

# FENOC

*FirstEnergy Nuclear Operating Company*

## BEAVER VALLEY POWER STATION TRAINING SECTION

July 26, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

Beaver Valley Training Center  
**Examination Outlines**  
NPD3DOT:3722

Dear Mr. Silk,

Enclosed for your review and approval are the outlines for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. These outlines are submitted in accordance with NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10).

The following materials are enclosed:

- Form ES-201-2, Examination Outline Quality Checklist – (Signed)
- Form ES-201-3, Examination Security Agreement (Copy)
- Form ES-301-1, Administrative Topics Outline RO - Rev. 0
- Form ES-301-1, Administrative Topics Outline SRO - Rev. 0
- Form ES-301-2, Control Room/In-Plant Systems Outline RO – Rev. 0
- Form ES-301-2, Control Room/In-Plant Systems Outline SRO-I – Rev. 0
- Form ES-301-4, Simulator Scenario Quality Checklist – Rev. 0 (Unsigned)
- Form ES-301-5, Transient and Event Checklist – Rev. 0 (7 pages)
- Form ES-301-6, Competencies Checklist – Rev. 0
- **RO Written Outline**
  - Form ES-401-2, PWR Examination Outline – RO-Rev. 0 (12 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – RO – Rev. 0 (1 page)
- **SRO Written Outline**
  - Form ES-401-2, PWR Examination Outline – SRO – Rev. 0 (5 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – SRO – Rev. 0 (1 page)
- Form ES-401-4, Record of Rejected K/As – Rev. 0
- Form ES-D-1, Scenario Outline – Rev. 0 (5 – All New)

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Page 2 of 2  
July 26, 2016

The unsigned Form ES-301-4, Simulator Scenario Quality Checklist, is being sent to support Form ES-201-2, Examination Outline Quality Checklist. A signed version of this form will be sent with the exam materials.

The Westinghouse developed PWROG Random Generator software was used to generate both the RO and SRO written examination outlines. This software follows the selection process described in ES-401, Attachment 1, Example Systematic Sampling Methodology and the K/A Elimination Guidance provided in ES-401. Replacement K/As were manually selected utilizing this same guidance. Rejected K/As were documented on Form ES-401-4, Record of Rejected K/As.

The expected additions to the Exam Security Agreement are additional Operations Validation Team members.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,



Daniel J. Ronnenberg  
Superintendent, Nuclear Operations Training



Shawn P. Snook  
Unit 1 Shift Manager – Facility Reviewer

cc: OPS Letter File  
Nuclear Records – Site

TG for DH – exam outlines – 16

TG/DH



**BEAVER VALLEY POWER STATION  
TRAINING SECTION**

August 29, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
• 2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

Beaver Valley Training Center  
**Examination Materials**  
NPD3DOT:3723

Dear Mr. Silk,

Enclosed for your review and approval are the Proposed Operating Examination Materials for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. The materials are submitted in accordance with NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10).

As previously discussed, the written exam materials will be submitted for review in a separate mailing.

The following materials are enclosed:

- Form ES-201-3, Examination Security Agreement (Copy)
- Form ES-301-1, Administrative Topics Outline RO - Rev. 1
- Form ES-301-1, Administrative Topics Outline SRO - Rev. 1
- Form ES-301-2, Control Room/In-Plant Systems Outline RO – Rev. 1
- Form ES-301-2, Control Room/In-Plant Systems Outline SRO-I – Rev. 1
- Form ES-301-3, Operating Test Quality Checklist – Rev. 1 (Signed)
- Form ES-301-4, Simulator Scenario Quality Checklist – Rev. 1 (Signed)
- Form ES-301-5, Transient and Event Checklist – Rev. 1 (7 pages)
- Form ES-301-6, Competencies Checklist – Rev. 1
- Form ES-D-1, Scenario Outline – Rev. 1 (5 – All New)
  - 5 simulator Scenarios
- 9 Administrative Topics JPMs
- 11 Control Room/In-Plant Systems JPMs
- An electronic copy of the exam materials on disk
- References:
  - Applicable procedures for each JPM

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Page 2 of 2  
August 29, 2016

Modifications to the previously submitted materials were made as a result of review and feedback received during the validation process. Modifications to the outlines and exam materials are identified in bold italic print.

The additions to the Exam Security Agreement are additional Operations Validation Team members.

All Proposed Examination Materials have been validated by Licensed Operations personnel in accordance with the guidance provided within NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10).

None of the materials being sent are considered "Safeguards" information.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,



Daniel J. Ronnenberg  
Superintendent, Nuclear Operations Training



Shawn P. Snook  
Unit 1 Shift Manager – Facility Reviewer

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# FENOC

*FirstEnergy Nuclear Operating Company*

## BEAVER VALLEY POWER STATION TRAINING SECTION

September 6, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
• 2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

Beaver Valley Training Center  
**Examination Materials**  
NPD3DOT:3724

Dear Mr. Silk,

Enclosed for your review and approval are the Proposed Written Examination Materials for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. These outlines are submitted in accordance with NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10).

The following materials are enclosed:

- **RO Written Outline**
  - Form ES-401-2, PWR Examination Outline – RO-Rev. 1 (12 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – RO – Rev. 1 (1 page)
- **SRO Written Outline**
  - Form ES-401-2, PWR Examination Outline – SRO – Rev. 1 (5 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – SRO – Rev. 1 (1 page)
- Form ES-401-4, Record of Rejected K/As – Rev. 1
- Form ES-401-6, Written Examination Quality Checklist – Rev. 1 (Signed)
- An electronic copy of the written exam materials on disk
- 100 written Examination Questions and Answers
- References
  - Reference pages for each written question's correct answer
  - References provided to the candidates for the written examination

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Page 2 of 2  
September 6, 2016

Modifications to the previously submitted materials were made as a result of review and feedback received during the validation process. Modifications to the outlines and exam materials are identified in bold italic print.

All Proposed Examination Materials have been validated by Licensed Operations personnel in accordance with the guidance provided within NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10).

None of the materials being sent are considered "Safeguards" information.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,



Daniel J. Ronnenberg  
Superintendent, Nuclear Operations Training



Shawn P. Snook  
Unit 1 Shift Manager – Facility Reviewer

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**BEAVER VALLEY POWER STATION  
TRAINING SECTION**

September 28, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
• 2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

**Updated Examination Materials**

Dear Mr. Silk,

Enclosed for your review and approval are the updated Operating Exam materials for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. The materials have been updated based upon comments made during the NRC walkthrough week of September 12, 2016.

The following materials are enclosed:

- A Summary document of the changes identified during the walkthrough week
- 9 Administrative Topics JPMs (JPM document with any modified candidate forms)
- 11 Control Room/In-Plant Systems JPMs (JPM documents only)
- Form ES-D-1, Scenario Outline – Rev. 1 (5 – All New)
- 5 simulator Scenarios
  
- An electronic copy of the exam materials on disk
- Electronic copy of the applicable revised handouts for each JPM on disk:

None of the materials being sent are considered "Safeguards" information.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,

Thomas A. Gaydosik  
Lead, Fleet Exam Team



**BEAVER VALLEY POWER STATION  
TRAINING SECTION**

October 10, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
• 2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

**Updated Examination Materials**

Dear Mr. Silk,

Enclosed for your review and approval are the updated Written Exam materials for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. The materials have been updated based upon your comments on the original exam submittal.

The following materials are enclosed:

- A Summary document of the changes identified from your comments
- A complete 100 Question Updated Exam Answer Key
- Copies of the questions that were modified from your comments for questions 51 through 100
- Modified Question number 12 (resubmitted due to changes made after you reviewed the first 50 questions)
- An electronic copy of the exam materials on disk

None of the materials being sent are considered "Safeguards" information.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,

Thomas A. Gaydosik  
Lead, Fleet Exam Team



# FENOC

FirstEnergy Nuclear Operating Company

## BEAVER VALLEY POWER STATION TRAINING SECTION

October 24, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
• 2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

### Updated Examination Materials

Dear Mr. Silk,

Enclosed for your review and approval are the updated Written Exam materials for the Beaver Valley Unit 1 Initial Licensed Operator Examination scheduled to begin October 31, 2016. The materials have been updated based upon your recent comments on the revised exam submittal.

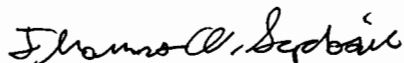
The following materials are enclosed:

- **Updated RO Written Outline**
  - Form ES-401-2, PWR Examination Outline – RO-Rev. AG (12 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – RO – Rev. AG (1 page)
- **Updated SRO Written Outline**
  - Form ES-401-2, PWR Examination Outline – SRO – Rev. AG (5 pages)
  - Form ES-401-3, Generic Knowledge and Abilities Outline Tier 3 – SRO – Rev. AG (1 page)
- Form ES-401-4, Record of Rejected K/As – Rev. AG
- Form ES-401-6, Written Examination Quality Checklist – Rev. AG (Signed)
- A Summary document of the changes identified from the most recent comments
- Copies of the questions that were modified from the list of comments
- A complete 100 Question Updated Exam Answer Key

None of the materials being sent are considered "Safeguards" information.

We request these materials be withheld from public disclosure until after the completion of the exam. If you have any questions, please feel free to contact Tom Gaydosik at 724-682-1884.

Sincerely,



Thomas A. Gaydosik  
Lead, Fleet Exam Team



**BEAVER VALLEY POWER STATION  
TRAINING SECTION**

November 28, 2016

Mr. David Silk  
USNRC Chief Examiner  
USNRC Region 1  
2100 Renaissance Blvd, Suite 100  
King of Prussia, PA 19406-2713

Beaver Valley Training Center  
**Post Examination Materials**  
NPD3DOT3725

In accordance with the guidance provided in NUREG 1021, Operator Licensing Examination Standards for Power Reactors (Revision 10), ES-501, Initial Post-Examination Activities, the following materials are submitted in support of the Beaver Valley Unit 1 Initial Licensing Examination that concluded on November 14, 2016.

1. Form ES-403-1, Written Examination Grading Quality Checklist
2. Form ES-201-3, Examination Security Agreement
3. The ORIGINAL Applicant answer sheets
4. The graded copies of the Applicant answer sheets
5. Two clean copies of each Applicant's answer sheet
6. All questions asked by the Applicants during the administration of the examination and the Proctor's responses to those questions.
7. The Written Examination Seating Chart
8. Requested modifications to the Written Examination answer key, with supporting documentation. (Attachment A)

After the Written Examination was completed, the Applicants participated in a review session to determine if enhancements to the questions were necessary. Results of this review indicate several questions should be evaluated for enhancements (*Questions 18, 35, 41, 42, 53, 65, and 71*) prior to reuse. These questions are being tracked by the Corrective Action Program (CR 2016-13493).

Post-exam analysis indicates potential generic training program weaknesses (*Questions missed by more than 50 percent of the Applicants; Questions 6, 19, 22, 23, 35, 44, 60, 67, 71, 78, 84 and 89*).

Investigations of these potential generic weaknesses are being tracked by the Corrective Action Program (CR 2016-13494).

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November 28, 2016

During the exam review, the applicants provided substantive comments for the written questions. Requested modifications to the answer key for these questions and supporting documentation is provided in Attachment A.

If you have any questions, or require more information, please contact me at (724-682-5995), or Tom Gaydosik at (724-682-1884).

Sincerely,

*JA Gaydosik for D. Ronnenberg*

Daniel J. Ronnenberg  
Superintendent, Nuclear Operations Training



Shawn P. Snook  
Unit 1 Shift Manager – Facility Reviewer

cc: Ops Letter File  
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# NRC Examination Student Questions During Exam and Proctor Responses

Time	Individual	Question/Response
0805		<b>Start Exam</b>
0844	RO /SRO # <u>SR0 I3</u>	<p>Question # <u>18</u></p> <p>Question: Does the question ask which of the following coincidence and logics will "directly" generate the reactor trip signal?</p> <p>Response: You have enough information to answer the question.</p> <p><i>NOTE: Clarified later during the exam due to multiple questions from the candidates and NRC concurrence, informed candidates. Question reads as follows: ....coincidence and logics will <b>directly or indirectly</b> generate the Reactor Trip Signal?</i></p>
0848	RO /SRO # <u>SR0 I9</u>	<p>Question # <u>8</u></p> <p>Question: In answer "C" does the word "the" PORV setpoint refer to a specific PORV?</p> <p>Response: No, it is not referring to a specific PORV.</p>
0905	RO /SRO # <u>R0 5</u>	<p>Question # <u>35</u></p> <p>Question: Is answer "A" saying both main feedwater pump bearing temperatures are 224 °F, or is it for a single main feedwater pump?</p> <p>Response: One pump as the wording is singular.</p>
0916	RO /SRO # <u>R0 9</u>	<p>Question # <u>18</u></p> <p>Does the question mean choice "A" directly generates the reactor trip?</p> <p>Response: You have enough information to answer the question.</p> <p><i>NOTE: Clarified later during the exam due to multiple questions from the candidates and NRC concurrence, informed candidates. Question reads as follows: ....coincidence and logics will <b>directly or indirectly</b> generate the Reactor Trip Signal?</i></p>
0918	RO /SRO # <u>SR0 I10</u>	<p>Question # <u>12</u></p> <p>Question: Does the question ask for immediate impact or longer term, i.e. 20 minutes from now?</p> <p>Response: Assume immediate response.</p>
0933	RO /SRO # <u>SR0 I2</u>	<p>Question # <u>41</u></p> <p>Question: Is the question two parts i.e. which valves will close and then which ones prevent radioactive release?</p> <p>Response: Question is asking one part, which valves close to provide that function.</p>

# NRC Examination Student Questions During Exam and Proctor Responses

Time	Individual	Question/Response
0940	RO /SRO # <u>R0 12</u>	Question # <u>48</u> Question: Is the ground effecting both the 1-2A and 1-2B Battery Chargers? Response: The ground was discovered on the in service battery charger.
0947	RO /SRO # <u>SR0 I6</u>	Question # <u>25</u> Question: During the IOAs, did they close the Main Steamline isolation valves or drive the limiter down and close the valves? Response: Assume the listed valves are failed open as per the bullet.
0951	RO /SRO # <u>R0 7</u>	Question # <u>58</u> Question: Are the "T <sub>avgs</sub> listed what they read now? Response: As per the bullet indication is for time "now".
0957	RO /SRO # <u>SR0 I8</u>	Question # <u>18</u> Question: Does the question mean "directly"? Response: You have enough information to answer the question.  <i>NOTE: Clarified later during the exam due to multiple questions from the candidates and NRC concurrence, informed candidates. Question reads as follows: ....coincidence and logics will <b>directly or indirectly</b> generate the Reactor Trip Signal?</i>
1007	RO /SRO # <u>R0 5</u>	Question # <u>2</u> Question: Is the answer to be based on Pressurizer pressure at this instant or based on a trend (lowering)? Response: Answer the question based upon current plant conditions.
1026	RO /SRO # <u>SR0 I6</u>	Question # <u>41</u> Question: Is the second half of the question supposed to be an inclusive basis for all valves to close? Response: Question is asking which valves close to provide that function.
1031	RO /SRO # <u>SR0 I1</u>	Question # <u>93</u> Question: Is AM-1MS-464B controller in Auto? Response: Assume the plant is in the normal configuration for startup.

# NRC Examination Student Questions During Exam and Proctor Responses

Time	Individual	Question/Response
1058	RO /SRO # <u>R0 2</u>	Question # <u>58</u> Question: Are the loop protection Tavg temperatures after the loop 3 Hot Leg failure? Response: Yes.
1103	RO /SRO # <u>SR0 17</u>	Question # <u>51</u> Question: Capitalized "River Water" does that mean Reactor Plant River Water because it is capitalized or water from the Ohio River? Response: Water from the Ohio River.
1103	RO /SRO # <u>R0 7</u>	Question # <u>16</u> Question: Is there a trend for the Steam Generator levels given? Response: Levels are at the levels given, there is no trend.
1112	RO /SRO # <u>SR0 18</u>	Question # <u>52</u> Question: Is this an all-inclusive list and do I consider normal, abnormal and flex? Response: Referred him to read the question stem and answer based upon the choices given.
1121	RO /SRO # <u>R0 11</u>	Question # <u>1</u> Question: Are these lights out (left side) and are the left side meters indicating "0" (meaning throttle valve position)? Response: Meter indications reflect the given lights. Yes throttle valve position meters are downscale.
1129	RO /SRO # <u>SR0 16</u>	Question # <u>60</u> Question: Is the question asking how we distribute Sodium Tetraborate (NaTB)? Response: Read the question stem to candidate.
1137	RO /SRO # <u>R0 11</u>	Question # <u>67</u> Question: For choice "A", does "Normal Operating Limits" mean per the curve (provided reference) or the way we normally operate the generator? Response: Response: Based on information provided and capability curve, what if anything do you do.

# NRC Examination Student Questions During Exam and Proctor Responses

Time	Individual	Question/Response
1140	RO /SRO # <u>R0 7</u>	Question # <u>40</u>  Question: Does "automatically aligned" mean as a results of this event or just that cooling water is aligned?  Response: Based on above conditions does cooling water automatically align to the "C" CAR fan.
1148	RO /SRO # <u>R0 5</u>	Question # <u>25</u>  Question: Did GV-1 and TV-1 remain open after the IOAs were completed?  Response: Review the initial conditions as they are given.
1211	RO /SRO # <u>R0 8</u>	Question # <u>58</u>  Question: Are the loop protection Tavg temperatures after the loop 3 Hot Leg failure?  Response: Yes.
1213	RO /SRO # <u>SR0 16</u>	Question # <u>71</u>  Question: Did Rad Pro do an assessment of the entry?  Response: If not stated in the question, then it did not occur.
1246	RO /SRO # <u>SR0 19</u>	Question # <u>48</u>  Question: Can I assume the ground only affects the inservice charger, not the redundant one (1-2A, 1-2B)?  Response: Yes.
1315	RO /SRO # <u>SR0 16</u>	Question # <u>90</u>  Question: Does the second part of the question mean that there is any way we could start up (i.e. engineering evaluation)?  Response: Base your answer on only the information given in the question.
1325	RO /SRO # <u>SR0 12</u>	Question # <u>25</u>  Question: Did GV-1 and TV-1 remain open after the IOAs were completed?  Response: Review the initial conditions as they are given.
1356	RO /SRO # <u>R0 8</u>	Question # <u>9</u>  Question: Is this what the BOP sees after trying to initiate emergency boration? Pointed out MOV-350 is closed.  Response: These are the indications after emergency boration was aligned.

# NRC Examination Student Questions During Exam and Proctor Responses

Time	Individual	Question/Response
1419	RO /SRO # <u>SR0 I6</u>	Question # <u>3</u> Question: I assume the question is referring to the "RCS boron concentration, does the LOCA cause a CIB? Response: Refers to RCS boron concentration. Cannot answer the second part of the question, use the information provided to make a determination.
1435	RO /SRO # <u>SR0 I9</u>	Question # <u>95</u> Question: Can we assume the reactor was locally tripped? Response: Review the conditions stated in the question.
1440	RO /SRO # <u>R0 8</u>	Question # <u>67</u> Question: Is the question asking what do I have to do to operate the generator as we do in the plant? Response: Based on information provided and capability curve, what if anything do you do?
1443	RO /SRO # <u>SR0 I9</u>	Question # <u>9</u> Question: Are the indications on the reference before initiation of emergency boration flow or after? Response: After initiation as stated in the question.
1540	RO /SRO # <u>SR0 I3</u>	Question # <u>60</u> Question: Is the question asking the components credited for iodine removal? Response: Yes.
1555		<b>End of the exam no further questions</b>

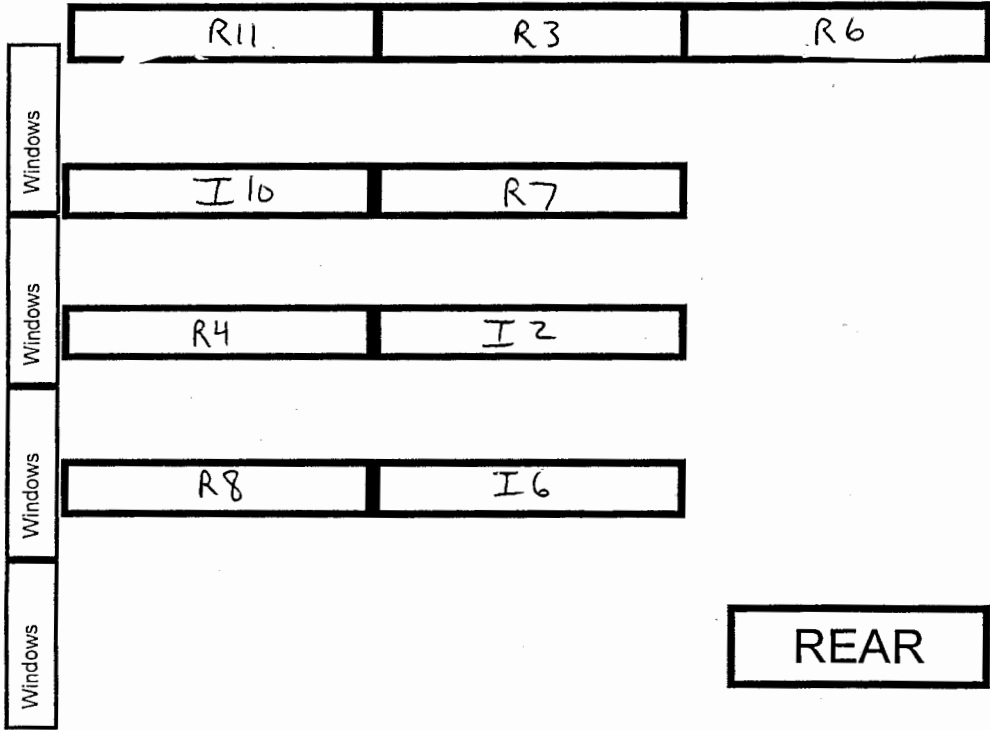
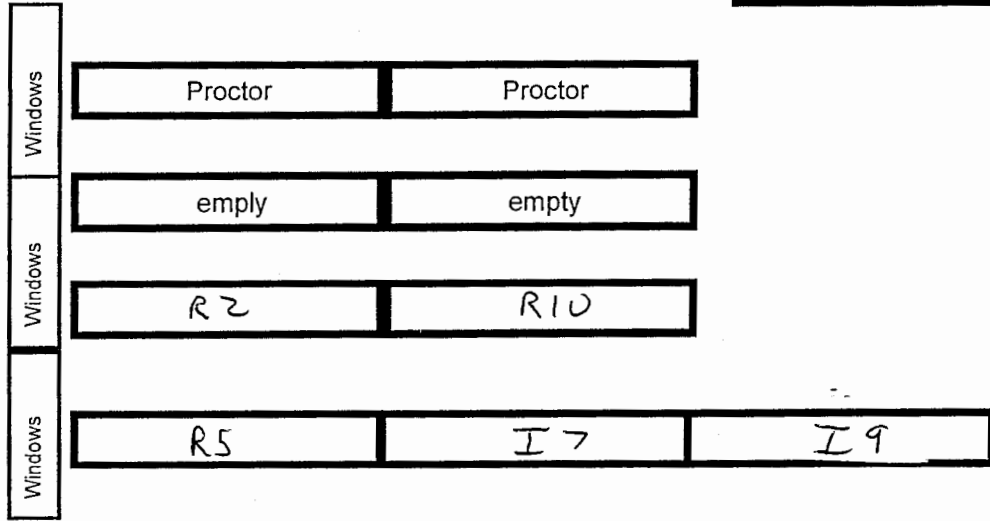


	RO 1	RO 2	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8	RO 9	RO 10	RO 11	RO 12	SRO 11	SRO 12	SRO 13	SRO 14	SRO 15	SRO 16	SRO 17	SRO 18	SRO 19	SRO 110	Average	Question #	Answer
1	1		1		1	A	1		1		1		C	1	1	1	1	1	1	1	A	1	86.4%	1	D
2	1		B		B		1		1		1		1	1	B	1	1	1	1	1	1	1	86.4%	2	C
3	1		1		1		1		C	1		C	1	1	1	1	1	1	1	1	1	1	90.9%	3	B
4	A		1		1	B	1		C	1		1	C	A	B	C	1	1	1	1	1	C	63.8%	4	D
5	1		1		D	1			1		A	1	D	1	1	1	1	D	1	1	D	1	72.7%	5	C
6	1		D		1	C	C		D		1		C	1	C	1	1	C	1	1	C	1		6	A
7	1		1		D	1			1		1		1	1	1	1	D	1	1	1	1	1	86.4%	7	B
8	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	8	C
9	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	9	B
10	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	10	A
11	1		C		1		C		1		C		1	C	1	1	1	1	1	1	1	1	77.3%	11	D
12	1		1		1		1		1		1		A	1	1	1	1	1	1	1	1	1	95.5%	12	C
13	D		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	95.5%	13	C
14	1		1		D	A	1		1		1		1	1	1	1	1	1	1	D	1	1	81.8%	14	B
15	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	15	B
16	1		C		1		C		1		1		1	1	1	1	1	1	1	1	1	1	90.9%	16	D
17	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	17	A
18	1		1		1		1		1		1		1	1	1	1	1	1	B	1	1	1	95.5%	18	A
19	D		D		1		B		1		A		1	D	1	1	D	D	D	D	D	1		19	C
20	1		1		1		1		1		1		1	1	1	1	1	1	1	D	1	1	95.5%	20	B
21	A		1		A	1		A		B	A	A	1	1	1	B	A	1	A	1	1	1	59.1%	21	D
22	C		C		1		C		C		C	1	A	A	1	1	1	1	1	C	C	A		22	D
23	C		C		C		C		1		C	1	C	C	1	C	C	1	C	1	C	1		23	A
24	1		1		A	B	B		B		1		1	1	1	1	1	1	1	1	1	1	77.3%	24	D
25	1		B		A		1		1		1		1	1	1	B	1	1	1	1	1	1	81.8%	25	D
26	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	26	B
27	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	27	C
28	1		1		B	1		1		1		1	1	B	1	B/D	1	1	1	1	1	1	86.4%	28	D
29	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	29	B
30	1		1		1		1		1		1		1	1	1	1	1	1	1	B	1	1	95.5%	30	C
31	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	31	D
32	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	32	B
33	1		1		1		1		1		1		1	1	1	1	1	1	1	1	C	1	95.5%	33	A
34	1		1		1		1		1		1		1	1	1	1	1	1	1	1	B	1	95.5%	34	A
35	B		B		B		B		1		B	B	1	1	B	C	B	B	B	1	1	B		35	A
36	1		1		1		1		1		1		C	1	1	1	1	1	1	1	1	1	95.5%	36	B
37	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	37	C
38	1		1		B		1		1		1		1	1	1	1	1	1	1	1	1	1	95.5%	38	C
39	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	39	D
40	1		1		1		1		1		1		1	1	1	1	1	1	1	1	C	1	90.9%	40	D
41	A		1		C		1		1		1		A	1	A	1	1	1	1	1	A	1	77.3%	41	D
42	A		1		B	1		1		1		1	B	B	1	1	B	1	1	1	1	1	77.3%	42	C
43	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	43	B
44	1		B		B		B		B		B	B	B	1	C	1	B	B	B	B	B	1		44	A
45	1		1		1		1		1		1		1	1	1	1	1	1	1	D	1	1	81.8%	45	B
46	1		1		1		1		1		C	1	1	1	1	1	1	1	1	1	1	1	95.5%	46	B
47	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	47	D
48	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	48	A
49	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	49	C
50	1		A		1		1		1		1		1	1	1	A	1	1	1	1	A	1	86.4%	50	C
51	1		1		1		1		1		1		1	1	1	1	1	1	1	1	1	1	100.0%	51	B

52	1	1	1	1	1	1	1	1	1	B	1	1	1	1	1	1	1	1	1	1	1	1	1	95.5%	52	C
53	1	1	1	1	1	1	1	1	1	1	1	1	1	D	1	A	C	D	1	D	1	1	77.3%	53	B	
54	C	1	1	1	1	C	1	1	1	1	1	1	1	C	1	1	1	1	1	C	1	1	81.8%	54	D	
55	1	A	1	1	1	1	1	1	1	A	1	1	1	A	1	1	1	1	1	1	1	1	86.4%	55	C	
56	C	1	1	1	1	D	1	1	1	1	B	1	1	1	1	1	1	1	1	D	1	1	81.8%	56	A	
57	1	1	1	1	1	1	1	1	1	D	1	1	1	1	1	1	1	1	1	1	1	1	95.5%	57	B	
58	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	A	1	1	1	1	1	1	95.5%	58	B	
59	1	B	1	1	1	1	1	1	1	B	1	1	1	B	1	1	1	1	1	B	1	1	81.8%	59	D	
60	C	1	1	1	A	C	1	1	1	C	C	1	1	C	1	C	C	1	1	A	1	1		60	D	
61	A	A	1	1	D	1	D	1	A	1	1	1	1	1	1	A	1	1	1	1	1	1	68.2%	61	B	
62	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%	62	D	
63	1	1	1	A	A	1	1	1	A	1	1	1	1	D	1	1	1	1	C	1	1	1	77.3%	63	B	
64	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%	64	A	
65	1	1	1	1	1	A	1	A	A	1	1	1	1	1	1	A	1	1	A	1	1	1	72.7%	65	C	
66	1	1	1	B	1	A	A	B	1	B	1	1	1	1	1	1	1	1	1	1	1	1	77.3%	66	C	
67	D	B	1	1	1	A	1	A	1	D	1	1	1	D	1	B	B	B	B	1	1	1		67	C	
68	1	1	1	D	1	D	D	D	1	D	1	1	1	C	1	1	1	1	1	D	1	1	63.6%	68	A	
69	C	1	1	1	1	B	1	1	1	C	1	1	1	C	1	1	1	1	1	1	1	1	72.7%	69	D	
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%	70	D	
71	C	C	D	C	D	C	C	C	C	C	C	C	C	C	1	C	1	C	C	C	C	C		71	A	
72	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%	72	D	
73	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	95.5%	73	A	
74	1	1	1	1	B	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	95.5%	74	A	
75	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%	75	C	
76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	76	A	
77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	77	D	
78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	1	A	1	1	A	1	A		78	C	
79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	79	D	
80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	B	1	1	1	1	90.0%	80	D	
81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	A	1	1	1	1	A	1	A	70.0%	81	B	
82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	A	B	1	1	1	1	A	1	60.0%	82	C	
83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	A	1	1	90.0%	83	C	
84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	C	C	1	C	C	C	1	1		84	D	
85	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	85	A	
86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	1	1	D	1	1	1	D	1	70.0%	86	B	
87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	D	1	1	90.0%	87	B	
88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	D	D	1	1	D	1	1	1	60.0%	88	A	
89	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	A	A	A	D	1	A	1		89	C	
90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	90	C	
91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	91	C	
92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	92	D	
93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	1	A	1	A	1	1	1	A	80.0%	93	B	
94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	C	1	1	C	1	C	1	1	70.0%	94	D	
95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	95	A	
96	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	D	1	D	1	D	70.0%	96	B	
97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	97	A	
98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	B	A	80.0%	98	C	
99	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	D	1	1	1	1	1	C	C	70.0%	99	A	
100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	1	1	1	1	1	1	1	1	100.0%	100	D	
		82.7%	90.7%	84.0%	80.0%	85.3%	80.0%	86.7%	90.7%	81.3%		86.7%	82.0%		84.0%	85.0%	83.0%	82.0%	87.0%	81.0%		91.0%	83.5%			
		82.7%	90.7%	84.0%	80.0%	85.3%	80.0%	86.7%	90.7%	81.3%		86.7%	82.7%	80.0%	85.3%	85.3%	82.7%	84.0%	89.3%	82.7%	80.0%	90.7%	83.9%			
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	80.0%	72.0%	80.0%	84.0%	84.0%	76.0%	80.0%	76.0%	76.0%	92.0%	80.0%			
	RO 1	RO 2	RO 3	RO 4	RO 5	RO 6	RO 7	RO 8	RO 9	RO 10	RO 11	RO 12	SRO 11	SRO 12	SRO 13	SRO 14	SRO 15	SRO 16	SRO 17	SRO 18	SRO 19	SRO 110	AVERAGE			

FRONT

November 14, 2016 NRC Written Exam  
Room 3/4 Sim Bldg. Desks are 6' wide.



REAR

