



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

November 24, 2010

Mr. Michael J. Pacilio  
Senior Vice President, Exelon Generation Company, LLC  
President and Chief Nuclear Officer (CNO), Exelon Nuclear  
4300 Winfield Road  
Warrenville IL 60555

SUBJECT: BYRON STATION, UNITS 1 AND 2  
NRC INITIAL LICENSE EXAMINATION REPORT 05000454/2010301(DRS);  
05000455/2010301(DRS)

Dear Mr. Pacilio:

On October 15, 2010, U. S. Nuclear Regulatory Commission (NRC) examiners completed the initial operator licensing examination process for an examination administered at your Byron Station, Units 1 and 2. The enclosed report documents the results of the examination which were discussed during a debrief on October 6, 2010, with Mr. D. Enright, Mr. B. Adams, Ms. E. Bogue, and other members of your staff. An exit meeting was conducted by telephone on October 20, 2010, between Ms. E. Bogue, Training Manager, of your staff and Mr. M. Bielby, NRC Chief Examiner, to review the proposed final grading of the written examination for the license applicants. During the telephone conversation NRC resolutions to post examination comments initially received by the NRC on October 15, 2010, were discussed.

The NRC examiners administered an initial license examination operating test during the weeks of September 27 and October 4, 2010. The written examination was administered by the facility Training staff on October 8, 2010. Eight (8) Senior Reactor Operator (SRO) and six (6) Reactor Operator (RO) applicants were administered license examinations. One of the SRO applicants was a licensed RO at Byron Station. The results of the examination were finalized on November 10, 2010. All fourteen (14) applicants passed all sections of their respective examinations and thirteen (13) applicable operator licenses were issued. One SRO license was not issued pending completion of eligibility requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

M. Pacilio

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

Sincerely,

***/RA by R. K. Walton for/***

Hironori Peterson, Chief  
Operations Branch  
Division of Reactor Safety

Docket Nos. 50-454; 50-455  
License No. NPF-37; NPF-66

Enclosures:   1. Operator Licensing Examination  
                  Report 05000454/2010301(DRS); 05000455/2010301(DRS)  
                  2. Simulation Facility Report  
                  3. Post Examination Comments and Resolutions  
                  4. Written Examinations and Answer Keys (RO and SRO)

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No. 50-454; 50-455

License No. NPF-37; NPF-66

Report No: 05000454/2010301(DRS); 05000455/2010301(DRS);

Licensee: Exelon Generation Company, LLC

Facility: Byron Station, Units 1 and 2

Location: Byron, IL

Dates: September 27 – October 6, 2010

Examiners: M. Bielby, Chief Examiner  
B. Palagi, Examiner  
R. Walton, Examiner

Approved by: Hironori Peterson, Chief  
Operations Branch  
Division of Reactor Safety

## **SUMMARY OF FINDINGS**

ER 05000454/2010301(DRS); 05000455/2010301(DRS); 09/27/10 - 10/06/10; Exelon Generation Company, LLC, Byron Station, Units 1 and 2; Initial License Examination Report.

The announced operator licensing initial examination was conducted by regional examiners in accordance with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1.

### Examination Summary:

- Fourteen initial license examinations were administered (eight Senior Reactor Operator (SRO) and six Reactor Operator (RO)).
- Fourteen applicants passed all sections of their examinations resulting in the issuance of seven SRO and six RO licenses. One SRO license was not issued pending completion of eligibility requirements.

## **REPORT DETAILS**

### **4. OTHER ACTIVITIES (OA)**

#### **4OA5 Other**

##### **.1 Initial Licensing Examinations**

###### **a. Examination Scope**

The NRC examiners conducted an announced operator licensing initial examination during the weeks of September 27 and October 4, 2010. The facility licensee's training staff used the guidance prescribed in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, to prepare the outline and develop the written examination and operating test. The examiners administered the operating test, consisting of job performance measures and dynamic simulator scenarios, during the period of September 27 through October 6, 2010. The facility licensee administered the written examination on September 8, 2010. Eight Senior Reactor Operator (SRO) and six Reactor Operator (RO) applicants were examined. During the on-site validation week of September 7, 2010, the examiners audited three license applications for accuracy.

###### **b. Findings**

###### **Written Examination**

The facility licensee's training staff developed the written examination. Written examination changes agreed upon between the NRC and the licensee were made according to NUREG-1021, Revision 9, Supplement 1. Subsequent to administration, the NRC graded the written examination and conducted a review of each question to determine the accuracy and validity of the examination questions. The licensee submitted two post-examination question comments based on the applicants' review by letter dated October 15, 2010, and received by NRC on October 15, 2010. The licensee's recommendations included changing the correct answer to one question, and leaving one question unchanged. The contents of the letter were discussed with the licensee in advance during a pre-scheduled exit meeting by telephone on October 20, 2010. The NRC completed final grading of the written examination on November 10, 2010. The results of the NRC's review of the station's comments are documented in Enclosure 3, Post Examination Comments and Resolutions.

###### **Operating Test**

The facility licensee's training staff developed the Operating Test. Operating Test changes agreed upon between the NRC and licensee were made according to NUREG-1021, Operator Licensing Examination Standards for Power Reactors. The licensee submitted no post-examination comments on the Operating Test. The NRC examiners completed operating test grading on November 10, 2010.

## Examination Results

Fourteen applicants passed all sections of their examinations resulting in the issuance of seven SRO and six RO licenses. One SRO license was not issued pending completion of eligibility requirements.

### .2 Examination Security

#### a. Inspection Scope

The NRC examiners briefed the facility contact on the NRC's requirements and guidelines related to examination physical security (e.g., access restrictions and simulator considerations) and integrity in accordance with 10 CFR 55.49, "Integrity of Examinations and Tests," and NUREG-1021, "Operator Licensing Examination Standard for Power Reactors." The examiners reviewed and observed the licensee's implementation and controls of examination security and integrity measures (e.g., security agreements) throughout the examination process.

#### b. Findings

No findings of significance were identified.

### 4OA6 Meetings

#### Exit Meeting

The chief examiner presented the examination team's preliminary observations and findings with Mr. D. Enright and other members of the licensee management and staff on October 6, 2010. An exit via teleconference was held on October 20, 2010, with Ms. E. Bogue and other members of the licensee staff following receipt of the site post-examination comments. The inspectors stated facility licensee's training staff facility licensee's training staff facility licensee's training staff that they had reviewed proprietary information during the preparation and administration of the examination, but that the proprietary information would not be included in the examination report. The licensee acknowledged the observations provided.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

D. Enright, Site Vice President  
B. Adams, Plant Manager  
E. Bogue, Training Director  
T. Leaf, Shift Operations Superintendent  
R. Peterson, Training Instructor  
G. Pickar, Operations Training Manager

#### NRC

M. Bielby, Chief Examiner  
B. Bartlett, Byron Senior Resident Inspector

### **ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened, Closed, and Discussed

None.

### **LIST OF ACRONYMS**

ADAMS	Agency-Wide Document Access and Management System
CFR	Code of Federal Regulations
CR	Condition Report
DRS	Division of Reactor Safety
ILT	Initial License Training
NRC	Nuclear Regulatory Commission
PARS	Publicly Available Records System
RO	Reactor Operator
SCR	Silicon Controlled Rectifier
SDP	Significance Determination Process
SRO	Senior Reactor Operator
SWO	Simulator Work Order

## **SIMULATION FACILITY REPORT**

Facility Licensee: Byron Station Units 1 and 2

Facility Licensee Docket No. 50-454; 50-455

Operating Tests Administered: September 27 – October 6, 2010

The following documents observations made by the NRC examination team during the initial operator 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	During a scenario the training building power supply breaker tripped for no apparent reason. The failure resulted in the simulator power supply transferring to batteries. The scenario was halted while an inspection of the power supply was performed. No apparent cause was identified for the breaker trip and the scenario was re-started from the failure point.



## **POST EXAMINATION COMMENTS AND RESOLUTIONS**

Question: 053 (1.00)

Given the following plant conditions:

- Annunciator 1-1-C7, "Remote S/D Panel Trouble" is LIT
- SER Point 1846 is printed for "Remote Shutdown Panel IA Press Low/Loss of Power Alarm"

Reference(s) Provided.

With this alarm LIT, Relay 1PSL-IA9X is \_\_ (1) \_\_, and device 1EL-IA009 is \_\_ (2) \_\_.

- |    | __ (1) __    | __ (2) __    |
|----|--------------|--------------|
| a. | de-energized | energized    |
| b. | energized    | energized    |
| c. | energized    | de-energized |
| d. | de-energized | de-energized |

Answer: a.

Reference: Drawing 6E-1-4030IA06, Remote Shutdown Control Panel Instrument Air Header Pressure Alarm

With low pressure, 1PSL-IA009 is open, de-energizing relay 1PSL-IA9X. Contact 1PSL-IA9X is NC (closed), thus energizing 1EL-009. The annunciator has contact 1PSL-IA9X 3-4 which is NC, and has to be closed to bring in the alarm.

### Applicant Comment:

Choice "d." is the correct answer. The question did not state that Radwaste Panel alarm 0PL01J-3-A6, "Panel Inst Air Supply Press Low" was lit, as would be expected if IA pressure were low. Per NRC rules, since the alarm was not in, only a loss of power or blown fuse could cause the listed alarm. If the annunciator circuit had lost power or fuse FU4-X or FU4-Y had blown, then both Relay 1PSL-IA9X and device 1EL-IA009 would be de-energized.

### Facility Proposed Resolution:

The licensee disagrees with the applicant's recommended correct answer.

During the exam, the applicant asked for the following clarification on Question 53: "Is the failure a fuse or just a loss of air"? The proctor's response was delayed while the clarification was being researched. However, in the interim, the applicant turned in his exam and left the exam area.

## **POST EXAMINATION COMMENTS AND RESOLUTIONS**

With 2 hours remaining before the end of the RO exam, the proctor's response was "Fuses are intact and the annunciator circuit has power available" which would have made choice "a." the only correct answer. No change to the original answer or grading is requested.

### **NRC Resolution:**

Recommendation accepted. The recommendation is supported by a review of the electrical drawing. The applicant was correct in his explanation of why answer "d." could have been correct based on the given question stem information and the assumptions made. However, the applicant chose to turn in his exam and leave the exam area before further clarification supplied by the proctor refuted the applicant's assumption and made "a." the only possible correct answer. Based on the pre- and post-examination review by licensee training staff, licensed operators and NRC examiners, the exam question and proctor clarification clearly did not change the original answer. Therefore, the question answer will remain unchanged from the as administered examination.

## **POST EXAMINATION COMMENTS AND RESOLUTIONS**

Question: 091 (1.00)

Given the following plant conditions:

- Unit 1 is at 60 % power
- The controlling Pressurizer Level channel indicates 100%
- The other hot calibrated pressurizer Level channels indicate 40%
- CHG LINE FLOW HIGH LOW (1-9-D3) is LIT
- The AUTO and DECREASE lights on 1CV121 M/A Controller are LIT

There is \_\_ (1) \_\_ GPM charging flow. The SRO will direct \_\_ (2) \_\_ to address the failure.

- |     |    |  |
|-----|----|--|
| a.. | 0  | locally bypassing 1CV121 per BOP CV-26, CV Valves Bypassing, Isolating and Restoration |
| b.  | 52 | locally bypassing 1CV121 per BOP CV-26, CV Valves Bypassing, Isolating and Restoration |
| c.  | 52 | manual control of 1CV121 per 1BOA Inst-2, Operation with a Failed Instrument Channel   |
| d.  | 0  | manual control of 1CV121 per 1BOA Inst-2, Operation with a Failed Instrument Channel   |

Answer: a.

Reference: 1 BOA Inst-2, Operation with a Failed Instrument Channel, BCB-1, Fig 4.

### Applicant Comment:

Choice "d." is the correct answer. The controller for 1CV121 is controlled in automatic by the Master Pressurizer Level controller. When the Master Pressurizer Level controller output goes to minimum demand, it lowers the 1CV121 controller demand to about 26%. The 1CV121 "Decrease" light does not go on. 1CV121 has a control bias to maintain about 52 GPM charging flow. For the given indication in the question that 1CV121 controller "Decrease" light is lit, there must be 0% demand on 1CV121, indicating 1CV121 is closed. In this situation, charging flow will be 0 GPM. Change correct answer to "d."

### Facility Proposed Resolution:

In the past, when the Master Pressurizer Level controller was at minimum, charging flow would be maintained at 52 GPM and the 1CV121 "Decrease" light would be lit. However, Simulator Work Request (SWR) 11733 "M/A Station for 1CV121 should indicate approximately 26% in Auto when at minimum flow of 52 GPM" was created on 5/14/2009, based on IR 918608. The simulator was subsequently changed so that when the Master Pressurizer Level controller has minimum demand output, 1CV121 "Decrease" light is not lit, and there is 52 GPM charging flow.

## **POST EXAMINATION COMMENTS AND RESOLUTIONS**

For the conditions stated in the question, if 1CV121 "Decrease" light is lit, 1CV121 will be fully closed, and charging flow will be 0 GPM, as stated in choice "d." The facility agrees with the applicant's comment, change the correct answer to choice "d."

### **NRC Resolution:**

Recommendation accepted. The examiners reviewed the referenced IR and SWR, and had the licensee verify the correct operation of the Master Pressurizer Level controller output, the 1CV121 controller, and the 1CV121 "Decrease" light with the System Engineer and Instrument Maintenance. The examiners also discussed the question review performed by various licensed operators and training staff with the Training Manager who agreed this was a potential training weakness that needs to be emphasized in requal training.

Choice a. was initially determined to be correct; however, based on additional reference information provided, and verification of the current operation of the Master Pressurizer Level controller, 1CV121 controller, and 1CV121 "Decrease" light by the System Engineer and Instrument Maintenance, choice "a." was determined to be incorrect, and the correct answer was changed to "d."

**WRITTEN EXAMINATIONS AND ANSWER KEYS (RO/SRO)**

RO/SRO Initial Examination ADAMS Accession #ML103330449.

The release of the RO/SRO Initial Examination will be delayed until October 8, 2012.

M. Pacilio

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

Sincerely,

**/RA by R. K. Walton for/**

Hironori Peterson, Chief  
Operations Branch  
Division of Reactor Safety

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