional Questions/Comments:____

____

____

____

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-016-II Rev: 6 Revision by: G. Thennes

Station Approval: Gary Thennes Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

See comments on other

Task Title: Bypass the Rod Worth Minimizer

Task References: S/R-0207-TP003 K/A:201006 A3.02 Rating:3.5/3.4
K/A:201006 A4.01 Rating:3.2/3.4

License: RO/SRO Suggested Testing Environment: **Simulator**
(Circle One)

Actual Testing Environment: Simulator X Plant ___ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **20.0 min.**

STOP Time __________
START Time __________
ACTUAL Time __________

Time Critical: NO X YES _____

References: QCOP 207-2 Rev. 5 ROD WORTH MINIMIZER BYPASS CONTROL

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Procedure revision does not change the content of this JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP REQUIREMENTS

JPM: LS-16-II

IC#: 21 (or any other that will support this task.)

IC Description: The unit is operating at near rated power.

Manual Actuations: -Prepare a Caution Card IAW QOP 207-2 step F.2.a.
-Verify RWM blocks enabled to full.
- Open Sequence book to Step 43
- Ensure demand print is on and operating.

SELECT ROD H-2 Prior to initiating malfunction,

Malfunctions: RD 19; FAILURE OF ALL RPIS INPUTS TO THE RWM
(imf rd19)

Remotes: NONE

Overrides: "A" and "B" RWM ready light.
(ior ~~z~~lohs10207ardy off)
(ior ~~z~~lohs10207brdy off)

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Reactor power is 100% percent of rated and in the process of a normal unit shutdown.
- RWM MODE SWITCH is in NORMAL.
- RWM TRANSFER SWITCH is selected to "A", with the "A" ON LINE light lit.
- Both RWM "A READY" and "B READY" lights are extinguished.
- Annunciator 901-5-B-3, ROD WORTH MIN BLOCK is illuminated. → Wasn't lit.
- This JPM is not time critical
- Sequence Step 43 @ 06

Initiating Cue: The Unit Supervisor directs you to bypass the Rod Worth Minimizer IAW QCOP 0207-02, due to failed RPIS inputs.

START TIME ______

Provide examinee with: QCOP 0207-02, ~~now~~, and a caution card when requested.
After applicant locates QCOP 0207-02, provide the supplied procedure.

Additional Questions/Comments:____
____
____

QCNPS – JOB PERFORMANCE MEASURE (JPM)

No comments

Operator's Name ______________________________
(print)

JPM: LP-001-I Rev: 14 Revised by: G. Thennes

Task Title: Locally Start-up the HPCI System to Control RPV Level

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/B-2300-TP012 K/A:206000 2.1.30 Rating:3.9/3.4
K/A:206000 2.1.20 Rating:4.3/4.2

License: RO/SRO **Suggested Testing Environment**: Plant
(Circle One)

Actual Testing Environment: Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **20 min.** **STOP Time:**__________
START Time:__________
Time Critical: NO X YES_ **ACTUAL Time:**__________

References: QCOP 2300-08 Rev. 12 HPCI LOCAL MANUAL OPERATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Updated reference procedure number, minor change (to referenced) procedure step. Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name______________________________
Signature:______________________________ Date:__________

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name______________________________________
(print)

JPM: LP-026-I Rev. 6 Revision by: G. Thennes

Task Title: De-energize ADS Valves to Prevent Spurious Operation by Repositioning Inhibit Switch

Station Approval:______________________________ Date:__________
(Exam Coordinator)

Operations Review:______________________________ Date:__________

Task References: L.O. S/R/A/B-4100-TP021 K/A: 218000 A2.06 Rating: 4.2/4.3

License: RO/SRO Suggested Testing Environment: **Plant**
(Circle One)

Actual Testing Environment: Simulator_____ Plant X CR_____

Testing Method: Simulate X Perform_____

Estimated Time to Complete: **10.0 min.** **STOP TIME** ________
Maximum Time to Complete: **10.0 min.** **START TIME** ________
Time Critical? NO____ YES X **ACTUAL TIME**________

* Please check into "tool box" or package or set of keys which would be given to an operator to perform this task.

References: QCARP 500-01, Rev. 4 UNIT TWO INJECTION WITH SSMP, Att. D, (pg. 1of 18)
QCARP 0000-01, Rev.8 IMPLEMENTING PROCEDURE FOR APPENDIX R SAFE SHUTDOWN, E.18

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

Please see comments within

COMMENTS/REMEDIATION: This revision brings the JPM up to the procedure revision. The JPM actions changed from pulling fuses to turining inhibit switch. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________________
Signature:______________________________________ Date:__________

Q - where does 10 min critical task come from / what commitment to NRC?

QCNPS-JOB PERFORMANCE MEASURE

OBTAIN STA APPROVAL, THEN CHECK OUT A KEY FOR THE 902-32 PANEL, FROM THE COMMUNICATION CENTER, PRIOR TO THIS JPM!

"tool box" or set of keys normally given to operator
obtain package

EVALUATOR: **Start this JPM in the vicinity of the CR or WEC.**

INITIAL CONDITIONS

- The U-2 Cable spreading room has experienced a severe fire. The fire area is SB-I.
- The U-2 NSO has just scrammed the reactor and is performing all the IMMEDIATE OPERATOR ACTIONS of QCARP 0000-01.
- The Fire Brigade has suppressed the fire but the Shift Manager has determined that normal operating procedures are inadequate to bring the unit to a cold shutdown and that QCARP 0500-01 is the appropriate procedure to utilize for this condition.
- **This JPM is time critical**

Initiating Cue: The Unit Supervisor directs you as the U2 Admin. NSO to perform your block 1 (one) actions of QCARP 0500-01.

EVALUATOR: **Start the clock as soon as you have provided the candidate with the key and procedure.** (CR area)

START TIME:_______________

Provide examinee with: QCARP 0500-01, ATTCH D and a key for the 902-32 panel.

Additional Questions/Comments:____

____

____

____

____

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name: ______________________________
(print)

JPM: LP-003-I-F Rev: 10 Revision by: G. Thennes

Task Title: Locally start-up a Diesel Generator with a Failure of the Vent Fan to Start

No comments

Station Approval: [signature] (Exam Coordinator) Date: 2-3-00

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/A-6600-TP004 **K/A:**264000 2.1.30 **Rating:**3.9/3.4
K/A:600000 AA2.17 **Rating:**3.1/3.6

License: RO/SRO (Circle One) **Suggested Testing Environment:** Plant

Actual Testing Environment Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ___

Estimated Time to Complete: **10.0 min.**

STOP Time: __________
START Time: __________

Time Critical? NO X YES ___

ACTUAL Time: __________

References: QCOP 6600-11 Rev. 13 DIESEL GENERATOR LOCAL OPERATION
LN-6600.R04, Emergency Diesel Generator, Rev. 4, pg. 18,62

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name: ______________________________

Signature: ______________________________ Date: ______________

Simulation Facility Exam Date:	Quad Cities 03-27-00	Scenario No.:1 Exam 1		Op Test No.: 1	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will continue rod withdrawal for heat up and pressurization. ~~The BOP Operator will initiate chest warming.~~ They will respond to a ~~Refuel floor ARM~~ failure and refer to TS. A CRD hydraulic pump trip will occur requiring the RO to start the standby CRD pump. The ECCS Keep Fill pump will trip. The crew will respond IAW the QCOA. They will respond to a IRM failure, reset the half scram and refer to TS. A steam leak will develop in the DW causing DW/P to rise to above 2.5 psig. ECCS injection will occur soon afterwards. All rods will not insert due to a hydraulic ATWS. The DG cooling water pump fails to start when the DG starts. ECCS injection will be terminated. The DG will be tripped due to loss of cooling and rods will be inserted per QCOP 0300-28. Boron injection will not be required.
Initial Conditions:	IC-94 412 psig Sequence Step 9.
Turnover:	Plant startup in progress. QCGP 1-1 is to be continued at step F.6. Control rod withdrawal is to continue to raise reactor pressure to 950 psig. Startup of the first feed pump has been completed and turbine chest warming is to be initiated per QCOP 5600-04. (No relief valve, RCIC or HPCI testing required.) Drywell inerting is in progress IAW QCOP 1600-20 at step F.12.g (1).

Event No.	Malf. No.	Event Type*		Event Description
1	None	R	RO SRO	Continue rod withdrawal to maintain reactor pressurization.
2	None	~~N~~	BOP SRO	~~Initiate turbine chest warming.~~
3	RM02M	I N	BOP SRO	~~Fuel Pool Channel 'A' Rad Monitor fails downscale~~ upscale. ~~Reactor Bx bldg ventilation~~ ADS timer logic failure
4	RD07A	C	RO SRO	CRD Hydraulic Pump 'A' Trip
5	Console Override RMCS04R	C	BOP SRO	~~ECCS Keep Fill Jockey Pump trip~~ Inadvertent RCIC start
6	NM05C Severity 100%	I	RO SRO	IRM 13 High High, half scram
7	MS04C Severity 3%, Ramp 15:00	M	All SRO	Steam leak in the DW (Ramp slow enough that AOP is entered.)
8	DGCWP #1 Trip	C	BOP SRO	DG Cooling Water Pump fails to automatically start.
9	RD13A, Severity 100% RD13B, Severity 100%	M	All SRO	Reactor fail to scram, Hydraulic ATWS

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

See comments within

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

   a. Unit 1 is starting up following a short maintenance outage and is currently at 0 MWe; Rod Step 9 is partially withdrawn; QCGP 1-1 is in progress at Step F.6. Shell warming and containment inerting is in progress.

   b. Unit 2 is at approximately 100% power.

   c. Normal electric plant lineup.

   d. Tech Spec limitations:

      (1) Unit 1: NONE

      (2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

   a. Continue with unit startup IAW QCGP 1-1, @ Step F.6. The HLA brief is complete for the start-up. Establish a heat up rate of less than 100 degrees/hour. Maintain pressure set 50 psig greater than reactor pressure IAW QCGP 1-1 F. 6.w.(3)
   A QNE is standing by in the control room. (The surrogate STA or the Simulator Operator may fill the role of the QNE)

   ~~b. Transfer from shell to chest warming per QCOP 5600-04. (No relief valve, HPCI or RCIC testing is required.)~~ and
   are complete

   c. Inerting in progress IAW QCOP 1600-20 at step F.12.g.(1)

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

Op-Test No.: 1 Scenario No.: 1 Event No.: 1

Event Description: Pulls rods to establish a heat-up rate of <100°/hour and maintains reactor vessel pressurization during chest warming.- QCGP 1-1, Step F.6.a.a

Time	Position	Applicant's Actions or Behavior
	SRO	• Briefs crew on upcoming evolutions. • Reviews REMA
	RO	• Pulls control rods to establish a heat-up rate of less than 100 degrees/hour IAW QCGP 4-1. • Monitors reactor during shell/chest warming for proper operation. • Maintain pressure regulator setpoint 50 psig > Reactor pressure using the "A" pressure regulator
	BOP	• Secures shell warming by pressing the decrease pushbutton on CHEST/SHELL WARMING SELECTOR to stop steam flow. IAW 5600-04 F.2 • When MAIN STOP VALVE POSITION DEMAND FOR CHEST/SHELL WARMING meter indicates 0% • Press the OFF pushbutton on CHEST/SHELL WARMING SELECTOR and verifies OFF pushbutton is lit • Verifies that Main Stop Valve #2 Closed, all CONTROL VALVE POSITION indicates zero, and ISV's OPEN after a period of time • Logs time shell warming secured and point #2 & #6 values from TR 1-5640-61 - Responds to Annunciator 901-8 B1 (expected)
	SRO	• Verfies operator actions and concurs or directs subsequent actions.

Comments:

Op-Test No.: 1	Scenario No.: 1	Event No.: 3

Event Description: Fuel Pool Channel "A" Rad Monitor fails downscale

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Annunciator 901-3 C-16 alarms • Refers to annunciator procedure. • Monitors REFUEL FLOOR RAD MONITOR CHANNNEL "A" unit for downscale indications. • Verifies that power is available to the radiation monitor by dispatching an NLO to check RPS bus 1A breaker#5 on, fuse in 901-40 terminal board BB fuse 1701-703F. • Determines that radiation monitor is inoperative and performs QCOS 1700-01
	SRO	• Determines that the channel must be returned to operable status within two hours or take the action required. Establish secondary containment integrity, isolate reactor building and control room ventilation systems, and have SBGTS operating within one hour. • Verifies immediate operator actions and concurs with or directs subsequent actions • Contacts maintenance to effect repairs. • Verifies operator actions and concurs or directs subsequent actions.

Comments:

modify / ADS timer logic failure

Op-Test No.: 1 Scenario No.: 1 Event No.: 6

Event Description: IRM 13 High High, Half Scram

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Verifies that Automatic Actions occur, half scram on "A" channel. • Monitors IRM indicating lights on 901(2)-5 panel and determines if alarm was caused by IRM high-high or IRM INOP. • Verifies IRMs at proper range per QCOP 0700-02. • Notifies Instrument Maintenance. • Positions appropriate IRM joy stick to • bypass IRM channel. • Verifies white BYPASS light is on for IRM 13 • Resets ½ scram IAW QCOP 0500-03.
	SRO	• Checks Technical Specifications and determines that minimum number of operable channels of IRMs met. • Directs RO to bypass the failed IRM and to reset the ½ scram. • Verifies operator actions and concurs or directs subsequent actions.

Comments: ____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #7, insert a steam leak in the "C" main steam line using malfunction MS04C. Note: Chief Examiner may change rate or size of steam leak to speed scenario up.	**Imf MS04C 3 15:00**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 8 & 9

Event Description: Reactor Fail to Scram, Hydraulic ATWS, & U-1 EDGCWP fails to autostart.

Time	Position	Applicant's Actions or Behavior
	RO	• Scrams reactor, places Mode Switch in SHUTDOWN, activates ARI, rods do not insert, reports failure to scram to US, runs recirculation pumps to minimum
Critical Task	SRO	• Directs actions of QGA 100 and QGA 101. • Orders ADS inhibited, Core Spray injection prevented • Orders isolations and automatic actions verified for +8" and 2.5 psig. • Orders performance of QCOP 0250-02. (Unit 2 Admin) • Orders reactor level maintained between 166" and +48" with condensate/feedwater. • Orders control rods inserted IAW QCOP 0300-28 or with QCGP 2-3 when power leg is exited. • Exits power leg when reactor power below IRM range 7
Critical Task Critical Task	RO/BOP	• Inhibits HPCI injection • Inhibits ADS. • Places core spray pumps in PTL. • Verifies isolations and automatic actions for +8" and 2.5 psig, reports that unit 1 EDGCWP did not autostart and dispatches an operator. • Reports recirc pumps tripped. • Performs QCOP 0300-28 actions, or QCGP 2-3 to insert control rods. • Directs NLO to close CRD 25 valve if necessary. • Ranges IRMs and informs US power below IRM range 7.

Comments: ____________________

Simulation Facility Exam Date:	Quad Cities 3/27/00	Scenario No 2 Exam 1		Op Test No 1	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will respond to a controller failure during performance of the SBGTS monthly surveillance. A APRM fails hi resulting in a half-scram. The crew bypasses the APRM and resets the half-scram. High vibration will be indicated on the "A" RR pump. Reactor power will be reduced with flow. The vibrations will cause gross seal degradation and eventually a RR suction line break. Actions taken to isolate the seal will be unsuccessful and DW/P will rise to above 2.5 psig. All LP and HP ECCS systems will receive an initiation signal. HPCI will not inject due to a controller failure until the crew takes manual control of the HPCI controller. QGA 100 and 200 will be entered. The first loop of torus spray selected will not operate, the second loop will operate. One set of SDV drain valves will not autoclose when the scram occurs. The RO will close the valves from the 901-5 panel.
Initial Conditions:	IC 21, 100 % power. "C" Reactor Feed Pump is tagged OOS.
Turnover:	Plant is presently at 100% power. "C" Reactor Feed Pump is tagged OOS for a bearing inspection. Monthly operability test (QCOS 7500-05) for "B" SGT train is to be performed following shift turnover.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Perform monthly SBGTS operability surveillance.
2	NM08A.100	I	RO SRO	APRM Channel "A" fails high/high
3	PC11B 40	I	BOP SRO	SBGTS flow controller fails to allow required system flow.
4	ANO9014C3 Alarm_on	R	RO SRO	Reduces core flow in response to high recirculation pump vibrations.
5	RR06A 100 5: RR07A 100 6:	C	BOP SRO	Recirculation pump seal failure
6	RR10B 5 10:00	M	BOP RO SRO	Recirculation pump suction line break. Increase failure to 5% over a 10 minute ramp time.
7	RD23A	C	RO SRO	Scram discharge volume drain valve sticks open. Removed by event trigger when close pushbutton is depressed.
8	Batch file for MO 1001-37A&B	C	BOP SRO	The selected torus spray valve fails to open(breaker trips), however the other loop valve will operate.
9	HP09 40	I	BOP SRO	HPCI controller failure prevents injection into the RPV in automatic. Manual operation possible. Inserted on a trigger on HPCI speed >0.5rpm.

*(N)ormal, (R)eactivity (I)nstrument, (C)omponent, (M)ajor Transient

See comments within

I. SIMULATOR SETUP

A. Initialize the simulator to IC 21.

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (4)

"C" Reactor Feed Pump
both supply breakers bus 11 & 12 (PTL)
auxiliary oil pump (PTL)
minimum flow valve (CLOSED)

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	820
c.	Reactor Power	100%

3. Miscellaneous Setup

a. Verify no LPRMs are bypassed in 901-37 panel.

b. Provide a copy of QCOS 7500-05 marked up appropriately for the B train of SBGT.

c. Have Caution Cards and Action Request Tags available.

C. Verify the initial conditions are met and bring the crew into the Simulator.

* Prereqs to QCOS-7500-05 are complete

Op-Test No.: 1 Scenario No.: 2 Event No.: 1 & 3

Event Description: Perform SBGTS Monthly Operability Surveillance IAW QCOS 7500-05

Time	Position	Applicant's Actions or Behavior
	SRO	Approves QCOS 7500-05 for "B" Train Operability Testing of SBGTS
	BOP	• ~~Notifies Radiation Protection of upcoming SBGTS start.~~ new initial condition • Records run time for "B"SBGTS train from NLO at local panel • Verify 1-7503 U1 RB INLET DMPR TO SBGTS **AND/OR** 2-7503 U2 RB INLET DMPR TO SBGTS are open • Place the 1/2B SBGTS TRAIN MODE SELECTOR SWITCH to B START • Verify the ½-7504B TURB BLDG CLG AIR DMPR closed • Verify the ½-7505B INLET DMPR open • Verify the ½-7506B 1/2B SBGTS FAN on • Verify the ½-7503B SBGTS AIR HTR on. • Verify the ½-7507B, 1/2 SBGTS FAN DISCH DMPR open. • Verify ½-7540-13B SBGTS flow on 1/2B SBGTS FLOW is 3600 to 4400 scfm and record • Recognizes inability to achieve proper flowrate and notifies US.
	SRO	• Refers to Technical Specifications and determines per 3.7.P. action 1 that the plant is in a 7 day LCO and must stop fuel moves, core alterations, and operations that could have the potential to drain the reactor vessel on U-2. • Directs shutdown of the system per the procedure or dispatches maintenance personnel to investigate the problem. • Verifies operator action and concurs with or directs subsequent actions.
	BOP	• Shuts down the system per the procedure or dispatches maintenance personnel to investigate the problem.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
ROLE PLAY: As NLO at the SBGTS train, when asked for "B" train run time meter reading, immediately report that the meter reads 2468.2 hours. If asked, as NLO, for a local flow indication, report flow @ 3400 scfm. If asked, as NLO, for final run time, report in hours and tenths of hours. One tenth for every six minutes they leave the train run.		

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
***When directed by the Chief Examiner to insert event #6, fail the "A" recirc pump suction line @ 5% severity over a 10:00 minute ramp time using malfunction rr10a.	**imf rr10a ~~5~~ 3 ~~10:00~~ 20:00**	
Trigger 3 should trip the 1A reactor feed pump trips @ 2.5 psig in the drywell. If it doesn't trip, manually trip it using malfuntion fw01A Trip both 1A+1B Rx feedwater pump - low suction pressure	**Imf fw01A**	

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 4		Op Test No 2	

Examiners:			Operators:		~~SRO~~
					~~RO~~
					BOP

See comments within

Objectives:	~~The second feed pump will be started without incident.~~ Rod withdrawal will continue to raise power. During rod withdrawal, the CRD FCV will fail closed and manual control will be taken or the standby FCV will be placed in service. The crew will then respond to a Rx. Bldg. Radiation Monitor failure. A trip of a Service Water Pump occurs and the BOP operator starts the standby Service Water Pump. While the BOP Operator is responding to the failed Service Water Pump, the 'A' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump. Following response and TS declaration for the failed radiation monitor, a small leak in the steam tunnel will cause a MSIV isolation and reactor scram. A full hydraulic ATWS will exist. SBLC will be initiated. Reactor level will be lowered intentionally and rods will be inserted IAW QOP 0300-28.
Initial Conditions:	IC 93 @ 42% power. QCGP 1-1 @ step F.9.r. Ready to startup second RFP. Rod step 29 @ target out ready to pull rods to raise power per QCGP 3-1 @ step F.3.
Turnover:	Plant startup in progress. ~~Start the second RFP with QCGP 1-1 at step F.9.r.~~ Control rod withdrawal is to continue to raise reactor power per QCGP 3-1 at step F.3 to the 75% 68 FCL. ~~All prerequisites for pump start are satisfied and operators is standing by. Zinc injection has been valved in and is in operation.~~

Event No.	Malf. No.	Event Type*		Event Description
~~1~~	~~None~~	~~N~~	~~BOP~~ ~~SRO~~	~~Start the second RFP.~~
2	None	R	RO SRO	Rod withdrawal to raise power to 75% 68 FCL.
3	RD11 Severity 0%	I	RO SRO	In-service CRD FCV fails closed. (NOTE insert during rod pulls).
4	RM02K Severity 100%	I	BOP SRO	Reactor Bldg. Vent Radiation Monitor Ch. 'A' fails high.
5	SW01A	C	BOP SRO	Service Water Pump 'A' trip.
6	FW17B	C	RO SRO	Condensate/Condensate Booster Pump 'A' Trip.
7	Console override DIHS13302 2D_OFF	C	RO SRO	Failure of Selected Condensate/Condensate Booster Pump to start.
8	MS09B 5% Severity, 5:00 Ramp	M	ALL	MSIV isolation due to MST high temperature.
9	RD13A and B 100% severity	M	ALL	Hydraulic ATWS
10	Console override open	C	BOP SRO	Failure of 1-220-44 and 45 to close on Group I isolation

* Hardware Problem – U1 DW Cooler MCC switches are loose

I. SIMULATOR SETUP

A. Initialize the simulator to IC93

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment Out Of Service

NONE

2. Power Level

a.	Recirc Pump Speed	~44% with flows balanced
b.	MegaWatts Electric	325 MWE
c.	Reactor Power	42%

3. Miscellaneous Setup

a. Prepare REMA for load increase to 75% FCL with rods

b. Prepare an Attachment "B" from QCGP 3-1.

c. Have copy of QCGP 1-1 signed off up to step F.~~9.~~ 9

d. Have a copy of QCOP 3200-03 signed off up to step F.2.b.

e. Have a copy of QCOS 7500-05 ready for use by the crew.

Not needed due to feed pump running as part of new initial conditions

C. Verify the initial conditions are met and bring the crew into the Simulator.

Add event 1 as initial setup

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is raising power following a start up after a short maintenance outage and is currently at ~ 325 MWe; Rod Step 29 @ target out; QCGP 1-1 is in progress at Step F.9.~~r.~~ g

b. QCGP 3-1 is at step F.3.

c. Unit 2 is at approximately 100% power.

d. Normal electric plant lineup.

e. Tech Spec limitations:

(1) Unit 1: NONE

(2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

a. Continue with unit startup IAW QCGP 1-1, @ Step F.9.~~e~~ g

b. Following turnover, start the second reactor feed pump. The 1B feedpump and 1C condensate pump are to be started.

c. Pull rods to 75% rod line. A QNE is present in the control room.

d. Operators are present in the plant at the condensate and feed pumps and fill and venting is complete per QCOP 3200-01 and all have been briefed on the feed and condensate pumps startup.

e. No maintenance has been performed on either the condensate, condensate booster pumps or reactor feedpumps and zinc injection has been valved in with the startup of the first feedpump.

f. The RFP manual recirculation valve at the main condenser has been verified open.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

Op-Test No.: Scenario No.: 4 Event No.: 1

Event Description: Start up of the second reactor feed pump.

Time	Position	Applicant's Actions or Behavior
	BOP	• Refers to QCOP 3200-03 • Verifies that the pump discharge valve is open. • Checks with in-plant NLO that step F.2. of the procedure has been completed. • Deselects the standby condensate pump by placing the selector switch to OFF. • Starts the third condensate pump. • Selects the non-running condensate pump as standby with the selector switch. • Checks pumps suction and discharge pressures. • Deselects the standby feed pump by placing the selector switch to OFF. • Verifies the recirculation valve is in AUTO. • Verifies auxiliary oil pump operating on pump to be started. • Checks with in-plant NLO that step F.8. of the procedure has been completed. • Starts the second feed pump • Checks auxiliary oil pump auto-trips and pump amperages. • Selects the non-running feed pump as standby with the selector switch. • Verifies the auxiliary oil pump operating for the selected standby pump. • Checks with in-plant NLO that step F.13 & 14 of the procedure has been completed. •
	SRO	• Verifies operator actions and concurs with or directs subsequent actions

Comments:

Set up as initial conditions

Op-Test No.: Scenario No.: 4 Event No.: 4		
Event Description: Reactor building vent radiation monitor channel "A" fails upscale.		
Time	**Position**	**Applicant's Actions or Behavior**
	RO/BOP	• Refers to QCAN 901(2)-3 A-3 & QCAN 901(2)-3 G-3 • Determines reading on indicator on 912-10 panel on back panel for "A" channel is upscale, "B" channel reading is normal • Notifies Chemistry and Radiation Protection departments. • Notifies IM department to investigate failure and effect repairs. • Refers to QCOS 1700-05. • Verifies automatic actions occur, refers to QOA 5750-07, QCOA 7500-01.
	SRO	• Refers to Technical Specifications 3.2.A. • Determines that channel must be returned to operable within 2 hours or secondary containment integrity established, SBGTS started, reactor building and control room ventilation isolated within the following hour. • Refers to QCOS 1700-05. • Verifies operator actions and concurs with or directs subsequent actions

Comments:

• All 8 Rx Bldg isolation dampers close
• All Rx Bldg supply + exhaust fans trip
• A SBGT Autostarts

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 6		Op Test No 2	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	Torus cooling will be secured following shift turnover. The crew will then raise reactor power following MSIV testing. They will respond to a FWLC valve lock up. ~~A recirc loop flow transmitter fails high requiring insertion of a half-scram.~~ A small steam leak in the DW will cause DW/T and DW/P to rise. The leak will require a reactor scram. When DW/P reaches 2.5 psig bus 14-1 will trip when RHR pump C starts. RHR Loop B spray logic fails such that RHR Loop B containment spray valves cannot be opened. DW spray valve 23A fails to ~~breaker trips when the valve is stroked~~ open and blowdown will be performed when DW/T cannot be maintained below 280°F. RPV saturation conditions will be reached following the blowdown and RPV Flooding will be performed.
Initial Conditions:	IC 20, with minor modification. Raise reactor power to ≈ 75% with flow. Place torus cooling in service. "B" Core Spray pump tagged OOS
Turnover:	Reactor power is presently at 75% to support weekly MSIV timing testing which has been completed satisfactorily. A special test of RCIC has also just been completed satisfactorily. RCIC is operable and in standby. Torus cooling, which was in service for the special RCIC test, is to be secured following turnover. Power is to be raised back to 100% once torus cooling is secured. In addition, "B" Core Spray Pump is OOS for motor winding inspection

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Secure Torus Cooling.
2	None	R	RO SRO	Raise reactor power with RRC flow.
3	FW08A	C	RO SRO	Feedwater Level Control Valves Lock Up
4	~~RR14A~~ ~~Severity 100%~~	~~I~~	~~RO~~ SRO	~~Recirc Loop Flow Transmitter Failure High~~ replace with event #4 from Scenario #3
5	MS04 Severity 1%, Ramp 10:00	M	ALL	Small steam leak in DW (Slow rise in DW/T and DW/P)
6	ED03E	C	BOP SRO	Bus 14-1 OC trip when RHR Pump C auto starts.
7	DIHS11001S17B	I	BOP SRO	Spray Logic Failure on RHR Loop 'B'
8	Drywell Spray valve 23A breaker trip	C	BOP SRO	RHR Spray valve 23A breaker trips when attempt is made to open valve.
9	Bat flashing	M	ALL	RPV water level indicators saturate.

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

see comments within

1. Torus cooling will be shut down as directed in the shift turnover.

2. Reactor power will be raised from 75% following MSIV testing.

3. A momentary lockup occurs on both Feedwater Level Control Valves. At this point the simulator operator will clear the malfunction The operators respond IAW QCAN 901-5, G-7, H-9, and QCOA 0600-01 and reset one or both FRVs. When the crew sends someone to investigate, lockup was due to a position error which has cleared and has been reset. Im's investigated and tightened a loose connection.

4. Recirc Loop Flow Transmitter FT-1-261-6A fails high resulting in an APRM Flow Reference Off Normal alarm. The operators respond IAW QCAN 901-5, D-6. The crew will send an operator to check the Flow Converter Power Supply. When this is done, cue the SRO that the flow bias signal is upscale. A half-scram is inserted by the RO and the SRO will refer to and comply with Technical Specifications.

5. A steam leak develops in the DW causing a slow but continuous rise in DW/P. A scram and ECCS initiation will be initiated at 2.5 psig. QGA 100 and 200 will be entered.

6. Bus 14-1 will trip when the 'C' RHR pump start rendering RHR pumps 'C' and 'D' inoperable.

7. RHR Loop 'B' Spray Logic fails preventing operation of RHR Loop 'B' containment spray and cooling valves.

8. DW spray valve 23A breaker fails to open when the valve switch is placed in OPEN and DW temperature continues to rise. When DW temperature cannot be maintained below 280°F reactor blowdown will be initiated. Following blowdown, RPV saturation conditions will be reached and RPV flooding will commence as directed in QGA 500-4. When RPV flooding is started, the scenario is terminated.

9. The scenario will be terminated when the crew has commenced RPV Flooding.

Based on the outline, the critical tasks are:

- Initiate an RPV Blowdown when unable to restore drywell temperature <280, PSP limits are reached, and/or as part of RPV Flooding.
- Initiate actions to restore adequate core cooling following the loss of all RPV water level indication IAW QGA 500-4, RPV Flooding.

References:

QCGP 3-1	Rev.19	QCOP 1000-02	Rev 12
QCAN 901(2)-5 G-7	Rev 3	QCOA 0201-01	Rev 11
QCAN 901(2)-5 H-8	Rev 3	QOA 6500-06	Rev 11
QCAN 901-5 D-6	Rev 0	QCOA 0600-01	Rev 4
QCOP 1000-09	Rev 12	QGA 100	Rev 4
QCOP 0500-04	Rev 6	QGA 200	Rev 6
QGA 500-1	Rev 8	QGA 500-4	Rev 10
QCAP 0230-19	Rev 8	QCGP 2-3	Rev 32

SIMULATOR SETUP

A. Initialize the simulator to IC 20.

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (1)

"B" Core Spray Pump PTL

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	625
c.	Reactor Power	75%

3. Miscellaneous Setup

w/1 RHR Pp.

a. Torus cooling in operation on "A" loop IAW QCOP 1000-09 and QCOP 1000-04. Procedure QCOP 1000-09 out and signed off to step F.2. Procedure QCOP 1000-04 out and signed off to step F.1.c.

b. Prepare a REMA and Attachment "B".

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC20.	**rst 20** **run**	
Assign trigger #1 to go true when drywell pressure > 2.5 psig and assign malfunction ED03E to trigger 1 to trip bus 14-1 when ECCS pumps start at 2.5 psig in the drywell.	**Select event trigger button.** **Select trigger #1** **Select drywell pressure greater than 2.5 psig from the pulldown menu.** **Enter command imf ed03e** **Select accept new event.**	
Fail the "B" loop of RHR spray logic by overriding the containment spray permissive S-17 switch to "OFF"	**Ior dihs11001s17b OFF**	Bold
Override switch for 1-1001-23A closed using override ihs1100123a.	Ior DIHS1100123A CLOSE	
Assign trigger #2 to trip the breaker for the 1-1001-23A valve when the control switch is taken to open.	**Select event trigger button.** **Select trigger #2** **Enter event: ZDIHS1100123A(2)** **Enter command:** **irf RH19AR OPEN** **Select accept new event.**	Delete due to switch being overriden closed simulator won't see switch open.
w/ 1 RHR pp. Ensure torus cooling is in operation on the "A" loop and RHRSW on both loops. On the White Board on the 901-55 panel write 3.5.A.1 Action 1 7 day LCO for "B" Core Spray OOS. **SETUP IS COMPLETE**		

Op-Test No.: Scenario No.: 6 Event No.: 1

Event Description: Secure torus cooling.

Time	Position	Applicant's Actions or Behavior
	BOP	Refers to QCOP 1000-09. Throttles closed MO 1-1001-36A (25 second hold) When RHR pump discharge pressure increases to within 25 ~~psig~~ of RHRSW pressure, stops running RHR pump and fully closes MO 1-1001-36A. Closes MO 1-1001-34A. Opens MO 1-1001-16A. A+B A+B Shuts down the RHRSW systems by stopping the ~~operating~~ RHRSW pumps and closing MO 1-1001-5A/5B Verifies "A" RHR loop in standby lineup IAW QCOP 1000-02 step F.3.
	SRO	• US verifies operator actions and concurs with or directs subsequent actions.

Comments:

Op-Test No.: Scenario No.: 6 Event No.: 4		
Event Description: Recirculation loop "A" flow transmitter failure.		

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Refers to annunciator 901-5 D-6. • Verifies Rod Block and stops power ascent • Contacts QNE and/or maintenance for assistance • Monitors lights on 901-37 panel to determine if failure is upscale, inop, or comparator. • Reports that flow converter output appears to have failed high(non-conservative) • Informs US that annunciator procedure requires a ½ scram on "A" channel. • Inserts ½ scram on "A" RPS channel IAW QCOP 0500-04, and verifies reactor power, and recirculation loop and total core flow are within operating limits and adjusts if necessary. • Informs the US to refer to QCAP 0230-19.
	SRO	• Refers to Technical Specifications 3.1 A-1, determines that 1 channel of flow biased neutron flux-high instrumentation is inoperable and must be tripped within 1 hour. • Refers to Technical Specifications 3.2 E-1, determines that 1 channel of control rod block actuation is less conservative and declares RBM #7 inop. • Refers to Technical Specifications 3.3 M., verifies that reactor is not in a limiting control rod pattern and determines 24 hours to repair or trip the channel in the next hour if not repaired. Satisfied when ½ scram inserted on "A" RPS channel. • Refers to QCAP 0230-19 equipment operability. • US verifies operator actions and concurs with or directs subsequent actions.

Comments: Replace with event #4 & Scenario #3

FINAL AS-ADMINISTERED EXAMINATION

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

FINAL AS-ADMINISTERED OPERATING TEST

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

FINAL AS-ADMINISTERED ADMINISTRATIVE JPMS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

ComEd
A Unicom Company

Nuclear Generation Group

Job Performance Measure

Reactor Mode Change

JPM Number: _ADM-A.1.1-RO/SRO_

Revision Number: _3_

Date: 03/09/00

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC 15, just prior to transferring the Mode Switch to RUN.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Need to fail 901-5 A-11, RPS Channel A/B Condenser Low Vacuum 21 IN HG, annunciator light ON.

   imf ano9015a11 ON

   Acknowledge annunciators after failing light ON

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Provide to Candidate:

Copy of QCGP 1-1 completed up to Step F.6.nn.(2).

Job Performance Measure (JPM)

INITIAL CONDITIONS

The Unit is being started up following a planned maintenance outage. All systems have performed as expected.

INITIATING CUE

The Unit Supervisor directs you to review plant conditions to ensure they support transferring the Reactor Mode Switch to RUN and complete QCGP 1-1, Step F.6.nn.(2) through (7). The Nuclear Engineer has satisfactorily completed QCTS 0910-07.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1.	Obtain QCGP 1-1, Step F.6.nn.	Obtains copy of procedure.	___	___	___
CUE	**Provide copy of QCGP once requested.**		___	___	___
(2)	Verify APRMs are indicating correctly on both panels.	Determines all APRMs indicating correctly.	___	___	___
(3)	Verify all APRM downscale lights are clear.	Determines downscale lights clear.	___	___	___
(4)	Verify Main Condenser backpressure is < 7 in Hg.	Determines main condenser backpressure is < 7 in Hg.	___	___	___
Note	**The next step is faulted. See the examiner cues on the next page.**				
*(5)	Verifies low vacuum alarm clear.	Determines low vacuum alarm is lit and not clear.	___	___	___
*2	Candidate should inform the US that step is not met. Critical that this occurs prior to mode switch change.	Informs US that mode switch cannot be changed as the condenser low vacuum alarm is not cleared.	___	___	___

Job Performance Measure (JPM)

ELEMENT			SAT	UNSAT	Comment Number
CUE	**Unit Supervisor will initiate actions for repair of the condenser annunciator. This JPM is complete.** **Note: remaining steps are incorporated if the candidate does not identify the condenser vacuum light issue or continues and verifies through (6).**				
(6)	Place one IRM/APRM recorder on each RPS channel to APRM.	Places one recorder on each channel to APRM	___	___	___
(7)	Transfer RX Mode Select switch to Run position and record time.	Transfer Rx mode switch to RUN. THIS SHOULD NOT OCCUR.	___	___	___

CUE (IF NECESSARY) **This JPM is complete.**

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Verification of Plant Parameters for Reactor Mode Change

JPM Number: ADM-A.1.1-RO Revision Number: 03

Task Number:

L.O. S/R-0002-TP001b

K/A Number and Importance:

K/A 2.1.23 Importance Rating 3.9

Suggested Testing Environment: Simulator

Actual Testing Environment: ■ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ■ Yes ❑ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

References: QCGP 1-1, Normal Unit Startup, Revision 33, Step F.6.nn

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ______________________________

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

The Unit is being started up following a planned maintenance outage. All systems have performed as expected.

INITIATING CUE

The Unit Supervisor directs you to review plant conditions to ensure they support transferring the Reactor Mode Switch to RUN and complete QCGP 1-1, Step F.6.nn.(2) through (7). The Nuclear Engineer has satisfactorily completed QCTS 0910-07.

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Nuclear Generation Group

Job Performance Measure

Update and Interpret Core Thermal Limits

JPM Number: ADM-1.1.2-RO/SRO

Revision Number: 1

Date: 03/03/00

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC-21.

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide to candidate: When cued give the copy of OD20 with MFLPD above requirements.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

Using the plant computer, update the screen or print out the current Core Performance Calculations and review the results for acceptability.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1	May obtain procedure to be used.	May obtain QOP-9900-20	___	___	___
*F.1	Initiates program	Type "20" and press return	___	___	___
CUE	**When printout or screen update is complete, provide the operator with pre-printed Core Performance Readout.**				
*2	Reviews the Core Performance data.	May review against criteria in QCOS 0005-S01 or 0005-03. Identifies MFLPD is > 1.000. (1.003)	___	___	___
3	Communicate Review Results	Inform US that MFLPD is above limits and that the QNE should be notified.	___	___	___
CUE	**The Unit Supervisor acknowledges MFLPD is 1.003 which is above the limits and will contact the QNE.**				

CUE - The JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Update and Interpret Core Thermal Limits

JPM Number: ADM-1.1.2-RO Revision Number: 01

Task Number:

Learning Objectives S/R-9900-TP001

K/A Number and Importance:

K/A 2.1.25 **IMP** 2.8/3.1

Suggested Testing Environment: Simulator or control room

Actual Testing Environment: ☐ Simulator ☐ Plant ☐ Control Room

Testing Method: ☐ Simulate ■ Perform

Faulted: ■ Yes ☐ No

Alternate Path: ☐ Yes ■ No

Time Critical: ☐ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** ____ minutes

References: QOP 9900-20, Core Performance Calculation, Revision 5
QOS 0005-01, Operations Department Weekly Summary of Daily Surveillance, Revision 70, Step 19
QOS 0005-03, Unit Operator's Daily Surveillance of Nuclear Units, Revision 17

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments:______________________________

____

____

____

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: ________

Job Performance Measure (JPM)

QUAD-1 WK-0750 27MAR00-12.32.44 4180 MWD/MTU TRIGR=USER REV=DEC94

CORE PERFORMANCE LOG --- SHORT EDIT

TBLNAM : DUAL LOOP OPERATION - OLMCPR=1.36

CTP CALCULATION : HEAT BALANCE SYMMETRY : FULL

STATE CONDITIONS		FLOW RATES / CORE PARAMETERS		NUCLEAR LIMITS		LOCATION
GMWE	814.5	WT	95.8 MLB/HR (97.7%)	CMPF	0.000	00-00-00
GMWT	2475.9 (98.0%)	WTSUB	91.5 MLB/HR	MFLCPR	0.873	43-18
EFF	32.9 %	WTFLAG	2	MAPRAT	0.874	43-19-19
PR	1003.8 PSIA	WFW	9.70 MLB/HR	FDLRX	0.781	43-19-19
DHS	24.5 BTU/LB	WD	31.93 MLB/HR	FDLRC	0.779	43-19-19
				MFLPD	1.003	43-19-19
ER	1.10	AVG VOID FRACTION	0.33			
ERATIO	.99	AVG POW DENSITY	42.2 KW/L	FCL	99.5%	
TARGET	1.11					
KEFF	1.0024	PRESS DROP (MEAS)	18.0 PSIA	XE NON-EQ	.0%	
		PRESS DROP (CALC)	0.1 PSIA			

CYCLE EXPOSURE 4180.0 MWD/MTU CAVEX 19298. MWD/MTU

LOCATION	1	2	3	4	5	6	7	8
RING REL POWER	1.20	1.21	1.14	1.02	0.97	0.91	0.81	0.41

************** CONTROL ROD DATA **************

	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	
59						--	--	--	--	--	*					59
55				--	--	--	--	06	--	--	--	--				55
51			--	--	--	--	--	--	--	--	--	--	--			51
47		--	--	--	--	00	--	--	--	00	--	--	--	--		47
43		--	--	--	--D	--	--	--	--	--	--	--	--	--		43
39	--	--	--	00	--	--	--	00	--	--	--	00	--	--	--	39
35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35
31	--	06	--	--	--	00	--	--	--	00	--	--	--	06	--	31
27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27
23	--	--	--	00	--	--	--	00	--	--	--	00	--	--	--	23
19		--	--	--	--	--	--	--	--	--	--	--	--	--		19
15		--	--	--	--	00	--	--	--	00	--	--	--	--		15
11			--	--	--	--	--	--	--	--	--	--	--			11
07				--	--	--	--	06	--	--	--	--				07
03						--	--	--	--	--						03
	02	06	10	14	18	22	26	30	34	38	42	46	50	54	58	

DISPLAY KEY
R = MFLCPR
M = MAPRAT
X = FDLRX
C = FDLRC
P = PRECOND
D = MFLPD
* = MULTPL.

CONTROL RODS SYMMETRIC, C.R. SEQUENCE:A-2, C.R. DENSITY: 0.088

SUBST. RODS:

APRM	1	2	3	4	5	6
READING	99.8%	100.8%	100.6%	100.0%	99.6%	99.4%
AGAF	0.993	1.002	1.001	0.995	0.991	0.989
AGAF	0.993	1.002	1.001	0.995	0.991	0.989

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is steady state at approximately 815 MWE.

INITIATING CUE

Using the plant computer, update the screen or print out the current Core Performance Calculations and review the results for acceptability.

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Job Performance Measure

JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: ADM-A.2-RO/SRO

Revision Number: 0

Date: 02/01/00

Approved By: Mike Swegle
Operations Representative

2-3-00
Date

Approved By: [signature]
Training Department

2-3-00
Date

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide candidate with:

QCOS 0202-07 with prerequisite steps completed.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

RR pump speed indication operating normally.

xxx = failed sensor

INITIATING CUE

QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation has been completed. The US directs you to complete QCOS 0202-07, Jet Pump Flow Distribution Comparison to support jet pump operability determination.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
1.	Obtains QCOS 0202-07.	Obtains QCOS 0202-07.	___	___	___
CUE	**Provide the candidate with copies of QCOS 0202-07.**				
*2.	Completes QCOS 0202-07, including Attachment A.	Determines Jet pump 4 failed to meet acceptance criteria.	___	___	___
*3	Completes QCOS 0202-07, Attachment A additional lines.	Determines Jet pumps 5 and 6 fail to meet the tightened tolerances	___	___	___
4.	Informs the US of the possible failure of #4 jet pump and the failure of Jet pumps 5 and 6 to meet the tightened tolerances.	Notifies Unit Supervisor of possible jet pump failures.	___	___	___
CUE	**Unit Supervisor understands the jet pump problems and will initiate the required paperwork.**				

CUE: The JPM is completed.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: JP/Shroud Access Hole Cover Test for Dual Loop Operation

JPM Number: ADM-A.2-RO Revision Number: 00

Task Number:

Learning Objective S/R-0202-EK032
S/R-0202-JP001

K/A Number and Importance:
K/A: 2.2.12 **Rating:**3.0/3.4

Suggested Testing Environment: Plant, Control Room, or Simulator

Actual Testing Environment: ☐ Simulator ☐ Plant ☐ Control Room

Testing Method: ☐ Simulate ■ Perform

Faulted: ■ Yes ☐ No

Alternate Path: ☐ Yes ■ No

Time Critical: ☐ Yes ■ No

Estimated Time to Complete: 15 minutes **Actual Time Used:** _____ minutes

References: QCOS 0202-06, Revision 12 , Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation,
QCOS 0202-07, Revision 9, Jet Pump Flow Distribution Comparison

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: ______________________________

____

____

____

____

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at operating at 100% power.

Recirculation pump A:

Speed - 94%.

Flow – 41 KGPM

Recirculation Loop A Flow – 48 M#/hr

Recirculation pump B

Speed - 94%.

Flow – 44.5 KGPM

Recirculation Loop B Flow – 48 M#/hr

Core Plate Differential Pressure – 17.6 psid

Total Core Flow – 95 M#/hr

Jet Pump Flows (pump #-flow mlb/hr)

1-5.0, 2-4.8, 3-4.9, 4-4.3, 5-4.3,

6-4.5, 7-xxx, 8-5.1, 9-5.1, 10-5.1,

11-4.8, 12-4.8, 13-4.8, 14-4.8, 15-4.8,

16-4.8, 17-4.5, 18-4.8, 19-4.8, 20-4.8

RR pump speed indication operating normally.

xxx = failed sensor

Initiating Cue:

QCOS 0202-06, Jet Pump/Shroud Access Hole Cover Test for Dual Loop Operation has been completed. The US directs you to complete QCOS 0202-07, Jet Pump Flow Distribution Comparison to support jet pump operability determination.

Key

ATTACHMENT A (Page 1 of 3)

JET PUMP FLOW DISTRIBUTION COMPARISON DATA SHEET

D. PREREQUISITE

1. The Unit Supervisor has completed the following Prerequisites:

   a. Unit: 1 — 1(2)

   b. Reason for test (check appropriate item):

Normal Surveillance	(X)
Post Maintenance	( )
Partial for ______________	( )
Other ______________	( )

   c. Permission to start test:

   U. Supervisor — US Signature   Today's / Now — Date / Time

H. PROCEDURE

H.1 **Record** Total Core Flow:

a. **IF** in Dual Loop Operation, **THEN** **obtain** flow from 1(2)-263-110, CORE FLOW AND DP. — 95 MLB/HR

b. **IF** in Single Loop Operation, **THEN** **determine** flow from QCOP 0202-07. — NA MLB/HR

H.2. **Record** Recirc Pump Speeds at 1(2)-262-25A/B, PMP A/B SPEED CONTROLLER. — 94 A%   94 B%

Document Retention: **Life of Plant**

KEY

ATTACHMENT A (Page 2 of 3)

JET PUMP FLOW DISTRIBUTION COMPARISON DATA SHEET

UNIT 1 CYCLE 16

Average Jet Pump flows: Loop A 4.79 Loop B 4.77

LOOP	METER	JET PUMP	JET PUMP FLOW	CHAR VALUE RANGE	ACTUAL FLOW/ AVERAGE FLOW	WITHIN RANGE
A	78A	1	5.0	0.900-1.100	1.044	✓
A	78B	2	4.8	0.871-1.064	1.002	✓
A	78C	3	4.9	0.863-1.055	1.023	✓
A	78D	4	4.3	0.902-1.103	.898	
A	78E	5	4.3	0.867-1.059	.898	✓
A	78F	6	4.5	0.902-1.103	.939	✓
A	78G	7	XXXXXX	Failed Sensor	XXXXXX	XXXXXX
A	78H	8	5.1	0.922-1.127	1.065	✓
A	78J	9	5.1	0.920-1.124	1.065	✓
A	78K	10	5.1	0.926-1.132	1.065	✓
B	78L	11	4.8	0.868-1.061	1.006	✓
B	78M	12	4.8	0.890-1.088	1.006	✓
B	78N	13	4.8	0.882-1.078	1.006	✓
B	78P	14	4.8	0.894-1.092	1.006	✓
B	78R	15	4.8	0.917-1.121	1.006	✓
B	78S	16	4.8	0.905-1.106	1.006	✓
B	78T	17	4.5	0.904-1.105	.943	✓
B	78U	18	4.8	0.919-1.124	1.006	✓
B	78V	19	4.8	0.898-1.098	1.006	✓
B	78W	20	4.8	0.923-1.128	1.006	✓

A	78E	* 5	4.3	0.915-1.011	.898	
A	78F	* 6	4.5	0.953-1.053	.939	

* **NOTE** Tightened tolerance due to cracks identified in the heat affected zone of the riser and riser brace weld for Jet Pumps 5 and 6.

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Job Performance Measure

Review a Radiation Work Permit

JPM Number: _ADM-A.3-RO_

Revision Number: _1_

Date: 03/09/00

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

1. SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide examinee with a copy of the RWP (same as the SRO RWP). Ensure dose rate on the survey map is >70 mr/hr in the work area.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is operating at 100% reactor power.

Your exposure history is:

Annual Non-QCNP TEDE Dose (from Dresden Station) – 1920 mrem

Annual QCNP TEDE Dose – 1050 mrem

Previous 24 hours DDE dose at QCNP from RWPs other than 000003 -195 mrem

INITIATING CUE

You have been directed to support FIN team maintenance on 1-1299-76A in the 1A RWCU pump room. It is expected that the task will take 30 minutes. You are to review the RWP and area maps to determine if you are able to complete the task and inform the Unit Supervisor. This is a NON EMERGENCY situation.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Calcs. to support answer in 3 and 4.

3) 1920 mrem + 1050 mrem + 45 mrem (from this entry) = 3015 mrem which is above the admin. limit for ComEd personnel at all sites. Cannot compete the job.

4) Can receive 30 mrem without exceeding the limit. 90 mrem field near the valve.

30 mrem/90 mrem= x minutes/60 minutes 20 minute stay time.

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtain RWP and area maps.	Obtain RWP and maps.	___	___	___
CUE	**Provide the RWP and maps when requested.**				
*2	Review RWP and applicable survey map.	Review RWP and applicable survey map and determine that dose at knees near valve is limiting. (90 mr/hr)	___	___	___
*3	Informs US.	Informs US that he would exceed adm exposure limits to complete the job and can not complete the task. See Calcs. on page 3.	___	___	___
CUE: (if needed)	**I need you to support the job. How long can you support the job without an extension?**				
*4	Determines max. stay time.	Determines that candidate would have 20 min stay time. See calcs on page 3.	___	___	___

CUE: The JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Review a Radiation Work Permit

JPM Number: ADM-A.3-RO Revision Number: 01

Task Number:

Learning Objective : R-RPS-001
RWTLL G4

K/A Number and Importance:
K/A 2.3.10 IMP 2.9/3.3

Suggested Testing Environment: Control Room , Simulator, Plant , or Classroom

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform **Faulted:** ■ Yes ❑ No
Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** _____ minutes

References: QCAP 0600-06, Radiation Work Permit Program, Revision 8
QCAP 0650-06, Unescorted Access to RCA, Rev. 3 Step D.2.c
QCAP 0630-06, Exposure Authorization and Control, Rev. 5, Step D.1.b

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments:______________________________

____

____

____

____

____

____

Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is operating at 100% reactor power.

Your exposure history is:

Annual NON-QCNP TEDE Dose (from Dresden Station) – 1920 mrem

Annual QCNP TEDE Dose – 1050 mrem

Previous 24 hours DDE dose at QCNP from RWPs other than 000003 -195 mrem

INITIATING CUE

You have been directed to support FIN team maintenance on 1-1299-76A in the 1A RWCU pump room. It is expected that the task will take 30 minutes. You are to review the RWP and area maps to determine if you are able to complete the task and inform the Unit Supervisor. This is a NON EMERGENCY situation.

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Job Performance Measure

Determine Radiation Exposure

JPM Number: _ADM-A.3-SRO_

Revision Number: _1_

Date: 03/09/00

Approved By: ____________________ ________
Operations Representative Date

Approved By: ____________________ ________
Training Department Date

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__N/A __).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

3. This completes the setup for this JPM.

Provide the candidate with:

A completed RWP for "A" RWCU pump room. Ensure dose rate on the survey map is >70 mr/hr in the work area. Also, the RWP exposure limit for the job must be 50 mrem. Expected time to complete the task is 30 min.

A list of workers and their exposure history.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at 100 percent reactor power on December 29. An operator is required to support the FIN team during the repair of valve 1-1299-76A in the "A" RWCU pump room. The electronic dose tracking system is currently down for repair.

INITIATING CUE

The Shift Manager directs you to review the RWP, area survey maps, and exposure histories of crew personnel and determine which personnel may complete the task without exceeding any QCNPS Administrative Limits.

This is a NON EMERGENCY situation.

It is expected that the task will take 30 minutes to complete.

The following is a list of the operators that are available to perform the task and their exposure histories.

	Annual NON-QCNP TEDE Dose	Annual QCNP TEDE Dose	Todays Dose DDE(1)
Operator A -	1920 mrem	1050 mrem	195 mrem
Operator B-	0 mrem	1940 mrem	265 mrem
Operator C-	825 mrem	1975 mrem	70 mrem
Operator D-	1100 mrem	1840 mrem	180 mrem

(1) Dose from RWPs other than 000003.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Evaluator: The candidate must determine that the dose to the knees must be the dose used and that the operators will receive 45 mrem during the .5 hour if they complete the Job. Correct answer is Operator D. Operator A will exceed the Combined exposure limit of 3000 mrem (1920 mrem + 1050 mrem + 45 mrem = 3015 mrem). Operator B will exceed the daily exposure limit of 300 mrem (265 mrem + 45 mrem = 310 mrem). Operator C will exceed the site annual exposure limit of 2000 mrem (1975 mrem + 45 mrem = 2020 mrem).

Job Performance Measure (JPM)

JPM Start Time: _______

	ELEMENT		**SAT**	**UNSAT**	**Comment Number**
CUE	**Provide a copy of the RWP and survey maps.**				
1	Obtains procedure to be used(if necessary) and reviews RWP and area survey maps.	May refer to QCAP 0630-06. Completes review.	___	___	___
CUE	**If asked, SM and RP have not allowed a dose extension.**				
*2	Determines which operator can complete the task.	Determines that only Operator D has exposure remaining to complete the task. See calcs. on the previous page.	___	___	___
3	Informs SM that operator D can complete the task.	Informs SM that only Operator D can complete the task.	___	___	___
CUE	**The SM understands that operator D can complete the task.**				

Evaluator: This JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ________________________________

Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Determine Radiation Exposure

JPM Number: ADM-A.3-SRO Revision Number: 01

Task Number:

Learning Objective S-RPS-001

K/A Number and Importance:

K/A 2.3.10 **IMP** 2.9/3.3

Suggested Testing Environment: Simulator , Control Room, or Plant

Actual Testing Environment: ❑ Simulator ❑ Plant ❑ Control Room

Testing Method: ❑ Simulate ■ Perform

Faulted: ❑ Yes ■ No

Alternate Path: ❑ Yes ■ No

Time Critical: ❑ Yes ■ No

Estimated Time to Complete: 10 minutes **Actual Time Used:** ____ minutes

References: QCAP 0630-06, Exposure Authorization and Control, Rev. 5, Step D.1.b
QCAP 0600-06, Radiation Work Permit Program, Rev. 8
QCAP 0650-06, Unescorted Access to RCA, Rev. 3, Step D.2.c

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory

Comments: ________________________________

Evaluator's Name: ________________________ (Print)

Evaluator's Signature: ________________________ Date: ________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 is at 100 percent reactor power on December 29. An operator is required to support the FIN team during the repair of valve 1-1299-76A in the "A" RWCU pump room. The electronic dose tracking system is currently down for repair.

INITIATING CUE

The Shift Manager directs you to review the RWP, area survey maps, and exposure histories of crew personnel and determine which personnel may complete the task without exceeding QCNPS Administrative Limits.

This is a NON EMERGENCY situation.

It is expected that the task will take 30 minutes to complete.

The following is a list of the operators that are available to perform the task and their exposure histories.

	Annual NON-QCNP TEDE Dose	Annual QCNP TEDE Dose	Todays Dose DDE(1)
Operator A -	1920 mrem	1050 mrem	195 mrem
Operator B-	0 mrem	1940 mrem	265 mrem
Operator C-	825 mrem	1975 mrem	70 mrem
Operator D-	1100 mrem	1840 mrem	180 mrem

(1) Dose from RWPs other than 000003.

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Job Performance Measure

Determine if Chimney Radiation Levels Exceed EAL Values

JPM Number: _ADM-A.4-RO_

Revision Number: _1_

Date: 03/10/00

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. Reset the simulator to IC (__ N/A__).

NOTE: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Initial conditions provide candidate with the specific Chimney radiation levels and Chimney flow. The radiation level provided in the initial conditions is such that the release is above the Unusual Event value and below the Alert value once the Equivalent Emergency Action Level Values are corrected for flow.

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 was shutdown to hot shutdown 1 hour ago. Core damage is present and an offsite gaseous release is in progress.

Chimney flow is 310,000 cfm.

SPING low range reading is 5.2 E-4 micro ci/cc.

INITIATING CUE

The Unit Supervisor directs you to use QCCP 0400-25, Attachment A, to determine the Emergency Action Level (UE, Alert, Site Emergency, General Emergency) using the Equivalent Emergency Action Level Values. The US informs you that all prerequisites have been satisfied.

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

Initial conditions provide candidate with the specific Chimney radiation levels and Chimney flow. The radiation level provided in the initial conditions is such that the release is above the Unusual Event value and below the Alert value once the Equivalent Emergency Action Level Values are corrected for actual chimney flow.

Calculations to correct for the flow difference:

<u>Flow Corrected Equivalent Emergency Action Level for Unusual Event</u> -

250,000 cfm/310,000 cfm X 4.25 E-04 micro ci/cc = 3.42 E-04 micro ci/cc

<u>Flow Corrected Equivalent Emergency Action Level for Alert</u> -

250,000 cfm/310,000 cfm X 1.23 E-03 micro ci/cc = 9.92 E-04 micro ci/c

Job Performance Measure (JPM)

JPM Start Time: _______

ELEMENT

			SAT	UNSAT	Comment Number
1.	Obtains copy of QCCP 0400-25, Attachment A.	Locates procedure.	___	___	___
CUE	**Provide copy of QCCP 0400-25, Attachment A once located or requested.**				
2.	Completes attachment A.	Performs calculations for flow corrections for Equivalent Emergency Action Level Values on Attachment A. See page 3 for calculations.	___	___	___
*3.	Determines equivalent emergency action level value for UE and Alert.	Determines value to be approx. 3.42 E-4micro ci/cc for UE and 9.92 E-4 micro ci/cc for Alert.	___	___	___
*4	Determines EAL level.	Determines EAL of Unusual Event.	___	___	___
5	Informs US of the EAL level.	Informs US the chimney radiation release rate above the UE level and below the Alert level.	___	___	___
CUE	**The US understands that the chimney radiation release rate is at the UE level.**				

CUE: This JPM is complete. JPM Stop Time:______

Job Performance Measure (JPM)

Operator's Name: ______________________________

Job Title: ☐ NLO ☐ RO ☐ SRO ☐ STA ☐ SRO Cert

JPM Title: Determine if Chimney Radiation Levels Exceed EAL Values

JPM Number: ADM-A.4-RO Revision Number: 01

Task Number:

S/R-1702-EK028

K/A Number and Importance:

K/A 295038EA2.01	IMP 3.3/4.3
K/A 2.4.47	IMP3.4/3.7

Suggested Testing Environment: Simulator or the Control Room

Actual Testing Environment: ☐ Simulator ☐ Plant ☐ Control Room

Testing Method: ☐ Simulate ■ Perform

Faulted: ☐ Yes ■ No

Alternate Path: ☐ Yes ■ No

Time Critical: ☐ Yes ■ No

Estimated Time to Complete: 12 minutes **Actual Time Used:** ____ minutes

References: QCCP 0400-25, Main Chimney and Reactor Vent Noble Gas Release Rate Action Levels, Revision 4

EVALUATION SUMMARY:

Were all the Critical Elements performed satisfactorily? ☐ Yes ☐ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ☐ Satisfactory ☐ Unsatisfactory

Comments: ______________________________

____

____

____

Evaluator's Name: ______________________ (Print)

Evaluator's Signature: ______________________ Date: ________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Unit 1 was shutdown to hot shutdown 1 hour ago. Core damage is present and an offsite gaseous release is in progress.

Chimney flow is 310,000 cfm.

SPING low range reading is 5.2 E-4 micro ci/cc.

INITIATING CUE

The Unit Supervisor directs you to use QCCP 0400-25, Attachment A, to determine the Emergency Action Level (UE, Alert, Site Emergency, General Emergency) using the Equivalent Emergency Action Level Values. The US informs you that all prerequisites have been satisfied.

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Job Performance Measure

Determine EAL and PARs

JPM Number: _ADM-A.4-SRO_

Revision Number: _0_

Date: 02/01/00

Approved By: ____________________ ________
Operations Representative **Date**

Approved By: ____________________ ________
Training Department **Date**

Job Performance Measure (JPM)

SIMULATOR SETUP INSTRUCTIONS

1. The simulator will be placed in freeze at the completion of NRC scenario #4.

2. Run immediately following Scenario #4. Tell simulator operator to freeze the simulator and not change any switches or controls until the JPM is finished.

   - Ensure a NARS form is available in the simulator.

   - Provide candidate with a blank copy of the NARS form if not available in the simulator.

3. When the above steps are completed for this and other JPMs to be run concurrently, then validate the concurrently run JPMs using the JPM Validation Checklist.

4. This completes the setup for this JPM.

Job Performance Measure (JPM)

INITIAL CONDITIONS

Plant conditions are as indicated.

INITIATING CUE

As the Shift Manager, you are to determine the appropriate Emergency Action Level (EAL) and the Protective Action Recommendations (PARs)for the current plant conditions including properly filling in step 9. on the NARS form. You may request any specific plant information from the NSOs. Inform the station director of the PARS determination once completed. Portions of this JPM are time critical.

The time clock starts when the candidate acknowledges the initiating cue. **Start the time critical time clock as soon as the Examinee makes the EAL determination.**

Job Performance Measure (JPM)

EVALUATOR: **PATH 1: The candidate may refer to the "Acting Station Director Implementing Procedure" (QEP 100-1) which will refer him to the "GSEP Emergency Procedures Implementation Guide" (QEP 100-T01). The "GSEP Implementation Guide" will direct him to QEP 0200-01 for GSEP EAL classification and QEP 100-T02 for PARs determination. The outline for these steps begin at 1. of this JPM.**

PATH 2: Alternatively, following declaration of the EAL, the candidate may refer to QEP 300-01, which will refer him to the NARS form (QEP 300-S4) and the NARS form instructions (QEP 300-T1). The NARS form instruction sheet will refer him to QEP 100-T02. The outline for these steps begin at 2. of this JPM.

JPM Start Time: ________

ELEMENT

			SAT	UNSAT	Comment Number
	PATH 1				
1.	Obtains procedure to be used.	Obtains QEP 100-1.	___	___	___
F.1	**QEP 100-1** Implements GSEP Emer. Proc.Implementation Guide.	Refers to QEP 100-T01.	___	___	___

Job Performance Measure (JPM)

ELEMENT			SAT	UNSAT	Comment Number
*A.4	**QEP 100-T01** Refers to "Quad Cities Emergency Action Levels (EAL)" (QEP 0200-01 and -T01)	Refers to QEP 0200-01 and -T01 Determines EAL: SAE: MS3 and/or FS-1 if Torus does not reach 110F. Or GAE: MG3 if Torus reaches 110F.	___	___	___
NOTE	**Start time for time critical portion time________**				
*A.4.c.	Refers to "Predetermined PARS from the Control Room" (QEP 0100-T02	Refers to QEP 0100-T02. Determines PAR and circles on NARS form. SAE: 9C, D, F, G GAE: 9C, H, J, G if <166” 9C, H, F, G if ≥166”	___	___	___
*1.a	Informs station director of PARS completion.	Informs station director of PARS completion within 15 minutes.	___	___	___
CUE	**The station director understands that the PARS determination is complete.**				
	Critical Stop Time________				
CUE	**The JPM is complete.**				
	JPM Stop Time ____________				

Job Performance Measure (JPM)

	ELEMENT		SAT	UNSAT	Comment Number
	PATH 2				
2	Obtain procedure to be used.	Obtains QEP 0300-1.	___	___	___
F.1.b	**QEP 0300-01** Refers to; "NARS Form Instructions For Use" (QEP 0300-T01).	Refers to QEP 0300-T01.	___	___	___
9.	**QEP 0300-T01** Refers to; "Predetermined PARS From The Control Room" (QEP 100-T02)	Refers to QEP 0100-T02.	___	___	___
*3.	**QEP 0100-T02** Determines EAL classification column.	Determines EAL: SAE: MS3 and/or FS-1 if Torus does not reach 110F. Or GAE: MG3 if Torus reaches 110F.	___	___	___

NOTE **Start time for time critical portion** **time________**

Job Performance Measure (JPM)

ELEMENT

			SAT	UNSAT	Comment Number
***4.**	Determines PARS from highest severity level and completes NARS form, Step 9.	Refers to QEP 0100-T02. Determines PAR and circles on NARS form. SAE: 9C, D, F, G GAE: 9C, H, J, G if <166" 9C, H, F, G if ≤166"	___	___	___
*9.a	Informs station director of PARS completion.	Informs station director of PARS completion within 15 minutes.	___	___	___
CUE	**The station director understands that the PARS determination is complete.**				

Critical Stop Time __________

CUE: The JPM is complete.

JPM Stop Time: _______

Job Performance Measure (JPM)

Operator's Name: ______________________________
Job Title: ❑ NLO ❑ RO ❑ SRO ❑ STA ❑ SRO Cert

JPM Title: Determine EAL and PARs
JPM Number: ADM-A.4-SRO Revision Number: 00
Task Number:
L/O S-GSEP-TP001/2

K/A Number and Importance:
K/A: 2.4.38 **Rating:** 4.0

Suggested Testing Environment: Simulator

Actual Testing Environment: ■Simulator ❑Plant ❑Control Room

Testing Method: ❑ Simulate **Faulted:** ❑ Yes ■ No
■ Perform **Alternate Path:** ❑ Yes ■ No

Time Critical: ■ Yes ❑ No

Time to Complete Time Critical Portion: 15 minutes
Actual Time Used: ___minutes

References:

QEP 0300-01 Rev. 25	NOTIFICATION FOR GSEP EMERGENCIES
QEP 0300-Tl Rev. 19	NARS FORMS INSTRUCTIONS FOR USE NARS FORM
QEP 0100-01 Rev. 10	ACTING STATION DIRECTOR IMPLEMENTING PROCEDURE
QEP 0100-T0l Rev. 18	GSEP EMERGENCY PROCEDURE IMPLEMENTATION GUIDE
QEP 0100-T02 Rev. 12	PREDETERMINED PARS FOR THE CR
QEP 0200-01 Rev. 13	CLASSIFICATION OF GSEP CONDITION
QEP 0200-T01 Rev. 25	CLASSIFICATION OF EMERGENCIES

EVALUATION SUMMARY:
Were all the Critical Elements performed satisfactorily? ❑ Yes ❑ No

The operator's performance was evaluated against the standards contained in this JPM, and has been determined to be: ❑ Satisfactory ❑ Unsatisfactory
Comments:______________________________
Evaluator's Name: ______________________________ (Print)

Evaluator's Signature: ______________________________ Date: __________

Job Performance Measure (JPM)

INITIAL CONDITIONS

Plant conditions are as indicated.

INITIATING CUE

As the Shift Manager, you are to determine the appropriate Emergency Action Level (EAL) and the Protective Action Recommendations (PARs)for the current plant conditions including properly filling in step 9. on the NARS form. You may request any specific plant information from the NSOs. Inform the station director of the ~~NARS~~ PARS AMS determination once completed. Portions of this JPM are time critical.

FINAL AS-ADMINISTERED WALKTHROUGH JPMS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

QCNPS-JOB PERFORMANCE MEASURE

O~~erator's Name: ______________________________
(print)

JPM: LS-019-I-F Rev: 17 Revision by: G. Thennes

Task Title: Control Reactor Pressure with RCIC.

Station Approval: ______________________ Date: __________
(Exam Coordinator)

Operations Review: ______________________ Date: __________

Task References: S/R-1300-TP003 **K/A:**217000 A2.10 **Rating:**3.1/3.1

License: RO/SRO **Suggested Testing Environment: Simulator**
(Circle One)

Actual Testing Environment: Simulator x Plant ___ CR ___

Testing Method: Simulate ____ Perform x

Estimated Time to Complete: **12 min.** **STOP Time:** __________
START Time: __________

Time Critical? NO X YES___ **ACTUAL Time:** __________

R~~rences: QCOP 1300-2 Rev. 17 RCIC SYSTEM MANUAL START-UP (INJECTION/PRESSURE CONTROL)

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Significantly modified JPM to incorporate failure of RCIC controller to control flow in auto. Incorporate minor editorial proc. changes. NOTE: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-019-I-F

IC#: Use IC-96 (ZIP Disk)

Must copy IC from zip disc to IC files directory in RIS. MST must then be shutdown and restarted for it to recognize new IC-96.

Can use IC-21 with the following modification.

IC Description: Full power, normal plant lineup

Manual Actuations:Reset the simulator, then take the simulator to run. Scram the reactor, place the mode switch in shutdown, and stabilize Reactor water level at +30" with the low flow feedwater regulator in auto.

Insert a Group I isolation using malfunction rp05a and rp05b(simulator command imf rp05a and imf rp05b)

S[illegible] the "A" Loop of Torus Cooling IAW QCOP 1000-9 and QCOP 1000-04.

Malfunctions: Controller fails to operate properly in auto. Will only provide 200 gpm in auto. Will respond and regulate flow at 400 gpm in manual.

Need imf RC06 50% severity No Ramp.

Note to Simulator Operator: Will have to control Rx pressure 900-1000 psig as NSO and acknowledge annunciators other than those caused by JPM actuations.

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The unit has been SCRAMMED due to a spurious Group I isolation.
- QGA 100 is being executed and relief valves are being used to control reactor pressure by other NSO.
- The U. S. has ordered reactor pressure to be controlled with RCIC.
- RCIC is in standby IAW QCOP 1300-1 with suction from the CCSTs.
- The unit is not in EGC control.
- Torus cooling is on "A" Loop.
- This JPM is NOT time critical

Initiating Cue: The Unit Supervisor directs you to manually start-up RCIC, in the pressure control mode, with suction from the CCSTs using QCOP 1300-02. Establish approximately 400 gpm flow and a discharge pressure of greater than 100 psig above reactor pressure and less than 1250 psig ~~above reactor pressure.~~ AMS

Start Time:_________

Provide examinee with: NA

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains copy of QCOP 1300-2.	[]	[]	
	Verify ECCS Initiation Signal is NOT present.	Determines DW press. < 2.5 psig & RPV level > -59" using available ind.	[]	[]	[]
*F.6.a.	Open HPCI Test Return Vlv.	Positions MO-2301-15 CS to open - Open light lit.	[]	[]	
*F.6.b.	Throttle open CCST Test Bypass Vlv.	Positions 1301-53 CS to open - Open light lit.	[]	[]	
*F.6.c.	Start Vacuum Pmp.	Positions Vacuum pmp. CS to start. - ON light lit.	[]	[]	
*F.6.d.	Open Turb. Clg. Wtr. Vlv.	Positions 1301-62 CS to open. - Open light lit.	[]	[]	
F.6.e.	Verify Pmp Disch Vlv Closed.	Verifies 1301-49 vlv closed. – Closed light lit.	[]	[]	[]
*F.6.f.	Open Min Flow Vlv.	Positions 1301-60 CS to open. - Open light lit.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6.g.	Open Stm. To Turb. Vlv.	Positions 1301-61 CS to open. - Open light lit.	[]	[]	

NOTE: Operator may place controller in manual and increases to 400 gpm as required in Step F.6.k.

F.6.h.	Verify flow indication.	Identifies flow at approximately 200 gpm. If manual control of FIC is selected, operator may increase flow to 400 gpm on FIC 1-1340-1.	[]	[]	[]

NOTE: The candidate should recognize the inability to maintain flow and pressure due to FIC 1-1340-1 failure in automatic. (How soon the candidate identifies the failure is dependent on how far 1301-53 was opened in step F.6.b). The candidate may choose to reperform step F.6.b to obtain more flow. This will affect the ability to meet step F.6.j.

i.	Verify close MIN FLOW VALVE.	Verifies MO 1-1301-60 closed. -CLOSED light lit.	[]	[]	
*F.6.j.(1) or (2)	Adjust to proper disch. flow/pressure.	Adjusts **FLOW** by: FIC 1-1340-1 in MAN and adjusts manual adjustment lever to achieve approx. 400 gpm. **AND** Throttles 1301-53 CS open/ closed as necessary until pmp. disch. press. 100 psig > RPV press and < 1250 psig.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.6.k.(1) - (4)	Monitor RCIC for proper operation.	Verifies;			
		Turbine speed 2250 to 4500 rpm. (SI 1-1340-501, Turb. speed)	[]	[]	[]
		Pmp Disch Press ≤ 1250 psig. (PI 1-1340-7, Pmp disch Press)	[]	[]	[]
		Pmp Suction Press 0 to 25 psig. (PI 1-1340-2, Pmp Suct Press)	[]	[]	[]
		Exhaust Press 1 to 20 psig. (PI 1-1340-3, Turb Exh Press)	[]	[]	[]
	The candidate informs the US RCIC is operating in the pressure control mode with suction from the CCSTs.	The candidate informs the US that task is complete.	[]	[]	[]
CUE	**The US understands that the RCIC is operating in the pressure control mode with suction from the CCSTs.**				

CUE: The JPM is complete.

Stop Time:___________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The unit has been SCRAMMED due to a spurious Group I isolation.
- QGA 100 is being executed and relief valves are being used to control reactor pressure by other NSO.
- The U. S. has ordered reactor pressure to be controlled with RCIC.
- RCIC is in standby IAW QCOP 1300-1 with suction from the CCSTs.
- The unit is not in EGC control.
- Torus cooling is on "A" Loop.
- This JPM is NOT time critical

Initiating Cue: The Unit Supervisor directs you to manually start-up RCIC, in the pressure control mode, with suction from the CCSTs using QCOP 1300-02. Establish approximately 400 gpm flow and a discharge pressure of greater than 100 psig. above reactor pressure and less than 1250 psig ~~above reactor pressure.~~ AWS

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ____
(print)

JPM: LS-003-I-F Rev. 5 Revision by: G. Thennes

Task Title: Perform the Monthly Core Spray Pump Operability Test for Core Spray Pump B With Failure of Minimum Flow Valve

Station Approval:______________________________ Date:__________
(Exam Coordinator)

Operations Review:______________________________ Date:__________

Task References: S/R-1400-TP005 K/A: 209001 A4.04 Rating: 2.9/2.9
K/A: 209001 A4.11 Rating:3.7/3.6
K/A: 209001 A4.12 Rating:3.6/3.5

License: RO/SRO Suggested Testing Environment: **Simulator**
(Circle One)

Actual Testing Environment: Simulator X Plant _____ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **16.5 min.** **STOP Time** _________
START Time _________
Time Critical? NO X YES____ **ACTUAL Time** _________

References: QCOS 1400-4, MONTHLY CORE SPRAY PUMP OPERABILITY TEST, Rev. 6

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMMENTS/REMEDIATION: Minor editorial revision to procedure. Does not change the performance of this JPM. The Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________

Signature:______________________________ Date:____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP REQUIREMENTS

JPM: LS-003-I-F

IC#: IC-21
IC Description: Normal steady state operations or plant shutdown may be used for this JPM.

Manual Actuations: NONE

Malfunctions: Insert malfunction CS06B, Core Spray Minimum Flow Valve Fails to Auto Close

(imf cs06b)

Override 38B hs to neutral: ior dihs1140238b norm

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Monthly Core Spray System Motor Operated Valve Test was performed last shift and the operability of MO-1-1402-4B has been proven and recorded on QCOS 1400-02.
- The Monthly Core Spray Pump Operability Test is required to be performed this shift.
- An Equipment Attendant is standing by to vent the core spray piping.
- Expected alarms 901-~~4~~3 Ams A-4, B-16, C-15, and H-5 were briefed but procedures were not reviewed.

Initiating Cue: The Unit Supervisor directs you to perform the Monthly Core Spray Pump Operability Test for the "B" Core Spray Pump IAW QCOS 1400-4. The EA has been briefed, has completed steps H.1.b, and is waiting at the pump room.

Start Time:________

Provide examinee with: QCOS 1400-4 (Evaluator: Ensure step D.1., PREREQUISITES, portion of QCOS is filled in. Reason = Partial for "B" Loop Step D.1 and D.2.) N/A steps as needed. Complete H.1.b.

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE		STANDARDS	SAT	UNSAT	N/A

CUE: Once asked by NSO: The EA reports he will complete prestart checks on 1B CS pump. Report back to NSO: The EA reports that the prestart checks are satisfactory and he is standing by for pump start.

CUE: Announcement has been made. The room is clear.

*H.3.b.(1)	Start 1B CS pump.	Positions CS to on-on light lit.	[]	[]	

CUE: (If asked) EA reports 1B CS pump is operating satisfactorily.

H.3.b.(2)	Verify MO 1-1402-38B opens.	Verifies MO 38B open light lit.	[]	[]	
*H.3.b.(3)	Open MO 1-1402-4B	Positions 4B CS to fully open 4B valve-open light lit.	[]	[]	
H.3.b.(4)	Verify MO 1-1402-38B closes.	Verifies 38B closed light lit.	[]	[]	
H.3.b.(4)	Report the Min. Flow valve did not close.	Informs US that 38B did not close.	[]	[]	

CUE: I understand that the 38B did not close. Shutdown the "B" Core Spray system IAW the procedure.

*H.3.c.(1)	Close MO 1-1402-4B.	Positions CS to close-closed light lit.	[]	[]	

NOTE: Hold throttle valve in the closed position for 25 seconds per QAP 0300-02. <u>Not Critical.</u>

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*H.3.c.(3)	Stop 1B CS pump.	Positions CS to stop-off light lit.	[]	[]	
H.3.c.(4)	Close MO 1-1402-38b.	Positions CS to close- OPEN light lit.	[]	[]	

CUE: I understand that the 38B will not close. I will write an Action Request and report this to the SM.

EVALUATOR: **Steps H.3.d & e. will only be performed if the core spray discharge pressure cannot be maintained between 40 and 90 psig. If pressure is greater than 90 psig step H.3.d. will be performed. If pressure is reduced to less than 40 psig step H.3.e. will be performed. These steps will become critical if they must be performed.**

H.3.d.(1)	Reduce discharge press. < 90 psig. Crack open MO-1-1402-4B	Cracks open MO-4B to slowly reduce discharge press-dual indication.	[]	[]	[]
H.3.d.(2)	Close MO-1-1402B-4B	Positions CS to close when disch. press. < 90 psig-closed light lit.	[]	[]	[]
H.3.e.(1)	Open MO 1-1402-4B.	Open MO 4B valve (Open light lit).	[]	[]	
H.3.e.(2)	Close MO 1-1402-4 B.	Closes MO 4B valve (closed light lit).	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.3.e.(3)	Fill and vent 1B CS system.	Informs US and/or the EA that the CS system requires filling and venting per QCOP 1400-01.	[]	[]	

CUE: IF requested to fill and vent the system report that it has been completed per QCOP 1400-01.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
H.4.	Perform independent verification.	Informs US independent verification required.	[]	[]	

CUE: US understands, he will delegate a man to verify 1B CS system line-up.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Candidate informs US that the task is complete with the reported deficiencies.	Informs US of task completion.	[]	[]	

CUE: The US understands that the task is complete with noted exceptions.

CUE: The JPM is complete.

Stop Time: ___________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The Core Spray System is in its normal standby lineup IAW QCOP 1400-01.
- The Monthly Core Spray System Motor Operated Valve Test was performed last shift and the operability of MO-1-1402-4B has been proven and recorded on QCOS 1400-02.
- The Monthly Core Spray Pump Operability Test is required to be performed this shift.
- An Equipment Attendant is standing by to vent the core spray piping.
- Expected alarms 901-~~4~~ 3 AmS A-4, B-16, C-15, and H-5 were briefed but procedures were not reviewed.

Initiating Cue: The Unit Supervisor directs you to perform the Monthly Core Spray Pump Operability Test for the "B" Core Spray Pump IAW QCOS 1400-4. The EA has been briefed, has completed steps H.1.b, and is waiting at the pump room.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name:____
(print)

JPM: LS-012-I Rev. 8 Revision by: G. Thennes

Task Title: Transfer Torus Water to the Main Condenser via the Condensate Demineralizers

Station Approval:______________________________Date:________________
(Exam Coordinator)

Operations Review:______________________________Date:________________

Task References: S/R-1000-TP012 **K/A:** 223001 A2.11 **Rating:** 3.6/3.8

License: RO/SRO
(Circle One)
Suggested Testing Environment: Simulator

Actual Testing Environment: Simulator X Plant___ CR___

Testing Method: Simulate_____ Perform X

Estimated Time to Complete: **11.5 min.** **STOP TIME:**_______
START TIME:_______

Time Critical? NO x YES_______ **ACTUAL TIME:**_____

References: QCOP 1000-10 Rev. 10, TORUS WATER TRANSFER TO THE MAIN CONDENSER VIA THE CONDENSATE DEMINERALIZERS

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory________ Unsatisfactory______

COMMENTS/REMEDIATION: Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________
Signature:______________________________Date:____________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-012-I

IC#: 21

IC Description: EOC, 100%, QCGP 1-1 complete, all rods full out.

Manual Actuation: -Start "B" and "C" RHR Service Water Pumps and establish 270 to 280 psig discharge pressure IAW QCOP 1000-4.
-Ensure torus level is at 0 inches.
-The simulator operator will act as the NLO.

Malfunctions: NONE

Remotes: When requested by the evaluator, insert remote function RH11R (irf RH11R open) to open the 919B valve. (RHR to "B" condensate pump)

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Both units are operating at near rated conditions.
- The Torus water level needs to be lowered to the lower operating limit prior to performing the HPCI Monthly surveillance.
- Chemistry has been notified of the upcoming water transfer.
- Q-HLA briefing has been conducted.
- The RHR System is filled and vented IAW QCOP 1000-2.
- No water is being transferred on Unit Two and all valve line-ups are normal.
- The "B" & "C" RHR Service Water pumps are running per QCOP 1000-04.
- The S.M. has authorized pumping the Torus to the U-1 Main Condenser via the Cond. Demins due to the Floor Drain Collector Tank being full.
- The Radwaste operator has verified the following valves are CLOSED;
  - -2-2001-833, UNIT 2 TORUS TO HOTWELL XTIE VLV
  - -½-2001-82, TORUS AND CONDENSER XTIE TO RDT VLV
  - -½-2001-85, TORUS CONDENSER XTIE TO WASTE COLLECTOR TK VLV
  - -½-2001-84, TORUS AND CONDENSER XTIE TO FDCT VLV
  - -AO 1-2001-175, DISCHARGE TO HOTWELL
  - -½-2099-60, RADWASTE TO RHR SYS XTIE VLV
  - -1-3399-441, COND TO RW
  - -1-2001-918, COND DECANT PMP TO 1A CONDENSER VLV
- The following valves have been verified closed and locked via the EWCS OOS program:
  - 1-1001-128A, 1A RHR Loop to drain valve
  - 1-1001-128B, 1B RHR Loop to drain valve
  - 2-1001-128A, 2A RHR Loop to drain valve
  - 2-1001-128B, 2B RHR Loop to drain valve
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to line-up and begin reducing the Torus level by transferring water from the Torus to the U-1 Main Condenser via the Condensate Demineralizers, using the 1C RHR Pump. The Unit NSO will maintain condenser water level IAW QCOP 3300-05.

START TIME:______________

Provide examinee with: QCOP 1000-10.

Additional Questions/Comments: Verify the simulator operator is available prior to starting the JPM. The simulator operator will act as the NLO.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Locates procedure QCOP 1000-10.	[ ]	[ ]	
CUE	**Provide candidate a copy of QCOP 1000-10 once the simulator copy is located.**				
F.1.a - d	Verify RHR Loop drn vlvs closed.	Verifies closed & locked from initial conditions the following valves;			
		1-1001-128A (1A RHR Loop to drain vlv)	[ ]	[ ]	[ ]
		1-1001-128B (1B RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
		2-1001-128A (2A RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
		2-1001-128B (2B RHR Loop to drain vlv.)	[ ]	[ ]	[ ]
F.2.a - d	Verify closed in Main Control Room:	MO 1-1001-20, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
		MO 1-1001-21, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
	Ask U-2 for indication on MO 2-1001-20 and 21.	MO 2-1001-20, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]
		MO 2-1001-21, RHR TO RW DISCH VLV.	[ ]	[ ]	[ ]

CUE: U-2 1001-20 & 21 valves are closed.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

NOTE: Steps F.3.a through F.3.f.1 are accomplished via the set up. If the examinee asks respond that all the valves are closed.

*F.3.f.2	Open U-1 torus to hotwell Xtie vlv.	Directs operator to open 1-2001-833 vlv. (U-1 torus to hotwell Xtie vlv.)	[ ]	[ ]	[ ]

CUE: (Examiner) Direct candidate to call NLO (sim operator).

CUE: (Simulator Operator) U-1 2001 833 is open.

NOTE: Steps F.4.a and F.4.b are accomplished via the set up. If the examinee asks respond the valves are closed.

*F.4.c	Throttle open B or C Cond pump suct. from RW.	Directs operator to open 1-2001-919B or 919C 3 turns.	[ ]	[ ]	[ ]

NOTE:: Simulator operator to open the 1-2001-919B(C) valve, RHR to "B(C)" condensate pump. (irf RH11R open)

CUE: (Simulator Operator) 1-2001-919B(C) is open 3 turns.

F.5	Verify RHR pp. suction from torus.	Verifies MO 1-1001-7C open light lit.	[ ]	[ ]	[ ]
F.6	Verify RHR Xtie vlvs open.	Verifies open light lit for;			
		MO 1-1001-19A (North Xtie Vlv)	[ ]	[ ]	[ ]
		MO 1-1001-19B (South Xtie Vlv)	[ ]	[ ]	[ ]
F.7	Verify RHR SW pumps running.	Verifies "B" & "C" RHR SW pumps run light lit.	[ ]	[ ]	[ ]
*F.8	Open torus test or spray valve.	Positions MO 1-1001-34B to open -open light lit.	[ ]	[ ]	[ ]

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE		STANDARDS	SAT	UNSAT	N/A

EVALUATOR: **The candidate may dispatch an operator to perform the pre-start checks of the 1C RHR pump. If he does, provide the following cue;**

CUE: 1C RHR pump is ready for start.

*F.9	Start "C" RHR pump.	Positions "C" RHR pump CS to start. -Pump light lit.	[ ]	[ ]	[ ]
*F.10	Immediately open torus water test valve.	Positions MO 1-1001-36B CS to open -open light lit & throttles to establish 3000-3500 gpm on "RHR Flow Ind" (1-1040-7)	[ ]	[ ]	[ ]
*F.13 & 14	Open RHR to RW Disch valves.	Positions CS to open for the following valves;			
		MO 1-1001-20 (RHR to RW Disch Vlv)	[ ]	[ ]	[ ]
		MO 1-1001-21 (RHR to RW Disch Vlv)	[ ]	[ ]	
CUE (If necessary)	**If candidate reads reactor conductivity off recorder and gets readings greater than 0.1 micro mho/cm, inform the candidate that Reactor coolant conductivity from pts. 1 and 2 are both .08 micro mho/cm .**				
F.15	Adjust transfer flowrate.	Throttles MO 1-1001-36B to establish 3000-3500 gpm on "RHR Flow Ind" (1-1040-7)	[ ]	[ ]	[ ]
	Candidate informs the US that torus water is being transfered to the U-1 main condenser via the condensate demineralizers, using the 1C RHR pump.	Informs the US that the transfer is in progress.			

PERFORMANCE OBJECTIVE	STANDARDS	SAT UNSAT N/A

CUE: The Unit Supervisor understands the transfer is in progress.

CUE: The JPM is complete.

Stop Time: __________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- Both units are operating at near rated conditions.
- The Torus water level needs to be lowered to the lower operating limit prior to performing the HPCI Monthly surveillance.
- Chemistry has been notified of the upcoming water transfer.
- Q-HLA briefing has been conducted.
- The RHR System is filled and vented IAW QCOP 1000-2.
- No water is being transferred on Unit Two and all valve line-ups are normal.
- The "B" & "C" RHR Service Water pumps are running per QCOP 1000-04.
- The S.M. has authorized pumping the Torus to the U-1 Main Condenser via the Cond. Demins due to the Floor Drain Collector Tank being full.
- The Radwaste operator has verified the following valves are CLOSED;
  - -2-2001-833, UNIT 2 TORUS TO HOTWELL XTIE VLV
  - -½-2001-82, TORUS AND CONDENSER XTIE TO RDT VLV
  - -½-2001-85, TORUS CONDENSER XTIE TO WASTE COLLECTOR TK VLV
  - -½-2001-84, TORUS AND CONDENSER XTIE TO FDCT VLV
  - -AO 1-2001-175, DISCHARGE TO HOTWELL
  - -½-2099-60, RADWASTE TO RHR SYS XTIE VLV
  - -1-3399-441, COND TO RW
  - -1-2001-918, COND DECANT PMP TO 1A CONDENSER VLV
- The following valves have been verified closed and locked via the EWCS OOS program:
  - 1-1001-128A, 1A RHR Loop to drain valve
  - 1-1001-128B, 1B RHR Loop to drain valve
  - 2-1001-128A, 2A RHR Loop to drain valve
  - 2-1001-128B, 2B RHR Loop to drain valve
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to line-up and begin reducing the Torus level by transferring water from the Torus to the U-1 Main Condenser via the Condensate Demineralizers, using the 1C RHR Pump. The Unit NSO will maintain condenser water level IAW QCOP 3300-05.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ______________________________
(print)

JPM: LS-037-I Rev: 11 Revision by: G. Thennes

Task Title: Bypass the Reactor Building Ventilation Isolation

Station Approval:______________________________ Date:__________
(Exam Coordinator)

Operations Review:______________________ Date:__________

Task References:S/R/A-1600-TP025

K/A: 288000 A2.01 Rating:3.3/3.4
K/A: 223002 A2.09 Rating:3.6/3.7
K/A: 223002 A4.03 Rating:3.6/3.5

License: RO/SRO Suggested Testing Environment: **CR**
(Circle One)

Actual Testing Environment: Simulator ___ Plant ___ CR X

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **5.0 min.**

Time Critical? NO X YES ___

STOP Time __________
START Time __________
ACTUAL Time __________

References: QCOP 1600-17 Rev. 3 BYPASSING THE GROUP II ISOLATION AND REACTOR BUILDING VENTILATION ISOLATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedure revision. No change to JPM technical content. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:______________________________
Signature:______________________________ Date:________________

QCNPS-JOB PERFORMANCE MEASURE

PERFORMANCE OBJECTIVE	STANDARDS	SAT UNSAT N/A

EVALUATOR: **ASK THE SHIFT MANAGER ON WHICH UNIT HE WOULD PREFER YOU TO PERFORM THIS JPM PRIOR TO READING THE INITIAL CONDITIONS TO THE CANDIDATE. UNIT 2 IS THE PREFERRED UNIT.**

INITIAL CONDITIONS

- A small leak inside the U-(1)2 Drywell has caused the pressure to creep to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor would like to restart the Reactor building ventilation per QGA 300.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to install the jumpers necessary to bypass the Reactor building ventilation isolation on U-(1)2 IAW QCOP 1600-17 so that ventilation can be restarted.

Start Time:________

Provide examinee with: QCOP 1600-17 when directed by cue.

EVALUATOR: **Do NOT allow the candidate to open the packet of jumpers!!**

EVALUATOR: **Disregard above statement if JPM is being performed in simulator.**

C.2.	Obtains procedure & jumpers.	Locates packet for QCOP 1600-17 in QGA equip. storage cabinet in CR.	[]	[]

C

CUE: You have jumpers & procedure. (Provide candidate with copy of QCOP 1600-17).

C.1.	Document procedure requiring installation.	Completes QCOP 1600-17 step C.1.	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.1.a.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts 49 & 50 on terminal board "B".	[]	[]	

**CUE: The jumper is installed on TB "B" pts. 49 & 50.
The jumper has been independently verified.**

*F.1.b.	Record jumper numbers and install 901(2)-15 panel jumpers.	Records jumper number and installs. Verbalizes placing jumper between pts. 38 & 39 on terminal board "E".	[]	[]	

**CUE: The jumper is installed on TB "E" pts. 38 & 39.
The jumper has been independently verified.**

F.3.	Return QCOP 1600-17 to US/SM.	Gives QCOP 1600-17 to US or SM.	[]	[]	
	Informs the US that the jumpers have been installed.	Informs the US the jumpers have been installed.	[]	[]	

CUE: The Unit Supervisor understands the jumpers have been installed.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- A small leak inside the U-(1)2 Drywell has caused the pressure to creep to 3.5 psig.
- All automatic functions occurred as expected.
- The MSIV room temperature has increased to 164°F and the Unit Supervisor would like to restart the Reactor building ventilation per QGA 300.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to install the jumpers necessary to bypass the Reactor building ventilation isolation on U-(1)2 IAW QCOP 1600-17 so that ventilation can be restarted.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name____
(print)

JPM: LS-052-I-F Rev.3 Revision by: G. Thennes

Task Title: **Uncoupled Control Rod During Reactor Startup to Criticality**

Station Approval:____________________________ Date:__________
(Exam Coordinator)

Operations Review:____________________________ Date:__________

Task References: L.O. S/R-0300-TP024 **K/A:** 201003A2.02 **Rating:**3.7/3.8
S/R-0302-EK026

License: RO/SRO **Suggested Testing Environment:**
(Circle One)

Actual Testing Environment: Simulator X Plant_ CR_

Testing Method: Simulate_ Perform X

Estimated Time to Complete: 20 **min.**

STOP TIME __________
START TIME:__________
ACTUAL TIME:__________

Time Critical? NO X YES__

References:			
	QCGP 1-1 Rev. 33	QCAN 901(2)-5 A-2 Rev. 0	QCOP 0207-01 Rev. 6
	QCGP 4-1 Rev. 16	QCOA 0300-03 Rev 8	QCOP 0300-07 Rev. 3

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory_ Unsatisfactory_

COMMENTS/REMEDIATION: Significantly modified startup JPM to add Uncoupled control rod failure. Minor procedure step changes incorporated. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name____________________________
Signature____________________________ Date:__________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-052-I-F

IC#: 91 (on Zip Disk)

Must copy IC from ZIP disc to IC file directory in RIS. MST must then be shut down and restarted for it to recognize new IC-91.

IC Description: BOL, Reactor S/U in progress, subcritical just below criticality

Reset the Simulator to IC#91
Take the simulator to RUN and verify Fast 1 is loaded in the RWM
Verify the RWM is initialized and correctly latched to the rod step.
Verify the correct insequence rod step is selected, then FREEZE the simulator until the evaluator cue.
Verify the Rod Sequence book is updated to the correct rod. Rod F-15 next rod out.
Keep the simulator in freeze until the candidate is ready to start this JPM.

Manual Actuation:

Place the SRM Recorder Selector Switches to monitor the highest 2 reading SRMs.

Place the SRM Recorder Speed Switch in FAST.

Once the candidate is ready to start the JPM, take the simulator to run.

Malfunctions: First rod withdrawn travels to the uncoupled position.
imf RD01R2259, control rod uncoupled 22-59, F-15.

Remotes: None

Overrides: None

Sim Operator: Need to verify rod moves as extra NSO.

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

-Reactor startup is in progress per QCGP 1-1 step F.4 and QCGP 4-1 step F.2.
-Reactor is subcritical.
-The QNE predicts the Reactor will go critical on Rod Step 6 with Rod H-13 @18 at a temperature of 182°F.
-All required briefings for the Reactor Startup have been completed.
-SRMs counts have doubled 3 times the initial count rate.
-An NSO is present and verifying the rod moves (QIV).

Initiating Cue: The Unit Supervisor directs you to continue the U-1 Reactor Startup and take the U-1 Reactor Critical on a period of 50 to 150 seconds. I am the acting NSO until you are ready to take the shift.

NOTE: When the candidate accepts the shift, take the simulator to RUN and start the JPM timeclock.

START TIME:_______________

Provide examinee with: QCGP 1-1 signed off through step F.4.d and a REMA for the Reactor Startup.

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.4	Withdraw Control Rods per QCGP 4-1.	Verifies correct control rod selected per control rod (F-15) seq. Sheet, QCIP 0930-07, Att. D..	[ ]	[ ]	[ ]
	Consults QIV for control rod verification.	Receives QIV.	[ ]	[ ]	[ ]
	Re-verifies correct control rod selected.	Re-verifies rod.	[ ]	[ ]	[ ]
	Withdraws selected control rod to desired position.	Withdraws rod F-15. Single notch from position 4-24 per rod seq. Sheet.	[ ]	[ ]	[ ]
	Monitors SRMs during Reactor Startup	Monitors period in attempt to establish SRM period of 50-150 seconds.	[ ]	[ ]	[ ]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A

Evaluator: JPM steps may occur in slightly different order due to procedure overlap between the QCOA and QCOS. The critical tasks are to enter the QCOA, enable the RWM, insert and disarm the control rod.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*B.1.	Responds to annunciator 901-5 A2, rod OVTRVL, using QCAN 901(2)-5 A2. May also respond to expected ann. A3 and B3. **NOT** a part of the critical task.	Verifies control rod F-15 position and determines at position 49 using Panel 901(2)-5, RWM main display screen, or OD-7, option 2.	[ ]	[ ]	[ ]
B.2.	Determines control rod F-15 is uncoupled and enters QCOA 0300-03.	Enters QCOA 0300-03.	[ ]	[ ]	[ ]
CUE (if necessary)	**The US will contact the lead nuclear engineer to determine previous history of rod uncoupling.**				
*D.1. (1.a)	Responds to uncoupled rod IAW QCOA 0300-03.	Enable RWM "Rod out-of-Service" option per QCOP 0207-01, step F.6.	[ ]	[ ]	[ ]
*F.6	Steps to enable OOS option IAW QCOP 0207-01..				
	a. Select secondary function	a. Selects sec. funct	[ ]	[ ]	[ ]
	b. Select Rod OOS	b. Selects rod OOS	[ ]	[ ]	[ ]
	c. Select rod F-15	c. Selects rod F-15	[ ]	[ ]	[ ]
	d. Verify F-15 in blue box.	d. Rod F-15 in blue box	[ ]	[ ]	[ ]
	e. Enter request for OOS	e. Request OOS	[ ]	[ ]	[ ]
	f. Drive F-15 to 00	f. Drive F-15 to 00	[ ]	[ ]	[ ]
CUE(if necessary)	**The US directs rod F-15 be driven to 00 IAW the QCOP 0207-01.**				

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6	Continue in QCOP 0207-01, step F.6.				
	g. Select exit function	Select exit function after F-15 at 00.	[ ]	[ ]	[ ]
	h. Verify F-15 is in light blue and has insert and withdraw blocks.	F-15 has insert and withdraw blocks.	[ ]	[ ]	[ ]
D.1	Continue to respond to uncoupled rod IAW QCOA 0300-03.				
(.c)	Electrically disarms rod F-15.	Informs the US of the need to electrically disarm rod F-15 per QCOP 0300-07.	[ ]	[ ]	[ ]
CUE(if necessary)	**The QNE will generate a Special Manuver Sheet, QCTP 0930-07, Att. G., when he arrives.**				

CUE: Unit Supervisor has initiated actions to have an NLO disarm the rod and has assigned another operator to complete the remaining steps.

EVALUATOR: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

-Reactor startup is in progress per QCGP 1-1 step F.4 and QCGP 4-1 step F.2.
-Reactor is subcritical.
-The QNE predicts the Reactor will go critical on Rod Step 6 with Rod H-13 @18 at a temperature of 182°F.
-All required briefings for the Reactor Startup have been completed.
-SRMs counts have doubled 3 times the initial count rate.
-An NSO is present and verifying the rod moves (QIV).

Initiating Cue: The Unit Supervisor directs you to continue the U-1 Reactor Startup and take the U-1 Reactor Critical on a period of 50 to 150 seconds. I am the acting NSO until you are ready to take the shift.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name:____
(print)

JPM: LS-005-II Rev: 13 Revised by: G. Thennes

Station Approval:____________________________ Date:__________
(Exam Coordinator)

Operations Review:____________________________ Date:__________

Task Title: Transfer Aux. Power from XFMR 11 to XFMR 12

Task References: S/R-0002-TP002 **K/A:** 262001 A4.02 **Rating:**3.4/3.4
K/A: 262001 A4.04 **Rating:**3.6/3.7

License: RO/SRO **Suggested Testing Environment:** Simulator
(Circle One)

Actual Testing Environment: Simulator X Plant ___ CR ___

Testing Method: Simulate ____ Perform X

Estimated Time to Complete: **4 min.** **STOP Time:**__________
START Time:__________
Time Critical: NO X YES____ **ACTUAL Time:**__________

References: QCGP 2-1 Rev. 28 NORMAL UNIT SHUTDOWN
QCOP 6500-09 Rev.3 ENERGIZING 4KV SWITCHGEAR AND TRANSFERRING AUXILIARY POWER

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Revised JPM to current procedures in use to transfer aux. power. No change of conduct of JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:________________________

Signature:______________________________ Date____________________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP SHEET

JPM: LS-005-II

IC#: 21 (or any other that will support this task.)

IC Description: The unit is operating at near rated power.

Manual Actuations: Ensure that the synchroscope key is located in the simulator near the 8 panel.

Malfunctions: NONE

Remotes: NONE

Overrides: NONE

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- The unit is operating at 100% power.
- Normal Unit Shutdown has just been directed.
- Shift Manager has directed Aux. Power transferred.
- Load Dispatcher (BPO) has given permission to transfer auxiliary power from XFMR 11 to XFMR 12.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to transfer Aux. power from Transformer 11 to Transformer 12.

START TIME ______________

Provide examinee with: Copy of QCGP 2-1

Additional Questions/Comments:____
____
____
____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Locates procedure QCGP 2-1 or QCOP 6500-09.	[]	[]	

CUE: Provide candidate with copy of QCGP 2-1 once the simulator copy is located.

IF candidate uses QCOP 6500-09, he will use the simulator copy. Inform the sim. operator of the need to replace the procedure.

EVALUATOR NOTE: The step numbers referenced in this JPM are found in QCGP 2-1. If the trainee uses QCOP 6500-09 the task completion is the same, however, the step numbers will be different.

EVALUATOR: **The order in which the busses are transferred is insignificant. The examinee may do steps F.3.b.(1) through F.3.b.(5). or step F.3.b.(6). through F.3.b.(10). first.**

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.b.(1)	Turn on synchroscope switch for XFMR 12 to Bus 11.	Insert synch key and rotate to on.	[]	[]	
F.3.b.(2)	Verify: XFMR 11 and XFMR 12 are in phase.	Verify: Synch scope at 12 o'clock and synch lights out.	[]	[]	[]
	Voltages are equal.	Running/incoming voltage equal.	[]	[]	[]
*F.3.b.(3)	Close XFMR 12 to Bus 11 ACB.	Positions bkr control switch to close.	[]	[]	
F.3.b(3)(a)	Verify breaker close indication.	Closed light lit.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.b(3)(b)	Verify alarm 901-8 D-1 Bus 11 Main & reserve ACB parallel lit.	901-8 D-1 "Bus 11 Main and Reserve ACB Parallel" alarm lit.	[]	[]	[]
F.3.b(3)(c)	Verify Amp indication XFMER 12 to Bus 11.	Amps indicated on the XFMER 12 to Bus 11 breaker ammeter on 901-8 panel.	[]	[]	
*F.3.b.(4)	Open XFMR 11 to Bus 11 breaker.	Position bkr control switch to trip.	[]	[]	
F.3.b(4)(a)	Verify breaker open indication.	Open light lit.	[]	[]	[]
F.3.b(4)(b)	Verify alarm 901-8 D-1 Bus 11 Main & Reserve ACB parallel resets.	Reset 901-8 D-1 "Bus 11 Main and Reserve ACB parallel" alarm.	[]	[]	[]
F.3.b(5)	Turn synchroscope switch off for XFMR 12 to Bus 11.	Rotate synch switch to off remove synch key.	[]	[]	
F.3.b(6)	Turn synchroscope switch on for XFMR 12 to Bus 14.	Insert synch key and rotate to on.	[]	[]	
F.3.b(7)(a)	Verify: XFMR 11 and XFRM 12 are in phase.	Verify: Synch scope at 12 o'clock and synch lights out.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.3.b.(8)	Close XFMR 12 to Bus 14 ACB.	Positions bkr control switch to close.	[]	[]	
F.3.b(8)(a)	Verify breaker close indication.	-Closed light lit.	[]	[]	[]
F.3.b(8)(b)	Verify alarm 901-8 B-5 Bus 14 Main and Reserve GCB parallel lit.	901-8 B-5 "Bus 14 Main and Reserve ACB Parallel" alarm lit.	[]	[]	[]
F.3.b(8)(c)	Verify amps indicated on XFMR 12 to Bus 14	Amps indicated on the XFMER 12 to Bus 14 breaker ammeter on the 901-8 Panel	[]	[]	[]
*F.3.b(9)	OPEN XFMR 11 to Bus 14 breaker.	Positions bkr control switch to trip.	[]	[]	
F.3.b(9)(a)	Verify breaker open indication.	-Open light lit.	[]	[]	[]
F.3.b(9)(b)	Verify alarm 901-8 B-5 Bus 14 Main & Reserve ACB parallel resets.	Reset 901-8 B-5 "Bus 14 Main and Reserve ACB Parallel" alarm.	[]	[]	[]

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.3.b(10)	Turn synchroscope switch off for XFMR 12 to Bus 14.	Rotate synch switch to off remove synch key.	[]	[]	
F.3.c.	NOTIFY the Bulk Power Operation (BPO) that transfer of auxiliary power from XFRM 11 to XFMR 12 is complete.	BPO notified.	[]	[]	

CUE: Acting as the Bulk Power Office respond you understand that the power transfer is complete.

	Candidate notifies US that transfer of auxiliary power from XFRM 11 to XFMR 12 is complete.	US notified.	[]	[]	

CUE: The US understands that the transfer of auxiliary power from XFRM 11 to XFMR 12 is complete

CUE: The JPM is complete.

Stop Time: ___________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The unit is operating at 100% power.
- Normal Unit Shutdown has just been directed.
- Shift Manager has directed Aux. Power transferred.
- Load Dispatcher (BPO) has given permission to transfer auxiliary power from XFMR 11 to XFMR 12.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to transfer Aux. power from Transformer 11 to Transformer 12.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name ____
(print)

JPM: LS-016-II Rev: 7 Revision by: G. Thennes

Station Approval: ____________________________ Date: _________
(Exam Coordinator)
Operations Review: ____________________________ Date: _________

Task Title: Bypass the Rod Worth Minimizer

Task References: S/R-0207-TP003 K/A:201006 A3.02 Rating:3.5/3.4
K/A:201006 A4.01 Rating:3.2/3.4

License: RO/SRO Suggested Testing Environment: **Simulator**
(Circle One)

Actual Testing Environment: Simulator _X_ Plant ___ CR ___

Testing Method: Simulate ____ Perform _X_

Estimated Time to Complete: **20.0 min.**

STOP Time __________
START Time __________
ACTUAL Time __________

Time Critical: NO _X_ YES _____

References: QCOP 207-2 Rev. 5 ROD WORTH MINIMIZER BYPASS CONTROL

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Procedure revision does not change the content of this JPM. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name: ______________________________
Signature: ______________________________ Date: ___________

QCNPS-JOB PERFORMANCE MEASURE

JPM SIMULATOR SETUP REQUIREMENTS

JPM: LS-16-II

IC#: 21 (or any other that will support this task.)

IC Description: The unit is operating at near rated power.

Manual Actuations:
-Prepare a Caution Card IAW QOP 207-2 step F.2.a.
-Verify RWM blocks enabled to full.
-Open rod sequence book to Step 43.
-Ensure demand printer is on and operating.

-Select Rod H-2 prior to initiating malfunction.
-Acknowledge annunciator once the malfunction is initiated.

Malfunctions: RD 19; FAILURE OF ALL RPIS INPUTS TO THE RWM
(imf rd19)

Remotes: NONE

Overrides: "A" and "B" RWM ready light.
(ior lohs10207ardy off)
(ior lohs10207brdy off)

QCNPS-JOB PERFORMANCE MEASURE

INITIAL CONDITIONS

- Reactor power is 100% percent of rated and in the process of a normal unit shutdown.
- RWM MODE SWITCH is in NORMAL.
- RWM TRANSFER SWITCH is selected to "A", with the "A" ON LINE light lit.
- Both RWM "A READY" and "B READY" lights are extinguished.
- Annunciator 901-5-B-3, ROD WORTH MIN BLOCK is illuminated.
- Sequence Step 43 @ 06
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to bypass the Rod Worth Minimizer IAW QCOP 0207-02, due to failed RPIS inputs.

START TIME ______

Provide examinee with: After applicant locates the procedure, provide with QCOP 0207-02. Provide a caution card when requested.

Additional Questions/Comments:____
____
____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtains QCOP 0207-2.	Locates QCOP 0207-02.	[]	[]	

CUE: Once candidate has located procedure, provide a copy of QCOP 0207-02

F.1.a.	Determines that both RWM computers are inoperable.	Initials the blank provided for step F.1.a.	[]	[]	
F.2.a.	Prepare a Caution Card to read, "RWM IN BYPASS."	Candidate attaches Caution Card to Rod Movement Control Switch.	[]	[]	

CUE: Provide the prepared Caution Card to the Examinee when actions are initiated to generate the caution card or if requested.

*F.2.b.	Place the RWM switch in bypass.	Moves the RWM Mode Select Switch to bypass.	[]	[]	
F.2.b.	Sign off step as complete.	Enters date and time in the blank provided.	[]	[]	
~~*~~F.3.(a)(1) PMS	Demands OD-7 Option 2 from the process computer.	Obtains OD-7 and determines that it is not displaying position.	[]	[]	

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
~~F~~.3.(a)(2) AMS	Enters rod positions on Attachment A.	Completes Attachment A.			
F.3.b.	Verifies rod pattern is correct.	Compares rod positions in the previous group moved **and** the present group **and** the next group to be moved to Attachment A. **and** initials step F.3.b.	[]	[]	
	Informs US that the rod positions are correct and the rod worth minimizer has been bypassed.	Informs US.	[]	[]	

CUE: The US understands that the rod positions are correct and the rod worth minimizer has been bypassed.

CUE: The JPM is complete.

Stop Time: ____________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- Reactor power is 100% percent of rated and in the process of a normal unit shutdown.
- RWM MODE SWITCH is in NORMAL.
- RWM TRANSFER SWITCH is selected to "A", with the "A" ON LINE light lit.
- Both RWM "A READY" and "B READY" lights are extinguished.
- Annunciator 901-5-B-3, ROD WORTH MIN BLOCK is illuminated.
- Sequence Step 43 @ 06
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to bypass the Rod Worth Minimizer IAW QCOP 0207-02, due to failed RPIS inputs.

QCNPS – JOB PERFORMANCE MEASURE (JPM)

Operator's Name ______________________________
(print)

JPM: LP-001-I Rev: 14 Revised by: G. Thennes

Task Title: Locally Start-up the HPCI System to Control RPV Level

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/B-2300-TP012 K/A:206000 2.1.30 Rating:3.9/3.4
K/A:206000 2.1.20 Rating:4.3/4.2

License: RO/SRO **Suggested Testing Environment:** Plant
(Circle One)

Actual Testing Environment: Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ___

Estimated Time to Complete: **20 min.** **STOP Time:**__________
START Time:__________
Time Critical: NO X YES_ **ACTUAL Time:**__________

References: QCOP 2300-08 Rev. 12 HPCI LOCAL MANUAL OPERATION

EVALUATION SUMMARY

The operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: Updated reference procedure number, minor change (to referenced) procedure step. Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name ______________________________
Signature: ______________________________ Date: __________

QCNPS – JOB PERFORMANCE MEASURE (JPM)

INITIAL CONDITIONS

- The need exists to utilize U-2 HPCI for level control per QGA 100 but, none of the Control Room controls are responding.
- The HPCI system is available and in standby per QCOP 2300-01 with suction from the CCST's.
- MO-2-2301-6 has been verified open and MO-2-2301-35 & 36 have been verified closed.
- The unit has scrammed.
- Drywell pressure is 1.3 psig.
- Reactor level is +15" decreasing at approximately 1"/min.
- The Shift Manager has ordered local operation of HPCI to add water to the vessel.
- You have a radio for communicating with the Control Room.
- The Control Room will be communicating with the TSC and an EO stationed at the 5 & 6 racks.
- HPCI turbine trips and isolations are cleared.
- All local valve control stations are available.
- An Equipment Operator has been dispatched to the D heater bay to open the HPCI pump discharge valve, MO-2-2301-8, when requested.
- The Diesel Generator Cooling water pump is ON.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to locally start-up the U-2 HPCI system to control reactor level IAW QCOP 2300-08.

Note: Do not start the clock until the candidate is in the HPCI Room.

Start Time:__________

Provide examinee with: None, a local procedure is available in the HPCI room. (copy of QCOP 2300-08 enclosed if the candidate asks for a copy)

Additional Questions/Comments:____

____

____

QCNPS – JOB PERFORMANCE MEASURE (JPM)

PERFORMANCE OBJECTIVE		STANDARDS	SAT	UNSAT	N/A
C.3	Obtain key for local vlv control stations. (Will be N/A if candidate chooses to break glass)	Obtains key for local vlv control stations from work execution center	[]	[]	[]

CUE: (if they choose to obtain the key)You have obtained the local vlv control station key.

F.4.d.(1)	Close HPCI stm line drn to mn cond.	Closes air supply to AO 2301-29 & 30 and opens air bleed petcock to AO-29 & 30.	[]	[]	

CUE: (Vlvs fail closed) Both air supplies have been rotated clockwise until they won't turn anymore, the petcocks have been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward vlv seat and has now stopped.

F.4.d.(2)	Open drn trap to drn pot vlv.	Closes air supply to AO 2301-28 and opens air bleed petcock to AO-28.	[]	[]	

CUE: (Vlv fails open) The air supply vlv has been rotated clockwise until it wouldn't turn anymore, the petcock has been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward the air operator and has now stopped.

F.4.e.	Start the GSL blower.	Depresses the GSL blower start pushbutton.	[]	[]	

CUE: The red light is lit.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.4.f.	Decrease MSC to LSS.	Rotates MSC handwheel clockwise to LSS (in front standard)	[]	[]	[]

CUE: The attempt is made to rotate the MSC handwheel clockwise but it will not move. (NOTE: Normally at LSS so won't turn)

CAUTION:	Locate air supply to drn valves.	Locates air supply to AO-64 & 65 vlvs.	[]	[]	[]
*F.4.g.	Open HPCI turb. stm supply vlv.	Uses key or breaks glass and depresses MO-2301-3 open PB.	[]	[]	

CUE: The red light is lit. *The trainee should indicate that he is watching the sump for steam.* After several seconds indicate that steam is issuing from the sump.

*F.4.h.	Close above seat drn to sump vlvs.	Closes air supply to AO 2301-64 & 65 and opens air bleed petcock to AO-64 & 65	[]	[]	

CUE: (Vlvs fail closed) Both air supplies have been rotated clockwise until they won't turn anymore, the petcocks have been rotated counter-clockwise and you could hear air bleeding from the press. reg. The vlv stem was moving toward vlv seat and has now stopped.

F.4.i.	Verify open min flow byp vlv.	Verifies MO 2301-14 vlv open light lit.	[]	[]	

CUE: The red light is lit.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.4.j.	Start the aux oil pmp.	Depresses the aux. oil pp. start pushbutton.	[]	[]	

CUE: The red light is lit.

*F.4.k.	Reset HPCI turbine and verify STOP valve opens.	Pulls turbine reset handle and verifies the stop valve opens (stem moves up).	[]	[]	

CUE: You have pulled reset handle. Indicate the stem is moving upward.

F.4.o.(1)	Verify open HPCI pmp discharge vlv.	Verified MO 2301-9 vlv open light lit or he may assume vlv is open from initial conditions.	[]	[]	[]

CUE: If candidate verifies open - the red light is lit.

*F.4.o.(2)	Open HPCI pmp disch vlv.	Contacts CR to have EO open MO 2301-8 vlv outside "D" htr bay.	[]	[]	

CUE: CR reports MO 2301-8 vlv is open.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.4.o.(3)	Start and increase turbine speed.	Rotates MSC handwheel counter-clockwise until turb. speed $\leq$ 4000 rpm & $\leq$ 1250 disch press. (Ind. on 2201(2)-29 rack)	[]	[]	

CUE: You have rotated the MSC counter-clockwise. (When candidate verifies indication) HPCI speed is ≈ 3800 rpm, disch press. is 1020 psig & CR reports that RPV level is -5" and slowly increasing.

F.4.o.(5)	Verify closed HPCI min flow byp vlv.	Verifies MO 2301-14 closed light is lit.	[]	[]	[]

CUE: The green light is lit.

F.4.o(6)	Stop aux. oil pmp.	Depresses aux. oil pmp stop PB.	[]	[]	

CUE: The green light is lit.

F.4.o.(7)	Verify emer. oil pmp off.	Verifies emergency oil pmp is off.	[]	[]	[]

CUE: The green light is lit. CR reports RPV level is +34". You need to decrease HPCI flow.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.4.o.(4) (b)	Decrease HPCI flow.	Rotates MSC handwheel clockwise. Any decrease in HPCI flow is adequate.	[]	[]	

CUE: RPV level is now holding steady at +35".

EVALUATOR: **The candidate should inform you that the task is complete. If the candidate does not stop at this point, the next step in the procedure, F.4.p.(8) & (9) is to monitor parameters. Provide the following cues for the desired indication.**

CUE:
-HPCI speed is 3750 rpm.
-Disch Press is 1000 psig.
-Suction pressure is 15 psig.
-Exhaust pressure is 25 psig.

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	The candidate should inform the US that U-2 HPCI has been locally started and is controlling reactor level.	Informs the US.	[]	[]	

CUE: The US understands that U-2 HPCI has been locally started and is controlling reactor level.

CUE: The JPM is complete.

Stop Time: ___________

QCNPS – JOB PERFORMANCE MEASURE (JPM)

CANDIDATE'S COPY

INITIAL CONDITIONS

- The need exists to utilize U-2 HPCI for level control per QGA 100 but, none of the Control Room controls are responding.
- The HPCI system is available and in standby per QCOP 2300-01 with suction from the CCST's.
- MO-2-2301-6 has been verified open and MO-2-2301-35 & 36 have been verified closed.
- The unit has scrammed.
- Drywell pressure is 1.3 psig.
- Reactor level is +15" decreasing at approximately 1"/min.
- The Shift Manager has ordered local operation of HPCI to add water to the vessel.
- You have a radio for communicating with the Control Room.
- The Control Room will be communicating with the TSC and an EO stationed at the 5 & 6 racks.
- HPCI turbine trips and isolations are cleared.
- All local valve control stations are available.
- An Equipment Operator has been dispatched to the D heater bay to open the HPCI pump discharge valve, MO-2-2301-8, when requested.
- The Diesel Generator Cooling water pump is ON.
- This JPM is not time critical.

Initiating Cue: The Unit Supervisor directs you to locally start-up the U-2 HPCI system to control reactor level IAW QCOP 2300-08.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name____
(print)

JPM: LP-026-I Rev. 7 Revision by: G. Thennes__________

Task Title: De-energize ADS Valves to Prevent Spurious Operation by Repositioning Inhibit Switch

Station Approval:_________________________________ Date:__________
(Exam Coordinator)

Operations Review:_________________________________ Date:__________

Task References: L.O. S/R/A/B-4100-TP021 K/A: 218000 A2.06 Rating: 4.2/4.3

License: RO/SRO Suggested Testing Environment: **Plant**
(Circle One)

Actual Testing Environment: Simulator_____ Plant X CR_____

Testing Method: Simulate X Perform_____

Estimated Time to Complete: **10.0 min.** **STOP TIME** ________
Maximum Time to Complete: **10.0 min.** **START TIME** ________
Time Critical? NO____ YES X **ACTUAL TIME**________

References: QCARP 500-01, Rev. 4 UNIT TWO INJECTION WITH SSMP, Att. D, (pg. 1of 18)
QCARP 0000-01, Rev.8 IMPLEMENTING PROCEDURE FOR APPENDIX R SAFE SHUTDOWN, E.18

EVALUATION SUMMARY

The Operator's performance is determined to be:
Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION: This revision brings the JPM up to the procedure revision. The JPM actions changed from pulling fuses to turning inhibit switch. Steps of this JPM shall be followed in order unless otherwise stated.

Evaluator's Name:____
Signature:____ Date:______________

QCNPS-JOB PERFORMANCE MEASURE

OBTAIN STA APPROVAL, THEN CHECK OUT A KEY FOR THE 902-32 PANEL, FROM THE WORK EXECUTION CENTER, PRIOR TO THIS JPM!

EVALUATOR: **Start this JPM in the vicinity of the WEC.**

INITIAL CONDITIONS

- The U-2 Cable spreading room has experienced a severe fire. The fire area is SB-I.
- The U-2 NSO has just scrammed the reactor and is performing all the IMMEDIATE OPERATOR ACTIONS of QCARP 0000-01.
- The Fire Brigade has suppressed the fire but the Shift Manager has determined that normal operating procedures are inadequate to bring the unit to a cold shutdown and that QCARP 0500-01 is the appropriate procedure to utilize for this condition.
- **This JPM is time critical**

Initiating Cue: The Unit Supervisor directs you as the U2 Admin. NSO to perform your block 1 (one) actions of QCARP 0500-01.

EVALUATOR: **Start the clock as soon as you have provided the candidate with the keys found in the QCARP toolbox and procedure (WEC area).**

START TIME:______________

Provide examinee with: QCARP 0500-01, ATTCH D and keys for the QCARP toolbox.

Additional Questions/Comments:____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
1.	Reports to the appropriate location.	Reports to aux. electric room panel 902-32 1E.	[]	[]	
*1.	Prevent relief vlv operation by placing the remote auto Blowdown Inhibit Switch 2-287-304A in INHIBIT.	Unlocks panel 902-32 and repositions switch to the INHIBIT position.	[]	[]	
CUE	**Point to the switch indicated by the candidate and state "The switch is here", point to the position selected by the candidate.**				
*2.	Notify U2 US.	Notifies U2 US that U-2 Admin NSO block 1 actions are complete. This is critical as the US can not continue actions until being informed that block 1 actions have been completed.	[]	[]	

CUE: The Unit Supervisor understands that your block 1 actions have been completed.

CUE: The JPM is complete.

STOP TIME:__________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- The U-2 Cable spreading room has experienced a severe fire. The fire area is SB-I.
- The U-2 NSO has just scrammed the reactor and is performing all the IMMEDIATE OPERATOR ACTIONS of QCARP 0000-01.
- The Fire Brigade has suppressed the fire but the Shift Manager has determined that normal operating procedures are inadequate to bring the unit to a cold shutdown and that QCARP 0500-01 is the appropriate procedure to utilize for this condition.
- **This JPM is time critical.**

Initiating Cue: The Unit Supervisor directs you as the U2 Admin. NSO to perform your block 1 (one) actions of QCARP 0500-01.

QCNPS-JOB PERFORMANCE MEASURE

Operator's Name: ______________________________
(print)

JPM: LP-003-I-F Rev: 10 Revision by: G. Thennes

Task Title: Locally start-up a Diesel Generator with a Failure of the Vent Fan to Start

Station Approval: [signature] Date: 2-3-00
(Exam Coordinator)

Operations Review: Mike Swegle Date: 2-3-00

Task References: S/R/A-6600-TP004 **K/A:**264000 2.1.30 **Rating:**3.9/3.4
K/A:600000 AA2.17 **Rating:**3.1/3.6

License: RO/SRO (Circle One) **Suggested Testing Environment:** Plant

Actual Testing Environment Simulator ___ Plant X CR ___

Testing Method: Simulate X Perform ____

Estimated Time to Complete: **10.0 min.** **STOP Time:**__________

START Time:__________

Time Critical? NO X YES ___ **ACTUAL Time:**__________

References: QCOP 6600-11 Rev. 13 DIESEL GENERATOR LOCAL OPERATION
LN-6600.R04, Emergency Diesel Generator, Rev. 4, pg. 18,62

EVALUATION SUMMARY

The operator's performance is determined to be:

Satisfactory _____ Unsatisfactory _____

COMMENTS/REMEDIATION Steps of this JPM shall be completed in order unless otherwise stated.

Evaluator's Name:______________________________

Signature:______________________________ Date:__________________

QCNPS-JOB PERFORMANCE MEASURE
INITIAL CONDITIONS

- A loss of off-site power has occurred on U-1. The U-1 Diesel failed to start.
- A fire in the plant has damaged fire detection cabling as indicated by control room alarms.
- A manual start from the Control Room was attempted but was not successful due to a faulty control switch.
- QCOA 6600-1 has been entered and other operators are taking action directed by that procedure.
- Electricians are investigating the cause of the failure to start.
- The Shift Manager has directed that the U-1 Diesel be started locally.
- The Diesel is in its normal standby line-up with the output breaker open as verified by the Control Room and an Equipment operator, locally.
- The Equipment Operator will standby to verify that the output breaker closes after the Diesel is up to speed, block the Auto- Start Relay as directed by QCOA 6600-1, and locally load the diesel as directed by the Control Room.
- Diesel day tank level is 90% and the storage tank level is 95%.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor directs you to locally start the U-1 Diesel Generator in accordance with QCOP 6600-11 and ensure the Diesel is operating properly.

Start time:_______

EVALUATOR: Do not start clock until the candidate is in the Diesel Generator Room.

Provide examinee with: None, a local procedure is available in the DG room.

Additional Questions/Comments____

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
	Obtain procedure to be used.	Obtains copy of QCOP 6600-11 (available in DG Room)	[]	[]	[]
F.2.	Verify maint. switch in "REMOTE AUTO START".	Verifies maint. switch in "up" position. (Engine panel)	[]	[]	[]

CUE: Point to the maintenance switch and state, "This switch is in the "up" position.

F.5.	Verifies "SPEED DROOP" set to "0".	At governor, ensures "SPEED DROOP" knob set on "0". (Top left knob)	[]	[]	[]

CUE: Point to "0" position on the speed droop knob and state, "This knob is here."

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
*F.6.	Isolate diesel controls.	Positions "Transfer switch" to "LOCAL" at the 2251-10 panel.	[]	[]	[]

CUE: Point to the local position on the transfer switch and state," This switch is in this position. Point to annunciator C-1 on the 2251-10 panel and state. "This annunciator is alarming."

F.7.	Notify plant personnel of Starting the engine.	Notifies the CR to announce the impending engine start, or uses page to announce it to the plant.	[]	[]	[]

CUE: As appropriate state, "I understand you are about to start the engine, I will make an announcement." or the announcement has been delivered to the plant via the page.

*F.8.	Start the engine.	Depresses "START" PB. (Engine panel)	[]	[]	

CUE: The diesel is rumbling and indicates 900 rpm. The E.O. at the bus reports that the output breaker has closed.

EVALUATOR: **In the following step, the red ind. light for the vent fan should be on, however this JPM simulates a trip of the Vent Fan Breaker therefore, when the operator looks at the fan indication both lights will be out.**

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.9.	Verify vent fan on.	Verifies fan red run light lit (on 37 panel) OR senses flow of air as exhaust dampers open.	[]	[]	[]

CUE: As appropriate state, "Both the red and green fan indicating lights are out" and "You DO NOT feel increased air flow."

EVALUATOR: According to the procedure, the operator will identify that the room fan is locked out due to cable damage per step E.3 of QCOP 6600-11. FP Bypass SW is moved to Bypass - Refer to QCOA 6600-08.

CUE: If the operator places the DG-1 Vent Fan on ALT FD per E.2 of QCOP 6600-11, the yellow alt. power light will not light and the fan will not start. Inform the candidate that "The yellow light is NOT lit and you DO NOT feel increased air flow."

CUE: Following actions by the candidate to get the key, inform the candidate he has the key to the lock box PNL 2251-37. The candidate may choose to simulate breaking the plexiglass to move the switch. If so, inform the candidate that the plexiglass is broken.

*E.3	Start Vent Fan.	Position the D.G. 1 Vent Fan Fire Prot. Bypass switch to Bypass (QCOA 6600-08, D.2.b.).	[]	[]	

CUE: As appropriate state, "The DG-1 Fan on FP Bypass red light is lit and you can feel air flow."

QCNPS-JOB PERFORMANCE MEASURE

	PERFORMANCE OBJECTIVE	STANDARDS	SAT	UNSAT	N/A
F.10.	Verify DGCWP on.	Verifies DGCWP red run light lit (on 37 panel) OR Verifies pressure on DG htx SW gauges. OR Observes flow meter outside DG room > 900 gpm.	[]	[]	[]

CUE: **As appropriate state, "The DGCWP red light is lit" OR, "The Diesel heat exchanger pressure gauges indicate 60 psig OR, "The flow meter indicates ≈950 gpm."**

CUE: **At the 2251-10 panel POINT to the following indications when the information is requested by the candidate.**

F.11.	Verify DG Frequency at 60hz.	Checks DG frequency meter	[]	[]	[]

CUE: **Point to 60HZ on the gauge and state "Frequency is here".**

F.12.	Verify DG Voltage at 4160.	Checks DG Voltage meter	[]	[]	[]

CUE: **Point to 4160 on the gauge and state "Voltage is here".**

	Report DG status to CR.	Reports to CR to provide them with the current status of the DG.	[]	[]	

CUE: **Provide cues as necessary depending on what the candidate reports to the CR. Inform the candidate that the US will not require any more load to be placed on the Diesel at this time.**

CUE: The JPM is complete.

STOP TIME: ________

QCNPS-JOB PERFORMANCE MEASURE

CANDIDATE'S COPY

INITIAL CONDITIONS

- A loss of off-site power has occurred on U-1. The U-1 Diesel failed to start.
- A fire in the plant has damaged fire detection cabling as indicated by control room alarms.
- A manual start from the Control Room was attempted but was not successful due to a faulty control switch.
- QCOA 6600-1 has been entered and other operators are taking action directed by that procedure.
- Electricians are investigating the cause of the failure to start.
- The Shift Manager has directed that the U-1 Diesel be started locally.
- The Diesel is in its normal standby line-up with the output breaker open as verified by the Control Room and an Equipment operator, locally.
- The Equipment Operator will standby to verify that the output breaker closes after the Diesel is up to speed, block the Auto- Start Relay as directed by QCOA 6600-1, and locally load the diesel as directed by the Control Room.
- Diesel day tank level is 90% and the storage tank level is 95%.
- This JPM is not time critical

Initiating Cue: The Unit Supervisor has directed you to locally start the U-1 Diesel Generator in accordance with QCOP 6600-11 and ensure the Diesel is operating properly.

FINAL AS-ADMINISTERED SCENARIOS

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Simulation Facility Exam Date:	Quad Cities 03-27-00	Scenario No.:1		Op Test No.: 1	
Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will continue rod withdrawal for heat up and pressurization. The BOP Operator will initiate chest warming. They will respond to a ADS timer logic failure. A CRD hydraulic pump trip will occur requiring the RO to start the standby CRD pump. RCIC will inadvertently autostart and the BOP will respond IAW the annunciator and the QCOP. They will respond to a IRM failure, reset the half scram and refer to TS. A steam leak will develop in the DW causing DW/P to rise to above 2.5 psig. ECCS injection will occur soon afterwards. All rods will not insert due to a hydraulic ATWS. The DG cooling water pump fails to start when the DG starts. ECCS injection will be terminated. The DG will be tripped due to loss of cooling and rods will be inserted per QCOP 0300-28. Boron injection will not be required.
Initial Conditions:	IC-94 412 psig Sequence Step 9.
Turnover:	Plant startup in progress. QCGP 1-1 is to be continued at step F.6.aa. Control rod withdrawal is to continue to raise reactor pressure to 950 psig. Startup of the first feed pump has been completed and turbine chest warming is to be initiated per QCOP 5600-04. No relief valve, RCIC or HPCI testing required.

Event No.	Malf. No.	Event Type*		Event Description
1	None	R	RO SRO	Continue rod withdrawal to maintain reactor pressurization.
2	None	N	BOP SRO	Initiate turbine chest warming.
3	RM02M	I	BOP SRO	ADS Timer Logic Failure
4	RD07A	C	RO SRO	CRD Hydraulic Pump 'A' Trip
5	Console Override RMCS04R	C	BOP SRO	Inadvertent RCIC Start
6	NM05C Severity 100%	I	RO SRO	IRM 13 High High, half scram
7	MS04C Severity 3%, Ramp 15:00	M	All SRO	Steam leak in the Drywell
8	DGCWP #1 Trip	C	BOP SRO	DG Cooling Water Pump fails to automatically start.
9	RD13A, Severity 100% RD13B, Severity 100%	M	All SRO	Reactor fail to scram, Hydraulic ATWS

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-01 Outline

1. Scenario will begin with a reactor startup in progress. Control rods are to be withdrawn to maintain reactor pressurization.

2. Per QCGP 1-1 step F. 6.j. the BOP operator will initiate main turbine chest warming.

3. Instrumentation for the ADS timer logic will malfunction alarming annunciator 90(2)-3 B-13. The crew will respond by resetting the timer and inhibiting ADS with the switch on the 901-3 panel. The SRO will refer to Technical Specifications.

4. CRD Hydraulic Pump 'A' will trip. The crew will respond IAW QCAN 901-5, B-2 and QCOA 0300-01. The standby pump will be started.

5. RCIC will inadvertently autostart due to a failure of the manual initiation push-button. The crew will take actions IAW QCAN 901-4 D-16 and QCOP 1300-05 to shutdown the system. If an attempt is made to restore the system to a standby lineup prior to identifying and rectifying the problem with the initiation push-button, the system will restart when the turbine trip reset button is depressed. The SRO will refer to Technical Specifications.

6. IRM 13 will fail High High resulting in a half scram. The IRM will be declared INOP and the SRO will refer to Technical Specifications. The crew will bypass the IRM and reset the half scram.

7. A steam leak develops in the DW. DW/P will slowly rise above the Primary Containment High Pressure Alarm setpoint (1.55 psig). The crew will respond IAW QCAN 901-3, A-16 and QCOA 0201-01. When drywell pressure exceeds 2.5 psig, the crew will enter QGA 100 and 200. Torus and drywell sprays will be initiated to control containment parameters and RHR flow controlled to prevent overfilling the reactor when all LP ECCS injection valves automatically open at 325 psig.

8. The DG Cooling Water Pump fails to start when it's respective DG starts. Cooling water flow cannot be established and the DG will be tripped.

9. Control rods do not insert due to a hydraulic ATWS and QGA 101 will be entered. Rods will be inserted per QCOP 0300-28 and when power falls below range 7 on IRMs the power leg is exited and QCGP 2-3 entered. Boron injection is not required.

The scenario will be terminated when the crew has control of RPV level and control rods are being inserted.

Based on the outline, the critical tasks are:
- Initiating Drywell Sprays.
- Inserting control rods following the ATWS IAW QCOP 0300-28 or QCGP 2-3.
- Controlling injection into the RPV to prevent fuel damage from a power excursion and overfilling the RPV.

<u>References</u>

QCAN 901(2)-4 D-16	Rev. 4	QCOP 0250-02	Rev. 4	QCOP 1600-20	Rev. 12
QCAN 901(2)-3 B-13	Rev. 3	QCGP 1-1	Rev.33	QCGP 4-1	Rev. 16
QCOP 0500-03	Rev 6	QCOP 5600-04	Rev. 2	QCGP 2-3	Rev. 32
QCAN 901(2)-3 A-16	Rev. 5	QCOS 1700-01	Rev. 5	QCOP 0700-02	Rev 7
QCAN 901(2)-3 C-16	Rev. 2	QCOA 0201-01	Rev. 11	QGA 100	Rev. 4
QCOP 0300-28	Rev 14	QGA 200	Rev. 6		

I. SIMULATOR SETUP

A. Initialize the simulator to IC94

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment Out Of Service

NONE

2. Power Level

a.	Recirc Pump Speed	32%
b.	MegaWatts Electric	0
c.	Reactor Power	0%

3. Miscellaneous Setup

a. Initial off steps in rod sequence book up to step 9, rod H-11.

b. Have copy of QCOP 5600-04 signed off up to step F.1.o.

c. Have copy of QCGP 1-1 signed off up to step F.6.aa.

d. Have copy of QCOS 0201-02 Attachment "A" "Heat up rate plot" filled out for 4 readings showing a slow heat up rate (5 degrees every 15 minutes).

e. Perform an OD-22 to show heat up rate #44 on monitor screen #2.

f. Have a prepared start-up REMA for use by the crew.

g. Ensure neutron instrumentation meters upscale, downscale, etc. lights are reset on back panels.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Copy IC94 from zip disc to IC files in RIS at instructor station. Shutdown MST and restart MST to allow the computer to read the new IC94. Reset simulator to IC 94.	**rst 94** **run**	
Verify annunciator horns are on.		
Hydraulically block both scram discharge volumes using malfunction RD13.	**imf RD13A 100** **imf RD13B 100**	
Prevent the unit 1 emergency diesel generator cooling water pump from autostarting upon an initiation signal.	**irf SW10R PTL**	
Set up turbine metal temperatures on recorder 5640-61 as follows: **In the action lists**, choose the "meters" tab, select "AOTR1564061F" and fill in "ramp start value" as 281, "override value" as 289, and "ramp time" as 60:00 (60 minutes). This overrides the initial metal temperature for point #6 to 281 and simulates a gradual increase due to shell warming.	**In the action list,** select meters tab and type: **AOTR1564061F** **Ramp start value = 281** **Override value = 289** **Ramp time = 60:00**	
Check load set @ zero.		
Check pressure set @ ~75 greater than reactor pressure to keep alarm clear.		
Check RWM is initialized and the sequence is "FAST1"		
Sign steps in rod sequence book up to step 9, rod F-3. Reset neutron monitor lights around back panels. Have copies of the following procedures: QCOP 5600-04 signed off up to step F.1.o. QCGP 1-1 signed off up to step F.6.aa. QCOS 0201-02 Attachment "A" "Heat up rate plot" filled out for 4 readings showing a slow heat up rate (5 degrees every 15 minutes).		
Perform an OD-22 to show heat up rate #44 on monitor screen #2.		
Have a start-up REMA prepared for use by crew.		
Ensure the White Board on the 901-55 panel is clean.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

   a. Unit 1 is starting up following a short maintenance outage and is currently at 0 MWe; Rod Step 9 is partially withdrawn; QCGP 1-1 is in progress at Step F.6.aa. Shell warming is in progress.

   b. Unit 2 is at approximately 100% power.

   c. Normal electric plant lineup.

   d. Tech Spec limitations:

      (1) Unit 1: NONE

      (2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

   a. Continue with unit startup IAW QCGP 1-1, @ Step F.6.aa. The HLA brief is complete for the start-up. Establish a heat up rate of less than 100 degrees/hour. Maintain pressure set 50 psig greater than reactor pressure IAW QCGP 1-1 F. 6.w.(3)
   A QNE is standing by in the control room. (The surrogate STA may fill the role of the QNE)

   b. Transfer from shell to chest warming per QCOP 5600-04. (No relief valve, HPCI or RCIC testing is required.)

   c. Reactor heat-up rate and turbine metal temperature monitoring is being recorded and tracked by another NSO.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1 Scenario No.: 1 Event No.: 1

Event Description: Pulls rods to establish a heat-up rate of <100°/hour and maintains reactor vessel pressurization during chest warming.- QCGP 1-1, Step F.6.aa.

Time	Position	Applicant's Actions or Behavior
	SRO	• Briefs crew on upcoming evolutions. • Reviews REMA
	RO	• Pulls control rods to establish a heat-up rate of less than 100 degrees/hour IAW QCGP 4-1. • Monitors reactor during shell/chest warming for proper operation. • Maintain pressure regulator setpoint 50 psig > Reactor pressure using the "A" pressure regulator
	BOP	• Secures shell warming IAW QCOP 5600-04 F.2. by pressing the decrease pushbutton on CHEST/SHELL WARMING SELECTOR to stop steam flow. • When MAIN STOP VALVE POSITION DEMAND FOR CHEST/SHELL WARMING meter indicates 0% • Press the OFF pushbutton on CHEST/SHELL WARMING SELECTOR and verifies OFF pushbutton is lit • Verifies that Main Stop Valve #2 Closed, all CONTROL VALVE POSITION indicates zero, and ISV's OPEN after a period of time • Logs time shell warming secured and point #2 & #6 values from TR 1-5640-61 • May need to respond to annunciator 901-7 B-1 as reactor pressure increases to advance pressure setpoint. (expected alarm)
	SRO	• Verifies operator actions and concurs or directs subsequent actions.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: During validation, approximately a one degree per minute heat-up rate was established after pulling 6 rods. **<u>WHEN</u>** performing Shell/Chest Warming, **<u>THEN</u>** steam should be admitted slowly and/or should be changed in small increments for the duration of the Chest Warming to avoid excessive Reactor pressure transients.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 2

Event Description: Initiate turbine chest warming.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs chest warming. • Verifies operator actions and concurs or directs subsequent actions.
	BOP	• Verifies MAIN STOP VLV POS DEMAND FOR CHEST/SHELL WARMING meter is at zero. • Verifies ALL VALVES CLOSED is selected on SPEED SET RPM selector. • Verifies Main Turbine reset. • Verifies Main Turbine remains on Turning Gear **OR** **NOT** at rest. • Presses OFF pushbutton on CHEST/SHELL WARMING SELECTOR. • Momentarily presses INCREASE pushbutton as necessary on CHEST/SHELL WARMING SELECTOR to admit steam. • Verifies MSV2 begins to OPEN. • Verifies STEAM CHEST temperature rises. • Adjusts steam flow to maintain the following as indicated on TR 1(2)-5640-61: • Verifies Point #4, STEAM CHEST INNER surface heatup rate less than 150°F/hr. • Verifies differential temperature between Point #4, STEAM CHEST INNER surface temperature **AND** Point #5, STEAM CHEST OUTER surface temperature in accordance with Attachment B.

Comments: ______

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: The surrogate STA may role play as the QNE as needed.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 3

Event Description: ADS Timer Logic Failure

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Annunciator 901-3 B-13 alarms • Refers to annunciator procedure. • Checks and determines that valid initiation conditions are not present. • Depresses and holds timer reset push-button for 3 seconds and checks to see if alarm has cleared. • Determines alarm not reset or cleared and inhibits ADS using keylock switch. • Notifies US that ADS is inhibited and to refer to QCAP 0230-19.
	SRO	• Refers to Technical Specification 3.5.A.4. and determines ADS inoperable and enters a 12 hours shutdown LCO. • Verifies immediate operator actions and concurs with or directs subsequent actions • Contacts maintenance to effect repairs.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event # 3, override annunciator 901-3 B-13 ON using malfunction ano9013B13.	**Imf ano9013b13 ON**	
ROLE PLAY: If dispatched as Electrical or Instrument Maintenance to investigate the ADS timer failure, report that you will start a troubleshooting work package ASAP.		
When or if directed by the Chief Examiner, delete the ADS timer malfunction.	**dmf ano9013b13**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 4

Event Description: CRD Hydraulic Pump "A" Trip

Time	Position	Applicant's Actions or Behavior
	RO This event should be initiated while the BOP is occupied with the ADS timer malfunction to allow the RO to receive credit for a component failure.	• References QCAN 901-5 B-2 for CRD pump trip • Closes or verify closed MO 1(2)-301-2A/B 1(2) A/B PMP DISCH VLV for the standby pump. • Starts the standby pump. • Verify steady-state current is <34 amps on 1(2)-302-1A/B. • Throttle MO 1(2)-301-2A/B, 1(2)A/B PMP DISCH VLV to maintain 1400-1500 psig discharge pressure. • Closes MO 1(2)-301-2A/B, 1(2)A/B CRD PMP DSCH VLV on the tripped pump. • Dispatches an operator to verify proper operation of the running pump/cause of "A" pump trip. • Refers to QCOA 0300-01.
	SRO	• Verifies operator actions and concurs or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the ADS timer malfunction to allow the RO to receive credit for a component failure.		
When directed by the Chief Examiner to insert event #4, insert a trip of the 1A CRD pump using RD07A	**Imf RD07A**	
ROLE PLAY: As NLO dispatched to investigate the 1A CRD pump trip, report back in 5 minutes that the pump is very hot and the breaker has a timed overcurrent target up. If asked to check out the 1B pump, after it is started wait 2 minutes and report that it appears to be operating normally.		

Op-Test No.: 1 Scenario No.: 1 Event No.: 5

Event Description: Inadvertent RCIC Initiation

Time	Position	Applicant's Actions or Behavior
	BOP/RO	• Refers to annunciator 901(2)-4 D-16. • Verifies the automatic actions occurred and checks for signs of a valid initiation signal. • Determines no valid initiation signal exists and shuts down RCIC IAW QCOP 1300-05. • Depresses TURB TRIP pushbutton. • Verifies closed the following valves MO 1-1301-61 and 60 • Verifies pump discharge flow decreases to zero on FIC 1-1340-1. • Verifies turbine speed decreases to zero on 1-1340-501. • Verifes closed the following valves, MO 1-1301-49, 62, 53, and 1-2301-15 (HPCI) • Attempts to shutdown the turbine vacuum pump and condensate pump(these will stay running due to initiation signal still present) • Verifies FIC 1-1340-1 in Auto and set at 400 gpm. • Resets INITIATION SIGNAL SEAL-IN AND RESET button. • Resets Turbine Trip by pressing the TURB RESET button(unless malfunction has been cleared by sim op, turbine will restart) • Notifies US that system will not be able to be reset and placed back into a standby condition until malfunction is repaired.
	SRO	• Checks Technical Specifications (14 day LCO) • Verifies operator actions and concurs or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, insert an override of the RCIC manual initiation pushbutton using override DIHS11300RMI	**Ior dihs11300rmi ON**	
ROLE PLAY: If dispatched as Electrical or Instrument Maintenance to investigate the RCIC inadvertent start, report that you will start a troubleshooting work package ASAP.		
When or if directed by the Chief Examiner, delete the override on the RCIC manual initiation pushbutton to allow the crew to restore RCIC to a standby lineup if desired.	**Dor dihs11300rmi**	

)p-Test No.: 1	Scenario No.: 1	Event No.: 6

Event Description: IRM 13 High High, Half Scram

Time	Position	Applicant's Actions or Behavior
	RO/BOP This event should be initiated while the BOP is occupied with the RCIC inadvertent start to allow the RO to receive credit for an instrument failure.	• Verifies that Automatic Actions occur, half scram on "A" channel. • Monitors IRM indicating lights on 901(2)-5 panel and determines if alarm was caused by IRM high-high or IRM INOP. • Verifies IRMs at proper range per QCOP 0700-02. • Notifies Instrument Maintenance. • Positions appropriate IRM joy stick to • bypass IRM channel. • Verifies white BYPASS light is on for IRM 13. • Resets ½ scram IAW QCOP 0500-03.
	SRO	• Checks Technical Specifications and determines that minimum number of operable channels of IRMs met. • Directs RO to bypass the failed IRM and to reset the ½ scram. • Verifies operator actions and concurs or directs subsequent actions.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the RCIC inadvertent start to allow the RO to receive credit for an instrument failure.		
When instructed by the Chief Examiner to insert event #6, fail IRM 13 upscale using malfunction NM05C.	**Imf NM05C 100**	

Op-Test No.: 1 Scenario No.: 1 Event No.: 7

Event Description: Steam Leak in the DW

Time	Position	Applicant's Actions or Behavior
	SRO	• Verifies immediate operator actions and concurs with or directs subsequent actions of QCOA 0201-01. • Sets scram criteria • Enters QGA 100 and 200 if drywell pressure reaches 2.5 psig. • Orders the 7th drywell cooler started • Monitors torus water temperature and initiate torus cooling at >90°F in the torus.
	BOP/RO	• Investigates the cause of increasing drywell pressure IAW QCOA 0201-01. • Starts the 7th drywell cooler. • Notifies RP of increasing drywell pressure. • Verifies proper line-up for inerting drywell.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #7, insert a steam leak in the "C" main steam line using malfunction MS04C. NOTE: Chief Examiner may change the rate or size of the steam leak to speed up the scenario if desired.	**Imf MS04C 3 15:00**	

Op-Test No.: 1	Scenario No.: 1	Event No.: 8 & 9

Event Description: Reactor Fail to Scram, Hydraulic ATWS, & U-1 EDGCWP fails to autostart.

Time	Position	Applicant's Actions or Behavior
	RO	• Scrams reactor, places Mode Switch in SHUTDOWN, activates ARI, rods do not insert, reports failure to scram to US, runs recirculation pumps to minimum
Critical Task	SRO	• Directs actions of QGA 100 and QGA 101. • Orders ADS inhibited, Core Spray injection prevented • Orders isolations and automatic actions verified for +8" and 2.5 psig. • Orders performance of QCOP 0250-02 by U-2 Admin NSO. • Orders reactor level maintained between 166" and +48" with condensate/feedwater. • Orders control rods inserted IAW QCOP 0300-28 or with QCGP 2-3 when power leg is exited. • Exits power leg when reactor power below IRM range 7
Critical Task Critical Task	RO/BOP	• Inhibits HPCI injection • Inhibits ADS. • Places core spray pumps in PTL. • Verifies isolations and automatic actions for +8" and 2.5 psig, reports that unit 1 EDGCWP did not autostart and dispatches an operator. • Reports recirc pumps tripped. • Performs QCOP 0300-28 actions, or QCGP 2-3 to insert control rods. • Directs NLO to close CRD 25 valve if necessary. • Ranges IRMs and informs US power below IRM range 7.

Comments: ______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: Can't enter QGA 101 unless QGA 100 entered first. During validation, US had to wait until 2.5 psig was reached in drywell due to low initial power.		
ROLE PLAY:		
As U-2, when directed, install QGA jumpers per QCOP 0250-02 to bypass isolations in QGA 101 using QG09R. Wait 3 minutes before reporting that the jumpers are installed.	**Irf qg09r activate**	
As U-2, when directed, install QGA jumpers per QCOP 0300-28 to bypass automatic scram signals using QG08R. Wait 3 minutes before reporting that the jumpers are installed.	**Irf qg08r activate**	

Op-Test No.: 1	Scenario No.: 1	Event No.: 9 con't

Event Description: Reactor Fail to Scram, Hydraulic ATWS continued...

Time	Position	Applicant's Actions or Behavior
Critical Task	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Directs recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Verifies CAMS started.
Critical Task Critical Task	RO/BOP	• Initiates torus sprays • Verifies recirc pumps tripped. • Verifies drywell coolers tripped. • Initiates drywell sprays. • Controls RHR flow to maintain containment pressure decrease while preventing injection if not needed.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
The scenario will be terminated when the crew has control of RPV level and control rods are being inserted.		

Simulation Facility Exam Date:	Quad Cities 3/27/00	Scenario No 2		Op Test No 1	
Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	The crew will respond to a controller failure during performance of the SBGTS monthly surveillance. A APRM fails hi resulting in a half-scram. The crew bypasses the APRM and resets the half-scram. High vibration will be indicated on the "A" RR pump. Reactor power will be reduced with flow. The vibrations will cause gross seal degradation and eventually a RR suction line break. Actions taken to isolate the leak will be unsuccessful and DW/P will rise to above 2.5 psig. All LP and HP ECCS systems will receive an initiation signal. All feedwater pumps will trip on low suction pressure. HPCI will not inject due to a controller failure until the crew takes manual control of the HPCI controller. QGA 100 and 200 will be entered. The first loop of torus spray selected will not operate, the second loop will operate. One set of SDV drain valves will not autoclose when the scram occurs. The RO will close the valves from the 901-5 panel.
Initial Conditions:	IC 21, 100 % power. "C" Reactor Feed Pump is tagged OOS.
Turnover:	Plant is presently at 100% power. "C" Reactor Feed Pump is tagged OOS for a bearing inspection. Monthly operability test QCOS 7500-05 for "B" SBGT train is to be performed following shift turnover.

Event No.	Malf. No.	Event Type*		Event Description
1	None	N	BOP SRO	Perform monthly SBGTS operability surveillance.
	NM08A.100	I	RO SRO	APRM Channel "A" fails high/high
3	PC11B 40	I	BOP SRO	SBGTS flow controller fails to allow required system flow.
4	ANO9014C3 Alarm_on	R	RO SRO	Reduces core flow in response to high recirculation pump vibrations.
5	RR06A 100 5: RR07A 100 6:	C	BOP SRO	Recirculation pump seal failure
6	RR10B 5 10:00	M	BOP RO SRO	Recirculation pump suction line break. Increase failure to 5% over a 10 minute ramp time.
7	RD23A	C	RO SRO	Scram discharge volume drain valve sticks open. Removed by event trigger when close pushbutton is depressed.
8	Batch file for MO 1001-37A&B	C	BOP SRO	The selected torus spray valve fails to open(breaker trips), however the other loop valve will operate.
9	HP09 40	I	BOP SRO	HPCI controller failure prevents injection into the RPV in automatic. Manual operation possible. Inserted on a trigger on HPCI speed >0.5rpm.

*(N)ormal, (R)eactivity (I)nstrument, (C)omponent, (M)ajor Transient

Scenario 2000-02 Outline

1. Scenario will begin with the reactor at 100% power. "B" SBGT monthly operability surveillance is to be completed per QCOS 7500-05.

2. An APRM 'A' will fail hi resulting in a half-scram. The reactor operator will bypass the APRM and reset the half-scram. The SRO will refer to and comply with Technical Specifications for loss of one APRM.

3. A failure of the SBGT controller prevents satisfactory surveillance and the "B" SBGT system will be shutdown and declared inoperable. The SRO will refer to and comply with Technical Specifications for SBGTS inoperative.

4. High vibration is annunciated on recirculation pump "A". The alarm cannot be reset and reactor power is lowered with RRC flow as directed by QCAN 901-4 C-3 and IAW QCGP 3-1.

5. As flow/power is being lowered RRC seal failure is indicated on the "A" RRC pump. [The failure degrades rapidly causing DW/T and DW/P to rise.]

6. Excessive vibrations cause a suction line break on the "A" RRC pump. DW/P and DW/T continue to rise. The reactor should be scrammed as a conservative action before DW/P reaches the trip setpoint. QGA 100 and 200 will be entered and executed.

7. Torus sprays will be directed, but the spray valve for the selected loop will not open when the valve is stroked. The other loop can be initiated successfully.

8. All feedwater pumps will trip on low suction pressure. A HPCI controller failure will prevent proper initiation and injection. This failure will be identified and reported and manual operation of HPCI will be needed for level control.

9. One set of SDV drain valves fails to close on the scram. The Reactor Operator will close the valves from the 901-5 panel IAW QCGP 2-3.

The scenario will be terminated when the crew has stabilized RPV level above TAF, initiated containment sprays and containment parameters are stable.

Based on the outline, the critical tasks are:

- Initiating Drywell Sprays.
- Isolating the SDV drain valves following the scram.
- Maintaining RPV water level above TAF.

References

QCOS 7500-05	Rev. 18	QCOP 0700-04	Rev. 5
QCOP 0500-03	Rev. 6	QCOP 1600-12	Rev. 7
QCAN 901(2)-5 A-6	Rev. 3	QCAP 0230-19	Rev. 8
QCAN 901(2)-4 C-3	Rev. 3	QCOA 0202-04	Rev. 11
QCOA 0202-06	Rev. 11		
QGA 100	Rev. 4		
QGA 200	Rev. 6		
QCGP 2-3	Rev. 32		
QCGP 3-1	Rev. 19		
QCOP 1000-30	Rev. 11		

I. SIMULATOR SETUP

A. Initialize the simulator to IC 21 .

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (4)

"C" Reactor Feed Pump
both supply breakers bus 11 & 12 (PTL)
auxiliary oil pump (PTL)
pump discharge valve (CLOSED)
place RFP selector switch to OFF
verify standby light on "C" feedpump OFF

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	820
c.	Reactor Power	100%

3. Miscellaneous Setup

a. Ensure adequate number of LPRMs per level in 901-37 panel.

b. Provide a copy of QCOS 7500-05 marked up appropriately for the B train of SBGT with prerequisites section completed.

c. Have Caution Cards and Action Request Tags available.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC21.	**rst 21** **run**	
Verify annunciator horns are on.		
Fail the "B" SBGTS flow controller using malfunction PC11B @ 40% severity.	**imf pc11b 40**	
Fail the HPCI flow controller using malfunction HP09 @ 40% severity and assign to trigger 1	**Select event trigger button.** **Select trigger #1.** **Select HPCI speed > 0.5 rpm from the pulldown menu.** **Enter command imf HP09 40** **Select accept new event.**	
Place Rx feedpump selector switch to OFF and override the standby light OFF using override	**Ior lohs13201C1 OFF**	
Fail the scram discharge volume drain valves to stick open using malfunction RD23B.	**IMF RD23B**	
Assign trigger 2 to delete malfunction RD23B when the south scram discharge volume drain valve close pushbutton is depressed.	**Trg 2 1030222sdvclose**	
Assign the command to delete malfunction rd23b to trigger 2. NOTE make sure you enclose the command in quotation marks as written	**Trg 2 "dmf rd23b"**	
Copy files "Torusspray37Atrip" & "Torusspray37Btrip" from zip disc to trigger directory in RIS on sim computer.		
Copy batch file "torusspray37abtrip" from zip disc to batch directory in RIS on simulator computer.		
Trip the breaker on the first selected torus spray valve using batch file torusspray37abtrip	**Bat torusspray37abtrip**	
Assign trigger 3 to trip all of the Rx feed pumps when 2.5 psig is reached in the drywell.	**Select event trigger button.** **Select trigger #3.** **Select drywell pressure greater than 2.5 psig from the pulldown menu.** **Enter command bat fwlowlow** **Select accept new event.**	
Ensure the White Board on the 901-55 panel is clean.		
Provide a copy of QCOS 7500-05 marked up appropriately for the B train of SBGT with prerequisites section completed.		
Ensure adequate number of LPRMs per level in 901-37 panel.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is at approximately 100% power.

b. Unit 2 is in day 6 of a 20 day refueling outage.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: NONE

(2) Unit 2: NONE.

2. Significant problems/abnormalities:

"C" reactor feed pump is OOS for bearing replacement.

3. Evolutions/maintenance for the oncoming shift:

a. Continue to operate the plant IAW operating procedures.

b. The monthly operability surveillance for "B" train of SBGTS IAW QCOS 7500-05 following shift turnover.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1 Scenario No.: 2 Event No.: 1 & 3

Event Description: Perform SBGTS Monthly Operability Surveillance IAW QCOS 7500-05

Time	Position	Applicant's Actions or Behavior
	SRO	Approves start of QCOS 7500-05 for "B" Train Operability Testing of SBGTS
	BOP	• Records run time for "B"SBGTS train from NLO at local panel • Verify 1-7503 U1 RB INLET DMPR TO SBGTS **AND/OR** 2-7503 U2 RB INLET DMPR TO SBGTS are open • Place the 1/2B SBGTS TRAIN MODE SELECTOR SWITCH to B START • Verify the ½-7504B TURB BLDG CLG AIR DMPR closed • Verify the ½-7505B INLET DMPR open • Verify the ½-7506B 1/2B SBGTS FAN on • Verify the ½-7503B SBGTS AIR HTR on. • Verify the ½-7507B, 1/2 SBGTS FAN DISCH DMPR open. • Verify ½-7540-13B SBGTS flow on 1/2B SBGTS FLOW is 3600 to 4400 scfm and record • Recognizes inability to achieve proper flowrate and notifies US.
	SRO	• Refers to Technical Specifications and determines per 3.7.P. action 1 that the plant is in a 7 day LCO and must stop fuel moves, core alterations, and operations that could have the potential to drain the reactor vessel on U-2. • Directs shutdown of the system per the procedure or dispatches maintenance personnel to investigate the problem. • Verifies operator action and concurs with or directs subsequent actions.
	BOP	• Shuts down the system per the procedure or dispatches maintenance personnel to investigate the problem.

nments:____________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
ROLE PLAY: As NLO at the SBGTS train, when asked for "B" train run time meter reading, immediately report that the meter reads 2468.2 hours. If asked, as NLO, for a local flow indication, report flow @ 3400 scfm. If asked, as NLO, for final run time, report in hours and tenths of hours. One tenth for every six minutes they leave the train run.		

Op-Test No.: 1 Scenario No.: 2 Event No.: 2

Event Description: "A" APRM Fails Upscale Resulting in a ½ Scram

Time	Position	Applicant's Actions or Behavior
	RO Initiate while the BOP is occupied with SBGT .	• Refers to QCAN 901-5 A-6 annunciator procedure • Checks for core instabilities (APRMs cycling 2-3 seconds) • Checks for High indications on individual LPRMs for that channel
	SRO	• Determines individual failure of APRM #1 • Checks Technical Specifications 3.1.A.1 & 3.2.E.1. and determines adequate number of operable channels and no LCO. • Directs RO to bypass APRM #1 with QCOP 0700-04 and to reset the ½ scram per QCOP 0500-03. • Initiates QCAP 0230-19 "Outage Report" for tracking purposes.
	RO	• Positions APRM #1 joystick to bypass and verifies the white bypass light illuminates for APRM #1.
	RO	• Resets ½ scram by placing the SCRAM RESET SWITCH to positions group2 and 3, then to group1 and 4 and verifies annunciator 901-5 D10 clears and scram solenoid channel "A" lights illuminate.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event should be initiated while the BOP is occupied with the SBGT surveillance to allow the RO to receive credit for an instrument failure.		
When directed by the Chief Examiner to insert event #2, fail the channel 1 "A" APRM upscale using malfunction nm08a @100% severity with no ramp time.	**Imf nm08a 100**	
Provide the crew with a Caution Card or Action Request tag when requested.		

Op-Test No.: 1 Scenario No.: 2 Event No.: 4

vent Description: Recirculation Pump 1A High Vibrations

Time	Position	Applicant's Actions or Behavior
	RO This event is the reactivity change for the RO and the BOP should be precluded from adjusting recirculation pump speeds.	• Refers to annunciator procedure QCAN 901-4 C3 • Attempts to reset vibration monitor by depressing PUMP VIBRATION MONITOR RESET pushbutton • Reduces both recirculation pumps speeds to 78%. • Reviews current performance of both recirculation pumps for abnormalities. • Contacts Vibration Engineer to begin evaluating recirculation pump vibration data. • Notifies US of vibration problem and actions taken.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions.

mments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: This event is the reactivity change for the RO and the BOP should be precluded from adjusting recirculation pump speeds if at all possible to allow the RO to receive credit for a reactivity manipulation.		
When directed by the Chief Examiner to insert event #4, override annunciator 901-4 C3 "recirc pump A high vibration" using malfunction ano9014c3	**Imf ano9014c3 on**	

Op-Test No.: 1 Scenario No.: 2 Event No.: 5

Event Description: Recirculation Pump 1A Seal Failure.

Time	Position	Applicant's Actions or Behavior
	BOP	• Refers to QCOA 0202-06. • Monitors pump seal pressures and temperatures • Monitors drywell pressure and temperature. • Dispatches NLO to check local seal indication. • When drywell pressure increases, trips the 1A recirculation pump using the generator drive motor control switch. • Verifies the recirculation pump trips. • Closes the 1-202-4A pump suction valve. • Closes the 1-202-5A pump discharge valve. • Refers to QCOA 0202-04.
	SRO	• Verifies operator actions and concurs with or directs subsequent action.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, fail both of the 1A recirc pump seal by inserting the following:		
Fail the inboard reactor recirc pump seal using malfunction RR06a @ 100% severity over a five minute ramp time.	**imf rr06a 100 5:00**	
Fail the outboard reactor recirc pump seal using malfunction RR07a @ 100% severity over a six minute ramp time .	**imf rr07a 100 6:00**	
When "A" recirculation pump is tripped trigger 4 should delete annunciator override on vibration monitor. If the annunciator stays up, manually delete the override using command dor ano9014C3.	**Select event trigger button.** **Select trigger #4.** **Type in .NOT.RR:MTR1020251A in the event.** **Enter command dmf ano9014C3** **Select accept new event.** **Select finish.**	
NOTE: If crew isolates the recirculation pump quickly, drywell pressure may not rise to the point that they scram the reactor. The next event breaks the recirculation loop to increase drywell pressure to the point of reactor scram.		

Op-Test No.: 1 Scenario No.: 2 Event No.:6,&,8

vent Description: "A" Recirculation Loop Suction Line Break

Time	Position	Applicant's Actions or Behavior
	ALL	• Drywell pressure increase noted and reactor scrammed.
	RO	• Reports all rods in, water level recovering, reactor pressure normal, and +8" QGA entry condition.
	SRO	• Directs the actions of QGA 100 at 2.5 psig in the drywell. • Directs performance of QCGP 2-3. • Directs that automatic isolations, ECCS and EDG starts verified. • Directs reactor level be controlled between 8 & 48" with feedwater, may need to transfer to HPCI as hotwell empties. • Directs a band for reactor pressure to be controlled using bypass valves and/or ADS valves if needed. Directs a cooldown at < 100 degrees/hour.
	BOP/RO	• Verifies automatic isolations, ECCS & EDG start.
Critical Task	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Verifies/Directs recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Directs torus cooling be initiated to keep torus less than 95 degrees. • Verifies/Directs CAMS started. • Directs torus level reduced IAW QCOP 1600-12 when level is greater than +2".

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
***When directed by the Chief Examiner to insert event #6, fail the "A" recirc pump suction line @ 3% severity over a 20:00 minute ramp time using malfunction rr10a.	**imf rr10a 3 20:00**	
Trigger 3 should trip all the reactor feed pump trips @ 2.5 psig in the drywell. If it doesn't trip, manually trip them using malfunction fw01A & fw01B	**Imf fw01A** **Imf fw01B**	

Op-Test No.: 1 Scenario No.: 2 Event No.:6,&,8 continued

:vent Description: "A" Recirculation Loop Suction Line Break continued.

Time	Position	Applicant's Actions or Behavior
	BOP	• Attempts to initiate torus spray. • Reports that torus spray isolation valve does not open. • Attempts to initiate torus spray on other loop. • Reports that torus spray initiated on other loop.
Critical Task	BOP/RO	• Trips recirc pumps. • Trips drywell coolers • Initiates drywell sprays. • Terminates drywell spray prior to drywell pressure dropping to 0 psig. • Terminates torus spray prior to torus pressure dropping to 0 psig. • Initiates torus cooling. • Reduces torus level IAW QCOP 1600-12.
	SRO	• Verifies operator action and concurs with or directs subsequent actions.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: 1 Scenario No.: 2 Event No.: 7,& 9

Event Description: Scram Discharge Volume Drain Valve Sticks Open, HPCI Flow Controller Failure.

Time	Position	Applicant's Actions or Behavior
	RO	• Enters QCGP 2-3 and performs scram checklist.
		• Reports 1A Reactor feedpump trip and S/B is OOS, level lowering.
Critical Task		• Discovers that one set of scram discharge volume drain valve did not autoclose on the scram and closes them with the pushbutton.
		• Reports automatic isolation failure to US.
Critical Task **		• Injects with preferred or alternate systems as directed to restore reactor level.
	BOP	• Reports to US that HPCI is not developing adequate discharge pressure.
		• Switches HPCI flow controller to manual and injects to maintain reactor water level.
Critical Task **		• Injects with preferred or alternate systems as directed to restore reactor level.
	SRO	• Verifies operator action and concurs with or directs subsequent actions.
Critical Task		• Directs other preferred injection systems to restore reactor level, may utilize alternate systems as needed.
		• Directs that ADS be inhibited when determines that reactor level can't be maintained above –59".

** NOTE that either RO or BOP can perform critical task of injecting to restore level, both do not need to perform task.

Comments:______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When the NSO attempts to close the scram discharge volume drain valves they should go closed(malfunction #7). Delete malfunction RD23B as necessary to ensure that they close when the pushbutton is pressed.	**dmf RD23B**	
The HPCI flow controller failure should prevent injection in automatic (malfunction #9), however if selected to manual, they should be able to inject with HPCI.		
NOTE: ***If HPCI failure not detected early enough and reactor pressure falls to within the capability of HPCI injection with the current degradation of the flow controller, it may be necessary to increase the severity of the flow controller failure to less than 40%.***		
The scenario will be terminated when the crew has stabilized RPV level above TAF, initiated containment sprays and containment parameters are stable.		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 4		Op Test No 2	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	Rod withdrawal will continue to raise power. During rod withdrawal, the CRD FCV will fail closed and manual control will be taken or the standby FCV will be placed in service. The crew will then respond to a Rx. Bldg. Radiation Monitor failure. A trip of a Service Water Pump occurs and the BOP operator starts the standby Service Water Pump. While the BOP Operator is responding to the failed Service Water Pump, the 'A' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump. Following response and TS declaration for the failed radiation monitor, a small leak in the steam tunnel will cause a MSIV isolation and reactor scram. A full hydraulic ATWS will exist. SBLC will be initiated. Reactor level will be lowered intentionally and rods will be inserted IAW QOP 0300-28.
Initial Conditions:	IC 93 @ 42% power rod step 29 target out, ready to pull rods to raise power per QCGP 3-1 @ step F.3.
Turnover:	Plant startup in progress. Control rod withdrawal is to continue to raise reactor power per QCGP 3-1 at step F.3 to the 68% FCL.

Event No.	Malf. No.	Event Type*		Event Description
1	None	R	RO SRO	Rod withdrawal to raise power to 68% FCL.
2	RD11 Severity 0%	I	RO SRO	In-service CRD FCV fails closed. (NOTE insert during rod pulls).
3	RM02K Severity 100%	I	BOP SRO	Reactor Bldg. Vent Radiation Monitor Ch. 'A' fails high.
4	SW01A	C	BOP SRO	Service Water Pump 'A' trip.
5	FW17B	C	RO SRO	Condensate/Condensate Booster Pump 'A' Trip.
~~6~~	Console override DIHS13302 2D_OFF	C	RO SRO	~~Failure of Selected Condensate/Condensate Booster Pump to start.~~ AMS
7	MS09B 5% Severity, 5:00 Ramp	M	ALL	MSIV isolation due to MST high temperature.
8	RD13A and B 100% severity	M	ALL	Hydraulic ATWS
9	Console override open	C	BOP SRO	Failure of 1-220-44 and 45 to close on Group I isolation

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

1. Control rods are to be withdrawn to establish 68% FCL IAW QCGP 3-1 step F.3.

2. During rod withdrawal, the CRD FCV fail closed. This will be recognized and manual control may be taken or the standby FCV will be placed in service IAW QCOA 0300-06.

3. When the plant is stable, the 'A' Reactor Building Ventilation Radiation Monitor will fail high. The crew will respond IAW QCAN 901-3 A-3 and QCOS 1700-05. The SRO will refer to and comply with Technical Specifications.

4. After the Rad Monitor response, the 'A' Service Water Pump will trip. The crew will respond IAW QCAN 912-1-A-3 and start the standby pump.

5. The 'A' Condensate/Condensate Booster Pump will trip and the standby pump will fail to AUTO start. The RO will start the standby pump.

6. A small steam leak develops in the main steam tunnel. A scram may be manually initiated as a conservative action as temperatures will eventually reach the point of MSIV isolation. Ultimately, the MSIV's will isolate on a Group I signal. Valves 1-220-44 and 45 will fail to close automatically on the Group I and the operators must manually close the valves to complete the isolation.

7. A hydraulic ATWS prevents rod insertion. QGA 101 will be entered. RPV/P will be controlled with the SRVs and RPV/L will be intentionally lowered to reduce reactor power. Rods will be inserted IAW QCOP 0300-28.

The scenario will be terminated when the crew has established torus cooling and control rods are be inserted per QCOP 0300-28.

Based on the outline, the critical tasks are:

- Intentionally lower RPV water level to reduce reactor power during the ATWS.
- Control RPV pressure after the initial lifting of the safety valves as directed by QGA 101, RPV Control (ATWS).
- Inject SBLC IAW QGA 101, RPV Control (ATWS).
- Individually insert control rods following the ATWS IAW QCOP 0300-28.

<u>References</u>

QGA 200	Rev. 6	QCGP 1-1	Rev. 33
QGA 101	Rev. 7	QCAN 901(2)-3 A-3	Rev. 3
QGA 100	Rev. 4	QCAN 901(2)-6 F-5	Rev. 0
QGGP 4-1	Rev. 16	QCGP 3-1	Rev. 19
QCOP 0300-28	Rev. 14	QCOP 0300-03	Rev. 4
QCOA 0300-06	Rev. 2	QOA 5750-07	Rev.8
QCOA 7500-01	Rev.10	QCAN 901(2)-3 G-3	Rev. 5
QCOS 1700-05	Rev. 6	QOA 900-4 C-18	Rev.3
QCAN 912-1 A-3	Rev. 2	QOA 900-3 H-2	Rev. 3

I. SIMULATOR SETUP

A. Initialize the simulator to IC93

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment Out Of Service

NONE

2. Power Level

a.	Recirc Pump Speed	~44% with flows balanced
b.	MegaWatts Electric	325 MWE
c.	Reactor Power	42%

3. Miscellaneous Setup

a. Prepare REMA for load increase to 68% FCL with rods

b. Prepare a blank Attachment "B" from QCGP 3-1.

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Copy IC93 from zip disc to IC files in RIS at instructor station. Shutdown MST and restart MST to allow the computer to read the new IC93.	**rst 93**	
Reset simulator to IC93.	**run**	
Verify annunciator horns are on.		
Hydraulically block both scram discharge volumes using malfunction RD13.	**imf RD13A 100** **imf RD13B 100**	
Ensure 5 condensate demins online.		
The following series of commands will prevent the 1-220-44 & 45 valves from indicating closed following a group I isolation. The triggers allow the overrides to be deleted when the control switches are taken to the close position:		
Using expert commands set trigger 10 to be true when hand switch for the 1-0220-44 valve is taken to close: (Must use "" to make command work.)	**Trgset 10 "zdihs1022044(1)"**	
Using expert commands set trigger 11 to be true when hand switch for the 1-0220-45 valve is taken to close: (Must use "" to make command work.)	**Trgset 11 "zdihs1022045(1)"**	
Override all light associated with the 1-0220-44 & 45 valves in their normal position on the 901-4 & 3 panels: Overrides all red lights on and green lights off until the control switch is moved to the close position.	**Ior LOHS10220441 off** **Ior LOHS10220442 on** **Ior LOHS10220451 off** **Ior LOHS10220452 on** **Ior LOIL10220441 off** **Ior LOIL10220442 on** **Ior LOIL10220451 off** **Ior LOIL10220452 on**	
Copy batch files scenario4grp1failure44, and scenario4grp1failure45 from zip disc to batch directory in RIS on the simulator computer.		
Assign batch file command to delete light overrides for the 1-0220-44 valve to trigger 10 using expert command.	**Trg 10 "bat scenario4grp1failure44"**	
Assign batch file command to delete light overrides for the 1-0220-44 valve to trigger 11 using expert command.	**Trg 11 "bat scenario4grp1failure45"**	
Ensure the White Board on the 901-55 panel is clean.		
SETUP IS COMPLETE		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is raising power following a start up after a short maintenance outage and is currently at ~ 325 MWe; Rod Step 29 @ target out; QCGP 3-1 is in progress at Step F.3.

b. Unit 2 is at approximately 100% power.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: NONE

(2) Unit 2: NONE.

2. Significant problems/abnormalities: NONE

3. Evolutions/maintenance for the oncoming shift:

a. Continue with unit startup IAW QCGP 3-1, @ Step F.3.

b. Pull rods to 68% rod line. A QNE is present in the control room.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 4 Event No.: 1 & 2

Event Description: Rod withdrawal to raise reactor power and the in-service CRD flow control valve fails closed.

Time	Position	Applicant's Actions or Behavior
	SRO	• Reviews REMA and Attachment A. • Briefs crew on upcoming reactivity evolution. • Directs that rods be pulled to the 75% flow control line. • Supervises the reactivity change.
	RO	• Reviews REMA and Attachment A. • Determines that RWM is operable. • Selects the desired control rod on the select matrix. • Verifies the selection of the proper control rod and its position on the RWM. • Communicates maneuver to QIV. • Self checks rod selection and moves the rod to desired position. • Initials the sequence book for the rod moved. • Performs coupling check on rods withdrawn to position 48.
	RO/BOP This is an instrument failure for the RO and BOP actions should be minimized	• Notices that rod fails to move or quits moving during withdrawal. • Checks charging water and drive water pressures. • Recognizes flow controller failure and refers to QCOA 0300-06 • Places the flow controller to manual and adjusts flow to 40 - 60 gpm • Dispatches NLO and/or maintenance to investigate failure, may direct NLO to switch over to the standby flow control valve IAW QCOP 0300-03
	SRO	• Refers to QCOA 0300-06 and notifies Shift Manager. • Verifies operator actions and concurs with or directs subsequent actions

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
STA should act as QIV/QNE for the rod pulls.		
When directed by the Chief Examiner to insert event #2, fail the CRD FCV closed using malfunction RD11	**IMF RD11 0**	
If dispatched as NLO to change over the CRD FCV, IAW QCOP 0300-03, ask them if step G.1. has been completed. Then delete the malfunction after 5 minutes and call in and report that task is complete up to step G.2.n.	**DMF RD11**	
NOTE: During validation, 5 rods raised the FCL from ~60 to 68%.		

Op-Test No.: Scenario No.: 4 Event No.: 3

Event Description: Reactor building vent radiation monitor channel "A" fails upscale.

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Refers to QCAN 901(2)-3 A-3 & QCAN 901(2)-3 G-3 • Determines reading on indicator on 912-10 panel on back panel for "A" channel is upscale, "B" channel reading is normal • Notifies Chemistry and Radiation Protection departments. • Notifies IM department to investigate failure and effect repairs. • Refers to QCOS 1700-05. • Verifies automatic actions occur, refers to QOA 5750-07, QCOA 7500-01. • All eight (8) Reactor Building isolation dampers close. • Reactor Building supply and exhaust fans trip. • SBGTS auto-starts.
	SRO	• Refers to Technical Specifications 3.2.A. • Determines that channel must be returned to operable within 2 hours or secondary containment integrity established, SBGTS started, reactor building and control room ventilation isolated within the following hour. • Refers to QCOS 1700-05. • Verifies operator actions and concurs with or directs subsequent actions

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #3, insert an upscale failure of the "A" Rx Bldg. Vent rad monitor using malfunction RM02K. If called as IM, report that you will start a work package and start ASAP.	**Imf RM02K 100**	

Op-Test No.: Scenario No.: 4 Event No.: 4 & 5 & ~~6~~ AMS

Event Description: Service water pump 1A trip. 1A Condensate pump trips ~~with failure of standby pump to autostart~~. AMS

Time	Position	Applicant's Actions or Behavior
	BOP	• Refers to QCAN 912-1 A-3. • Determines that the 1A service water pump tripped. • Starts the standby service water pump. • Dispatches operators to tripped motor and to the supply breaker. • ~~Contacts maintenance to investigate standby pump failure to autostart.~~ AMS
	RO Event 6 should be inserted while the BOP operator is occupied with the service water pump trip to allow for the RO component failure.	• Refers to QCAN 901(2)-6 F-5. • Determines that the 1A pump tripped ~~and that the standby pump did not autostart.~~ AMS • ~~Starts the standby condensate pump.~~ AMS • Verifies condensate pump discharge and reactor feed pump suction pressures. • Monitors reactor water level. • Dispatches operators to tripped motor and to the supply breaker.
	SRO	• Verifies operator actions and concurs with or directs subsequent actions

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE: Event 6 should be inserted while the BOP operator is occupied with the service water pump trip to allow the RO to achieve credit for a component failure.		
When directed by the Chief Examiner to insert event #4, insert an trip of the 1A service water pump using malfunction SW01A.	**imf SW01A**	
As NLO dispatched to investigate the tripped motor on the 1A service water pump, wait 5 minutes and report that the motor is hotter than the other running pumps but no damage is evident.		
As NLO dispatched to the supply breaker for the 1A service water pump, wait 3 minutes and report that an overcurrent target is up.		
When directed by the Chief Examiner to insert event #5, insert an trip of the 1A condensate/condensate booster pump using malfunction FW17A.	**imf FW17A**	
Pull up drawing FW2 to monitor status of the 1D condensate pump to delete standby light override when the pump is started.		
Trigger #1 should delete the override on the 1D condensate pump standby light. If it doesn't, delete the override manually.	**dor LOHS13302D4**	
As NLO dispatched to investigate the tripped motor on the 1A condensate pump, wait 4 minutes and report that the motor is hotter than the other running pumps but no damage is evident.		
As NLO dispatched to the supply breaker for the 1A condensate pump, wait 3 minutes and report that an overcurrent target is up.		
If dispatched as NLO to swap H2 injection points, report back 5 minutes later that injection is lined up to 1D and 1A is secured.		

Op-Test No.: Scenario No.: 4 Event No.: 7 & 8 & 9		
Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure.		

Time	Position	Applicant's Actions or Behavior
	ALL	• Refers to QCAN 901-3 H-2 and determines that the high area temperature is in the MSIV room. • Attempts to determine the cause of the high temperature. • May scram the reactor in anticipation of a group 1 isolation on high temperature in the MSIV room or as an attempt to isolate the discharge into the area per QGA 300.
	SRO	• Enters QGA 300 on area temperature above alarm setpoint. • Directs isolation of the discharge into the area (completed when MSIVs close)
	RO	• Scrams reactor, places Mode Switch in SHUTDOWN, reports hydraulic ATWS to US (this can be done without direction by the US) • Activates ARI, runs recirculation pumps to minimum, starts inserting CRAM rods into the core. (this can be done without direction by the US)
	SRO	• Enters QGA 100 and transitions into and directs actions of QGA 101. • Directs ADS inhibited, Core Spray injection prevented • Directs isolations and auto-starts verified for QGA entry conditions.
Critical Task		• Directs reactor level intentionally lowered to reduce reactor power.
Critical Task		• Directs control rods inserted IAW QCOP 0300-28.
Critical Task		• Directs injection of SBLC from boron tank
Critical Task		• Directs reactor pressure maintained 800 to 1000 psig with ADS valves.

Comments:____

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #8, insert a 5% break in a main steam line in the MSIV room ramped over 5 minutes using malfunction MS09B.	**imf MS09B 5 5:00**	

Op-Test No.: Scenario No.: 4 Event No.: 7 & 8 & 9 continued

Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure continued

Time	Position	Applicant's Actions or Behavior
Critical Task	RO	• Terminates and prevents injection except for Boron, CRD, and RCIC to lower level.
		• Monitors indications for power <3%, level is –142", or all ADS valves are closed and drywell pressure is < 2.5 psig and reports to US if any met.
Critical Task		• Injects SBLC from boron tank when directed.
		• Performs or directs actions of QCOP 0300-28.
		• Bypasses scram discharge volume high level trip and attempts to reset scram.
		• Directs U-2 admin NSO to insert jumpers to bypass all reactor scram signals and de-energize ARI if necessary @ -59".
		• Resets scram and attempts another scram
		• Resets scram and directs another operator to individually scram rods.
Critical Task		• Continues to individually insert control rods, CRAMS first, then spiralling out from center.
	BOP	• Inhibits HPCI injection
		• Inhibits ADS.
		• Places core spray pumps in PTL.
Critical Task		• Maintains reactor pressure 800 to 1000 psig with ADS valves
	SRO	• Directs the actions of QGA 200.
		• Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus.
		• Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig.
		• Directs recirc pumps and drywell coolers tripped.
		• Directs drywell sprays.
		• Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
As another control room operator, when directed to insert jumpers to bypass all reactor scram signals, wait 2 minutes and insert remote function QG08R and report that jumpers are installed.	**IRF QG08R activate**	
As another control room operator, when directed to de-energize ARI, wait 3 minutes and insert remote function QG14R and report that fuses for ARI are removed.	**IRF QG14R activate**	
As another operator, when directed to individually scram rods, select panel view from simulator menu and select 901-16 panel. Select one scram switch and override the switch to the scram position, check to see if it inserts,(it won't) then return the switch to normal position. Repeat this three more times, choosing a rod from each of the four quadrants. Report to the RO that none of the rods inserted from any quadrant.		

Op-Test No.: Scenario No.: 4 Event No.: 7 & 8 & 9 continued

Event Description: Main steam line break in the steam tunnel, hydraulic ATWS, partial group 1 isolation failure continued

Time	Position	Applicant's Actions or Behavior
	BOP	• Verifies all automatic actions have taken place for 2.5 psig in drywell, 1060 psig in reactor, and +8" reactor level. • Finds 1-0220-44 & 45 valves failed to reposition during group 1 isolation and closes them. • Initiates torus sprays. • Verifies recirc pumps and drywell coolers are tripped. • Initiates drywell sprays • Controls RHR flow to maintain containment pressure decrease while preventing injection if not needed.

Comments:

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
The scenario can be terminated when the crew has established torus cooling and control rods are be inserted per QCOP 0300-28. **NOTE!!** **Freeze the simulator when directed by the Chief Examiner and do not change any switches or settings so that SRO candidate may perform a JPM based on GSEP classification following the end of the scenario.**		

Simulation Facility Exam Date:	Quad Cities 03/27/00	Scenario No. 6		Op Test No 2	

Examiners:			Operators:		SRO
					RO
					BOP

Objectives:	Torus cooling will be secured following shift turnover. The crew will then raise reactor power following MSIV testing. They will respond to a FWLC valve lock up. "B" recirculation pump will develop a speed signal failure causing pump speed to increase. A small steam leak in the DW will cause DW/T and DW/P to rise. The leak will require a reactor scram. When DW/P reaches 2.5 psig bus 14-1 will trip when RHR pump C starts. RHR Loop B spray logic fails such that RHR Loop B containment spray valves cannot be opened. DW spray valve 23A fails to open and blowdown will be performed when DW/T cannot be maintained below 280°F. RPV saturation conditions will be reached following the blowdown and RPV Flooding will be performed.
Initial Conditions:	IC 20, with minor modification. Raise reactor power to ≈ 75% with flow. Place torus cooling in service. "B" Core Spray pump tagged OOS
Turnover:	Reactor power is presently at 75% to support weekly MSIV timing testing which has been completed satisfactorily. A special test of RCIC has also just been completed satisfactorily. RCIC is operable and in standby. Torus cooling, which was in service for the special RCIC test, is to be secured following turnover. Power is to be raised back to 100% once torus cooling is secured. In addition, "B" Core Spray Pump is OOS for motor winding inspection

Event No.	Malf. No.	Event Type*		Event Description
~~1~~	None	N	BOP SRO	~~Secure Torus Cooling.~~ AMS
2	None	R	RO SRO	Raise reactor power with RRC flow.
3	FW08A	C	RO SRO	Feedwater Level Control Valves Lock Up
4	RR09B Severity 0%, Ramp 1:00	I	RO SRO	Recirc Pump "B" Speed Signal Fails Low
5	MS04 Severity 1%, Ramp 10:00	M	ALL	Small steam leak in DW (Slow rise in DW/T and DW/P)
6	ED03E	C	BOP SRO	Bus 14-1 OC trip when RHR Pump C auto starts.
7	DIHS11001S17B	I	BOP SRO	Spray Logic Failure on RHR Loop 'B'
8	Drywell Spray valve 23A breaker trip	C	BOP SRO	RHR Spray valve 23A breaker trips when attempt is made to open valve.
9	Bat flashing	M	ALL	RPV water level indicators saturate.

*(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Scenario 2000-06 Outline

1. Torus cooling will be shut down as directed in the shift turnover.

   Reactor power will be raised from 75% following MSIV testing.

3. A momentary lockup occurs on both Feedwater Level Control Valves. At this point the simulator operator will clear the malfunction The operators respond IAW QCAN 901-5, G-7, H-9, and QCOA 0600-01 and reset one or both FRVs. When the crew sends someone to investigate, lockup was due to a position error which has cleared and has been reset. IM's investigated and tightened a loose connection.

4. The crew will respond to a failure of RRC Pump 'B' speed signal IAW QCOA 0202-02. SRO refers to and complies with Technical Specifications for RRC pump speed mismatch.

5. A steam leak develops in the DW causing a slow but continuous rise in DW/P. A scram and ECCS initiation will be initiated at 2.5 psig. QGA 100 and 200 will be entered.

6. Bus 14-1 will trip when the 'C' RHR pump start rendering RHR pumps 'C' and 'D' inoperable.

7. RHR Loop 'B' Spray Logic fails preventing operation of RHR Loop 'B' containment spray and cooling valves.

8. DW spray valve 23A breaker fails to open when the valve switch is placed in OPEN and DW temperature continues to rise. When DW temperature cannot be maintained below 280°F reactor blowdown will be initiated. Following blowdown, RPV saturation conditions will be reached and RPV flooding will commence as directed in QGA 500-4. When RPV flooding is started, the scenario is terminated.

9. The scenario will be terminated when the crew has commenced RPV Flooding.

Based on the outline, the critical tasks are:

- Initiate an RPV Blowdown when unable to restore drywell temperature <280, PSP limits are reached, and/or as part of RPV Flooding.
- Initiate actions to restore adequate core cooling following the loss of all RPV water level indication IAW QGA 500-4, RPV Flooding.

References:

QCGP 3-1	Rev.19	QCOP 1000-02	Rev 12
QCAN 901(2)-5 G-7	Rev 3	QCOA 0201-01	Rev 11
QCAN 901(2)-5 H-8	Rev 3	QOA 6500-06	Rev 11
QCOA 0600-01	Rev 4	QCAP 0230-19	Rev 8
QCOP 1000-09	Rev 12	QGA 100	Rev 4
QGA 200	Rev 6	QCGP 2-3	Rev 32
QGA 500-1	Rev 8	QGA 500-4	Rev 10
QCOA 0202-02	Rev 7	QCOA 0202-04	Rev 11
QCOP 0202-12	Rev 12	QCAN 901(2)-4 A-5	Rev 0
QCAN 901(2)-4 C-5	Rev 0		

SIMULATOR SETUP

A. Initialize the simulator to IC 20.

1. Take the simulator to RUN.

B. Set up the simulator as follows:

1. Equipment OOS Cards Needed (1)

"B" Core Spray Pump PTL

2. Power Level

a.	Recirc Pump Speed	(BALANCE FLOWS)
b.	MegaWatts Electric	625
c.	Reactor Power	75%

3. Miscellaneous Setup

a. Torus cooling in operation on "A" loop IAW QCOP 1000-09 and QCOP 1000-04 using one RHR pump. Procedure QCOP 1000-09 out and signed off to step F.2. Procedure QCOP 1000-04 out and signed off to step F.1.c.

b. Prepare a REMA and Attachment "B".

C. Verify the initial conditions are met and bring the crew into the Simulator.

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
Reset simulator to IC20.	**rst 20** **run**	
Assign trigger #1 to go true when drywell pressure > 2.5 psig and assign malfunction ED03E to trigger 1 to trip bus 14-1 when ECCS pumps start at 2.5 psig in the drywell.	**Select event trigger button.** **Select trigger #1** **Select drywell pressure greater than 2.5 psig from the pulldown menu.** **Enter command imf ed03e** **Select accept new event.**	
Fail the "B" loop of RHR spray logic by overriding the containment spray permissive S-17 switch to "OFF"	**Ior dihs11001s17b OFF**	
Override switch for 1-1001-23A closed using override ihs1100123a.	**Ior dihs1100123A CLOSE**	
Ensure torus cooling is in operation on the "A" loop with one RHR pump and RHRSW on both loops. On the White Board on the 901-55 panel write 3.5.A.1 Action 1 7 day LCO for "B" Core Spray OOS. **SETUP IS COMPLETE**		

II. SHIFT TURNOVER INFORMATION

A. Conduct a shift turnover with the operating crew.

1. Plant conditions:

a. Unit 1 is at approximately 75% power.

b. Unit 2 is at approximately 100% power.

c. Normal electric plant lineup.

d. Tech Spec limitations:

(1) Unit 1: 3.5.A.1 Action 1 7 day LCO for "B" Core Spray OOS.

(2) Unit 2: NONE.

2. Significant problems/abnormalities:

a. "B" Core Spray Pump is OOS for motor winding inspection.

3. Evolutions/maintenance for the oncoming shift:

a. Torus cooling, in service to support earlier surveillances, needs to be secured following turnover. Power is then to be returned to 100% following turnover with recirculation flow.

b. Electrical Maintenance will continue inspection on the "B" Core Spray motor windings.

B. Panel Walk Downs

1. Allow the operators approximately five minutes to familiarize themselves with the plant status.

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 1
Event Description: Secure torus cooling.

Time	Position	Applicant's Actions or Behavior
	BOP	• Refers to QCOP 1000-09. • Throttles closed MO 1-1001-36A until RHR pressure is within 25 psig of RHRSW pressure. • When RHR pump discharge pressure increases to within 25 psig of RHRSW pressure, stops running RHR pump and fully closes MO 1-1001-36A and holds switch closed for 25 seconds after closed light indication is received to ensure valve fully closed. • Closes MO 1-1001-34A. • Opens MO 1-1001-16A. • Verifies "A" RHR loop in standby lineup IAW QCOP 1000-02 step F.3. • Shuts down the RHRSW system IAW QCOP 1000-04 by stopping the A & B loop RHRSW pumps and closing MO 1-1001-5A & B valves.
	SRO	• US verifies operator actions and concurs with or directs subsequent actions.

AMS

Comments:

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 2

Event Description: Raise reactor power with reactor recirculation flow.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs that reactor power be increased to 100% per the REMA and Attachment B. • US verifies operator actions and concurs with or directs subsequent actions.
	RO	• Raises reactor power with recirculation flow IAW QCGP 3-1, REMA and Attachment B. • Increases recirculation pumps speeds to increase reactor power at less than 100 MWE/hour. • Monitors power increase on nuclear instrumentation. • Monitors thermal limits. • Maintains load set 10% above main generator load. • Monitors drywell pressure and directs adjustments to containment pressure controller as needed. • Monitors and verifies main generator excitation limits are within hydrogen cooling system capability. • Verifies and adjusts reactor pressure as needed.

Comments:

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
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Op-Test No.: Scenario No.: 6 Event No.: 3

Event Description: Feedwater level control valves “A” & “B” lock up.

Time	Position	Applicant's Actions or Behavior
	RO	• Refers to annunciator 901-5 G-7 & H-8. • Determines that neither feedwater regulating valve is controlling level and depresses the reset button for either or both valves. • Refers to QCOA 0600-01. • Dispatches operators and/or maintenance personnel to investigate the lockup.
	SRO	• Refers to QCOA 0600-01. • US verifies operator actions and concurs with or directs subsequent actions.

Comments:

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #3, insert, then immediately delete, feedwater regulating valve lockups for both "A" & "B" feed reg valves using malfunction FW08.	**IMF FW08A** **IMF FW08B** **DMF FW08A** **DMF FW08B**	
If directed as operators or maintenance to investigate the cause of the feed reg valves lock up, report back 4 minutes later that the NEMATRON indicated that a "position error" occurred on both the "A" & "B" feed reg valves and has cleared. FIN team members are looking into the problem.		
Report back 10 minutes after event #3 that FIN team found and repaired a loose connection in the NEMATRON cabinet and all checks out satisfactorily.		

Op-Test No.: Scenario No.: 6 Event No.: 4		
Event Description: "B" Recirculation pump speed signal fails low causing pump speed to increase.		

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• Recognizes "B" recirculation pump speed, reactor power, or megawatts increasing. • Checks thermal power < 2511 • Refers to QCOA 0202-02 and QCOA 0400-01. • Attempts to adjust recirculation pump speed to within 10% of each other. • Notifies US that "B" pump will not respond to controls. • Dispatches Operations personnel and/or maintenance personnel to investigate problem.
	SRO	• Refers to Technical Specifications. • Determines per 3.6.C that speeds must be with 10% of each other within 2 hours or the pump must be tripped. • US verifies immediate operator actions and concurs with or directs subsequent actions. • Contacts a QNE. • IF PUMP IS TRIPPED, refers to 3.6.A. for single loop operation.
	BOP/RO	IF PUMP IS TRIPPED: • Trips the malfunctioning pump. • Refers to QCOA 0202-04 & QCOA 0400-02 • IF PUMP IS TRIPPED, drives all CRAM rods and control rods in sequence to target-in into core to lower FCL <70%. • Refers to QCOP 0202-07 to determine total core flow. • Verifies pump discharge valve closed (reopens after 5 minutes) and monitors idle recirculation loop temperature.

Comments:____

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #4, fail the "B" reactor recirculation pump speed signal low using malfunction RR09B.	**Imf RR09B 0 1: 00**	
If requested to lock up the "B" recirc pump scoop tube from the control room as U-2 admin NSO per QCOP 0202-12, wait 3 minutes and then override annunciators 901-4 C-5 and 901-A-5 ON and override the green scoop tube power reset light on the 901-4 panel OFF.	**imf ano9014c5 ON** **imf ano9014a5 ON** **ior lohs10202302B OFF**	
Now delete the override on annunciator 901-4 A-5 to allow the alarm to clear, and inform unit 1 operator that steps F.1.a, b, c, & d. are complete.	**dmf ano9014a5**	
If dispatched to manually lock up the recirc pump scoop tube and change recirc pump speed report that you will start ASAP. DO NOT TAKE ANY ACTIONS TO CHANGE PUMP SPEED!		
If contacted as QNE, tell them you will comply with their wishes ASAP.		
If contacted as maintenance, tell them will develop a work package and begin repairs ASAP.		

Op-Test No.: Scenario No.: 6 Event No.: 5		
Event Description: Small steam leak in drywell.		

Time	Position	Applicant's Actions or Behavior
	BOP	• Investigates the cause of increasing drywell pressure IAW QCOA 0201-01. • Starts the 7th drywell cooler. • Notifies RP of increasing drywell pressure.
	SRO	• Verifies immediate operator actions and concurs with or directs subsequent actions of QCOA 0201-01. • Sets scram criteria • Enters QGA 100 and 200 if drywell pressure reaches 2.5 psig. • Orders the 7th drywell cooler started • Monitors torus water temperature and initiate torus cooling at >90°F in the torus.

Comments:____

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
When directed by the Chief Examiner to insert event #5, insert a 1% leak in the B steam line in the drywell ramped over 10:00 minutes using malfunction MS04B.	**Imf MS04B 1 10:00**	

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) & 6

Event Description: Small steam leak in drywell (continued) and bus 14-1 overcurrent trip at 2.5 psig in drywell ECCS start signal.

Time	Position	Applicant's Actions or Behavior
	RO	• Reactor scrammed when scram criteria met. • Reports all rods in, water level recovering, reactor pressure normal, and +8" QGA entry condition.
	SRO	• Directs the actions of QGA 100 at 2.5 psig in the drywell. • Directs performance of QCGP 2-3. • Directs that automatic isolations, ECCS and EDG starts verified. • Directs that bus 19 be crosstied to bus 18 to restore power and RPS "B". • Directs reactor level be controlled between 8 & 48" with a preferred injection system. • Directs a cooldown at < 100 degrees/hour with bypass valves.
	RO	• Performs QCGP 2-3. • Maintains reactor level between 8 & 48" with a preferred injection system. • Starts a cooldown at < 100 degrees/hour with bypass valves.
	BOP	• Verifies automatic isolations, ECCS & EDG starts. • Verifies that the Unit 1 EDG autostarts, but does not load to the bus due to the overcurrent indication on bus 14-1 via annunciator 901-8 F-3. • Places the Unit 1 EDG control switch to stop. • Reports to US that bus 14-1 is de-energized and refers to QOA 6500-06. • Crossties bus 19 from bus 18 and directs operators to restore power to RPS "B". • Notifies Unit Supervisor and/or phones Shift Manager about potential GSEP classification condition.

Comments:____________________

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
NOTE Bus 14-1 should trip upon ECCS initiation signal when trigger #1 goes true @ 2.5 psig in the drywell. If bus 14-1 doesn't trip at 2.5 psig, trip it using malfunction ED03E	**Imf ED03E**	
If dispatched as NLO or maintenance to bus 14-1, report back 4 minutes later that there is an overcurrent target up and no visual damage.		
If directed to restore power to RPS "B" report back 4 minutes later and state that you are ready to repower the bus.		
Restore to normal power using RP28R	**Irf RP28R reset**	
Restore to alternate (dirty) power using RP29R	**Irf RP03R alt**	

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) 7 & 8

Event Description: Small steam leak in drywell (continued) Drywell spray logic failure on "B" loop, breaker trip on "A" loop drywell spray valve.

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the actions of QGA 200 at 2.5 psig in the drywell. • Verifies torus level below 27 feet and orders torus spray prior to 5 psig in the torus. • Verifies torus level below 17 feet and drywell parameters within DSIL curve when torus pressure exceeds 5 psig. • Directs recirc pumps and drywell coolers tripped. • Directs drywell sprays. • Directs drywell and torus spray be terminated prior to the respective space dropping below 0 psig. • Directs torus cooling be initiated to keep torus less than 95 degrees. • Verifies CAMS started.
	BOP	• Attempts to initiate torus spray.("B" loop will not initiate due to failed logic) • Trips recirc pumps. • Trips drywell coolers • Attempts to initiates drywell sprays. • Reports that drywell spray isolation valves do not open on "B" loop and that the breaker for the MO 1-1001-23A tripped when the attempt was made to open the valve • Dispatches an operator to the MO 1-1001-23A valve breaker. • Terminates torus spray prior to torus pressure dropping to 0 psig. • Initiates torus cooling. • Reports that drywell temperature rising

Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
If dispatched as NLO to reset breaker for the 1-1001-23A valve, report back 4 minutes later that the breaker will not reset. If dispatched as NLO to manually open the 1-1001-23A valve, do not report back. If contacted about status, tell them that you are having trouble opening the valve by yourself and have called other operators for assistance.		

Op-Test No.: Scenario No.: 6 Event No.: 5 (continued) & 9

Event Description: Small steam leak in drywell (continued) and reactor level indicators saturate.

Time	Position	Applicant's Actions or Behavior
	SRO	• Transitions to QGA 500-1 when unable to lower or restore drywell temperature < 280 or reaches PSP limit.
		• Verifies that drywell pressure > 2.5 psig.
		• Direct that Core Spray and LPCI not needed for core cooling be prevented.
		• Verifies torus level is above 5'.
Critical Task		• Directs all 5 ADS valve opened.
		• Directs that reactor water level instruments be monitored for saturation due to high drywell temperature and lowering reactor pressure.
		• Transitions into QGA 500-4 when reports that all reactor level instruments have flashed.
		• Directs closure of MSIVs, main steam line drains, and RCIC isolation valves.
Critical Task		• Directs injection to control reactor pressure 59 psig above torus pressure, but as low as possible.
	RO/ BOP	• Prevents Core Spray and LPCI injection not needed for core cooling.
Critical Task		• Opens all 5 ADS valves, leaves switches in manual and checks position indications.
		• Monitors for saturation conditions and reports when conditions reached, then monitors reactor level indications for signs of flashing
		• Reports when all reactor level instruments flash and none are usable.
Critical Task		• Injects to control reactor pressure 59 psig above torus pressure, but as low as possible.

Comments:______________________________

B. Suggested Instructional Methods/ Media, plus Instructor's Notes	C. Simulator Commands	D. Objectives
AFTER blowdown has been initiated, when and if requested by Chief Examiner, increase the steam line break to 100% to reduce the time to reach saturation conditions.	**mmf MS04B 100 1**	
Monitor for saturation conditions and notify the Chief Examiner when saturation is reached to assist them in determining when to insert event # 9.		
When directed by the Chief Examiner to insert event #9, insert a batch file to flash all reactor level indicators using bat flashing.	**Bat flashing**	
If directed to bypass reactor feed pump high level trips for flooding, wait 3 minutes and insert remote function QG13R	**Irf QG13R activate**	
The scenario can be terminated when the crew has commenced RPV Flooding as directed by the Chief Examiner.		

FINAL AS-ADMINISTERED WRITTEN EXAMINATION

FOR THE QUAD CITIES EXAMINATION - MARCH 27 - APRIL 3, 2000

Facility: QUAD CITIES Date of Exam: 4/3/00 Exam Level: RO/SRO

	Item Description	Initials a	Initials b	Initials c
1.	Answer key changes and question deletions justified and documented	GMT N/A	MS N/A	N/A
2.	Applicants' scores checked for addition errors (reviewers spot check > 25% of examinations)	GMT AMS	MS	[illegible]
3.	Grading for all borderline cases (80% +/- 2%) reviewed in detail	GMT N/A	MS N/A	N/A
4.	All other failing examinations checked to ensure that grades are justified	GMT N/A	MS N/A	N/A
5.	Performance on missed questions checked for training deficiencies and wording problems; evaluate validity of questions missed by half or more of the applicants	GMT AMS	MS	[illegible]

	Printed Name / Signature	Date
a. Grader	Ann Marie Stone / AnnMarie Stone Gary Thennes / [signature]	4/11/00 4/4/00
b. Facility Reviewer(*)	Mike Swegle / Mike Swegle	4/4/00
c. NRC Chief Examiner (*)	Dell McNeil / [signature]	04/11/00
d. NRC Supervisor (*)	David E. Hills / [signature]	4-24-00

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

Facility: QUAD CITIES | Date of Exam: 4/3/00 | Exam Level: RO/SRO

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	Printed Name / Signature	Date
a. Grader	Ann marie STONE / Ann Marie Stone Gary Thennes / Gary Thennes	4/11/00 4/4/00
b. Facility Reviewer(*)	Mike Swegle / Mike Swegle	4/4/00
c. NRC Chief Examiner (*)	Dell McNeil / Dell R. McNeil	04/11/00
d. NRC Supervisor (*)	David E. Hills / David E. Hills	4-24-00

(*) The facility reviewer's signature is not applicable for examinations graded by the NRC; two independent NRC reviews are required.

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information

Name: MASTER	Region: III
Date: April 03, 2000	Facility/Unit: Quad Cities Nuclear Station
License Level: RO	Reactor Type: GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

____
Applicant's Signature

Results

Examination Value	100.0	Points
Applicant's Score	________	Points
Applicant's Grade	________	Percent

ANSWER SHEET

Multiple Choice (Circle or X your choice)
If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

001 a b c d ___
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003 a b c d ___
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045 a b c d ___

ANSWER SHEET

Multiple Choice (Circle or X your choice)
If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

046 a b c d ___
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089 a b c d ___
090 a b c d ___

ANSWER SHEET

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

091 a b c d ___

092 a b c d ___

093 a b c d ___

094 a b c d ___

095 a b c d ___

096 a b c d ___

097 a b c d ___

098 a b c d ___

099 a b c d ___

100 a b c d ___

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

WRITTEN EXAMINATION GUIDELINES

1. ***[Read Verbatim]*** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.

3. For an initial examination, the time limit for completing the examination is five hours.

3. You may bring pens, pencils, and calculators into the examination room. Use black ink to ensure legible copies.

4. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.

5. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.

6. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only.* When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question.

7. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

8. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination.

9. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

10. Do you have any questions?

QUESTION: 001 (1.00)

During normal full power operation which of the following is an immediate result of the loss of CRD hydraulics?

a. Multiple rod drifts will occur.

b. Control rod scram times will NOT be met.

c. Accumulator charging pressure at the CRD hydraulic unit will be lost.

d. CRD drive temperatures will increase.

QUESTION: 002 (1.00)

With the Mode Switch in REFUEL, which of the following will cause a rod block?

a. A control rod is selected.

b. The bridge is over the core with the main grapple full up and unloaded.

c. The bridge is over the core with the frame hoist loaded.

d. The bridge is over the fuel pool with the main grapple loaded.

QUESTION: 003 (1.00)

The Reactor Manual Control (RMC) Auxiliary Timer will generate a Select Block if the Master Timer malfunctions during a . . .

a. notch in cycle.

b. notch out cycle.

c. continuous insert evolution.

d. continuous withdraw evolution.

QUESTION: 004 (1.00)

A caution in QCGP 1-1 states that NOTCH OVERRIDE shall NOT be used between positions 04 and 24 from the time half the Control Rods are fully withdrawn UNTIL at least one bypass valve is partially open. Adherence to this caution . . .

a. minimizes the potential for inadvertent short periods.

b. ensures that the reactor heatup rate will not be exceeded.

c. ensures NO "double notching" will occur during approach to criticality.

d. provides the Nuclear Engineer adequate time to calculate reactor period.

QUESTION: 005 (1.00)

A LOCA has occurred. The following conditions exist:

-	Reactor Level	-40 inches, rising slowly
-	Reactor Pressure	600 psig, steady
-	HPCI	-Injecting at rated flow, in AUTO

Which of the following describes HPCI operation if HPCI Flow Controller, FIC 2340-1, fails such that it senses high flow?

a. HPCI speed will rise and continue to rise until the mechanical trip setpoint is reached.

b. HPCI speed will rise until the Motor Gear Unit (MGU) takes control to maintain speed at 4000 RPM.

c. HPCI speed will lower to 2000 RPM at which time speed will be maintained by the Motor Gear Unit (MGU).

d. HPCI speed will lower until the Motor Speed Changer (MSC) takes control to maintain speed at the MSC High Speed Stop (HSS).

QUESTION: 006 (1.00)

Traversing In-Core Probe (TIP) operation is in progress on Unit Two for required LPRM calibration. A feedwater transient is lowering reactor water level. If reactor water level drops below +8 inches . . .

a. ALL TIP shear valves will fire.

b. power to the TIP system will be load shed.

c. ALL TIP motion will stop where it is and the ball valves will close.

d. ANY TIP NOT in its shield chamber will transfer to "reverse" operating mode.

QUESTION: 007 (1.00)

Reactor startup is in progress. Control rods are being withdrawn to establish reactor heatup. All IRMs are reading approximately 45 on Range 6. A DOWNSCALE failure on IRM Channel 12 occurs, immediately followed by an INOP failure on IRM Channel 17. Which of the following describes the appropriate operator actions for the stated conditions?

a. Bypass the Channel 17 INOP condition, then reset the half scram.

b. A scram has been initiated automatically, take the immediate actions for a scram.

c. Downrange Channel 12 to clear the DOWNSCALE condition, then reset the half scram.

d. Plant conditions require initiation of a manual scram, place the reactor mode switch in SHUTDOWN.

QUESTION: 008 (1.00)

A LOCA occurred coincident with several electrical malfunctions. The following conditions existed TWO MINUTES AGO:

-	Drywell pressure	3.5 psig, rising
-	Reactor level	-60 inches lowering slowly
-	Bus 13-1 de-energized	1/2 DG failed to auto start
-	Bus 14-1 de-energized	Over current trip

As the operator re-energizes bus 13-1, ADS valves will open ..

a. 110 seconds after power is restored to the bus.

b. 6.5 minutes after power is restored to the bus.

c. when discharge pressure is sensed from ANY of the Division 1 ECCS pumps.

d. 110 seconds after discharge pressure is sensed from ANY of the Division 1 ECCS pumps.

QUESTION: 009 (1.00)

QGA 200 directs stopping Drywell and Torus sprays before their respective pressures drop to zero (0) psig. Continued spray operation past this point will . . .

a. result in dilution of the nitrogen atmosphere in the primary containment.

b. cause "chugging" and subsequent downcomer damage.

c. exceed the capacity of the torus/drywell vacuum breaker system.

d. exceed the capacity of the torus to reactor building vacuum breaker system.

QUESTION: 010 (1.00)

Unit 1 is at full power with all systems aligned in their normal line up when one of the running condensate pumps is inadvertently turned off by the operator. Which of the following will complete the statement?

The standby Condensate Pump will start automatically when the __(1)__ and the running Reactor Feed Pumps will trip if the __(2)__.

a. (1) running condensate pump is turned off,
(2) feed pump suction header pressure drops to 145 psig.

b. (1) running condensate pump is turned off,
(2) feed pump discharge header pressure drops to 1000 psig.

c. (1) feed pump suction header pressure drops to 145 psig,
(2) feed pump discharge pressure drops to 1000 psig.

d. (1) feed pump suction header pressure drops to 145 psig,
(2) feed pump suction header pressure drops to 125 psig.

QUESTION: 011 (1.00)

Reactor power is being raised from 98% to 100% with core flow when annunciators RECIRC LOOP A FLOW LIMIT and RECIRC LOOP B FLOW LIMIT are received. Which of the following describes the condition that initiated these annunciators AND the expected operator response?

a. These are expected alarms when loop flows reach 100%, no operator action is required.

b. Total feed flow has dropped below 20% of rated, the operator should verify recirc runback to 32%.

c. Total steam flow has dropped below 20% of rated, the operator must reduce total core flow to <45%.

d. Loop flows have reached their maximum allowable value, the operator must reduce flow until the alarms clear.

QUESTION: 012 (1.00)

Feedwater level control is in "Runout Flow Control" mode of operation. A second feed pump is started to raise RPV water level. Which of the following describes the effect this will have on the FWLC system? The feedwater regulating valves (FRV) . . .

a. will automatically return to the "level control" mode when both narrow range YARWAY levels reach +20 inches.

b. will automatically return to the "level control" mode as soon as flow is detected on the second feed pump.

c. can be MANUALLY returned to the "level control" mode provided at least two feed pumps are running and the "flow control mode reset" pushbutton is depressed.

d. can be MANUALLY returned to the "level control" mode provided both narrow range GEMAC instruments reach +20 inches and the "flow control mode reset" pushbutton is depressed.

QUESTION: 013 (1.00)

Time 04:00:00	Loss of Coolant Accident on Unit One Reserve Feed Breaker to Bus 13 fails to auto close. All other actions occur as expected.
Time 04:00:10	DG 1/2 output breaker closes

Given these conditions, which of the following selections identifies when the Unit One RHR Pumps will start?

a. A starts at 04:00:10
B starts at 04:00:15
C starts at 04:00:00
D starts at 04:00:00

b. A starts at 04:00:00
B starts at 04:00:00
C starts at 04:00:10
D starts at 04:00:15

c. A starts at 04:00:15
B starts at 04:00:10
C starts at 04:00:00
D starts at 04:00:00

d. A starts at 04:00:10
B starts at 04:00:15
C starts at 04:00:00
D starts at 04:00:05

QUESTION: 014 (1.00)

A malfunction has caused one of the Unit 2 Reactor Building Outlet Isolation Dampers to close. Which of the following describes ALL the response(s) of Unit 2 Secondary Containment systems to this event?

a. SBGT will automatically start.

b. Unit 2 Reactor Building Exhaust fans trip.

c. Unit 2 Reactor Building Supply AND Exhaust fans trip.

d. Unit 2 Reactor Building Supply fans trip AND SBGT automatically starts.

QUESTION: 015 (1.00)

Unit Two was operating at rated conditions when a spurious turbine trip occurred. Which of the following describes the status of the Unit Two electrical distribution system assuming all systems and components responded as designed?

a. Buses 21, 22, 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

b. Buses 21 and 22 are energized from Reserve Aux. Transformer 22.
Bus 23 is energized from Bus 21.
Bus 24 is energized from Bus 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

c. Buses 21 and 22 are energized from Unit Aux. Transformer 21.
Buses 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from Bus 23.
Bus 24-1 energized from Bus 24.

d. Buses 21, 22, 23 and 24 are energized from Reserve Aux. Transformer 22.
Bus 23-1 energized from 1/2 the Diesel Generator.
Bus 24-1 is energized from the Unit 2 Diesel Generator.

QUESTION: 016 (1.00)

The plant was operating at 97% power when a transient occurred. After conditions stabilized the Unit NSO noted the recirculation pump drive motor breakers AND generator field breakers were tripped on both recirculation pumps. The existing status of the Recirculation System was a direct result of . . .

a. a reactor pressure spike to 1210 psig.

b. drywell pressure rising and peaking at 2.1 psig.

c. reactor water level lowering to -65 inches.

d. reactor feed flow lowering below 1.5E6 lbm/hr.

QUESTION: 017 (1.00)

While moving a spent fuel bundle in the Fuel Pool, a Fuel Pool Storage Low Level Alarm is received and Fuel Pool Level is confirmed to be decreasing. Which of the following describes the expected operator action for these conditions?

a. Return bundle to its original location.

b. Suspend bundle movement where it is.

c. Place bundle in the nearest storage location.

d. Lower bundle as far as possible without moving refueling bridge.

QUESTION: 018 (1.00)

During ATWS conditions, which of the following defines the requirement for boron injection before torus temperature reaches 110°F?

a. To prevent reduction of NSPH to ALL ECCS pumps.

b. To minimize the challenge to fuel and reactor integrity.

c. To assure prompt injection of the Cold Shutdown Weight of Boron.

d. To preclude reaching the Heat Capacity Temperature Limit.

QUESTION: 019 (1.00)

Which of the following identifies the lowest Torus level at which you can open SRVs without violating procedural guidance?

a. 4 ft.

b. 6.5 ft.

c. 11 ft.

d. 18.5 ft.

QUESTION: 020 (1.00)

A failure to scram occurred and available injection systems cannot maintain RPV level above -142 inches.

Which of the following describes why QGA 101 allows the bottom end of the level band to be lowered from -142 inches to -166 inches?

a. Lowered level and power facilitates mixing of boron.

b. Eliminates power oscillations allowing accurate RPV level indication on the fuel zone instruments.

c. Reactor power and the associated steam flow is reduced, allowing available injection systems to maintain level.

d. The covered portion of the core can generate enough steam flow to adequately cool the uncovered portion of the core.

QUESTION: 021 (1.00)

With Unit 1 at 100% power, annunciator 901-4 C-16, "MST HI TEMP RWCU OUTBD ISOL BYPASS" is in alarm. Which of the following describes the impact, if any, this condition will have if a steam leak were to occur in the steam tunnel?

a. None of the RWCU system isolation valves will close automatically.

b. Neither the outboard MSIVs nor the outboard RWCU isolation valves will close automatically.

c. All RWCU valves will respond as designed, but the outboard MSIVs will NOT isolate automatically.

d. All MSIVs will respond as designed, but the outboard RWCU isolation valves will not isolate automatically.

QUESTION: 022 (1.00)

The standby Reactor Building Exhaust fan failed to automatically start following a malfunction which initiated a trip of one of the running exhaust fans. Assuming a normal system line up before the fan malfunction, which of the following identifies the final status of the Reactor Building Ventilation system?

a. All supply fans will be tripped, the operable exhaust fan will remain running.

b. All fans will continue to operate as they were before the exhaust fan trip.

c. All supply fans and exhaust fans will be tripped.

d. All supply fans and exhaust fans will be tripped, isolation dampers will be closed.

QUESTION: 023 (1.00)

A plant transient has occurred and the following plant parameters exist:

-	Reactor status	All Rods fully inserted
-	Reactor water level	+2 inches, rising slowly
-	Reactor pressure	900 psig, lowering slowly
-	Drywell pressure	2.1 psig, rising slowly
-	"A" RHR Room temp	120°F, steady
-	"A" RHR Room level	+2 inches, no change

Which of the following identifies ALL the QGAs that should be entered and implemented?

a. QGA 100 (RPV Control) QGA 200 (Primary Containment Control) QGA 300 (Secondary Containment Control)

b. QGA 100 (RPV Control) QGA 200 (Primary Containment Control)

c. QGA 100 (RPV Control) QGA 300 (Secondary Containment Control)

d. QGA 200 (Primary Containment Control) QGA 300 (Secondary Containment Control)

QUESTION: 024 (1.00)

Unit Two is shutdown in preparation for refueling outage. A normal river discharge is in progress. RHR Shutdown Cooling (SDC) is in operation with B RHR pump and B RHR SW pump. The NSO throttles open 2-1001-5A, RHR Heat Exchanger Service Water Discharge Valve, to increase RHR service water flow through the RHR heat exchangers. Annunciator 902-3, G-1, Liquid Process Rad Monitor Hi Radiation, now alarms, and Service Water effluent high radiation is confirmed to be rising. Which of the following describes the appropriate operator response for the described conditions?

a. Shut down the RHR SW pump ONLY, and notify Chemistry.

b. Verify 2-1-001-5A automatically closes and continue to monitor radiation levels.

c. Verify BOTH RHR and RHR SW pumps automaticaly trip then notify chemistry.

d. Shut down operating RHR and RHR SW Pumps and monitor radiation levels.

QUESTION: 025 (1.00)

Given the following conditions:

- A feedwater level control malfunction has resulted in lowering reactor water level
- Reactor water level has reached +5 inches

Which of the following are the EXPECTED NSO actions with reactor power still at 100%?

a. Inform the Unit Supervisor of the condition and insert a manual reactor scram only when directed by the US.

b. Insert a manual reactor scram and inform the Unit Supervisor of the condition and the action taken.

c. Run Recirc Flow to minimum, trip BOTH Reactor Recirc Pumps and raise reactor level to greater than +20".

d. Perform an immediate power reduction and raise reactor water level to 12" greater than narrow range instrument zero.

QUESTION: 026 (1.00)

The Unit NSO has to be relieved by an extra NSO so he can meet with the Shift Manager for about l/2 hour in the Shift Manager's office. Which of the following describes the minimum required turnover?

a. The relief NSO MUST review the current Shift Turnover Sheet AND be updated on any deviations of plant status/activities from the sheet by the off-going NSO.

b. ALL NSO actions for the turnover, including the Shift Turnover Sheet, MUST be completed.

c. The relief NSO MUST read the Control Room logs AND tour the control boards with the off-going NSO.

d. ALL NSO actions for the turnover, including the Shift Turnover Sheet, MUST be completed AND the Unit Supervisor is required to initial the Turnover Sheet.

QUESTION: 027 (1.00)

Unit Two was operating normally at rated conditions when a single Recirculation Pump tripped. Which of the following identifies the conditions that will require the operator to initiate a MANUAL scram? ASSUME THE FCL PRIOR TO THE TRIP WAS 99%

a. LPRMs are oscillating on irregular intervals(1.0 to 6.0 seconds) and with irregular magnitude (between 0% and 2%).

b. Indicated core flow at 43% of rated core flow.

c. Indicated core flow at 35% of rated core flow.

d. LPRMs are oscillating at regular intervals (1.5 to 2.5 seconds) and the magnitude of the oscillations are 5% to 6% and rising.

QUESTION: 028 (1.00)

Which of the following resulting combinations of reactor power and pressure indicate violation of a Safety Limit?

a. Reactor power -- 38%
   Reactor pressure -- 850 psig

b. Reactor power -- 30%
   Reactor pressure -- 820 psig

c. Reactor power -- 28%
   Reactor pressure -- 770 psig

d. Reactor power -- 20%
   Reactor pressure -- 750 psig

QUESTION: 029 (1.00)

Given a copy of the Generator Cooling Capability Curve:

Which of the following identifies the set of Main Generator parameters where generator operating limits are EXCEEDED?

	Power	Reactive Load	H2 Pressure	H2 Temperature
a.	600 MWe	+200 MVARs	60 psig	42°C
b.	700 MWe	+300 MVARs	45 psig	42°C
c.	800 MWe	+250 MVARs	45 psig	36°C
d.	820 MWe	+350 MVARs	60 psig	36°C

QUESTION: 030 (1.00)

A loss of feed transient on Unit One has caused reactor level to drop to -70 inches. Neither HPCI or RCIC have responded as designed and the Safe Shutdown Makeup Pump (SSMP) has been placed in service to automatically restore reactor level. Reactor level is now -5 inches and recovering. Which of the following describes the SSMP indications on the SSMP panel 912-8 as reactor level rises to above +48 inches? ASSUME NORMAL SYSTEM RESPONSE WITHOUT ANY OPERATOR ACTIONS

	Safe Shut Down Pump ½-2901	Flow Control Valve 1/2-2601-6	Unit Supply valve 1-2901-8
a.	RED light on	400 gpm	RED light on
b.	RED light on	400 gpm	GREEN light on
c.	GREEN light on	Zero gpm	GREEN light on
d.	AMBER light on	Zero gpm	RED light on

QUESTION: 031 (1.00)

Unit Two is operating at rated power with an Initial License Candidate (ILC) under instruction as NSO on Unit Two. A loss of feedwater heating occurs, the flow control line is rising slowly and it is determined that the "CRAM Rods" must be inserted. The Unit Two NSO is involved in restoring a normal feedwater heater lineup. The Unit 2 Admin. NSO is recording APRM readings from the 902-37 panel. Under these "Abnormal" conditions, per OP-AA- 101-104, "Watch Standing Practices", who may perform the task of rod insertion?

a. The Unit Two NSO.

b. The Operations Manager.

c. The Initial License Candidate.

d. The Qualified Nuclear Engineer.

QUESTION: 032 (1.00)

Which of the following is considered to be a T-Mod as described in CC-AA-112, "Temporary Modifications"?

a. The removal of RHR pump motor control power fuses as part of an OOS for repair of the motor.

b. A charging hose with a pressure guage attached when charging a SBLC accumulator IAW QCOP 1100-10.

c. A pressure guage installed on an engineered test point tap.

d. A strip chart recorder installed due to the failure of the installed component.

QUESTION: 033 (1.00)

This year you have accumulated 10 REM Shallow Dose Equivalent, Whole Body. What's the maximum external dose whole body skin exposure that you can receive before you exceed the Legal Federal Annual limit?

a. 5 Rem

b. 10 Rem

c. 40 Rem

d. 50 Rem

QUESTION: 034 (1.00)

Extraordinary circumstances require a task to be performed which will result in excessive radiation exposure. Which of the following is accurate regarding an EMERGENCY EXPOSURE?

a. Approval MUST be granted by the Rad Chem Superintendent, Station Manager and Site Vice President.

b. Approval MUST be granted by the Station Manager, Site Vice President and the ComEd Medical Director.

c. Approval SHOULD be granted by the Rad Chem Superintendent and the Station Manager but the exposure is voluntary and approval is NOT mandatory.

d. Approval SHOULD be granted by the Rad Chem Superintendent, Station Manager and ComEd Medical Director but the exposure is voluntary and approval is NOT mandatory.

QUESTION: 035 (1.00)

QGA 200-5, Hydrogen Control, initial steps to control hydrogen direct venting and purging containment. Prior to venting, an evacuation is directed for the SBGT area. The evacuation is necessary to protect personnel from the potential for . . .

a. a hydrogen explosion.

b. high area temperatures.

c. changing radiological conditions.

d. a nitrogen rich, oxygen deficient atmosphere.

QUESTION: 036 (1.00)

The following containment parameters exist as a result of a loss of Reactor Building Closed Cooling Water (RBCCW) during a LOCA.

- Drywell Temperature 275°F
- Drywell Pressure 14 psig

Which of the following identifies and explains the concerns IF RBCCW flow is re-established to the drywell under these conditions?

a. Damage to the RBCCW Pump seals due to high temperature water.

b. Excessive reduction in drywell pressure due to high RBCCW flow.

c. Damage to the RBCCW pumps due to runout.

d. Damage to RBCCW components due to water hammer.

QUESTION: 037 (1.00)

A valid Group One (1) isolation signal has been received. All MSIVs responded as designed except Outboard MSIV 203-2A which failed to close. Which of the following identifies the SPDS indications for the described condition(s)? The PCIS box will be . . .

a. Solid RED.

b. RED with a smaller white box stating "OPEN".

c. Solid GREEN.

d. GREEN with a smaller white box stating "CLOSED".

QUESTION: 038 (1.00)

The earliest time that the Rod Worth Minimizer(RWM) rod blocks will automatically ENABLE is . . .

a. as soon as either steam flow OR feedwater flow decrease to less than 20%.

b. one (1) minute after steam flow AND feedwater flow are both less than 20%.

c. as soon as steam flow AND feedwater flow have both increased to more than 20%.

d. when steam flow OR feedwater flow has been above 20% for more than one (1) minute.

QUESTION: 039 (1.00)

Plant operation is stable with the following parameters following a failure of the "A" recirc pump controller.

- Reactor Power	78% of rated.
- Reactor Level	Stable in the normal range.
- A Recirc Pump Speed	64% of rated.
- B Recirc Pump Speed	100% of rated.

Which of the following should be taken for the conditions that now exist?

a. Immediately trip the "A" recirculation pump.

b. Locally raise "A" pump speed to 74% of rated.

c. Lower "B" pump speed to 79% of rated.

d. Immediately place the reactor Mode Switch in SHUTDOWN.

QUESTION: 040 (1.00)

Given the following conditions:

- The plant is operating at 55% power.
- A speed signal failure on the "A" Recirculation Pump has resulted in a Scoop Tube Lock up.
- Preparations are in progress to take local manual control of the "A" Scoop Tube Positioner.
- Prior to taking local manual control, a reactor scram occurs.

Which of the following are REQUIRED for these conditions?

a. Trip the "A" Recirculation Pump immediately.

b. Place the local Disconnect Switch to "OFF", then trip the "A" Recirculation Pump.

c. Direct an Equipment Operator to manually position the "A" Recirculation Pump scoop tube to "minimum" speed.

d. If the difference in recirculation loop flows was greater than 5% at the time of the scram, then trip the "A" Recirculation Pump.

QUESTION: 041 (1.00)

A LOCA is in progress. RHR Loop Select Logic has determined that there is NO difference between "A" and "B" Jet Pump Riser pressures. MO-1001-29B failed to automatically open when the reactor low pressure premissive was satisfied. Which of the following describes the minimum action(s) necessary to initiate RHR LPCI flow into the RPV? (Assume that RPV level remains below -59" and injection valve MO-1001-29B cannot be opened.)

a. Reset the LPCI Loop Select Logic, the RHR injection valves MO-1001-28A and MO-1001-29A will then open automatically.

b. Reset the LPCI Loop Select Logic, then open RHR injection valves MO-1001-28A and MO-1001-29A using the control switches on 90X-3.

c. Wait for the 5 minute Loop Select Timer to time out, then open RHR injection valves MO-1001-28A and MO-1001- 29A using the control switches on 90X-3.

d. Manually open RHR injection valves MO-1001-28A and MO- 1001-29A locally.

QUESTION: 042 (1.00)

Unit One is recovering from a reactor scram. Reactor Water Cleanup (RWCU) blowdown flow has been maximized to the main condenser to maintain proper reactor water level. CU SYSTEM AFTER NON REG HX HIGH TEMP is annunciated. Which of the following will occur as a DIRECT result of the temperature rise IF prompt action is NOT taken by the operator?

a. Automatic isolation of both filter demineralizers.

b. Automatic isolation of all blowdown to the main condenser.

c. Automatic isolation of RWCU primary containment isolation valves.

d. Automatic bypass of all RWCU flow around the filter demineralizers.

QUESTION: 043 (1.00)

Shutdown Cooling (SDC) is being placed in service IAW QCOP 1000-5 using Recirculation Loop A and RHR Pump B. Which of the following identifies the interlocks that minimize the potential for inadvertent vessel draindown as the task is performed?

a. BOTH RHR cross-tie valves, 19A AND 19B, must be closed before SDC suction valve, 43B, can be opened.

b. Torus suction valve, 7B, must be closed before SDC suction valves, 47 AND 50, can be opened.

c. Torus spray valve, 37A, must be closed before EITHER SDC suction valves, 47 OR 50, can be opened.

d. Torus spray/test return valve, 34A, must be closed before SDC suction valve, 43B, can be opened.

QUESTION: 044 (1.00)

A loss of feed event occurred resulting in RPV level dropping to -65 inches. HPCI was in normal standby line up and has responded as designed. Which of the following describes HPCI system response if torus level rises to +6"?

a. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke closed. HPCI CCST suction valve (2301-6) will remain open, HPCI injection is not interrupted.

b. HPCI CCST suction valve (2301-6) will stroke closed, HPCI turbine will trip. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open, HPCI will start and inject.

c. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open. HPCI CCST suction valve (2301-6) will stroke closed, HPCI will continue to inject during the transfer.

d. HPCI turbine will trip. Suppression Pool suction (2301-35 and 36) will stroke closed and CCST suction (2301-6) valves will stroke open simultaneously. HPCI will start and inject after suction is realigned.

QUESTION: 045 (1.00)

The following annunciator has been received on Unit One, CORE SPRAY SYS 1 BUS/LOGIC PWR FAILURE. The loss of logic power can be attributed to a loss of . . .

a. 125 VDC Main Bus 1B-1.

b. 120/240 VAC Instrument Bus.

c. 125 VDC Distribution Panel 1A-1.

d. 120/240 VAC Essential Service Bus.

QUESTION: 046 (1.00)

The plant is in an ATWS condition. The keylock switch for the Standby Liquid Control (SBLC) system is placed in SYS 1. Aside from starting the "A" SBLC pump, what else will this switch movement initiate?

a. ONLY RWCU inboard isolation valve, MO-1201-2 will close.

b. BOTH primer assemblies in the System 1 squib valve will energize.

c. ALL squib primer assemblies circuits for BOTH System 1 AND System 2 will energize.

d. ONLY RWCU inboard isolation valve, MO-1201-2, AND outboard isolation valve, MO-1201-5, will close.

QUESTION: 047 (1.00)

The plant is operating at 75% power with all systems in their normal lineup when numerous annunciators and changes in indication are received including:

- Channel B half scram
- Control rod withdrawl block
- Numerous Division 2 Isolation valves close including RWCU valves 1201-5 (RWCU Isolation) and 1201-80 (RWCU return).

Which of the following accounts for the described conditions?

a. Loss of MCC 15-2

b. Loss of MCC-18-2.

c. Loss of MCC 19-2

d. Loss of Turbine Building 125 VDC Bus 1B1

QUESTION: 048 (1.00)

Unit One startup is in progress and Mode 1 was just entered. Plant operation is now stable following a loss of RPS "B". No operator action has been taken except to silence and acknowledge alarms. Which of the following will initiate a full reactor scram?

a. IRM Channel 14 fails upscale.

b. APRM Channel 2 fails downscale.

c. Reactor high pressure transmitter to RPS, 1-263-55-D, fails upscale.

d. Reactor low level transmitter to RPS, 1-263-57-A, fails downscale.

QUESTION: 049 (1.00)

Which of the following describes the Full Core Display indications that will alert the Unit NSO that a control rod is inserted beyond the FULL-IN position?

a. GREEN LED with " - -" indication.

b. AMBER LED with "00" indication.

c. WHITE LED with "00" indication.

d. RED LED with "--" indication.

QUESTION: 050 (1.00)

Conditions:

- Plant startup in progress.
- The heating range has been reached.
- IRMs 13, 14, and 16 are on range 7.
- IRMs 11,12, 15, 17, and 18 are on range 8.

Which of the following will initiate a ROD BLOCK?

a. SRM INOP.

b. SRM Downscale.

c. SRM Detector Not Full In.

d. Shorting links are removed.

QUESTION: 051 (1.00)

A heat balance has just been completed and core power has been calculated to be 95.5% of rated. The Weekly APRM Flow Biased High Flux Calibration Test, QCOS-0700-06, is in progress with the following results:

APRM	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6
Meter Reading	95.0	98	93.0	95.5	92.5	96.0

Which of the following describes required action(s), if any, based on the APRM surveillance results?

a. Immediately, place the Reactor Mode Switch in SHUTDOWN.

b. Initiate action to adjust the gain on APRM Channels 2, 3 and 5.

c. All APRM readings are within limits, no action is required at this time.

d. Reduce power with flow to less than 75% as indicated on the highest APRM (CH. 2).

QUESTION: 052 (1.00)

During normal full power operation, INDICATED water level in the reactor vessel downcomer region is . . .

a. LOWER than ACTUAL level inside the dryer skirt due to high recirculation suction flow in the downcomer.

b. LOWER than ACTUAL level inside the dryer skirt due to the increased void content in the core at full power.

c. HIGHER than ACTUAL level inside the dryer skirt due to the pressure drop across the steam dryer.

d. HIGHER than ACTUAL level inside the dryer skirt due to the subcooling effect from feedwater in the downcomer.

QUESTION: 053 (1.00)

RCIC has responded as designed to a valid initiation signal. Reactor level has risen and RCIC has responded correctly at the high level setpoint. Which of the following describes present system status AND manipulations, if any, that may be necessary if reactor level drops to -65 inches?

a. The RCIC steam supply valve is closed, at -59 inches it will automatically reopen to allow injection.

b. The RCIC turbine is tripped. RCIC will inject after the trip throttle linkage is reset locally at the turbine.

c. The RCIC injection valve is closed, RCIC is operating on minimum flow. At -59" the injection valve will reopen.

d. The RCIC steam supply valve is closed. The reset pushbutton on panel 901-4 must be depressed to allow injection.

QUESTION: 054 (1.00)

A loss of feed event has occurred. Reactor level dropped to -65 inches and all systems responded as designed. HPCI has been secured. Level is now being restored with RCIC delivering 400 gpm in AUTO. Which of the following describes the impact that a loss of 125 VDC Bus 1A will have on the operation of RCIC?

a. The governor will fail open resulting in an RCIC mechanical trip.

b. RCIC will fail to isolate if a valid isolation signal were received.

c. The RCIC flow controller will fail to zero resulting in a loss of RCIC flow.

d. The RCIC flow controller will fail full scale resulting in an RCIC electrical overspeed trip.

QUESTION: 055 (1.00)

Given the following conditions on Unit One:

-	RPV level	-90" lowering slowly
-	Drywell pressure	3.0 psig rising slowly

All systems have responded as expected. Fifteen (15) seconds ago the operator acknowledged annunciator AUTO BLOWDOWN TIMER START and depressed and released the TIMER RESET pushbutton. Which of the following describes the operation of the Safety Relief Valves in the ADS Mode? Under these conditions the ADS valves will. . .

a. only open after 8 minutes and 15 seconds.

b. only open if their respective control switches are placed in MAN.

c. open 110 seconds after the timer starts regardless of RPV water level.

d. open automatically in 95 seconds provided RPV water level remains below -59".

QUESTION: 056 (1.00)

Unit One was operating normally at rated power with RHR in Torus Cooling when a LOCA signal was received. All systems have responded as designed. Which of the following describes the design feature that will ensure maximum ECCS injection flow?

a. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after RHR injection flow has commenced.

b. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after the LOCA initiation signal.

c. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the LOCA initiation signal.

d. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the open permissive signal (325 psig reactor pressure) has been received.

QUESTION: 057 (1.00)

With Unit One operating at full power, annunciator 901-3-C-14, TORUS VACUUM RELIEF VLV 20A NOT FULL CLOSED, alarms. Which of the following are the implications if this condition is confirmed to be true?

a. Primary Containment integrity will be violated until the Torus to Reactor Building Vacuum Breaker is closed.

b. Drywell to Torus separation CANNOT be ensured until the Drywell to Torus Vacuum Breaker is closed.

c. The check valve in the Torus to Reactor Building Vacuum Breaker line is now providing Primary Containment integrity.

d. The check valve in the Drywell to Torus Vacuum Breaker line is now providing Primary Containment integrity.

QUESTION: 058 (1.00)

Unit 2 is operating at 100% power when a small steam leak develops which causes drywell pressure to rise to 3.0 psig. The reactor scrams and all immediate scram actions are taken. Reactor water level lowers to + 5" inches before being restored to the normal band. Which of the following identifies the MINIMUM Primary Containment Isolation System Group(s) that should have isolated?

a. Group I.

b. Group II.

c. Groups I & III.

d. Groups II & III.

QUESTION: 059 (1.00)

Given the following:

- Unit One operating at 100% power.
- Torus Cooling is in operation using RHR pump "A".
- RHR "A" Service Water Pump is running.
- Cooling valves MO-1001-34A, Torus Test or Spray Valve, is full open and MO-1001-36A, Torus H2O Test Valve, is throttled to establish system pressure.
- HX bypass valve MO-1001-16A is throttled to establish temperature reduction.

Which of the following identifies the final status of these components if drywell pressure should rise to 2.7 psig?

	1001-34A	1001-36A	RHR Pump A	RHR SW Pump A
a.	Open	Open	Running	Off
b.	Open	Closed	Running	Off
c.	Closed	As Is	Off	Running
d.	Closed	Closed	Running	Off

QUESTION: 060 (1.00)

Which of the following is a function of the fuel pool Skimmer Weirs?

a. Maintain a set fuel pool water level

b. Ensure net positive suction head for the FPCC pumps

c. Evacuate air from directly over the surface of the fuel pools

d. Permit draining of the reactor cavity while maintaining normal fuel pool level

QUESTION: 061 (1.00)

QCOP 0203-01, Reactor Pressure Control Using Manual Relief Valve Actuation, states that when operating the ADS valves their control switches should NOT be placed in OFF. If the control switch is placed in OFF, the valve will . . .

a. open on setpoint pressure, but NOT on an ADS signal.

b. open on an ADS signal, but NOT on setpoint pressure.

c. NOT open on setpoint pressure OR an ADS signal.

d. open on setpoint pressure OR an ADS signal once it has been closed for 10 seconds.

QUESTION: 062 (1.00)

Steam pressure utilized by the EHC logic is sensed . . .

a. at the equalizing header.

b. in the reactor steam dome.

c. at the reference leg for the YARWAY wide range level detectors.

d. at the reference leg for the GEMAC narrow range level detectors.

QUESTION: 063 (1.00)

Rx Power is 100% with the FWLC system in 3 element control. The breaker for the 1C reactor feed pump has been racked out in preparation for pump maintenance. While implementing the OOS procedure the operator incorrectly isolates the flow transmitter for the 1C RFP such that it outputs an upscale flow signal. Which of the following describes the effect, if any, this will have on the reactor feed water system?

a. Feedwater reg valves rapidly close, the reactor will scram on low level.

b. No effect on the system as the feed pump breaker has already been racked out.

c. Feedwater reg valves rapidly open, the feed pumps and main turbine will trip on high level.

d. Loss of flow signal will initiate a FW reg valve lockup, feed flow to the vessel remains constant.

QUESTION: 064 (1.00)

The "B" SBGT train flow was noted to be 3700 SCFM during a dual unit outage when the monthly surveillance was performed. Unit 1 is preparing to perform refueling operations, the reactor head is still fully tensioned. Unit 2 is in Shutdown Cooling with a temperature band of 150 - 180°F. Refueling operations may

a. NOT take place due to the "B" SBGT being INOP.

b. take place due to both "A" and "B" SBGT trains being operable.

c. NOT take place due to the potential to drain the reactor vessel.

d. take place for the next 7 days only if "A" SBGT train is in operation.

QUESTION: 065 (1.00)

The Unit 1 250 VDC system has just failed. Which of the following identifies the systems effected by this failure?

a. Unit 1 HPCI and Unit 2 RCIC.

b. Unit 1 HPCI and Unit 1 RCIC.

c. Unit 2 HPCI and Unit 1 RCIC.

d. Unit 2 HPCI and Unit 2 RCIC.

QUESTION: 066 (1.00)

A LOCA has occurred on Unit One simultaneously with a loss of off-site power. Both the #1 and the #1/2 Diesel Generator have failed to start. Which of the following describes the response of the Station Blackout (SBO) Diesels #1 and #2 to these events?

a. Both SBO Diesel Generators must be manually started. All bus loading must be performed by the operator.

b. Both SBO Diesel Generators will start when the LOCA signal is received. All bus loading must be manually performed by the operator.

c. Both SBO Diesel Generators must be manually started. Various bus loads will sequence on in 5 second intervals.

d. Both SBO Diesel Generators will start 60 seconds after their respective buses are de-energized. Bus loads will automatically sequence on at five (5) second intervals

QUESTION: 067 (1.00)

The average Drywell Equipment and Floor Drain sump pump flowrates were determined on Sunday (first shift) this work week. On Wednesday (first shift) the DW Floor Drain Sump integrator malfunctioned and was declared inoperable. Which of the following describes the effect of this malfunction on plant operation?

a. A plant shutdown must be commenced because Identified leakage cannot be determined.

b. A plant shutdown must be commenced because Unidentified leakage cannot be determined.

c. Operation can continue provided the DRYWELL FL DR PUMPS HIGH DISCHARGE FLOW annunciator is NOT received.

d. Operation can continue, as flow rates can be calculated using the previously established flow rate and timing pump operation.

QUESTION: 068 (1.00)

Given the following parameters and trends:

- MSL Rad monitors at 12 X Normal, rising slowly.
- Steam supply to Primary SJAE's at 125 psig, steady.
- SJAE rad monitors reading normal and steady.
- Holdup line inlet pressure at 6 psig, lowering slowly.
- Holdup line inlet temperature at 160°F, rising slowly.

Which of the following describes how Off-gas components HAVE responded or WILL respond?

a. SJAE suction valves should already be closed.

b. Off-gas to stack (AO-5406) will isolate in 15 minutes.

c. Mechanical Vacuum pump should already be interlocked off.

d. Pressurized drain tank discharge valve, AO-5437, should close immediately.

QUESTION: 069 (1.00)

The plant is operating at 25% power. The "B" MSL Radiation Monitor is inoperative and has been placed in the "TRIPPED" condition. Which of the following identifies plant AND operator response if a loss of RPS Bus "B" were to occur?

a. The reactor will scram, perform the immediate scram actions.

b. Reactor operation is unaffected, perform the actions for a loss of RPS.

c. The reactor will scram and the MSIVs will isolate, take action for scram and isolation.

d. Reactor operation is unaffected but the turbine will trip, take action for loss of RPS and a turbine trip.

QUESTION: 070 (1.00)

Which of the following identifies ALL the Diesel Driven Fire Pump indications that are available in the Control Room?

a. Diesel Fire Pump discharge valve position indications and individual diesel day tank levels.

b. Diesel Fire Pump run status lights and header pressure.

c. Diesel Fire Pump run status lights and BATT 1/BATT 2 power available lights.

d. Diesel Fire Pump discharge valve position indications and BATT 1/BATT 2 power available lights.

QUESTION: 071 (1.00)

Upon a loss of Instrument Air, the East and West Turbine Building Supply Fan dampers will . . .

a. fail closed.

b. fail open.

c. fail as-is.

d. NOT be affected.

QUESTION: 072 (1.00)

Unit One is at power with the following RBCCW system alignment.

- 1A RBCCW Pump is OOS
- 1/2 RBCCW feed from bus 19 is OOS
- 1B RBCCW Pump operating normally
- 1/2 RBCCW Pump lined up to Unit 1 and operating normally powered from Bus 29

Which of the following identifies the RBCCW system response to a valid LOCA signal on Unit One?

a. Both running RBCCW pumps will trip, all system isolation valves remain open.

b. Both running RBCCW pumps will trip and the non- containment loads will automatically isolate.

c. Both running RBCCW pumps will continue to run, the non- containment loads will automatically isolate.

d. 1B RBCCW Pump will trip, 1/2 RBCCW pump will continue to run, all system isolation valves remain open.

QUESTION: 073 (1.00)

During Single Loop Operation, Total Core Flow as indicated by FR- 1(2)-263-110 (Digital Flow Indicating Recorder for total core flow and core plate DP on the 901 5 panel) is . . .

a. inaccurate because the flow through the idle recirculation pump is reversed.

b. inaccurate because of backflow through the idle jet pumps.

c. accurate because total core flow is unaffected by the number of recirculation pumps in operation.

d. accurate because an averaging circuit automatically subtracts all jet pump flow through the idle loop.

QUESTION: 074 (1.00)

Which of the following vacuum readings corresponds to the lowest condenser vacuum at which the bypass valves will remain effective in reducing reactor pressure? (Consider ONLY actual plant setpoints per QOA 3300-02, Loss of Condenser Vacuum for your answer)

a. 1 inch Hg vacuum (29 inches backpressure).

b. 8 inches Hg vacuum (22 inches backpressure).

c. 20 inches Hg vacuum (10 inches backpressure).

d. 21 inches Hg vacuum (9 inches backpressure).

QUESTION: 075 (1.00)

Unit One was operating at rated power when a transient occurred resulting in the following electrical distribution alignment.

- Bus 13-1 energized from Bus 13.
- 1/2 Diesel Generator is running unloaded.
- Unit 1 Diesel Generator running, loaded to Bus 14-1.

Which of the following identifies the condition(s) that caused the described alignment?

a. Loss of off-site power.

b. LOCA and loss of Bus 14.

c. LOCA and loss of off-site power.

d. Turbine/generator trip and a LOCA.

QUESTION: 076 (1.00)

Which of the following describes the effect of a total loss of Safety related 250 VDC during normal operation?

a. Loss of power to HPCI valve MO-2301-4.

b. All inboard MSIV solenoids will de-energize.

c. Alternate power supply to the ESS inverter is unavailable.

d. Automatic trip capability for Main Turbine/Generator is lost due to loss of protective relaying.

QUESTION: 077 (1.00)

Initial Conditions:

- Plant startup is ongoing with reactor and main turbine heat up in progress.
- Reactor Level +35", stable
- Reactor Pressure 750 psig, rising slowly
- Reactor power 5% on the APRMs
- MSIVs Open
- Main Turbine Reset

Which of the following describes plant response if the Reactor Mode Switch were placed in RUN at this time?

a. Plant status would remain the same, all parameters are within limits.

b. A direct scram signal would be initiated from reactor low pressure conditions.

c. A rod block would be initiated from APRM downscale conditions.

d. A direct scram signal would be initiated from MSIV position indication.

QUESTION: 078 (1.00)

During a reactor pressure transient in which reactor pressure rises and peaks at 1145 psig, over pressure protection is assured by the opening of . . .

a. ALL FIVE relief valves AND TWO safety valves.

b. ALL FIVE relief valves AND ALL safety valves.

c. TWO relief valves ONLY.

d. ALL FIVE relief valves ONLY.

QUESTION: 079 (1.00)

A transient occurred resulting in a loss of normal feedwater. The reactor was scrammed and RCIC and HPCI were manually initiated to restore RPV level. Level dropped to -44 inches and is now +50 inches and rising rapidly. The operator should immediately ..

a. Stop injection from HPCI and RCIC.

b. Initiate RWCU reject to lower RPV level.

c. Stop injection from HPCI, allow RCIC injection to continue.

d. Throttle HPCI and RCIC discharge flow to maintain current level.

QUESTION: 080 (1.00)

A steam line break has occurred on Unit One. Which of the following provides a valid entry condition to QGA 200, Primary Containment Control?

a. Any area high temperature as indicated by AREA HI TEMP STEAM LEAK DETECTION on panel 901-3.

b. Report from the EO that steam is coming from beneath the Steam Tunnel Door and the door is hot to the touch.

c. Hi temperature in the area of the MSIV solenoids as indicated by annunciator UNIT 1 DRYWELL TEMP HI on panel 912-7.

d. Hi temperature on the return air to DW coolers as indicated on 1-TR1-2340-9, HPCI and Drywell Air Temperature Recorder.

QUESTION: 081 (1.00)

The plant is recovering from a reactor scram and MSIV isolation. QGA 200 has been entered. The INITIAL steps to initiate Torus cooling in the Torus Temperature Leg are taken to . . .

a. ensure ECCS pump NPSH/Vortex limits are not exceeded.

b. maintain torus temperature below the Heat Capacity Limit.

c. maintain torus temperature below the Technical Specification limit.

d. maintain torus temperature below the Boron Injection Temperature (BIT).

QUESTION: 082 (1.00)

An ATWS has occurred and RPV injection was prevented to intentionally lower RPV level. Injection is now required to maintain RPV level between -142 inches and -166 inches. Which of the following describes the potentially adverse effect(s) of injection under these conditions?

a. Fuel cladding may be damaged as cold water is sprayed onto hot exposed fuel.

b. Rapid injection of cold water may cause RPV metal temperature limits to be exceeded.

c. Rapid injection of water into the RPV could cause a large reactor power excursion which could result in core damage.

d. Addition of cold water may affect the density of the variable instrument leg and therefore the accuracy of RPV level instruments.

QUESTION: 083 (1.00)

QCARP-0000-01, Implementing Procedure for Appendix R Safe Shutdown, has been entered due to a fire and evacuation (abandonment) of the control room. Actions are directed to disable specific plant equipment. Complying with these directions . . .

a. will prevent spurious system initiation and limit inventory loss.

b. ensures that the fire cannot spread to the opposite unit.

c. will prevent unnecessary primary containment isolations.

d. ensures that operator action will not cause cooldown limits to be exceeded.

QUESTION: 084 (1.00)

The plant is operating normally at rated power when the operator notes that drywell pressure and recirculation pump and motor temperatures are rising slowly. Which of the following identifies the cause of these rising trends?

a. Service Water leak inside containment.

b. Service Air leak outside containment.

c. RBCCW leak inside containment.

d. TBCCW leak outside containment.

QUESTION: 085 (1.00)

Instrument Air header pressure on Unit One has dropped to 85 psig and is now stable. Instrument Air Compressor 1A is running loaded. Which of the following describes the expected configuration of the rest of the plant air system?

	Instrument Air Compressor 1B	Dryer Bypass Valves	Little Joe Valve
a.	Running Loaded	OPEN	OPEN
b.	Running Loaded	CLOSED	OPEN
c.	Running Unloaded	OPEN	CLOSED
d.	Running Unloaded	CLOSED	CLOSED

QUESTION: 086 (1.00)

RPS "A" MG set tripped during a plant startup. The following parameters now exist.

-	Reactor MODE switch	STARTUP
-	MSIVs	Open
-	Reactor power	9%
-	Reactor pressure	920 psig
-	RPS Bus "A"	de-energized

Which of the following describes the response of the MSIVs IF RPS Bus "B" were to be de-energized?

a. All MSIVs will close.

b. All MSIVs will remain open.

c. All Inboard MSIVs will close.

d. All Outboard MSIVs will close.

QUESTION: 087 (1.00)

A loss of all CRD pumps has occurred during a reactor startup. The minimum designed reactor pressure listed that will assure control rods will scram is . . .

a. 625 psig

b. 525 psig

c. 425 psig

d. 325 psig

QUESTION: 088 (1.00)

A LOCA has occurred. RPV level initially dropped to -225 inches. RHR is now in operation in the LPCI mode and reactor water level is just above top of active fuel and increasing. Drywell spray initiation has been directed by the DW Pressure leg of QGA 200. Which of the following identifies the RHR manipulation(s) required to initiate Drywell Spray? (Only consider interlocks associated with RHR.)

a. All interlocks are satisfied, open the inboard (23B) and outboard (26B) spray valves.

b. Place the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

c. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE, then open the inboard (23B) and outboard (26B) spray valves.

d. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE and the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

QUESTION: 089 (1.00)

A reactor Safety Valve has inadvertently opened during normal full power operation. Which of the following identifies the expected indications available to the operator when this event occurs?

	901(2) 21 Panel Tail Pipe Temperature Digital Display	901(2) 21 Panel Accoustic Monitor	901(2) 21 Panel Valve Position
a.	525 to 540°F	.01	RED light ON ONLY
b.	525 to 540°F	.99	RED and AMBER lights ON
c.	310 to 335°F	.01	RED light ON ONLY
d.	310 to 335°F	.99	RED and AMBER lights ON

QUESTION: 090 (1.00)

QGA Detail A cautions that RPV water level instrumentation MAY be inaccurate if Drywell temperature is at or above RPV Saturation Temperature because . . .

a. the variable leg may flash, causing level to read falsely low.

b. the reference leg may flash, causing level to read falsely high.

c. outgassing of non-condensibles could occur, causing level to read falsely high.

d. both the variable and reference legs could flash, causing level to read falsely low.

QUESTION: 091 (1.00)

QGA 500-2, STEAM COOLING, directs RPV Blowdown when RPV water level reaches -184 inches and no injection source is available. Which of the following describes why this action is taken?

a. Blowdown increases steam flow up through the core improving heat transfer from the fuel.

b. Blowdown results in significant void formation which reduces reactor power production.

c. At lower pressures, less enthalpy is required to create steam, thus more steam is available for cooling.

d. RPV Blowdown dumps any radioactivity resulting from fuel failure into the torus, preventing uncontrolled release later.

QUESTION: 092 (1.00)

QGA 300, Secondary Containment Control, directs the installation of jumpers to bypass Reactor Building Ventilation Isolation. Which of the following identifies the signal(s) that will cause Reactor Building Ventilation to isolate AFTER the jumpers have been installed?

a. High radiation signal ONLY.

b. High drywell pressure ONLY.

c. High radiation signal AND high drywell pressure.

d. High drywell pressure AND low reactor vessel level.

QUESTION: 093 (1.00)

The plant is operating normally at rated power. A VALID signal results in numerous annunciators and automatic system realignment occurs resulting in the following plant conditions.

- Reactor operation is steady at 100%.
- SBGT system operating, maintaining reactor building differential pressure.
- Control Room is in 100% recirculation mode.
- Reactor Building ventilation is isolated.

Assuming no operator actions have been taken to this point, which of the following identifies the action(s) that should be taken?

a. Enter and execute QGA 300.

b. Enter and execute QGA 400.

c. Initiate a manual scram, enter and execute QGA 100 and QGA 200.

d. Place the reactor mode switch in SHUTDOWN, enter and execute QGA 100.

QUESTION: 094 (1.00)

The plant is in an ATWS condition and QGA 101 requires that the Recirculation Pumps be tripped. Which of the following completes the statement regarding the reason for this direction? A Recirc Pump trip provides for . . .

a. reduction in the potential for chugging.

b. more efficient boron mixing.

c. an increase in core cooling.

d. a rapid increase in core voids.

QUESTION: 095 (1.00)

QGA 200-5, Hydrogen Control, has been entered and both Drywell and Torus sprays have been initiated. The following conditions now exist:

- DW Temperature 220°F, lowering slowly
- DW Pressure 3.5 psig, lowering slowly
- Torus Pressure 2.0 psig, lowering slowly
- Reactor Water Level -195 inches steady
- All ECCS systems Injecting
- DW Oxygen Unknown
- DW Hydrogen 7%
- Torus Oxygen 4%
- Torus Hydrogen 5%

Which of the following describes: 1) why torus spray must be secured and 2) why drywell spray operation is allowed to continue at this time?

a. 1) Adequate core cooling IS assured and
2) Drywell temperature requires maximizing spray to the Drywell.

b. 1) Adequate core cooling is NOT assured and
2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

c. 1) Adequate core cooling IS assured and
2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

d. 1) Adequate core cooling is NOT assured and
2) Drywell temperature requires maximizing spray to the drywell.

QUESTION: 096 (1.00)

Installed CARDOX (Carbon Dioxide) system protects fire hazard areas where a waterbased system could permanently damage the equipment. Which of the following hazards use CARDOX?

a. The Computer Room

b. Unit 1 and Unit 2 Diesel Generator Rooms

c. Unit 1 and Unit 2 Main Transformers

d. Unit 1 and Unit 2 Main Turbine Bearings

QUESTION: 097 (1.00)

Power ascension in progress. Rods are being withdrawn to set the rod pattern. The following parameters are sensed by the LPRM/RBM circuitry when a control rod is selected for withdrawal.

-	Reactor Power	69% as indicated by APRMs.
-	Core Flow	55% of rated as driven by the recirculation system.
-	Local Average Power	67% as detected by LPRMs and sent to the averaging circuit.

Which of the following describes the indications AND response of the RBM as control rod withdrawal is initiated?

a. The RBM INOP light should be illuminated indicating that the RBM will not allow any control rod motion.

b. The RBM TRIP SET HIGH light will illuminate to indicate that the RBM will allow unrestricted control rod motion until local power reaches the High Trip Set Point (HTSP).

c. At 71% power, the PUSH SETUP and OK TO SET HI lights will illuminate. When the SETUP pushbutton is depressed local power can rise to the High Trip Set Point (HTSP).

d. When local power reaches 77% the PUSH SETUP and OK TO SET HI HI lights will illuminate. When the SETUP pushbutton is depressed local power can rise as high as the High Clamp at 106%.

QUESTION: 098 (1.00)

Given the following information regarding operation of Unit One:

- 13:00:00 Steady state power at 50% of rated.
- 13:05:00 Total loss of stator cooling, load reduction initiated.
- 13:06:00 Load reduction in progress, 13,100 Stator Amps.
- 13:07:00 Load reduction in progress, 9,200 Stator Amps.
- 13:08:00 Load reduction terminated, 7375 Stator Amps.
- 13:09:00 Determination is made the stator cooling WILL be restored within 15 minutes.
- 13:09:00 Conductivity before the loss of flow is determined to have been 1.75 micro mhos/cm.

Based upon this information, what will be the status of the main turbine/generator and the electrical distribution system at 13:30:00? Assume all automatic actions occur and required operator actions are taken.

a. The main generator load is being returned to normal, all electrical distribution remains in a normal alignment.

b. The main generator is operating at reduced load, all electrical distribution systems are in their normal alignment.

c. The main generator automatically tripped at 13:08:00, Aux power transferred to the Reserve Auxiliary Transformer.

d. The main generator will be manually tripped at or before 13:12:00, Aux power transferred to the Reserve Auxiliary Transformer.

QUESTION: 099 (1.00)

The plant was operating at 99% power. The following conditions now exist:

-	Reactor power	All rods fully inserted except one at position 24
-	Reactor level	+13 inches
-	Drywell pressure	2.68 psig
-	Suppression Pool level	+1.8 inches
-	Rx Building Pressure	- 0.12 inches H2O

Which of the following procedures are entered DIRECTLY based on the stated conditions?

a. QGA 100 (RPV Control) and QGA 101 (RPV Control ATWS).

b. QGA 100 (RPV Control) and QGA 200 (Primary Containment Control).

c. QGA 200 (Primary Containment Control) and QGA 300 (Secondary Containment Control).

d. QGA 100 (RPV Control), QGA 101 (RPV Control ATWS) and QGA 200 (Primary Containment Control).

QUESTION: 100 (1.00)

The reactor was at 100% power when an ATWS occurred.

-	Reactor pressure	920 psig and stable on the bypass valves.
-	Reactor power	All IRMs on Range 6.
-	Reactor level	+30 inches and stable with condensate and feed.
-	Boron injection	has not been initiated.
-	Depressurization	is allowed and is directed IAW QGA 101.

Which of the following identifies the concerns associated with a depressurization as allowed under the described conditions?

a. Reactor water level may rise rapidly as pressure is reduced.

b. Positive reactivity added may return the reactor to criticality.

c. MSIVs will automatically isolate when reactor pressure is reduced.

d. Depressurization will cause the cooldown limit to be exceeded.

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

ANSWER: 001 (1.00)
d
REFERENCE:
LF-0301, Control Rod Blade and Drive Mechanisms, Rev. 2, Pages 36, 54
LF-0302, CRD Hydraulics, Rev. 2, Page 37

ANSWER: 002 (1.00)
c
REFERENCE:
LF-0280, Reactor Manual Control System, Rev. 5, Page 18

ANSWER: 003 (1.00)
b
REFERENCE:
LF-0280, Reactor Manual Control System, Rev. 5, Page 6

ANSWER: 004 (1.00)
a
REFERENCE:
QCGP 1-1, Normal Unit Startup, Rev. 31, Page 12

ANSWER: 005 (1.00)
d
REFERENCE:
LIC-2300, High Pressure Coolant Injection, Rev. 6, page 64

ANSWER: 006 (1.00)
d
REFERENCE:
LIC-704A, Traversing In Core Probe, (Unit 52), Rev. 15

ANSWER: 007 (1.00)
a
REFERENCE:
LP-LIC-0702 Intermediate Range Monitoring System, Rev. 3, page 30
QCAN 901(2)-5 C-15 RPS Channel B IRM Hi HI or INOP, Rev. 2, page 1

ANSWER: 008 (1.00)
c
REFERENCE:
LIC-0203, Automatic Depressurization System, Rev. 21, pages 15-17

ANSWER: 009 (1.00)
a
REFERENCE:
L-QGA200, Primary Containment Control, Rev. 0, page 29

ANSWER: 010 (1.00)
d
REFERENCE:
LIC-3200, Feed and Condensate, Rev. 2, page 52
QOP 3200-02 Startup of the First RFP, Rev. 15, page 3
QOP 3300-11 Cond/Cond Booster Pump Changeover, Rev. 11, page 2

ANSWER: 011 (1.00)
b
REFERENCE:
LF-0202, Reactor Recirculation System, Rev. 7, page 42

ANSWER: 012 (1.00)
a
REFERENCE:
LIC-0600, Feed Water Level Control, Rev. 3, pages 10, 11

ANSWER: 013 (1.00)
a
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, page 46

ANSWER: 014 (1.00)
c
REFERENCE:
LNF-5750, Plant Ventilation Systems, Rev. 0, pages 22, 30

ANSWER: 015 (1.00)
a
REFERENCE:
LN-6500, 4KV/480 V Distribution, Rev. 1, page 314

ANSWER: 016 (1.00)
c
REFERENCE:
LF-0202, Reactor Recirculation System, Rev. 7, Appendix A pg 2

ANSWER: 017 (1.00)
c
REFERENCE:
QCOA 1900-01, Loss of water level in the Fuel Storage Pool or Reactor Cavity, Rev. 7, Section D, page 2

ANSWER: 018 (1.00)
d
REFERENCE:
LP QGA 101, QGA 101 RPV Control (ATWS), Rev. 0, Section F.2.d, page 115

ANSWER: 019 (1.00)
b
REFERENCE:
QGA 500-1, RPV Blowdown, Rev. 8, page 1
L-QGA 500-1, RPV Blowdown, Rev. 0, page 12

ANSWER: 020 (1.00)
d
REFERENCE:
LP-QGA-101, RPV Control ATWS, Rev. 0, Section G.2.b, page 43

ANSWER: 021 (1.00)
d
REFERENCE:
LF-1200, Reactor Water Cleanup, Rev. 3, page 23
QCAN 901-4 C16, MAIN STEAM TUNNEL HIGH TEMPERATURE RWCU OUTBOARD ISOLATION VALVE BYPASS, Rev. 0, page 1

ANSWER: 022 (1.00)
c
REFERENCE:
QOA 5750-05, RX Bldg. Supply/Exhaust fan trip, Rev. 12
LNF 5750, Plant Building Ventilation, Rev. 0, page 22

ANSWER: 023 (1.00)
c
REFERENCE:
QGA 100, RPV Control, Rev. 4
QGA 300, Secondary Containment Control, Rev. 9

ANSWER: 024 (1.00)
d
REFERENCE:
QCOA-1700-02, High Radiation Detected on Eberline Rad Monitoring System, Rev. 5, page 4

ANSWER: 025 (1.00)
b
REFERENCE:
OP-AA-101-102, Operation Department Roles and Responsibilities, Revision 1, Section 7

294001G101 ..(KA's)

ANSWER: 026 (1.00)
a
REFERENCE:
OP-AA-101-401, Shift Turnover and Relief, Rev. 1, Page 3

ANSWER: 027 (1.00)
d
REFERENCE:
QCOA 0202-04, Trip of a Single Recirculation Pump, Revision 11, Page 3
QCOA 0400-02, Core Instabilities, Rev 6, Page 1

ANSWER: 028 (1.00)
c
REFERENCE:
LF-0800, Fuel Safety Limits, App. D page 6
TS 2.1.A, Safety Limits

ANSWER: 029 (1.00)
c
REFERENCE:
LIC 6000, Main Generator, Revision 1, pages 54 and 56
QCOP 6000-02, Adjusting VARS on the Main Generator, Rev 1, Att. A

ANSWER: 030 (1.00)
a

REFERENCE:
LIC-2900, Safe Shudown System, Rev. 3, Page 52

ANSWER: 031 (1.00)
a
REFERENCE:
OP-AA-101-104, Watch Standing Practices, Rev. 0, Page 2

ANSWER: 032 (1.00)
d
REFERENCE:
CC-AA-112 Temporary Modifications, Rev. 0, Exhibit F, Page 39-41

ANSWER: 033 (1.00)
c
REFERENCE:
QCAP-0630-06, Exposure Authorization and Control, Rev. 5,
Attachment 17
Nuclear-General Emp. Training Study Guide, Rev. 22, Page 59

ANSWER: 034 (1.00)
d
REFERENCE:
QCAP 0630-06, Exposure Authorization and Control, Rev. 5, D.4.e., Page 11

ANSWER: 035 (1.00)
c
REFERENCE:
QCOP 1600-13, Post Accident Venting of Primary Containment, Rev. 11, Page 4
LP-QGA200, Primary Containment Control, Page 8

ANSWER: 036 (1.00)
d
REFERENCE:
LF-3700, Reactor Building Closed Cooling Water, Rev. 3, Page 50a
QCOP 3700-02, RBCCW System Startup and Operation, Rev. 9, Page 4

ANSWER: 037 (1.00)
c
REFERENCE:
LIC-9900, Operation of SPDS, Rev. 1, Pages 58 and 60
QOP 9900-102, SPDS, Rev. 6, Pages 2,4,6

ANSWER: 038 (1.00)
a
REFERENCE:
LIC-0207, Rod Worth Minimizer, Rev. 4, Pages 62, 70

ANSWER: 039 (1.00)
c
REFERENCE:
Technical Specifications, 3.6.C

ANSWER: 040 (1.00)
a
REFERENCE:
QCOP 0202-12, RRC System MG Scoop Tube Lockup and Manual
Operation, Rev. 12, page 2

ANSWER: 041 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, Pages 15, 43, 44
QCOP 1000-30, Post Accident RHR Operation, Rev. 11, Page 8

ANSWER: 042 (1.00)
c
REFERENCE:
LF-1200, Reactor Water Cleanup System, Rev. 3, Page 24
QCAN 901(2)-4 F12, CU SYSTEM AFTER NON REG HX HIGH TEMP, Rev. 4, Page 1

ANSWER: 043 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, Page 14

ANSWER: 044 (1.00)
c
REFERENCE:
LIC-2300, High Pressure Coolant Injection, Rev. 6, Page 17
QCOA 2300-04, HPCI Automatic Initiation, Rev. 9, Page 5

ANSWER: 045 (1.00)
c
REFERENCE:
LF-1400, Core Spray, Rev. 3, page 38
QCAN 901(2)-3 C5, CORE SPRAY SYS 2 LOGIC PWR FAILURE BUS, Rev. 2, page 2
QCOA 1400-02, Core Spray Loss of 125 VDC Auto Initiation Control Power, Rev. 4, page 4

ANSWER: 046 (1.00)
b
REFERENCE:
LIC-1100, Standby Liquid Control System, Rev. 5, page 18

ANSWER: 047 (1.00)
c
REFERENCE:
LF-0500, Reactor Protection, Rev. 4, page 37
QCOA 6700-05, 480 V Bus 19(29) Failure, Rev. 11, page 2
QOA 7000-01, 125 VAC RPS Bus Failure, Rev. 22, pages 3, 4

ANSWER: 048 (1.00)
d
REFERENCE:
LIC-0263, Reactor Instrumentation, Rev. 3, page 52

ANSWER: 049 (1.00)
a
REFERENCE:
LF-0280, Reactor Manual Control and RPIS System, Rev. 5, pages 7, 10

ANSWER: 050 (1.00)
a
REFERENCE:
LP LIC-0701, Source Range Monitor System and App., Rev. 4, pages 16 and 17
QCAN 901(2)-5 A4, SRM High or INOP, Rev. 2, page 1

ANSWER: 051 (1.00)
b
REFERENCE:
LIC-0703, LPRM/APRM Monitoring Systems, Rev. 5, page 63
Technical Specifications Table 4.1 A-1
QCOS-0700-06, PRM Flow Biased High Flux, Rev. 15, pages 2, 5, and Calibration Test

ANSWER: 052 (1.00)
c
REFERENCE:
LIC-0263, Reactor Vessel Instrumentation, Rev. 3, page 62

ANSWER: 053 (1.00)
a
REFERENCE:
LIC-1300, Reactor Core Isolation Cooling, Rev. 5, page 40

ANSWER: 054 (1.00)
b
REFERENCE:
LIC-1300, Reactor Core Isolation Cooling, Rev. 5, page 64

ANSWER: 055 (1.00)
d
REFERENCE:
LIC-0203, Automatic Depressurization, Rev. 21, page 25

ANSWER: 056 (1.00)
b
REFERENCE:
LP-1000, Residual Heat Removal System, Rev. 5, pages 10-15

ANSWER: 057 (1.00)
c
REFERENCE:
LNF-1601, Primary and Secondary Containment, Rev. 1, page 46

ANSWER: 058 (1.00)
d
REFERENCE:
LN-1603, Primary Containment Isolation, Rev. 0, pages 8, 10
QCAP 0200-10, EOP Expectation Standards, Rev. 22, Att. M and o

ANSWER: 059 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, page 49
QCOA 1000-04, LPCI Automatic Initiation, Rev. 8, page 2

ANSWER: 060 (1.00)
a
REFERENCE:
LNF-1900, Fuel Pool Cooling, Rev. 3, page 8

ANSWER: 061 (1.00)
b
REFERENCE:
QCOP 0203-01RPV Pressure Control Using Manual Relief Valve
Actuation, Rev. 8, page 1
LIC-0203, Automatic Depressurization System, Rev. 6, page 25

ANSWER: 062 (1.00)
a
REFERENCE:
LIC-5652, EHC Logic System, Rev. 4, page 4

ANSWER: 063 (1.00)
a
REFERENCE:
LIC-0600, Feedwater level Control, Rev. 3, Attachment OE936, pages 50-54

259002A101 ..(KA's)

ANSWER: 064 (1.00)
b
REFERENCE:
LF-7500, Standby Gas Treatment System, Rev. 9, page 50
Technical Specifications Amend., 3/4.7.P.2.a, pages 175 and 171

261000G222 ..(KA's)

ANSWER: 065 (1.00)
a
REFERENCE:
LN-6900, DC, Rev. 3, pages 35, 36

263000K303 ..(KA's)

ANSWER: 066 (1.00)
a
REFERENCE:
LN-6620, SBO System, Rev. 4, pages 6, 12

264000K301 ..(KA's)

ANSWER: 067 (1.00)
d
REFERENCE:
LIC-2000, Radioactive Waste Processing, Rev. 1, pages 78-80
QCOS 1600-07, Reactor Coolant Leakage in the Drywell, Rev. 12,
page 10

268000A401 ..(KA's)

ANSWER: 068 (1.00)
a
REFERENCE:
LN-5400, Off Gas, Rev. 6, pages 41,42,43
QCAN 901(2)-7 A13, Rev. 2

271000K408 ..(KA's)

ANSWER: 069 (1.00)
b
REFERENCE:
LF-1701, Process Radiation Monitoring, Rev. 2, page 20

272000A202 ..(KA's)

ANSWER: 070 (1.00)
b
REFERENCE:
LN-4100, Fire Protection, Rev. 5, Section IV.A.1, page 50

286000A406 ..(KA's)

ANSWER: 071 (1.00)
b
REFERENCE:
LNF-5750, Plant Ventilation, Rev. 0, page 61

288000K603 ..(KA's)

ANSWER: 072 (1.00)
d
REFERENCE:
LF-3700, Reactor Building Closed Cooling Water System, Rev. 3,
page 26

400000G131 ..(KA's)

ANSWER: 073 (1.00)
b
REFERENCE:
LF-0202, Reactor Recirculation System, Rev. 7, page 62

295001K207 ..(KA's)

ANSWER: 074 (1.00)
b
REFERENCE:
QOA 3300-02, Loss of Condenser Vacuum, Rev. 18, page 1

295002K103 ..(KA's)

ANSWER: 075 (1.00)
b
REFERENCE:
LN-6600, Diesel Generators, Rev. 4, page 29

295003A102 ..(KA's)

ANSWER: 076 (1.00)
c
REFERENCE:
LN-6900, DC Distribution, Rev. 3, page 35
QOA 6900-01, Safety Related 250 VDC Battery and System Failure,
Rev. 13, page 1

295004A204 ..(KA's)

ANSWER: 077 (1.00)
d
REFERENCE:
LF-0500, Reactor Protection, Rev. 4, page 28

295006A206 ..(KA's)

ANSWER: 078 (1.00)
d
REFERENCE:
LIC 0203, Automatic Depressurization System, Rev. 21, pages 3,8
LIC 0250, Main Steam, Rev. 4, page 8

295007K304 ..(KA's)

ANSWER: 079 (1.00)
a
REFERENCE:
QCOA 0201-08, High Reactor Level, Rev. 6, page 2
OP-AA-101-102, Ops. Dept. Roles and Responsibilities, Rev. 1,
Section 4.8.7.4, page 7
295008G449 ..(KA's)

ANSWER: 080 (1.00)
d
REFERENCE:
LNF-1601, Primary Containment, Rev. 1, page 72

295012A201 ..(KA's)

ANSWER: 081 (1.00)
c
REFERENCE:
LP-QGA200, Primary Containment Control, Rev. 0, pages 49, 53

295013K301 ..(KA's)

ANSWER: 082 (1.00)
c
REFERENCE:
L-QGA101, RPV Control (ATWS), Rev. 0, page 47
QGA 101, RPV Control (ATWS), Rev, 7

295014G420 ..(KA's)

ANSWER: 083 (1.00)
a
REFERENCE:
QCARP-0000-01, Implementing Procedure for Safe Shutdown, Rev. 8,
page 8 and the Appendix R attachments

295016K303 ..(KA's)

ANSWER: 084 (1.00)
c
REFERENCE:
QCOA 3700-06, RBCCW Leak Inside Containment, Rev. 3, page 1
LF-3700, Reactor Building Closed Cooling Water, Rev. 3, page 40
LF-3700, Reactor Building Closed Cooling, Rev. 3, page 3

295018A203 ..(KA's)

ANSWER: 085 (1.00)
b
REFERENCE:
QOA 4700-01, Instrument Air Low Pressure, Rev. 12, page 1
LF-4600/4700, Air Systems, Rev. 5, pages 21, 24, 25, 42

295019K301 ..(KA's)

ANSWER: 086 (1.00)
b
REFERENCE:
LN-1603, Primary Containment Isolation, Rev. 0, page 18 and
System Figure 1603-2

295020A101 ..(KA's)

ANSWER: 087 (1.00)
c
REFERENCE:
LF-0301, Control Rod Blade and Drive Mechanisms, Rev. 2, page 40

295022K101 ..(KA's)

ANSWER: 088 (1.00)
b
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, pages 12, 13
QCOP 1000-30, Post Accident RHR Operation, Rev. 11, pages 4, 5, 7, 8

295024K211 ..(KA's)

ANSWER: 089 (1.00)
d
REFERENCE:
LIC-0250, Main Steam, Rev. 4, pages 28 and 32

295025K103 ..(KA's)

ANSWER: 090 (1.00)
b
REFERENCE:
L-QDETAILS, QGA Details, Rev. 0, page 10
LIC-0263, Rx Vessel Instrumentation, Rev. 3, page 64

295028A203 ..(KA's)

ANSWER: 091 (1.00)
a
REFERENCE:
LP QGA 500-2, Steam Cooling, Rev. 0, page 3

295031K305 ..(KA's)

ANSWER: 092 (1.00)
a
REFERENCE:
LP-QGA300, Secondary Containment Control, Rev. 0, Sections IV.A.2
and 3, page 13
QGA 300, Secondary Containment Control, Rev. 9

295033K201 ..(KA's)

ANSWER: 093 (1.00)
a
REFERENCE:
LNF-5750, LNF-5752, Plant Ventilation, Control Room Ventilation,
Rev. 0, Section 3, pages 43, 45
LF-7500, Standby Gas Treatment, Rev. 9, page 36
LP-QGA 300, Secondary Containment Control, Rev. 0, pages 7,9

295034G402 ..(KA's)

ANSWER: 094 (1.00)
d
REFERENCE:
LP-QGA101, RPV Control ATWS, Rev. 0, page 109
LN-0303, ATWS, Rev. 2, page 44

295037K301 ..(KA's)

ANSWER: 095 (1.00)
b
REFERENCE:
L-QGA200, Primary Containment, Hydrogen Control, Rev. 0, pages 5, 7, 14
L-QGAINTRO, QGA Introduction, Rev. 0, page 31

500000A106 ..(KA's)

ANSWER: 096 (1.00)
b
REFERENCE:
LN-4100-1, Fire Protection Systems, Rev. 5, Section 3.a.1), page 6

600000A108 ..(KA's)

ANSWER: 097 (1.00)
c
REFERENCE:
LIC-700-5, Rod Block Monitor System, Rev. 2, page 34
QOP-700-05, Rod Block Monitor, Rev. 9, page 2

215002K402 ..(KA's)

ANSWER: 098 (1.00)
d
REFERENCE:
LIC-5300, Generator Auxiliaries, Rev. 4, pages 8-11

245000K301 ..(KA's)

ANSWER: 099 (1.00)
b
REFERENCE:
L-QGA 200, Primary Containment Control Flow Chart, Rev. 0, pages 7, 9
L-QGA 100, RPV Control, Rev. 0, pages 7, 9

295010G401 ..(KA's)

ANSWER: 100 (1.00)
b
REFERENCE:
LP-QGA-101, RPV Control ATWS, Rev. 0, page 99
295015K102 ..(KA's)

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

ANSWER KEY

001 d	021 d	041 d	061 b	081 c
002 c	022 c	042 c	062 a	082 c
003 b	023 c	043 d	063 a	083 a
004 a	024 d	044 c	064 b	084 c
005 d	025 b	045 c	065 a	085 b
006 d	026 a	046 b	066 a	086 b
007 a	027 d	047 c	067 d	087 c
008 c	028 c	048 d	068 a	088 b
009 a	029 c	049 a	069 b	089 d
010 d	030 a	050 a	070 b	090 b
011 b	031 a	051 b	071 b	091 a
012 a	032 d	052 c	072 d	092 a
013 a	033 c	053 a	073 b	093 a
014 c	034 d	054 b	074 b	094 d
015 a	035 c	055 d	075 b	095 b
016 c	036 d	056 b	076 c	096 b
017 c	037 c	057 c	077 d	097 c
018 d	038 a	058 d	078 d	098 d
019 b	039 c	059 d	079 a	099 b
020 d	040 a	060 a	080 d	100 b

This answer key corresponds to the preceding software examination, and was not used to grade the applicant's examinations. See the next sheet for the actual grading sheet.

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

ANSWER KEY

001	b	021	d	041	b	061	b	081	b
002	a	022	c	042	c	062	b	082	b
003	d	023	d	043	d	063	c	083	c
004	c	024	c	044	a	064	d	084	c
005	c	025	c	045	d	065	b	085	b
006	a	026	c	046	a	066	b	086	d
007	a	027	b	047	b	067	b	087	d
008	d	028	c	048	a	068	c	088	b
009	c	029	d	049	d	069	a	089	b
010	d	030	a	050	d	070	d	090	d
011	c	031	d	051	b	071	d	091	a
012	d	032	c	052	a	072	a	092	d
013	c	033	a	053	a	073	c	093	a
014	d	034	a	054	b	074	b	094	a
015	c	035	b	055	a	075	d	095	c
016	b	036	c	056	a	076	c	096	c
017	a	037	a	057	a	077	c	097	d
018	a	038	b	058	d	078	b	098	d
019	c	039	d	059	a	079	a	099	b
020	a	040	c	060	b	080	c	100	b

This answer key was used to grade the examinations given to the RO applicants. They differed from the file examinations labeled MASTER in that the four choices (distractors) were randomly shuffled and printed subsequent to the station providing the above copy of the examination. The questions and distractors were the same; the correct answer location sometimes changed.

U.S. Nuclear Regulatory Commission
Site-Specific
Written Examination

Applicant Information

Name: MASTER	Region: III
Date: APRIL 03, 2000	Facility/Unit: QUAD CITIES NUCLEAR
License Level: SRO	Reactor Type: GE
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five hours after the examination starts.

Applicant Certification

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

____
Applicant's Signature

Results

Examination Value	100.0 Points
Applicant's Score	______ Points
Applicant's Grade	______ Percent

ANSWER SHEET

Multiple Choice (Circle or X your choice)
If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

001 a b c d ___
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ANSWER SHEET

Multiple Choice (Circle or X your choice)
If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

046 a b c d ___
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083 a b c d ___
084 a b c d ___
085 a b c d ___
086 a b c d ___
087 a b c d ___
088 a b c d ___
089 a b c d ___
090 a b c d ___

ANSWER SHEET

Multiple Choice (Circle or X your choice)

If you change your answer, write your selection in the blank.

MULTIPLE CHOICE

091 a b c d ___

092 a b c d ___

093 a b c d ___

094 a b c d ___

095 a b c d ___

096 a b c d ___

097 a b c d ___

098 a b c d ___

099 a b c d ___

100 a b c d ___

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

WRITTEN EXAMINATION GUIDELINES

1. ***[Read Verbatim]*** After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.

2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.

3. For an initial examination, the time limit for completing the examination is five hours.

3. You may bring pens, pencils, and calculators into the examination room. Use black ink to ensure legible copies.

4. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.

5. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.

6. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question.

7. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.

8. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination.

9. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.

10. Do you have any questions?

QUESTION: 001 (1.00)

Given the following conditions:

- A feedwater level control malfunction has resulted in lowering reactor water level
- Reactor water level has reached +5 inches

Which of the following are the EXPECTED NSO actions with reactor power still at 100%?

a. Inform the Unit Supervisor of the condition and insert a manual reactor scram only when directed by the US.

b. Insert a manual reactor scram and inform the Unit Supervisor of the condition and the action taken.

c. Run Recirc Flow to minimum, trip BOTH Reactor Recirc Pumps and raise reactor level to greater than +20".

d. Perform an immediate power reduction and raise reactor water level to 12" greater than narrow range instrument zero.

QUESTION: 002 (1.00)

The Unit NSO has to be relieved by an extra NSO so he can meet with the Shift Manager for about l/2 hour in the Shift Manager's office. Which of the following describes the minimum required turnover?

a. The relief NSO MUST review the current Shift Turnover Sheet AND be updated on any deviations of plant status/activities from the sheet by the off-going NSO.

b. ALL NSO actions for the turnover, including the Shift Turnover Sheet, MUST be completed.

c. The relief NSO MUST read the Control Room logs AND tour the control boards with the off-going NSO.

d. ALL NSO actions for the turnover, including the Shift Turnover Sheet, MUST be completed AND the Unit Supervisor is required to initial the Turnover Sheet.

QUESTION: 003 (1.00)

Unit Two was operating normally at rated conditions when a single Recirculation Pump tripped. Which of the following identifies the conditions that will require the operator to initiate a MANUAL scram? ASSUME THE FCL PRIOR TO THE TRIP WAS 99%

a. LPRMs are oscillating on irregular intervals(1.0 to 6.0 seconds) and with irregular magnitude (between 0% and 2%).

b. Indicated core flow at 43% of rated core flow.

c. Indicated core flow at 35% of rated core flow.

d. LPRMs are oscillating at regular intervals (1.5 to 2.5 seconds) and the magnitude of the oscillations are 5% to 6% and rising.

QUESTION: 004 (1.00)

Which of the following resulting combinations of reactor power and pressure indicate violation of a Safety Limit?

a. Reactor power -- 38%
Reactor pressure -- 850 psig

b. Reactor power -- 30%
Reactor pressure -- 820 psig

c. Reactor power -- 28%
Reactor pressure -- 770 psig

d. Reactor power -- 20%
Reactor pressure -- 750 psig

QUESTION: 005 (1.00)

Given a copy of the Generator Cooling Capability Curve:

Which of the following identifies the set of Main Generator parameters where generator operating limits are EXCEEDED?

	Power	Reactive Load	H2 Pressure	H2 Temperature
a.	600 MWe	+200 MVARs	60 psig	42°C
b.	700 MWe	+300 MVARs	45 psig	42°C
c.	800 MWe	+250 MVARs	45 psig	36°C
d.	820 MWe	+350 MVARs	60 psig	36°C

QUESTION: 006 (1.00)

A loss of feed transient on Unit One has caused reactor level to drop to -70 inches. Neither HPCI or RCIC have responded as designed and the Safe Shutdown Makeup Pump (SSMP) has been placed in service to automatically restore reactor level. Reactor level is now -5 inches and recovering. Which of the following describes the SSMP indications on the SSMP panel 912-8 as reactor level rises to above +48 inches? ASSUME NORMAL SYSTEM RESPONSE WITHOUT ANY OPERATOR ACTIONS

	Safe Shut Down Pump ½-2901	Flow Control Valve 1/2-2601-6	Unit Supply valve 1-2901-8
a.	RED light on	400 gpm	RED light on
b.	RED light on	400 gpm	GREEN light on
c.	GREEN light on	Zero gpm	GREEN light on
d.	AMBER light on	Zero gpm	RED light on

QUESTION: 007 (1.00)

Unit Two is operating at rated power with an Initial License Candidate (ILC) under instruction as NSO on Unit Two. A loss of feedwater heating occurs, the flow control line is rising slowly and it is determined that the "CRAM Rods" must be inserted. The Unit Two NSO is involved in restoring a normal feedwater heater lineup. The Unit 2 Admin. NSO is recording APRM readings from the 902-37 panel. Under these "Abnormal" conditions, per OP-AA- 101-104, "Watch Standing Practices", who may perform the task of rod insertion?

a. The Unit Two NSO.

b. The Operations Manager.

c. The Initial License Candidate.

d. The Qualified Nuclear Engineer.

QUESTION: 008 (1.00)

Which of the following is considered to be a T-Mod as described in CC-AA-112, "Temporary Modifications"?

a. The removal of RHR pump motor control power fuses as part of an OOS for repair of the motor.

b. A charging hose with a pressure guage attached when charging a SBLC accumulator IAW QCOP 1100-10.

c. A pressure guage installed on an engineered test point tap.

d. A strip chart recorder installed due to the failure of the installed component.

QUESTION: 009 (1.00)

This year you have accumulated 10 REM Shallow Dose Equivalent, Whole Body. What's the maximum external dose whole body skin exposure that you can receive before you exceed the Legal Federal Annual limit?

a. 5 Rem

b. 10 Rem

c. 40 Rem

d. 50 Rem

QUESTION: 010 (1.00)

Extraordinary circumstances require a task to be performed which will result in excessive radiation exposure. Which of the following is accurate regarding an EMERGENCY EXPOSURE?

a. Approval MUST be granted by the Rad Chem Superintendent, Station Manager and Site Vice President.

b. Approval MUST be granted by the Station Manager, Site Vice President and the ComEd Medical Director.

c. Approval SHOULD be granted by the Rad Chem Superintendent and the Station Manager but the exposure is voluntary and approval is NOT mandatory.

d. Approval SHOULD be granted by the Rad Chem Superintendent, Station Manager and ComEd Medical Director but the exposure is voluntary and approval is NOT mandatory.

QUESTION: 011 (1.00)

QGA 200-5, Hydrogen Control, initial steps to control hydrogen direct venting and purging containment. Prior to venting, an evacuation is directed for the SBGT area. The evacuation is necessary to protect personnel from the potential for . . .

a. a hydrogen explosion.

b. high area temperatures.

c. changing radiological conditions.

d. a nitrogen rich, oxygen deficient atmosphere.

QUESTION: 012 (1.00)

The following containment parameters exist as a result of a loss of Reactor Building Closed Cooling Water (RBCCW) during a LOCA.

- Drywell Temperature 275°F
- Drywell Pressure 14 psig

Which of the following identifies and explains the concerns IF RBCCW flow is re-established to. the drywell under these conditions?

a. Damage to the RBCCW Pump seals due to high temperature water.

b. Excessive reduction in drywell pressure due to high RBCCW flow.

c. Damage to the RBCCW pumps due to runout.

d. Damage to RBCCW components due to water hammer.

QUESTION: 013 (1.00)

A valid Group One (1) isolation signal has been received. All MSIVs responded as designed except Outboard MSIV 203-2A which failed to close. Which of the following identifies the SPDS indications for the described condition(s)? The PCIS box will be . . .

a. Solid RED.

b. RED with a smaller white box stating "OPEN".

c. Solid GREEN.

d. GREEN with a smaller white box stating "CLOSED".

QUESTION: 014 (1.00)

The earliest time that the Rod Worth Minimizer(RWM) rod blocks will automatically ENABLE is . . .

a. as soon as either steam flow OR feedwater flow decrease to less than 20%.

b. one (1) minute after steam flow AND feedwater flow are both less than 20%.

c. as soon as steam flow AND feedwater flow have both increased to more than 20%.

d. when steam flow OR feedwater flow has been above 20% for more than one (1) minute.

QUESTION: 015 (1.00)

Plant operation is stable with the following parameters following a failure of the "A" recirc pump controller.

- Reactor Power 78% of rated.
- Reactor Level Stable in the normal range.
- A Recirc Pump Speed 64% of rated.
- B Recirc Pump Speed 100% of rated.

Which of the following should be taken for the conditions that now exist?

a. Immediately trip the "A" recirculation pump.

b. Locally raise "A" pump speed to 74% of rated.

c. Lower "B" pump speed to 79% of rated.

d. Immediately place the reactor Mode Switch in SHUTDOWN.

QUESTION: 016 (1.00)

Given the following conditions:

- The plant is operating at 55% power.
- A speed signal failure on the "A" Recirculation Pump has resulted in a Scoop Tube Lock up.
- Preparations are in progress to take local manual control of the "A" Scoop Tube Positioner.
- Prior to taking local manual control, a reactor scram occurs.

Which of the following are REQUIRED for these conditions?

a. Trip the "A" Recirculation Pump immediately.

b. Place the local Disconnect Switch to "OFF", then trip the "A" Recirculation Pump.

c. Direct an Equipment Operator to manually position the "A" Recirculation Pump scoop tube to "minimum" speed.

d. If the difference in recirculation loop flows was greater than 5% at the time of the scram, then trip the "A" Recirculation Pump.

QUESTION: 017 (1.00)

A LOCA is in progress. RHR Loop Select Logic has determined that there is NO difference between "A" and "B" Jet Pump Riser pressures. MO-1001-29B failed to automatically open when the reactor low pressure premissive was satisfied. Which of the following describes the minimum action(s) necessary to initiate RHR LPCI flow into the RPV? (Assume that RPV level remains below -59" and injection valve MO-1001-29B cannot be opened.)

a. Reset the LPCI Loop Select Logic, the RHR injection valves MO-1001-28A and MO-1001-29A will then open automatically.

b. Reset the LPCI Loop Select Logic, then open RHR injection valves MO-1001-28A and MO-1001-29A using the control switches on 90X-3.

c. Wait for the 5 minute Loop Select Timer to time out, then open RHR injection valves MO-1001-28A and MO-1001- 29A using the control switches on 90X-3.

d. Manually open RHR injection valves MO-1001-28A and MO- 1001-29A locally.

QUESTION: 018 (1.00)

Unit One is recovering from a reactor scram. Reactor Water Cleanup (RWCU) blowdown flow has been maximized to the main condenser to maintain proper reactor water level. CU SYSTEM AFTER NON REG HX HIGH TEMP is annunciated. Which of the following will occur as a DIRECT result of the temperature rise IF prompt action is NOT taken by the operator?

a. Automatic isolation of both filter demineralizers.

b. Automatic isolation of all blowdown to the main condenser.

c. Automatic isolation of RWCU primary containment isolation valves.

d. Automatic bypass of all RWCU flow around the filter demineralizers.

QUESTION: 019 (1.00)

Shutdown Cooling (SDC) is being placed in service IAW QCOP 1000-5 using Recirculation Loop A and RHR Pump B. Which of the following identifies the interlocks that minimize the potential for inadvertent vessel draindown as the task is performed?

a. BOTH RHR cross-tie valves, 19A AND 19B, must be closed before SDC suction valve, 43B, can be opened.

b. Torus suction valve, 7B, must be closed before SDC suction valves, 47 AND 50, can be opened.

c. Torus spray valve, 37A, must be closed before EITHER SDC suction valves, 47 OR 50, can be opened.

d. Torus spray/test return valve, 34A, must be closed before SDC suction valve, 43B, can be opened.

QUESTION: 020 (1.00)

A loss of feed event occurred resulting in RPV level dropping to -65 inches. HPCI was in normal standby line up and has responded as designed. Which of the following describes HPCI system response if torus level rises to +6"?

a. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke closed. HPCI CCST suction valve (2301-6) will remain open, HPCI injection is not interrupted.

b. HPCI CCST suction valve (2301-6) will stroke closed, HPCI turbine will trip. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open, HPCI will start and inject.

c. HPCI Suppression Pool suction valves (2301-35 and 36) will stroke open. HPCI CCST suction valve (2301-6) will stroke closed, HPCI will continue to inject during the transfer.

d. HPCI turbine will trip. Suppression Pool suction (2301-35 and 36) will stroke closed and CCST suction (2301-6) valves will stroke open simultaneously. HPCI will start and inject after suction is realigned.

QUESTION: 021 (1.00)

The following annunciator has been received on Unit One, CORE SPRAY SYS 1 BUS/LOGIC PWR FAILURE. The loss of logic power can be attributed to a loss of . . .

a. 125 VDC Main Bus 1B-1.

b. 120/240 VAC Instrument Bus.

c. 125 VDC Distribution Panel 1A-1.

d. 120/240 VAC Essential Service Bus.

QUESTION: 022 (1.00)

The plant is in an ATWS condition. The keylock switch for the Standby Liquid Control (SBLC) system is placed in SYS 1. Aside from starting the "A" SBLC pump, what else will this switch movement initiate?

a. ONLY RWCU inboard isolation valve, MO-1201-2 will close.

b. BOTH primer assemblies in the System 1 squib valve will energize.

c. ALL squib primer assemblies circuits for BOTH System 1 AND System 2 will energize.

d. ONLY RWCU inboard isolation valve, MO-1201-2, AND outboard isolation valve, MO-1201-5, will close.

QUESTION: 023 (1.00)

The plant is operating at 75% power with all systems in their normal lineup when numerous annunciators and changes in indication are received including:

- Channel B half scram
- Control rod withdrawl block
- Numerous Division 2 Isolation valves close including RWCU valves 1201-5 (RWCU Isolation) and 1201-80 (RWCU return).

Which of the following accounts for the described conditions?

a. Loss of MCC 15-2

b. Loss of MCC-18-2.

c. Loss of MCC 19-2

d. Loss of Turbine Building 125 VDC Bus 1B1

QUESTION: 024 (1.00)

Unit One startup is in progress and Mode 1 was just entered. Plant operation is now stable following a loss of RPS "B". No operator action has been taken except to silence and acknowledge alarms. Which of the following will initiate a full reactor scram?

a. IRM Channel 14 fails upscale.

b. APRM Channel 2 fails downscale.

c. Reactor high pressure transmitter to RPS, 1-263-55-D, fails upscale.

d. Reactor low level transmitter to RPS, 1-263-57-A, fails downscale.

QUESTION: 025 (1.00)

Which of the following describes the Full Core Display indications that will alert the Unit NSO that a control rod is inserted beyond the FULL-IN position?

a. GREEN LED with " - -" indication.

b. AMBER LED with "00" indication.

c. WHITE LED with "00" indication.

d. RED LED with "--" indication.

QUESTION: 026 (1.00)

Conditions:

- Plant startup in progress.
- The heating range has been reached.
- IRMs 13, 14, and 16 are on range 7.
- IRMs 11,12, 15, 17, and 18 are on range 8.

Which of the following will initiate a ROD BLOCK?

a. SRM INOP.

b. SRM Downscale.

c. SRM Detector Not Full In.

d. Shorting links are removed.

QUESTION: 027 (1.00)

A heat balance has just been completed and core power has been calculated to be 95.5% of rated. The Weekly APRM Flow Biased High Flux Calibration Test, QCOS-0700-06, is in progress with the following results:

APRM	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6
Meter Reading	95.0	98	93.0	95.5	92.5	96.0

Which of the following describes required action(s), if any, based on the APRM surveillance results?

a. Immediately, place the Reactor Mode Switch in SHUTDOWN.

b. Initiate action to adjust the gain on APRM Channels 2, 3 and 5.

c. All APRM readings are within limits, no action is required at this time.

d. Reduce power with flow to less than 75% as indicated on the highest APRM (CH. 2).

QUESTION: 028 (1.00)

During normal full power operation, INDICATED water level in the reactor vessel downcomer region is . . .

a. LOWER than ACTUAL level inside the dryer skirt due to high recirculation suction flow in the downcomer.

b. LOWER than ACTUAL level inside the dryer skirt due to the increased void content in the core at full power.

c. HIGHER than ACTUAL level inside the dryer skirt due to the pressure drop across the steam dryer.

d. HIGHER than ACTUAL level inside the dryer skirt due to the subcooling effect from feedwater in the downcomer.

QUESTION: 029 (1.00)

RCIC has responded as designed to a valid initiation signal. Reactor level has risen and RCIC has responded correctly at the high level setpoint. Which of the following describes present system status AND manipulations, if any, that may be necessary if reactor level drops to -65 inches?

a. The RCIC steam supply valve is closed, at -59 inches it will automatically reopen to allow injection.

b. The RCIC turbine is tripped. RCIC will inject after the trip throttle linkage is reset locally at the turbine.

c. The RCIC injection valve is closed, RCIC is operating on minimum flow. At -59" the injection valve will reopen.

d. The RCIC steam supply valve is closed. The reset pushbutton on panel 901-4 must be depressed to allow injection.

QUESTION: 030 (1.00)

A loss of feed event has occurred. Reactor level dropped to -65 inches and all systems responded as designed. HPCI has been secured. Level is now being restored with RCIC delivering 400 gpm in AUTO. Which of the following describes the impact that a loss of 125 VDC Bus 1A will have on the operation of RCIC?

a. The governor will fail open resulting in an RCIC mechanical trip.

b. RCIC will fail to isolate if a valid isolation signal were received.

c. The RCIC flow controller will fail to zero resulting in a loss of RCIC flow.

d. The RCIC flow controller will fail full scale resulting in an RCIC electrical overspeed trip.

QUESTION: 031 (1.00)

Given the following conditions on Unit One:

- RPV level -90" lowering slowly
- Drywell pressure 3.0 psig rising slowly

All systems have responded as expected. Fifteen (15) seconds ago the operator acknowledged annunciator AUTO BLOWDOWN TIMER START and depressed and released the TIMER RESET pushbutton. Which of the following describes the operation of the Safety Relief Valves in the ADS Mode? Under these conditions the ADS valves will. . .

a. only open after 8 minutes and 15 seconds.

b. only open if their respective control switches are placed in MAN.

c. open 110 seconds after the timer starts regardless of RPV water level.

d. open automatically in 95 seconds provided RPV water level remains below -59".

QUESTION: 032 (1.00)

Unit One was operating normally at rated power with RHR in Torus Cooling when a LOCA signal was received. All systems have responded as designed. Which of the following describes the design feature that will ensure maximum ECCS injection flow?

a. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after RHR injection flow has commenced.

b. RHR-1001-16A(B), RHR heat exchanger bypass valves, CAN NOT be closed for one minute after the LOCA initiation signal.

c. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the LOCA initiation signal.

d. RHR-1001-34A(B) and RHR-1001-36A(B), torus spray valves, CAN NOT be opened for one minute after the open permissive signal (325 psig reactor pressure) has been received.

QUESTION: 033 (1.00)

With Unit One operating at full power, annunciator 901-3-C-14, TORUS VACUUM RELIEF VLV 20A NOT FULL CLOSED, alarms. Which of the following are the implications if this condition is confirmed to be true?

a. Primary Containment integrity will be violated until the Torus to Reactor Building Vacuum Breaker is closed.

b. Drywell to Torus separation CANNOT be ensured until the Drywell to Torus Vacuum Breaker is closed.

c. The check valve in the Torus to Reactor Building Vacuum Breaker line is now providing Primary Containment integrity.

d. The check valve in the Drywell to Torus Vacuum Breaker line is now providing Primary Containment integrity.

QUESTION: 034 (1.00)

Unit 2 is operating at 100% power when a small steam leak develops which causes drywell pressure to rise to 3.0 psig. The reactor scrams and all immediate scram actions are taken. Reactor water level lowers to + 5" inches before being restored to the normal band. Which of the following identifies the MINIMUM Primary Containment Isolation System Group(s) that should have isolated?

a. Group I.

b. Group II.

c. Groups I & III.

d. Groups II & III.

QUESTION: 035 (1.00)

Given the following:

- Unit One operating at 100% power.
- Torus Cooling is in operation using RHR pump "A".
- RHR "A" Service Water Pump is running.
- Cooling valves MO-1001-34A, Torus Test or Spray Valve, is full open and MO-1001-36A, Torus H2O Test Valve, is throttled to establish system pressure.
- HX bypass valve MO-1001-16A is throttled to establish temperature reduction.

Which of the following identifies the final status of these components if drywell pressure should rise to 2.7 psig?

	1001-34A	1001-36A	RHR Pump A	RHR SW Pump A
a.	Open	Open	Running	Off
b.	Open	Closed	Running	Off
c.	Closed	As Is	Off	Running
d.	Closed	Closed	Running	Off

QUESTION: 036 (1.00)

Which of the following is a function of the fuel pool Skimmer Weirs?

a. Maintain a set fuel pool water level

b. Ensure net positive suction head for the FPCC pumps

c. Evacuate air from directly over the surface of the fuel pools

d. Permit draining of the reactor cavity while maintaining normal fuel pool level

QUESTION: 037 (1.00)

QCOP 0203-01, Reactor Pressure Control Using Manual Relief Valve Actuation, states that when operating the ADS valves their control switches should NOT be placed in OFF. If the control switch is placed in OFF, the valve will . . .

a. open on setpoint pressure, but NOT on an ADS signal.

b. open on an ADS signal, but NOT on setpoint pressure.

c. NOT open on setpoint pressure OR an ADS signal.

d. open on setpoint pressure OR an ADS signal once it has been closed for 10 seconds.

QUESTION: 038 (1.00)

Steam pressure utilized by the EHC logic is sensed . . .

a. at the equalizing header.

b. in the reactor steam dome.

c. at the reference leg for the YARWAY wide range level detectors.

d. at the reference leg for the GEMAC narrow range level detectors.

QUESTION: 039 (1.00)

Rx Power is 100% with the FWLC system in 3 element control. The breaker for the 1C reactor feed pump has been racked out in preparation for pump maintenance. While implementing the OOS procedure the operator incorrectly isolates the flow transmitter for the 1C RFP such that it outputs an upscale flow signal. Which of the following describes the effect, if any, this will have on the reactor feed water system?

a. Feedwater reg valves rapidly close, the reactor will scram on low level.

b. No effect on the system as the feed pump breaker has already been racked out.

c. Feedwater reg valves rapidly open, the feed pumps and main turbine will trip on high level.

d. Loss of flow signal will initiate a FW reg valve lockup, feed flow to the vessel remains constant.

QUESTION: 040 (1.00)

The "B" SBGT train flow was noted to be 3700 SCFM during a dual unit outage when the monthly surveillance was performed. Unit 1 is preparing to perform refueling operations, the reactor head is still fully tensioned. Unit 2 is in Shutdown Cooling with a temperature band of 150 - 180 degrees. Refueling operations may

a. NOT take place due to the "B" SBGT being INOP.

b. take place due to both "A" and "B" SBGT trains being operable.

c. NOT take place due to the potential to drain the reactor vessel.

d. take place for the next 7 days only if "A" SBGT train is in operation.

QUESTION: 041 (1.00)

The Unit 1 250 VDC system has just failed. Which of the following identifies the systems effected by this failure?

a. Unit 1 HPCI and Unit 2 RCIC.

b. Unit 1 HPCI and Unit 1 RCIC.

c. Unit 2 HPCI and Unit 1 RCIC.

d. Unit 2 HPCI and Unit 2 RCIC.

QUESTION: 042 (1.00)

A LOCA has occurred on Unit One simultaneously with a loss of off-site power. Both the #1 and the #1/2 Diesel Generator have failed to start. Which of the following describes the response of the Station Blackout (SBO) Diesels #1 and #2 to these events?

a. Both SBO Diesel Generators must be manually started. All bus loading must be performed by the operator.

b. Both SBO Diesel Generators will start when the LOCA signal is received. All bus loading must be manually performed by the operator.

c. Both SBO Diesel Generators must be manually started. Various bus loads will sequence on in 5 second intervals.

d. Both SBO Diesel Generators will start 60 seconds after their respective buses are de-energized. Bus loads will automatically sequence on at five (5) second intervals

QUESTION: 043 (1.00)

The average Drywell Equipment and Floor Drain sump pump flowrates were determined on Sunday (first shift) this work week. On Wednesday (first shift) the DW Floor Drain Sump integrator malfunctioned and was declared inoperable. Which of the following describes the effect of this malfunction on plant operation?

a. A plant shutdown must be commenced because Identified leakage cannot be determined.

b. A plant shutdown must be commenced because Unidentified leakage cannot be determined.

c. Operation can continue provided the DRYWELL FL DR PUMPS HIGH DISCHARGE FLOW annunciator is NOT received.

d. Operation can continue, as flow rates can be calculated using the previously established flow rate and timing pump operation.

QUESTION: 044 (1.00)

Given the following parameters and trends:

- MSL Rad monitors at 12 X Normal, rising slowly.
- Steam supply to Primary SJAE's at 125 psig, steady.
- SJAE rad monitors reading normal and steady.
- Holdup line inlet pressure at 6 psig, lowering slowly.
- Holdup line inlet temperature at 160 degrees F, rising slowly.

Which of the following describes how Off-gas components HAVE responded or WILL respond?

a. SJAE suction valves should already be closed.

b. Off-gas to stack (AO-5406) will isolate in 15 minutes.

c. Mechanical Vacuum pump should already be interlocked off.

d. Pressurized drain tank discharge valve, AO-5437, should close immediately.

QUESTION: 045 (1.00)

The plant is operating at 25% power. The "B" MSL Radiation Monitor is inoperative and has been placed in the "TRIPPED" condition. Which of the following identifies plant AND operator response if a loss of RPS Bus "B" were to occur?

a. The reactor will scram, perform the immediate scram actions.

b. Reactor operation is unaffected, perform the actions for a loss of RPS.

c. The reactor will scram and the MSIVs will isolate, take action for scram and isolation.

d. Reactor operation is unaffected but the turbine will trip, take action for loss of RPS and a turbine trip.

QUESTION: 046 (1.00)

Which of the following identifies ALL the Diesel Driven Fire Pump indications that are available in the Control Room?

a. Diesel Fire Pump discharge valve position indications and individual diesel day tank levels.

b. Diesel Fire Pump run status lights and header pressure.

c. Diesel Fire Pump run status lights and BATT 1/BATT 2 power available lights.

d. Diesel Fire Pump discharge valve position indications and BATT 1/BATT 2 power available lights.

QUESTION: 047 (1.00)

Upon a loss of Instrument Air, the East and West Turbine Building Supply Fan dampers will . . .

a. fail closed.

b. fail open.

c. fail as-is.

d. NOT be affected.

QUESTION: 048 (1.00)

Unit One is at power with the following RBCCW system alignment.

- 1A RBCCW Pump is OOS
- 1/2 RBCCW feed from bus 19 is OOS
- 1B RBCCW Pump operating normally
- 1/2 RBCCW Pump lined up to Unit 1 and operating normally powered from Bus 29

Which of the following identifies the RBCCW system response to a valid LOCA signal on Unit One?

a. Both running RBCCW pumps will trip, all system isolation valves remain open.

b. Both running RBCCW pumps will trip and the non- containment loads will automatically isolate.

c. Both running RBCCW pumps will continue to run, the non- containment loads will automatically isolate.

d. 1B RBCCW Pump will trip, 1/2 RBCCW pump will continue to run, all system isolation valves remain open.

QUESTION: 049 (1.00)

During Single Loop Operation, Total Core Flow as indicated by FR- 1(2)-263-110 (Digital Flow Indicating Recorder for total core flow and core plate DP on the 901 5 panel) is . . .

a. inaccurate because the flow through the idle recirculation pump is reversed.

b. inaccurate because of backflow through the idle jet pumps.

c. accurate because total core flow is unaffected by the number of recirculation pumps in operation.

d. accurate because an averaging circuit automatically subtracts all jet pump flow through the idle loop.

QUESTION: 050 (1.00)

Which of the following vacuum readings corresponds to the lowest condenser vacuum at which the bypass valves will remain effective in reducing reactor pressure? (Consider ONLY actual plant setpoints per QOA 3300-02, Loss of Condenser Vacuum for your answer)

a. 1 inch Hg vacuum (29 inches backpressure).

b. 8 inches Hg vacuum (22 inches backpressure).

c. 20 inches Hg vacuum (10 inches backpressure).

d. 21 inches Hg vacuum (9 inches backpressure).

QUESTION: 051 (1.00)

Unit One was operating at rated power when a transient occurred resulting in the following electrical distribution alignment.

- Bus 13-1 energized from Bus 13.
- 1/2 Diesel Generator is running unloaded.
- Unit 1 Diesel Generator running, loaded to Bus 14-1.

Which of the following identifies the condition(s) that caused the described alignment?

a. Loss of off-site power.

b. LOCA and loss of Bus 14.

c. LOCA and loss of off-site power.

d. Turbine/generator trip and a LOCA.

QUESTION: 052 (1.00)

Which of the following describes the effect of a total loss of Safety related 250 VDC during normal operation?

a. Loss of power to HPCI valve MO-2301-4.

b. All inboard MSIV solenoids will de-energize.

c. Alternate power supply to the ESS inverter is unavailable.

d. Automatic trip capability for Main Turbine/Generator is lost due to loss of protective relaying.

QUESTION: 053 (1.00)

Initial Conditions:

- Plant startup is ongoing with reactor and main turbine heat up in progress.
- Reactor Level +35", stable
- Reactor Pressure 750 psig, rising slowly
- Reactor power 5% on the APRMs
- MSIVs Open
- Main Turbine Reset

Which of the following describes plant response if the Reactor Mode Switch were placed in RUN at this time?

a. Plant status would remain the same, all parameters are within limits.

b. A direct scram signal would be initiated from reactor low pressure conditions.

c. A rod block would be initiated from APRM downscale conditions.

d. A direct scram signal would be initiated from MSIV position indication.

QUESTION: 054 (1.00)

During a reactor pressure transient in which reactor pressure rises and peaks at 1145 psig, over pressure protection is assured by the opening of . . .

a. ALL FIVE relief valves AND TWO safety valves.

b. ALL FIVE relief valves AND ALL safety valves.

c. TWO relief valves ONLY.

d. ALL FIVE relief valves ONLY.

QUESTION: 055 (1.00)

A transient occurred resulting in a loss of normal feedwater. The reactor was scrammed and RCIC and HPCI were manually initiated to restore RPV level. Level dropped to -44 inches and is now +50 inches and rising rapidly. The operator should immediately ..

a. Stop injection from HPCI and RCIC.

b. Initiate RWCU reject to lower RPV level.

c. Stop injection from HPCI, allow RCIC injection to continue.

d. Throttle HPCI and RCIC discharge flow to maintain current level.

QUESTION: 056 (1.00)

A steam line break has occurred on Unit One. Which of the following provides a valid entry condition to QGA 200, Primary Containment Control?

a. Any area high temperature as indicated by AREA HI TEMP STEAM LEAK DETECTION on panel 901-3.

b. Report from the EO that steam is coming from beneath the Steam Tunnel Door and the door is hot to the touch.

c. Hi temperature in the area of the MSIV solenoids as indicated by annunciator UNIT 1 DRYWELL TEMP HI on panel 912-7.

d. Hi temperature on the return air to DW coolers as indicated on 1-TR1-2340-9, HPCI and Drywell Air Temperature Recorder.

QUESTION: 057 (1.00)

The plant is recovering from a reactor scram and MSIV isolation. QGA 200 has been entered. The INITIAL steps to initiate Torus cooling in the Torus Temperature Leg are taken to . . .

a. ensure ECCS pump NPSH/Vortex limits are not exceeded.

b. maintain torus temperature below the Heat Capacity Limit.

c. maintain torus temperature below the Technical Specification limit.

d. maintain torus temperature below the Boron Injection Temperature (BIT).

QUESTION: 058 (1.00)

An ATWS has occurred and RPV injection was prevented to intentionally lower RPV level. Injection is now required to maintain RPV level between -142 inches and -166 inches. Which of the following describes the potentially adverse effect(s) of injection under these conditions?

a. Fuel cladding may be damaged as cold water is sprayed onto hot exposed fuel.

b. Rapid injection of cold water may cause RPV metal temperature limits to be exceeded.

c. Rapid injection of water into the RPV could cause a large reactor power excursion which could result in core damage.

d. Addition of cold water may affect the density of the variable instrument leg and therefore the accuracy of RPV level instruments.

QUESTION: 059 (1.00)

QCARP-0000-01, Implementing Procedure for Appendix R Safe Shutdown, has been entered due to a fire and evacuation (abandonment) of the control room. Actions are directed to disable specific plant equipment. Complying with these directions . . .

a. will prevent spurious system initiation and limit inventory loss.

b. ensures that the fire cannot spread to the opposite unit.

c. will prevent unnecessary primary containment isolations.

d. ensures that operator action will not cause cooldown limits to be exceeded.

QUESTION: 060 (1.00)

The plant is operating normally at rated power when the operator notes that drywell pressure and recirculation pump and motor temperatures are rising slowly. Which of the following identifies the cause of these rising trends?

a. Service Water leak inside containment.

b. Service Air leak outside containment.

c. RBCCW leak inside containment.

d. TBCCW leak outside containment.

QUESTION: 061 (1.00)

Instrument Air header pressure on Unit One has dropped to 85 psig and is now stable. Instrument Air Compressor 1A is running loaded. Which of the following describes the expected configuration of the rest of the plant air system?

	Instrument Air Compressor 1B	Dryer Bypass Valves	Little Joe Valve
a.	Running Loaded	OPEN	OPEN
b.	Running Loaded	CLOSED	OPEN
c.	Running Unloaded	OPEN	CLOSED
d.	Running Unloaded	CLOSED	CLOSED

QUESTION: 062 (1.00)

RPS "A" MG set tripped during a plant startup. The following parameters now exist.

-	Reactor MODE switch	STARTUP
-	MSIVs	Open
-	Reactor power	9%
-	Reactor pressure	920 psig
-	RPS Bus "A"	de-energized

Which of the following describes the response of the MSIVs IF RPS Bus "B" were to be de-energized?

a. All MSIVs will close.

b. All MSIVs will remain open.

c. All Inboard MSIVs will close.

d. All Outboard MSIVs will close.

QUESTION: 063 (1.00)

A loss of all CRD pumps has occurred during a reactor startup. The minimum designed reactor pressure listed that will assure control rods will scram is . . .

a. 625 psig

b. 525 psig

c. 425 psig

d. 325 psig

QUESTION: 064 (1.00)

A LOCA has occurred. RPV level initially dropped to -225 inches. RHR is now in operation in the LPCI mode and reactor water level is just above top of active fuel and increasing. Drywell spray initiation has been directed by the DW Pressure leg of QGA 200. Which of the following identifies the RHR manipulation(s) required to initiate Drywell Spray? (Only consider interlocks associated with RHR.)

a. All interlocks are satisfied, open the inboard (23B) and outboard (26B) spray valves.

b. Place the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

c. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE, then open the inboard (23B) and outboard (26B) spray valves.

d. Place the Containment Cooling 2/3 Level & ECCS Init. Bypass switch (S18B) to MANUAL OVERRIDE and the Containment Cooling Permissive control switch (S17B) to ON, then open the inboard (23B) and outboard (26B) spray valves.

QUESTION: 065 (1.00)

A reactor Safety Valve has inadvertently opened during normal full power operation. Which of the following identifies the expected indications available to the operator when this event occurs?

	901(2) 21 Panel Tail Pipe Temperature Digital Display	901(2) 21 Panel Accoustic Monitor	901(2) 21 Panel Valve Position
a.	525 to 540 Deg. F	.01	RED light ON ONLY
b.	525 to 540 Deg. F	.99	RED and AMBER lights ON
c.	310 to 335 Deg. F	.01	RED light ON ONLY
d.	310 to 335 Deg. F	.99	RED and AMBER lights ON

QUESTION: 066 (1.00)

QGA Detail A cautions that RPV water level instrumentation MAY be inaccurate if Drywell temperature is at or above RPV Saturation Temperature because . . .

a. the variable leg may flash, causing level to read falsely low.

b. the reference leg may flash, causing level to read falsely high.

c. outgassing of non-condensibles could occur, causing level to read falsely high.

d. both the variable and reference legs could flash, causing level to read falsely low.

QUESTION: 067 (1.00)

QGA 500-2, STEAM COOLING, directs RPV Blowdown when RPV water level reaches -184 inches and no injection source is available. Which of the following describes why this action is taken?

a. Blowdown increases steam flow up through the core improving heat transfer from the fuel.

b. Blowdown results in significant void formation which reduces reactor power production.

c. At lower pressures, less enthalpy is required to create steam, thus more steam is available for cooling.

d. RPV Blowdown dumps any radioactivity resulting from fuel failure into the torus, preventing uncontrolled release later.

QUESTION: 068 (1.00)

QGA 300, Secondary Containment Control, directs the installation of jumpers to bypass Reactor Building Ventilation Isolation. Which of the following identifies the signal(s) that will cause Reactor Building Ventilation to isolate AFTER the jumpers have been installed?

a. High radiation signal ONLY.

b. High drywell pressure ONLY.

c. High radiation signal AND high drywell pressure.

d. High drywell pressure AND low reactor vessel level.

QUESTION: 069 (1.00)

The plant is operating normally at rated power. A VALID signal results in numerous annunciators and automatic system realignment occurs resulting in the following plant conditions.

- Reactor operation is steady at 100%.
- SBGT system operating, maintaining reactor building differential pressure.
- Control Room is in 100% recirculation mode.
- Reactor Building ventilation is isolated.

Assuming no operator actions have been taken to this point, which of the following identifies the action(s) that should be taken?

a. Enter and execute QGA 300.

b. Enter and execute QGA 400.

c. Initiate a manual scram, enter and execute QGA 100 and QGA 200.

d. Place the reactor mode switch in SHUTDOWN, enter and execute QGA 100.

QUESTION: 070 (1.00)

The plant is in an ATWS condition and QGA 101 requires that the Recirculation Pumps be tripped. Which of the following completes the statement regarding the reason for this direction? A Recirc Pump trip provides for . . .

a. reduction in the potential for chugging.

b. more efficient boron mixing.

c. an increase in core cooling.

d. a rapid increase in core voids.

QUESTION: 071 (1.00)

QGA 200-5, Hydrogen Control, has been entered and both Drywell and Torus sprays have been initiated. The following conditions now exist:

-	DW Temperature	220 degrees F, lowering slowly
-	DW Pressure	3.5 psig, lowering slowly
-	Torus Pressure	2.0 psig, lowering slowly
-	Reactor Water Level	-195 inches steady
-	All ECCS systems	Injecting
-	DW Oxygen	Unknown
-	DW Hydrogen	7%
-	Torus Oxygen	4%
-	Torus Hydrogen	5%

Which of the following describes: 1) why torus spray must be secured and 2) why drywell spray operation is allowed to continue at this time?

a. 1) Adequate core cooling IS assured and
2) Drywell temperature requires maximizing spray to the Drywell.

b. 1) Adequate core cooling is NOT assured and
2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

c. 1) Adequate core cooling IS assured and
2) Drywell H2 and O2 concentrations remain above combustible (deflagration) limits.

d. 1) Adequate core cooling is NOT assured and
2) Drywell temperature requires maximizing spray to the drywell.

QUESTION: 072 (1.00)

Installed CARDOX (Carbon Dioxide) system protects fire hazard areas where a waterbased system could permanently damage the equipment. Which of the following hazards use CARDOX?

a. The Computer Room

b. Unit 1 and Unit 2 Diesel Generator Rooms

c. Unit 1 and Unit 2 Main Transformers

d. Unit 1 and Unit 2 Main Turbine Bearings

QUESTION: 073 (1.00)

Which of the following identifies a task that requires Shift Authorization To Start Work?

a. Fire hose and extinguisher inspections.

b. Interim Radwaste Storage Facility (IRSF) overhead crane inspection by Mechanical Maintenance.

c. In-shop fabrication of a part to be used in a Safety Related system.

d. IM surveillance requiring opening of the 901-32 panel in auxiliary electric room.

QUESTION: 074 (1.00)

A Rad Waste valve is being returned to service. The restoration requires Independent Verification (IV). The second operator is expected to receive five (5) mrem whole body during performance of the IV. Which of the following describes how the IV should be addressed?

a. A waiver for the IV should be granted and the IV should not be performed.

b. Allow the IV to be performed, follow up with written justification for the exposure.

c. Allow the operator to perform the IV, the radiation exposure is within the prescribed guidelines.

d. Re-verify component status with the operator that performed the task and note the conversation on the clearance sheet.

QUESTION: 075 (1.00)

Which of the following describes the plant conditions that assure Adequate Core Cooling?

a. No injection flow; reactor water level unknown; reactor pressure 75 psig; torus pressure 35 psig; 1 SRV open.

b. No injection flow; reactor water level at the 2/3 core height; reactor pressure 100 psig; torus pressure 25 psig; 5 SRVs open.

c. Injection flow; reactor water level at the 2/3 core height; reactor pressure 95 psig; torus pressure 35 psig; and 4 SRVs open.

d. Injection flow; reactor water level at 21" below the top of the fuel; reactor pressure 100 psig; torus pressure 25 psig; 5 SRVs open.

QUESTION: 076 (1.00)

An inadvertent HPCI initiation occurred during normal full power operation. HPCI injection into the reactor was confirmed and HPCI was secured. The unit continues to operate at full power. Which of the following identifies the actions that must be taken for described conditions?

a. Within 15 minutes, notify state and local government agencies.

b. Within one (1) hour notify the NRC Operation Center via the ENS.

c. Within four (4) hours notify the NRC Operation Center via the ENS.

d. No notifications must be made.

QUESTION: 077 (1.00)

What would be the consequences of spraying the drywell with drywell pressure at 35 psig and temperature at 350°F.

a. The capacity of drywell to torus vacuum breakers will be exceeded resulting in a failure of the boundary between drywell and torus (containment).

b. The capacity of torus to reactor building vacuum breakers will be exceeded resulting in the deinerting of the primary containment.

c. The capacity of drywell to torus vacuum breakers will be exceeded resulting in the deinerting of the primary containment.

d. The capacity of torus to reactor building vacuum breakers will be exceeded resulting in damage to the primary containment.

QUESTION: 078 (1.00)

The safety valves are sized and their setpoints are designed to keep reactor vessel peak pressure below 1375 psig during a . . .

a. full closure of the MSIVs with a failure to scram.

b. failure of the EHC pressure regulator with a failure of the relif valves to lift.

c. turbine trip with a failure of the bypass valves to open and a failure to scram.

d. full closure of the MSIVs with a neutron flux scram and a failure of the relief valves to lift.

QUESTION: 079 (1.00)

Both Units were operating normally when a loss of off-site power (LOOP) occurred on Unit One. Three minutes later a LOOP coincident with a LOCA occurred on Unit Two. Which of the following describes the status of Unit One and Unit Two electrical distribution five minutes after the initial event on Unit One? Assume all electrical lineups were normal prior to the loss of power and NO operator action is taken.

a. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 is energized from the 1/2 DG and Bus 23-1 is de-energized.

b. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 and Bus 23-1 are both de-energized.

c. Buses 14-1 and 24-1 are powered by their respective unit DGs.
Bus 13-1 is de-energized and Bus 23-1 is energized from the 1/2 DG.

d. Buses 13-1 and 23-1 are powered by their respective DGs.
Bus 14-1 is de-energized and Bus 24-1 is energized from the 1/2/DG.

QUESTION: 080 (1.00)

During SBGT system operation, reactor building differential pressure is maintained by . . .

a. inlet vanes on the SBGT fan adjusting to maintain the reactor building pressure at -0.25 in. of water.

b. an orifice at the SBGT train outlet maintaining 4000 scfm flow at the outlet.

c. a damper on the fan inlet adjusting to maintain 4000 scfm flow at the inlet.

d. a common discharge header flow control valve adjusting reactor building pressure at -0.25 in. of water.

QUESTION: 081 (1.00)

A 4KV voltage transient has occurred causing Bus 13 voltage to drop to 2900 volts. With regard to Bus 13, which of the following identifies the action(s) that will occur to maintain plant electrical integrity?

a. All load breakers on Bus 13 will trip.

b. The supply breaker and all load breakers on Bus 13 will trip.

c. The supply breaker to Bus 13 will trip, all other breakers remain closed.

d. All load breakers on Bus 13 will automatically trip EXCEPT the feed breaker to Bus 13-1.

QUESTION: 082 (1.00)

An ATWS condition exists. RCIC is in AUTO, injecting at rated flow to maintain reactor water level. SRVs are being cycled to maintain reactor pressure. Which of the following describes the RCIC system FINAL parameters as reactor pressure rises from 800 to 1000 psig?

	Turbine Speed	Pump Flow	Pump Discharge Pressure
a.	Lower	Remain the same	Higher
b.	Remain the same	Lower	Lower
c.	Higher	Remain the same	Higher
d.	Higher	Higher	Remain the same

QUESTION: 083 (1.00)

A LOCA has occurred coincident with an ATWS. The following conditions have just been established.

-	Reactor power	17% of rated, steady.
-	Reactor pressure	1210 psig peak pressure, lowering
-	Reactor level	-60 inches, lowering.
-	Drywell pressure	1.95 psig, rising.
-	Drywell temperature	200 deg. F, rising.

Which of the following describes the automatic response of the Recirculation System to the stated parameters and trends? Both Recirculation Pump Field Breakers . . .

a. will trip in approximately 9 seconds.

b. should have tripped due high reactor pressure.

c. should have tripped due to power greater than 3%.

d. will trip if drywell pressure rises an additional 0.25 psig.

QUESTION: 084 (1.00)

A transient has occurred resulting in an MSIV closure. QGA 100 has been entered and present plant status is such that direction has been given to "Stabilize RPV pressure below 1060 psig using main turbine bypass valves". Actions taken by the NSO should be to . . .

a. monitor automatic operation of the SRVs while attempting to re-open the MSIVs.

b. cycle SRVs in preferred sequence to stabilize pressure and equalize torus temperature.

c. cycle a single SRV to lower, then stabilize, reactor pressure.

d. open several SRVs in preferred sequence to lower pressure to 325 psig, close the SRVs and monitor the pressure rise.

QUESTION: 085 (1.00)

An Appendix R Fire has required evacuation (abandonment) of the control room. All immediate actions have been taken and preparations are now being made to initiate RHR Shutdown Cooling (SDC). Assuming an initial reactor pressure of 950 psig, which of the following identifies the time required to clear the RHR SDC interlocks at design pressure minus 30 psig? Attachment B of QCARP 0300-01 may be used as necessary.

a. 149 to 153 minutes

b. 132 to 136 minutes

c. 120 to 124 minutes

d. As rapidly as possible, normal limits are NOT applicable under these conditions.

QUESTION: 086 (1.00)

An accident has occurred and a reactor BLOWDOWN has been performed IAW QGA 400, Radioactivity Release Control. At the very least, release rates must be in excess of the values associated with . . .

a. an UNUSUAL EVENT.

b. an ALERT.

c. a SITE AREA EMERGENCY.

d. a GENERAL EMERGENCY.

QUESTION: 087 (1.00)

QGA 400, Radioactivity Release Control, requires a Reactor Scram before the offsite release rate reaches a specific Emergency Plan level. Initiation of a scram will . . .

a. stop any fuel damage in the reactor core and thus reduce the rate of release outside of the containment.

b. lower reactor pressure and allow low pressure systems to inject into the reactor, limiting the release to the environment.

c. reduce the energy that the reactor may be discharging outside of primary and secondary containment to decay heat levels.

d. reduce the boil-off rate of inventory which raises reactor water level thereby reducing the discharge to the environment.

QUESTION: 088 (1.00)

The following plant conditions exist on Unit 1:

- Mode 5
- Reactor Water Level at reactor vessel flange
- Shutdown Cooling in operation on A loop with A & B pump and A heat exchanger available
- C & D RHR pumps are OOS
- B RHR heat exchanger is OOS and drained for maintenance

What actions are required per Tech Specs for the above condtions?

a. Restore at least ONE RHR pump to operable status within 30 days.

b. Within ONE hour demonstrate operability of one alternate method capable of decay heat removal.

c. Provided that both core spray systems are operable and restore ONE RHR pump to operable status within 7 days.

d. Suspend ALL operations involving an increase in reactor decay heat load and establish secondary containment integrity within 4 hours.

QUESTION: 089 (1.00)

Given the following conditions:

- The Standby Gas Treatment System is in operation to support an ongoing HPCI surveillance.
- The Mode Select Switch for the "B" SBGT system is in RUN and the Mode Select Switch for the "A" SBGT system is in STANDBY.
- An event occurs on the refuel floor that causes ONE of the Refuel Floor ARMs to exceed its respective trip setpoint.

The "A" SBGT fan will ONLY start if. . .

a. the logic senses the "B" fan breaker is open.

b. a low flow condition exists on the "B" fan.

c. the second refuel floor ARM exceeds its trip setpoint.

d. Reactor Building differential pressure is less than - 0.25 in. of water.

QUESTION: 090 (1.00)

QGA 200 directs that the reactor be scrammed before Torus temperature reaches a value which is equivalent to the Boron Injection Initiation Temperature (BIIT). The BIIT is defined to be the greater temperature which results from either the Torus temperature at which Technical Specifications require a reactor scram or the highest Torus temperature at which initiation of SBLC will result in . . .

a. injection of the Hot Shutdown Boron Weight before the Torus exceeds pump vortex limits.

b. injection of the Cold Shutdown Boron Weight before the Torus heats to the PSP limit.

c. injection of the Cold Shutdown Boron Weight before the Torus exceeds the PCPL.

d. injection of the Hot Shutdown Boron Weight before the Torus heats to the HCL.

QUESTION: 091 (1.00)

Which of the following identifies the possible result of a high level in the suppression pool (greater than 18.5 feet)?

a. The static weight of the column of water in the tailpipes could damage the quenchers, tailpipes, or supports.

b. ADS valves may not function because of water backing up into the ADS valve bodies.

c. Unstable steam condensation outside of the quenchers could damage the quenchers.

d. ADS valve actuation could damage the tailpipes or quenchers when the water is discharged.

QUESTION: 092 (1.00)

Following the __________ curve will prevent damage due to air entrainment.

a. ECCS Vortex Limit

b. RHR NPSH Limit

c. Heat Capacity Limit

d. Core Spray NPSH Limit

QUESTION: 093 (1.00)

The plant is operating at rated conditions. A loss of Torus integrity has resulted in a rapid lowering of Torus level. Which of the following identifies the action to be taken, and why, if Torus level drops to 11 feet?

a. Prevent HPCI operation to prevent direct pressurization of the Primary Containment.

b. Inhibit operation of ADS to prevent direct pressurization of the Primary Containment.

c. Prevent all heat input into the Torus to ensure Heat Capacity Limit is not exceeded.

d. Prevent RCIC operation to prevent direct damage to the pump from inadequate NPSH requirements.

QUESTION: 094 (1.00)

A plant transient has occurred. All primary system discharges into affected areas have been terminated. Temperatures in various areas of Unit 2 are as follows:

-	RWCU Pump Room "A"	149°F
-	RWCU HX Area	180°F
-	MSIV Room	307°F
-	HPCI Room	138°F
-	RHR Room "B"	300°F

Based upon the attached Table, Table S from QGA 300, which of the following describes conditions in the plant?

a. The ONLY equipment necessary for the safe shutdown of the unit that can be considered reliable is equipment in the HPCI room.

b. Personnel may safely enter ALL of the areas as necessary for the safe shutdown the plant.

c. Personnel may safely enter the HPCI room, the RWCU Pump Room "A", and the RWCU Hx area for safe shutdown of the plant.

d. Equipment operability necessary for the safe shutdown of the unit is assured in the RWCU Pump Room "A", the HPCI room, and the RHR Room "B".

QUESTION: 095 (1.00)

Unit One is in MODE 5 with refueling underway. Reactor Building Exhaust fans 1B and 1C are out of service for maintenance, when Reactor Building Exhaust fan 1A trips due to an overload. Reactor Building differential pressure is now -0.05" wc and rising toward 0". Which of the following describes the MINIMUM actions required to satisfy Tech Spec requirements?

a. Restore Secondary Containment to operable within 4 hours.

b. Suspend CORE ALTERATIONS and restore Secondary Containment to operable within 12 hours

c. Immediately suspend movement of irradiated fuel in the secondary containment and close Secondary Containment isolation dampers.

d. Immediately suspend movement of irradiated fuel in the secondary containment, suspend CORE ALTERATIONS, and initiate action to suspend operations with the potential to drain the vessel.

QUESTION: 096 (1.00)

The reactor failed to scram from 40% power and the following conditions exist:

- RPV Water Level is +25" and slowly lowering
- Boron injection initiated, power 12% and decreasing
- Recirc pumps tripped
- Torus Temperature 91 deg. F and rising slowly
- All emergency and normal sources of reactor makeup water are available at full capacity
- 2 SRV's are open and 1 SRV is being cycled to control reactor pressure

With respect to the above conditions, which of the following statements describes how reactor water level should be controlled?

a. Control reactor water level +20" to -20" until all control rods are to or beyond position 04.

b. Control reactor water level -166" to +48" until only the HSD weight of boron has been injected.

c. Control reactor water level -166" to +48" until only the CSD weight of boron has been injected.

d. Lower reactor water level by terminating and preventing all injection except that from boron, RCIC, and CRD.

QUESTION: 097 (1.00)

QGA 400, Radioactivity Release Control, directs "Run Turbine Building Vent per QOP 5750-01". Which of the following describes the relationship between this action and the radiation levels that may exist in the Turbine Building?

a. Assures that any radioactivity in the turbine building is being discharged through a ground level release point to limit the dispersion of the radioactivity.

b. Results in positive pressure inside the turbine building to limit the intrusion of radioactivity from the reactor building.

c. Results in recirculation of the turbine building atmosphere with a reduction in the amount of radioactivity released.

d. Assures that any radioactivity in the turbine building is discharged through an elevated and monitored release point.

QUESTION: 098 (1.00)

Given the following information regarding operation of Unit One:

- 13:00:00 Steady state power at 50% of rated.
- 13:05:00 Total loss of stator cooling, load reduction initiated.
- 13:06:00 Load reduction in progress, 13,100 Stator Amps.
- 13:07:00 Load reduction in progress, 9,200 Stator Amps.
- 13:08:00 Load reduction terminated, 7375 Stator Amps.
- 13:09:00 Determination is made the stator cooling WILL be restored within 15 minutes.
- 13:09:00 Conductivity before the loss of flow is determined to have been 1.75 micro mhos/cm.

Based upon this information, what will be the status of the main turbine/generator and the electrical distribution system at 13:30:00? Assume all automatic actions occur and required operator actions are taken.

a. The main generator load is being returned to normal, all electrical distribution remains in a normal alignment.

b. The main generator is operating at reduced load, all electrical distribution systems are in their normal alignment.

c. The main generator automatically tripped at 13:08:00, Aux power transferred to the Reserve Auxiliary Transformer.

d. The main generator will be manually tripped at or before 13:12:00, Aux power transferred to the Reserve Auxiliary Transformer.

QUESTION: 099 (1.00)

The plant was operating at 99% power. The following conditions now exist:

- Reactor power	All rods fully inserted except one at position 24
- Reactor level	+13 inches
- Drywell pressure	2.68 psig
- Suppression Pool level	+1.8 inches
- Rx Building Pressure	- 0.12 inches H2O

Which of the following procedures are entered DIRECTLY based on the stated conditions?

a. QGA 100 (RPV Control) and QGA 101 (RPV Control ATWS).

b. QGA 100 (RPV Control) and QGA 200 (Primary Containment Control).

c. QGA 200 (Primary Containment Control) and QGA 300 (Secondary Containment Control).

d. QGA 100 (RPV Control), QGA 101 (RPV Control ATWS) and QGA 200 (Primary Containment Control).

QUESTION: 100 (1.00)

The reactor was at 100% power when an ATWS occurred.

- Reactor pressure	920 psig and stable on the bypass valves.
- Reactor power	All IRMs on Range 6.
- Reactor level	+30 inches and stable with condensate and feed.

- Boron injection has not been initiated.
- Depressurization is allowed and is directed IAW QGA101.

Which of the following identifies the concerns associated with a depressurization as allowed under the described conditions?

a. Reactor water level may rise rapidly as pressure is reduced.

b. Positive reactivity added may return the reactor to criticality.

c. MSIVs will automatically isolate when reactor pressure is reduced.

d. Depressurization will cause the cooldown limit to be exceeded.

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

ANSWER: 001 (1.00)
b
REFERENCE:
OP-AA-101-102, Operation Department Roles and Responsibilities, Revision 1, Section 7

294001G101 ..(KA's)

ANSWER: 002 (1.00)
a
REFERENCE:
OP-AA-101-401, Shift Turnover and Relief, Rev. 1, Page 3

ANSWER: 003 (1.00)
d
REFERENCE:
QCOA 0202-04, Trip of a Single Recirculation Pump, Revision 11,
Page 3
QCOA 0400-02, Core Instabilities, Rev 6, Page 1

ANSWER: 004 (1.00)
c
REFERENCE:
LF-0800, Fuel Safety Limits, App. D page 6
TS 2.1.A, Safety Limits

ANSWER: 005 (1.00)
c
REFERENCE:
LIC 6000, Main Generator, Revision 1, pages 54 and 56
QCOP 6000-02, Adjusting VARS on the Main Generator, Rev 1, Att. A

ANSWER: 006 (1.00)
a
REFERENCE:
LIC-2900, Safe Shudown System, Rev. 3, Page 52

ANSWER: 007 (1.00)
a
REFERENCE:
OP-AA-101-104, Watch Standing Practices, Rev. 0, Page 2

ANSWER: 008 (1.00)
d
REFERENCE:
CC-AA-112 Temporary Modifications, Rev. 0, Exhibit F, Page 39-41

ANSWER: 009 (1.00)
c
REFERENCE:
QCAP-0630-06, Exposure Authorization and Control, Rev. 5, Attachment 17
Nuclear-General Emp. Training Study Guide, Rev. 22, Page 59

ANSWER: 010 (1.00)
d
REFERENCE:
QCAP 0630-06, Exposure Authorization and Control, Rev. 5, D.4.e.,
Page 11

ANSWER: 011 (1.00)
c
REFERENCE:
QCOP 1600-13, Post Accident Venting of Primary Containment, Rev.
11, Page 4
LP-QGA200, Primary Containment Control, Page 8

ANSWER: 012 (1.00)
d
REFERENCE:
LF-3700, Reactor Building Closed Cooling Water, Rev. 3, Page 50a
QCOP 3700-02, RBCCW System Startup and Operation, Rev. 9, Page 4

ANSWER: 013 (1.00)
c
REFERENCE:
LIC-9900, Operation of SPDS, Rev. 1, Pages 58 and 60
QOP 9900-102, SPDS, Rev. 6, Pages 2,4,6

ANSWER: 014 (1.00)
a
REFERENCE:
LIC-0207, Rod Worth Minimizer, Rev. 4, Pages 62, 70

ANSWER: 015 (1.00)
c
REFERENCE:
Technical Specifications, 3.6.C

ANSWER: 016 (1.00)
a
REFERENCE:
QCOP 0202-12, RRC System MG Scoop Tube Lockup and Manual Operation, Rev. 12, page 2

ANSWER: 017 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, Pages 15, 43, 44
QCOP 1000-30, Post Accident RHR Operation, Rev. 11, Page 8

ANSWER: 018 (1.00)
c
REFERENCE:
LF-1200, Reactor Water Cleanup System, Rev. 3, Page 24
QCAN 901(2)-4 F12, CU SYSTEM AFTER NON REG HX HIGH TEMP, Rev. 4, Page 1

ANSWER: 019 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, Page 14

ANSWER: 020 (1.00)
c
REFERENCE:
LIC-2300, High Pressure Coolant Injection, Rev. 6, Page 17
QCOA 2300-04, HPCI Automatic Initiation, Rev. 9, Page 5

ANSWER: 021 (1.00)
c
REFERENCE:
LF-1400, Core Spray, Rev. 3, page 38
QCAN 901(2)-3 C5, CORE SPRAY SYS 2 LOGIC PWR FAILURE BUS, Rev. 2, page 2
QCOA 1400-02, Core Spray Loss of 125 VDC Auto Initiation Control Power, Rev. 4, page 4

ANSWER: 022 (1.00)
b
REFERENCE:
LIC-1100, Standby Liquid Control System, Rev. 5, page 18

ANSWER: 023 (1.00)
c
REFERENCE:
LF-0500, Reactor Protection, Rev. 4, page 37
QCOA 6700-05, 480 V Bus 19(29) Failure, Rev. 11, page 2
QOA 7000-01, 125 VAC RPS Bus Failure, Rev. 22, pages 3, 4

ANSWER: 024 (1.00)
d
REFERENCE:
LIC-0263, Reactor Instrumentation, Rev. 3, page 52

ANSWER: 025 (1.00)
a
REFERENCE:
LF-0280, Reactor Manual Control and RPIS System, Rev. 5, pages 7, 10

ANSWER: 026 (1.00)

a
REFERENCE:
LP LIC-0701, Source Range Monitor System and App., Rev. 4, pages 16 and 17
QCAN 901(2)-5 A4, SRM High or INOP, Rev. 2, page 1

ANSWER: 027 (1.00)
b
REFERENCE:
LIC-0703, LPRM/APRM Monitoring Systems, Rev. 5, page 63
Technical Specifications Table 4.1 A-1
QCOS-0700-06, PRM Flow Biased High Flux, Rev. 15, pages 2, 5, and Calibration Test

ANSWER: 028 (1.00)
c
REFERENCE:
LIC-0263, Reactor Vessel Instrumentation, Rev. 3, page 62

ANSWER: 029 (1.00)
a
REFERENCE:
LIC-1300, Reactor Core Isolation Cooling, Rev. 5, page 40

ANSWER: 030 (1.00)

b
REFERENCE:
LIC-1300, Reactor Core Isolation Cooling, Rev. 5, page 64

ANSWER: 031 (1.00)
d
REFERENCE:
LIC-0203, Automatic Depressurization, Rev. 21, page 25

ANSWER: 032 (1.00)
b
REFERENCE:
LP-1000, Residual Heat Removal System, Rev. 5, pages 10-15

ANSWER: 033 (1.00)
c
REFERENCE:
LNF-1601, Primary and Secondary Containment, Rev. 1, page 46

ANSWER: 034 (1.00)
d
REFERENCE:
LN-1603, Primary Containment Isolation, Rev. 0, pages 8, 10
QCAP 0200-10, EOP Expectation Standards, Rev. 22, Att. M and o

ANSWER: 035 (1.00)
d
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, page 49
QCOA 1000-04, LPCI Automatic Initiation, Rev. 8, page 2

ANSWER: 036 (1.00)
a
REFERENCE:
LNF-1900, Fuel Pool Cooling, Rev. 3, page 8

ANSWER: 037 (1.00)
b
REFERENCE:
QCOP 0203-01RPV Pressure Control Using Manual Relief Valve
Actuation, Rev. 8, page 1
LIC-0203, Automatic Depressurization System, Rev. 6, page 25

ANSWER: 038 (1.00)
a
REFERENCE:
LIC-5652, EHC Logic System, Rev. 4, page 4

ANSWER: 039 (1.00)

a
REFERENCE:
LIC-0600, Feedwater level Control, Rev. 3, Attachment OE936, pages 50-54

259002A101 ..(KA's)

ANSWER: 040 (1.00)
b
REFERENCE:
LF-7500, Standby Gas Treatment System, Rev. 9, page 50
Technical Specifications Amend., 3/4.7.P.2.a, pages 175 and 171

261000G222 ..(KA's)

ANSWER: 041 (1.00)
a
REFERENCE:
LN-6900, DC, Rev. 3, pages 35, 36

263000K303 ..(KA's)

ANSWER: 042 (1.00)
a
REFERENCE:
LN-6620, SBO System, Rev. 4, pages 6, 12

264000K301 ..(KA's)

ANSWER: 043 (1.00)
d
REFERENCE:
LIC-2000, Radioactive Waste Processing, Rev. 1, pages 78-80
QCOS 1600-07, Reactor Coolant Leakage in the Drywell, Rev. 12, page 10
268000A401 ..(KA's)

ANSWER: 044 (1.00)
a
REFERENCE:
LN-5400, Off Gas, Rev. 6, pages 41,42,43
QCAN 901(2)-7 A13, Rev. 2

271000K408 ..(KA's)

ANSWER: 045 (1.00)
b
REFERENCE:
LF-1701, Process Radiation Monitoring, Rev. 2, page 20

272000A202 ..(KA's)

ANSWER: 046 (1.00)
b
REFERENCE:
LN-4100, Fire Protection, Rev. 5, Section IV.A.1, page 50

286000A406 ..(KA's)

ANSWER: 047 (1.00)

b
REFERENCE:
LNF-5750, Plant Ventilation, Rev. 0, page 61

288000K603 ..(KA's)

ANSWER: 048 (1.00)
d
REFERENCE:
LF-3700, Reactor Building Closed Cooling Water System, Rev. 3,
page 26

400000G131 ..(KA's)

ANSWER: 049 (1.00)
b
REFERENCE:
LF-0202, Reactor Recirculation System, Rev. 7, page 62

295001K207 ..(KA's)

ANSWER: 050 (1.00)
b
REFERENCE:
QOA 3300-02, Loss of Condenser Vacuum, Rev. 18, page 1

295002K103 ..(KA's)

ANSWER: 051 (1.00)
b
REFERENCE:
LN-6600, Diesel Generators, Rev. 4, page 29

295003A102 ..(KA's)

ANSWER: 052 (1.00)
c
REFERENCE:
LN-6900, DC Distribution, Rev. 3, page 35
QOA 6900-01, Safety Related 250 VDC Battery and System Failure,
Rev. 13, page 1

295004A204 ..(KA's)

ANSWER: 053 (1.00)
d
REFERENCE:
LF-0500, Reactor Protection, Rev. 4, page 28

295006A206 ..(KA's)

ANSWER: 054 (1.00)
d
REFERENCE:
LIC 0203, Automatic Depressurization System, Rev. 21, pages 3,8
LIC 0250, Main Steam, Rev. 4, page 8

295007K304 ..(KA's)

ANSWER: 055 (1.00)
a
REFERENCE:
QCOA 0201-08, High Reactor Level, Rev. 6, page 2
OP-AA-101-102, Ops. Dept. Roles and Responsibilities, Rev. 1, Section 4.8.7.4, page 7

295008G449 ..(KA's)

ANSWER: 056 (1.00)
d
REFERENCE:
LNF-1601, Primary Containment, Rev. 1, page 72

295012A201 ..(KA's)

ANSWER: 057 (1.00)
c
REFERENCE:
LP-QGA200, Primary Containment Control, Rev. 0, pages 49, 53

295013K301 ..(KA's)

ANSWER: 058 (1.00)
c
REFERENCE:
L-QGA101, RPV Control (ATWS), Rev. 0, page 47
QGA 101, RPV Control (ATWS), Rev, 7
295014G420 ..(KA's)

ANSWER: 059 (1.00)
a
REFERENCE:
QCARP-0000-01, Implementing Procedure for Safe Shutdown, Rev. 8, page 8 and the Appendix R attachments

295016K303 ..(KA's)

ANSWER: 060 (1.00)
c
REFERENCE:
QCOA 3700-06, RBCCW Leak Inside Containment, Rev. 3, page 1
LF-3700, Reactor Building Closed Cooling Water, Rev. 3, page 40
LF-3700, Reactor Building Closed Cooling, Rev. 3, page 3

295018A203 ..(KA's)

ANSWER: 061 (1.00)
b
REFERENCE:
QOA 4700-01, Instrument Air Low Pressure, Rev. 12, page 1
LF-4600/4700, Air Systems, Rev. 5, pages 21, 24, 25, 42

295019K301 ..(KA's)

ANSWER: 062 (1.00)
b
REFERENCE:
LN-1603, Primary Containment Isolation, Rev. 0, page 18 and
System Figure 1603-2

295020A101 ..(KA's)

ANSWER: 063 (1.00)

c
REFERENCE:
LF-0301, Control Rod Blade and Drive Mechanisms, Rev. 2, page 40

295022K101 ..(KA's)

ANSWER: 064 (1.00)
b
REFERENCE:
LF-1000, Residual Heat Removal System, Rev. 5, pages 12, 13
QCOP 1000-30, Post Accident RHR Operation, Rev. 11, pages 4, 5, 7, 8

295024K211 ..(KA's)

ANSWER: 065 (1.00)
d
REFERENCE:
LIC-0250, Main Steam, Rev. 4, pages 28 and 32

295025K103 ..(KA's)

ANSWER: 066 (1.00)
b
REFERENCE:
L-QDETAILS, QGA Details, Rev. 0, page 10
LIC-0263, Rx Vessel Instrumentation, Rev. 3, page 64

295028A203 ..(KA's)

ANSWER: 067 (1.00)
a
REFERENCE:
LP QGA 500-2, Steam Cooling, Rev. 0, page 3
295031K305 ..(KA's)

ANSWER: 068 (1.00)
a
REFERENCE:
LP-QGA300, Secondary Containment Control, Rev. 0, Sections IV.A.2
and 3, page 13
QGA 300, Secondary Containment Control, Rev. 9

295033K201 ..(KA's)

ANSWER: 069 (1.00)
a
REFERENCE:
LNF-5750, LNF-5752, Plant Ventilation, Control Room Ventilation,
Rev. 0, Section 3, pages 43, 45
LF-7500, Standby Gas Treatment, Rev. 9, page 36
LP-QGA 300, Secondary Containment Control, Rev. 0, pages 7,9

295034G402 ..(KA's)

ANSWER: 070 (1.00)
d
REFERENCE:
LP-QGA101, RPV Control ATWS, Rev. 0, page 109
LN-0303, ATWS, Rev. 2, page 44

295037K301 ..(KA's)

ANSWER: 071 (1.00)
b
REFERENCE:
L-QGA200, Primary Containment, Hydrogen Control, Rev. 0, pages 5, 7, 14
L-QGAINTRO, QGA Introduction, Rev. 0, page 31

500000A106 ..(KA's)

ANSWER: 072 (1.00)
b
REFERENCE:
LN-4100-1, Fire Protection Systems, Rev. 5, Section 3.a.1), page
6

600000A108 ..(KA's)

ANSWER: 073 (1.00)
d
REFERENCE:
MA-AA-AD-6-03009, Work Execution, Rev. 0, Page 9

294001G219 ..(KA's)

ANSWER: 074 (1.00)
c
REFERENCE:
OP-AA-101-106, Verification Practices, Rev. 0, Page 4

294001G310 ..(KA's)

ANSWER: 075 (1.00)
d
REFERENCE:
LP-QGAINTRO, QGA Introduction, Rev. 0, Pages 31, 33, 35
L-QGA100, QGA 100, RPV Control, Rev. 0, Page 47
L-QGADET, QGA Details, Rev. 0, Page 60

294001G417 ..(KA's)

ANSWER: 076 (1.00)
c
REFERENCE:
Reportability Manual, Rev. 5, SAF 1.7, Page 1
Reportability Manual, Rev. 6, SAF 1.12, Page 1

294001G430 ..(KA's)

ANSWER: 077 (1.00)
a
REFERENCE:
LP-QGA Details, Primary Containment, Rev. 0, page 24

226001K506 ..(KA's)

ANSWER: 078 (1.00)
d
REFERENCE:
LIC-0250, Main Steam, Rev. 4, page 18
TSUP Bases, 2.1.C

239001K407 ..(KA's)

ANSWER: 079 (1.00)
c
REFERENCE:
LN-6600, Emergency Diesel Generators, Rev. 4, page 44-46

262001K602 ..(KA's)

ANSWER: 080 (1.00)
c
REFERENCE:
LF-7500, Standby Gas Treatment System, Rev. 9, pages 2, 12, Fig.
1

290001K104 ..(KA's)

ANSWER: 081 (1.00)
a
REFERENCE:
LN-6500, 4KV/480 Distribution, Rev. 1, page 86, 88, 106

295003K303 ..(KA's)

ANSWER: 082 (1.00)
c
REFERENCE:
LIC-1300, Reactor Core Isolation Cooling, Rev. 5, page 10
,
295007K303 ..(KA's)

ANSWER: 083 (1.00)
a
REFERENCE:
LF-0202, Reactor Recirculation System, Rev. 7, Appendix A, pg 2

295009A103 ..(KA's)

ANSWER: 084 (1.00)
b
REFERENCE:
L-QGA100, RPV Control, Rev. 0, pages 61, 63, 65
QCOP 0203-01, Rx Pressure Control Using Manual Relief Valve
Actuation, Rev. 8, Section F, page 4

295013K103 ..(KA's)

ANSWER: 085 (1.00)
b
REFERENCE:
LF-0201, Vessel and Internals, Rev. 7, pages 2, 25
QCARP 0300-01, UnitT 1 Torus and Shutdown Cooling Using Div I
RHR, Rev. 11, Att. B

295016A206 ..(KA's)

ANSWER: 086 (1.00)
b
REFERENCE:
QGA 400, Radioactivity Release Control, Rev. 4, Flow Chart
L-QGA-400, Radioactivity Release Control, Rev. 0, page 3

295017K206 ..(KA's)

ANSWER: 087 (1.00)
c
REFERENCE:
LP-QGA400, Radioactivity Release Control, Rev. 0, page 7

295017K304 ..(KA's)

ANSWER: 088 (1.00)
b
REFERENCE:
3/4.10.L, Refueling Operations, Revs. 171&167, Section 3.10,
pages 3/4.10-16
LF-1000, Residual Heat Removal System, Rev. 5, Section IV.A, page 70
LF-1000, Residual Heat Removal System, Rev. 5, Section IV.A, page 70

295021G111 ..(KA's)

ANSWER: 089 (1.00)
b
REFERENCE:
LF-7500, Standby Gas Treatment, Rev. 9, pages 22 and 36
QCOA 7500-02, SBGT Fan Tripped or Failed to Start Automatically, Rev. 7, page 1

295023A107 ..(KA's)

ANSWER: 090 (1.00)
d
REFERENCE:
LP-QGA200, Primary Containment Control, Rev. 0, Sections C.1 and 2, page 53
LP-QGA101, RPV Control (ATWS), Rev. 0, Section F.2.d, page 115

295026G418 ..(KA's)

ANSWER: 091 (1.00)
d
REFERENCE:
QGA 200, Primary Containment Control,
L-QGA200a, Rev. 0, Section VI. Torus Level, pages 59, 65

295029K206 ..(KA's)

ANSWER: 092 (1.00)
a
REFERENCE:
L-QGADET, QGA Details, Rev. 0, page 80

295030K102 ..(KA's)

ANSWER: 093 (1.00)
a
REFERENCE:
LP QGA 200, Primary Containment Control, Rev. 0, page 67

295030K302 ..(KA's)

ANSWER: 094 (1.00)
d
REFERENCE:
LP-QGA 300, Secondary Containment Control, Rev. 0, Att 1, page 19
QGA 300, Secondary Containment Control, Rev. 11

295032A202 ..(KA's)

ANSWER: 095 (1.00)
d
REFERENCE:
LNF-1601, Primary and Secondary Containment Integrity

295035K101 ..(KA's)

ANSWER: 096 (1.00)
d
REFERENCE:
L-QGA101, Rev. 0

295037K303 ..(KA's)

ANSWER: 097 (1.00)
d
REFERENCE:
L-QGA400, Radioactive Release Control, Rev. 0, page 5

295038A203 ..(KA's)

ANSWER: 098 (1.00)
d
REFERENCE:
LIC-5300, Generator Auxiliaries, Rev. 4, pages 8-11

245000K301 ..(KA's)

ANSWER: 099 (1.00)
b
REFERENCE:
L-QGA 200, Primary Containment Control Flow Chart, Rev. 0, pages 7, 9
L-QGA 100, RPV Control, Rev. 0, pages 7, 9

295010G401 ..(KA's)

ANSWER: 100 (1.00)
b
REFERENCE:
LP-QGA-101, RPV Control ATWS, Rev. 0, page 99
295015K102 ..(KA's)

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

ANSWER KEY

001	b	021	c	041	a	061	b	081	a
002	a	022	b	042	a	062	b	082	c
003	d	023	c	043	d	063	c	083	a
004	c	024	d	044	a	064	b	084	b
005	c	025	a	045	b	065	d	085	b
006	a	026	a	046	b	066	b	086	b
007	a	027	b	047	b	067	a	087	c
008	d	028	c	048	d	068	a	088	b
009	c	029	a	049	b	069	a	089	b
010	d	030	b	050	b	070	d	090	d
011	c	031	d	051	b	071	b	091	d
012	d	032	b	052	c	072	b	092	a
013	c	033	c	053	d	073	d	093	a
014	a	034	d	054	d	074	c	094	d
015	c	035	d	055	a	075	d	095	d
016	a	036	a	056	d	076	c	096	d
017	d	037	b	057	c	077	a	097	d
018	c	038	a	058	c	078	d	098	d
019	d	039	a	059	a	079	c	099	b
020	c	040	b	060	c	080	c	100	b

This answer key corresponds to the preceding software examination, and was not used to grade the applicant's examinations. See the next sheet for the actual grading sheet.

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

ANSWER KEY

001	b	021	d	041	a	061	a	081	b
002	a	022	c	042	d	062	c	082	c
003	d	023	d	043	b	063	d	083	b
004	c	024	c	044	a	064	c	084	b
005	c	025	c	045	d	065	d	085	d
006	a	026	b	046	a	066	a	086	d
007	a	027	c	047	b	067	a	087	b
008	d	028	d	048	c	068	b	088	d
009	d	029	a	049	a	069	d	089	a
010	c	030	a	050	a	070	b	090	a
011	d	031	b	051	d	071	c	091	a
012	c	032	c	052	a	072	c	092	d
013	c	033	a	053	b	073	b	093	a
014	d	034	b	054	b	074	b	094	a
015	d	035	d	055	b	075	a	095	d
016	c	036	b	056	c	076	b	096	d
017	c	037	c	057	d	077	c	097	d
018	a	038	d	058	b	078	c	098	d
019	c	039	a	059	b	079	b	099	b
020	a1	040	d	060	b	080	b	100	b

This answer key was used to grade the examinations given to the SRO applicant. It differed from the file examinations labeled MASTER in that the four choices (distractors) were randomly shuffled and printed subsequent to the station providing the above copy of the examination. The questions and distractors were the same; the correct answer location sometimes changed.