**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

August 14, 2015

Mr. Brian Boles
Site Vice President
FirstEnergy Nuclear Operating Co.
Davis-Besse Nuclear Power Station
5501 N. State Rte. 2, Mail Stop A–DB–3080
Oak Harbor, OH 43449–9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION
NRC INITIAL LICENSE EXAMINATION REPORT 05000346/2015301

Dear Mr. Boles:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed the initial operator licensing examination process for licensed applicants employed your Davis-Besse Nuclear Power Station. The enclosed report documents the results of those examinations. Preliminary observations noted during the examination process were discussed on June 18, 2015, with Mr. J. Cuff, Training Manager, and other members of your staff. An exit meeting was conducted by telephone on July 28, 2015, between Mr. R. Oesterle, Site Operations Manager, other members of your staff, and Mr. D. Reeser, Chief Operator Licensing Examiner, to review the proposed final grading of the written examination for the licensed applicants. During the telephone conversation, NRC resolutions of the station's post-examination comments, initially received by the NRC on June 30, 2015, were discussed.

The NRC examiners administered an initial license examination operating test during the week of June 15, 2015. The written examination was administered by Davis-Besse Nuclear Power Station training department personnel on June 22, 2015. Four Senior Reactor Operator (SRO) and three Reactor Operator (RO) applicants were administered license examinations. The results of the examinations were finalized on July 23, 2015. Three applicants failed one or more sections of the administered examination and were issued proposed license denial letters. Four applicants passed all sections of their respective examinations and one applicant was issued a senior operator license. The license for one SRO applicant is being withheld pending the determination of amount of any additional Responsible Nuclear Power Plant Experience that must be obtained prior to the issuance of their license. In accordance with NRC policy, the licenses for the remaining RO applicants are being withheld pending the outcome of any written examination appeal that may be initiated.

The written examination and other related written examination documentation will be withheld from public disclosure for 24 months per your request. However, if an applicant received a proposed license denial letter because of a written examination grade that is less than 80 percent, the applicant will be provided a copy of the written examination. For examination security purposes, your staff should consider that written examination uncontrolled and exposed to the public.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, “Public Inspections, Exemptions, Requests for Withholding,” of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC’s Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA Raymond Keith Walton Acting for/***

Hironori Peterson, Chief
Operations Branch
Division of Reactor Safety

Docket No. 50-346
License No. NPF-3

Enclosure:
Operator Licensing Examination Report (ER)
05000346/2015301 w/Attachments:
1. Supplemental Information
2. Post-Examination Comments and Resolution
3. Simulation Facility Fidelity Report

cc w/encl: Distribution via LISTSERV®
J. Cuff, Manager-Training

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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|---|---|
| Docket No: | 50-346 |
| License No: | NPF-3 |
| Report No: | 05000346/2015301 |
| Licensee: | FirstEnergy Nuclear Operating Company (FENOC) |
| Facility: | Davis-Besse Nuclear Power Station |
| Location: | Oak Harbor, OH |
| Dates: | June 15, 2015, through June 30, 2015 |
| Inspectors: | D. Reeser, Operations Engineer; Chief Examiner<br>B. Palagi, Senior Operations Engineer; Examiner<br>N. Valos, Senior Reactor Analyst; Examiner |
| Approved by: | H. Peterson, Chief<br>Operations Branch<br>Division of Reactor Safety |

Enclosure

## SUMMARY

ER 05000346/2015301; 06/15/2015 – 06/30/2015; FirstEnergy Nuclear Operating Company; Davis-Besse Nuclear Power Station; Initial License Examination Report.

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

Examination Summary

Four of seven applicants passed all sections of their respective examinations. Three applicants (two Senior Reactor Operator (SRO) and one Reactor Operator (RO)) failed one or more sections of the administered examination and were issued proposed license denials. One applicant was issued a senior operator license. The license for one SRO applicant is being withheld pending the determination of the amount of any additional Responsible Nuclear Power Plant Experience that must be obtained prior to the issuance of their license. In accordance with NRC policy, the licenses for the remaining two RO applicants are being withheld pending the outcome of any written examination appeal that may be initiated. (Section 4OA5.1).

## REPORT DETAILS

4OA5 Other Activities

.1 Initial Licensing Examinations

a. Examination Scope

The U.S. Nuclear Regulatory Commission (NRC) examiners and members of the facility licensee's staff used the guidance prescribed in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9-Supplement 1, to develop, validate, administer, and grade the written examination and operating test. Members of the facility licensee's staff prepared the outlines and developed the written examination and operating test. The NRC examiners validated the proposed examination during the week of May 18, 2015, with the assistance of members of the facility licensee's staff. During the on-site validation week, the examiners audited two license applications for accuracy. The NRC examiners, with the assistance of members of the facility licensee's staff, administered the operating test, consisting of job performance measures (JPMs) and dynamic simulator scenarios, during the period of June 15, 2015, through June 18, 2015. The facility licensee administered the written examination on June 22, 2015.

b. Findings

(1) Written Examination

The NRC examiners determined that the Reactor Operator (RO) portion of the written examination, as proposed by the licensee, was within the range of acceptability expected for a proposed examination. Less than 20 percent of the proposed examination questions were determined to be unsatisfactory and required modification or replacement.

The NRC examiners initially determined that the Senior Reactor Operator (SRO) portion of the written examination, as proposed by the licensee, was within the range of acceptability expected for a proposed examination. Five out of 25 (20 percent) of the proposed examination questions were determined to be unsatisfactory and required modification or replacement.

On June 30, 2015, the licensee submitted documentation noting that there were two post-examination comments for consideration by the NRC examiners when grading the written examination. The post-examination comments and the NRC resolution for the post-examination comments are included as Attachment 2 of this report.

During the review and resolution of the post-examination comments, the NRC examiners determined that two additional questions on the SRO portion of the written examination were unsatisfactory, and the questions were deleted from the as-administered examination. With these two additional unsatisfactory questions, more than 20 percent of the proposed SRO written examination questions were determined to be unsatisfactory. Four of the unsatisfactory questions lacked sufficient focus (e.g., unclear

intent, inaccurate operating conditions, more information was needed, or too much needless information) within the question stem to elicit the correct answer; two questions contained two or more implausible distracters; and two questions failed to meet the "SRO Only" criteria. Additional attention in this area is warranted.

All changes made to the proposed written examination, were made in accordance with NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and documented on Form ES-401-9, "Written Examination Review Worksheet," which will be available electronically in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS).

The proposed written examination, as well as the final as-administered examination and answer key (ADAMS Accession Number ML15217A601), will be available in 24 months electronically in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS.

The NRC examiners graded the written examination on July 21, 2015, and conducted a review of each missed question to determine the accuracy and validity of the examination questions.

(2) Operating Test

The NRC examiners determined that the operating test, as originally proposed by the licensee, was within the range of acceptability expected for a proposed examination. Changes made to the operating test, documented in a document titled, "Operating Test Comments," as well as the final as-administered dynamic simulator scenarios and JPMs, are available electronically in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS.

The NRC examiners completed operating test grading on July 23, 2015.

(3) Examination Results

Four applicants at the SRO level and three applicants at the RO level were administered written examinations and operating tests. Three applicants (two SRO and one RO) failed one or more sections of the administered examination and were issued proposed license denials. Four applicants (two SRO and two RO) passed all portions of their examinations. One applicant was issued a senior operator license on July 23, 2015. The license for one SRO applicant is being withheld pending the determination of the amount of any additional Responsible Nuclear Power Plant Experience that must be obtained prior to the issuance of their license. Two RO applicants passed all portions of the license examination, but received written test grades below 82 percent. In accordance with NRC policy, the applicant's licenses will be withheld until any written examination appeal possibilities by other applicants have been resolved. If the applicant's grade is still equal to or greater than 80 percent after any appeal resolution, the applicant will be issued an operating license. If the applicant's grade has declined below 80 percent, the applicant will be issued a proposed license denial letter and offered the opportunity to appeal any questions the applicant feels were graded incorrectly.

.2 Examination Security

a. Scope

The NRC examiners reviewed and observed the licensee's implementation of examination security requirements during the examination validation and administration to assure compliance with Title 10 of the *Code of Federal Regulations*, Section 55.49, “Integrity of Examinations and Tests.” The examiners used the guidelines provided in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors,” to determine acceptability of the licensee’s examination security activities.

b. Findings

None

4OA6 Management Meetings

.1 Debrief

The chief examiner presented the examination team's preliminary observations and findings on July 18, 2015, to Mr. J. Cuff, Training Manager, and other members of the Davis-Besse Nuclear Power Station Operations and Training Department staff.

.2 Exit Meeting Summary

The chief examiner conducted an exit meeting, by telephone, on July 28, 2015, with Mr. R. Oesterle, Site Operations Manager, and other members of the Davis-Besse Nuclear Power Station staff. The NRC’s final disposition of the station’s post-examination comments were disclosed and discussed during the telephone discussion. The examiners asked the licensee whether any of the material used to develop or administer the examination should be considered proprietary. No proprietary or sensitive information was identified during the examination or debrief/exit meetings.

ATTACHMENTS:
1. Supplemental Information
2. Post Examination Comments and Resolution
3. Simulation Facility Fidelity Report

## SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

Licensee

R. Oesterle, (Acting) Manager, Site Operations
J. Phillippe, Superintendent, Operations Services
D. Hartnett, Superintendent, Nuclear Operations Training
S. Martin, Supervisor, Nuclear Operations Training
M. Klein, Lead Exam Developer
T. Gaydosik, Fleet Lead Exam Developer

U.S. Nuclear Regulatory Commission

D. Kimble, Senior Resident Inspector
T. Briley, Resident Inspector
D. Reeser, Chief Examiner
B. Palagi, Examiner
N. Valos, Examiner

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened, Closed, Discussed

None

## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

None

## LIST OF ACRONYMS USED

| | |
|---|---|
| ADAMS | Agencywide Documents Access and Management System |
| CFR | *Code of Federal Regulations* |
| ER | Examination Report |
| JPM | Job Performance Measure |
| NRC | U.S. Nuclear Regulatory Commission |
| PARS | Publicly Available Records System |
| RO | Reactor Operator |
| SRO | Senior Reactor Operator |

**FACILITY SUBMITTED POST-EXAMINATION COMMENT:**

The facility recommends changing the correct answer for Question #78 from B to D.

78. The plant is operating at 100 percent power.

The following conditions are noted:

- PRSRC2B Reactor Coolant (RC) Pressure Loop 1 is 2090 psig and slowly lowering.
- PRSRC2A2 RC Pressure Loop 2 is 2090 psig and slowly lowering.
- All Pressurizer Heater Banks are ON.
- FI MU34 Makeup (MU) Flow Train 2 indicates 25 gpm.

Which of the following describes:
(1) the correct section of DB-OP-02513 Pressurizer System Abnormal Operation to implement?

and

(2) the action to implement if the initial mitigation actions are NOT successful?

A. (1) Pressurizer Spray Valve RC 2 Failed Open
(2) Evaluate for continued operation per NOP-OP-1010 Operational Decision Making

B. (1) Pressurizer Spray Valve RC 2 Failed Open
(2) Initiate shutdown per DB-OP-02504 Rapid Shutdown

C. (1) Pressurizer Vapor Space Leak
(2) Evaluate for continued operation per NOP-OP-1010 Operational Decision Making

D. (1) Pressurizer Vapor Space Leak
(2) Initiate shutdown per DB-OP-02504 Rapid Shutdown

Part (1) of the question requires the candidate to select the correct section of DB-OP-02513, Pressurizer System Abnormal Operation, to implement. The two sections provided as options are “Pressurizer Spray Valve RC 2 Failed Open” or “Pressurizer Vapor Space Leak”.

Per DB-OP-02513, Pressurizer System Abnormal Operation, Step 2.2.3 symptoms for a Pressurizer Spray Valve RC 2 Failed Open are:

- Lowering RCS pressure with no change in TAVE or Pressurizer level

In the stem of the question, Reactor Coolant System pressure in Loop 1 and Loop 2 are stated to be 2090 psig and slowly lowering. The normal value for Reactor Coolant System pressure is 2155 psig. No information provided in the stem of the question indicates that RCS Tave is changing, therefore it is expected that the candidate will conclude Tave is constant. The stem of the question also states that FI MU34 Makeup (MU) Flow Train 2 indicates 25 gpm. The normal flow rate for Makeup is 40 to 45 gpm. A review of plant data for computer point F738, RC MU FLOW 2 LOW RANGE (GPM), was performed for Cycle 18 and Cycle 19 to validate

[that] normal Makeup flow rate is 40 to 45 gpm. Normal Makeup flow rate is dependent on the setting for Reactor Coolant System Letdown. The station philosophy over the last two run cycles is to set RCS Letdown flow rate to approximately 70 gpm to optimize RCS chemistry control. Previous run cycles operated with a lower RCS Letdown flow rate of approximately 50 gpm, which resulted in a normal Makeup flow rate of 25 gpm for those run cycles. Based on the information provided in the stem of the question (25 gpm Makeup flow rate) and being trained on the current plant configuration (40 to 45 gpm normal Makeup flow rate), it is expected that the candidate would conclude that a lower than normal Makeup flow rate exists. A lower than normal Makeup flow rate will occur when MU32, Makeup Flow Controller, responds to a rising Pressurizer level. The stem of the question describes a lowering RCS pressure with no change in TAVE, but a rising Pressurizer level.

Pressurizer Spray Valve RC 2 Failed Open, is NOT the correct section of DB-OP-02513, Pressurizer System Abnormal Operation, to implement based on a conflict between the information provided in the stem of the question and the symptoms described in step 2.2.3 of DB-OP-02513, Pressurizer System Abnormal Operation.

Per DB-OP-02513, Pressurizer System Abnormal Operation, Step 2.7.1 symptoms for a Pressurizer Vapor Space Leak are:

- RCS Pressure is lowering
- Pressurizer Level is rising
- Tave is constant
- All available heaters are on

In the stem of the question, Reactor Coolant System pressure in Loop 1 and Loop 2 are stated to be 2090 psig and slowly lowering. The normal value for Reactor Coolant System pressure is 2155 psig.

The Makeup flow rate provided in the stem of the question (25 gpm) is below the normal Makeup flow rate (40 to 45 gpm). A lower than normal Makeup flow rate will occur when MU32, Makeup Flow Controller, responds to a rising Pressurizer level.

No information provided in the stem of the question indicates that RCS Tave is changing, therefore it is expected that the candidate will conclude Tave is constant.

The stem of the question states that all Pressurizer Heater Banks are ON.

Pressurizer Vapor Space Leak, is the correct section of DB-OP-02513, Pressurizer System Abnormal Operation, to implement based on the information provided in the stem of the question and the symptoms described in step 2.7.1 of DB-OP-02513, Pressurizer System Abnormal Operation.

Part (2) of the question requires the candidate to select the correct action to implement if the initial mitigation actions are NOT successful. The bases for the correct action to implement is dependent on how the symptom was diagnosed in Part (1) of the question. The two actions provided as options are “Evaluate for continued operation per NOP-OP-1010 Operational Decision Making” OR “Initiate shutdown per DB-OP-02504 Rapid Shutdown”.

In the stem of the question, Reactor Coolant System pressure in Loop 1 and Loop 2 are stated to be 2090 psig and slowly lowering. The normal value for Reactor Coolant System pressure is 2155 psig. The stem of the question also states that all Pressurizer Heater Banks are ON. All Pressurizer Heater Banks are designed to be ON when RCS Pressure lowers to 2105 psig. An RCS Pressure of 2090 psig and slowly lowering with all Pressurizer Heater Banks ON indicates continued operation will be challenged due to the inability to maintain RCS pressure control.

If Part (1) of the question is correctly diagnosed as a Vapor Space Leak, then step 4.7.5 applies. The information contained in the stem of the question does not support remaining in the expected response column of step 4.7.5 (NOP-OP-1010 is an option in the Expected Response column), therefore it is expected that the Response Not Obtained will be completed per step 4.7.5.c requiring a plant shutdown per DB-OP-02504.

If Part [(1)] of the question is incorrectly diagnosed as Pressurizer Spray Valve RC 2 Failed Open, then step 4.2.1.c Response Not Obtained will be completed requiring a plant shutdown per DB-OP-02504. The information contained in the stem of the question indicates that continued operation will be challenged due to the inability to maintain RCS pressure control, therefore NOP-OP-1010, Operational Decision Making, is not appropriate. However, NOP-OP-1010, Operational Decision Making, has been utilized for Pressurizer Spray Valve RC 2 not fully closing and is a plausible option.

Conclusion:

The information provided in the stem of the question and the symptoms provided in the DB-OP-02513, Pressurizer System Abnormal Operation, supports a diagnosis of Pressurizer Vapor Space Leak. Additionally, the information provided in the stem of the question and the direction provided in DB-OP-02513, Pressurizer System Abnormal Operation, supports the action to [initiate] shutdown per DB-OP-02504 Rapid Shutdown. The correct answer to question 78 is D due to containing the correct answer to Part (1) and Part (2) of the question. Answers A, B, and C are not correct due to containing a wrong answer to Part (1) and/or Part (2).

**NRC EVALUATION OF COMMENT**

The question, as submitted, was designed to test the ability of the applicant to determine and interpret Makeup System Flow indications as they apply to Pressurizer Pressure Control Malfunctions (K/A 000027 AA2.07). The basis for the requested change centers on the value of the Makeup System Flow provided as an initial condition in the stem of the question. The supporting documentation, provided with the examination submittal, stated that the “normal” makeup flow was 25 gpm and this value was not challenged during the review and approval of the examination. If Makeup System Flow was at the “normal” value, this would provide an indirect indication that Pressurizer Level was not changing, and with the other conditions stated in the stem, allow the test taker to diagnose that the Pressurizer Spray Valve (RC 2) had failed open. A constant Pressurizer Level would also allow the test taker to rule out a Pressurizer Vapor Space leak as the reason for the transient.

The new information provided by the facility, in support of the requested change, states that for the last two fuel cycles the plant has been, and is currently being, operated with a nominal Makeup System flowrate of 40-45 gpm. The Makeup System flowrate is approximately equal to the Letdown System flowrate (≈ 70 gpm) minus the Reactor Coolant Pump Seal Injection flowrate (≈ 32 gpm). Appendix E (Policies and Guidelines for Taking NRC Examinations) of NUREG 1021, "Operator Licensing Examination Standards For Power Reactors," directs the applicants to: "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;" and "answer all questions based on actual plant operation, procedures, and references." Since the Makeup System Flowrate provided in the stem of the question is less than the facility's "normal" flow rate, it is reasonable for the applicant to assume that Pressurizer Level is changing; therefore, the basis supporting the original answer (B), that pressurizer level is not changing, is no longer valid. The only other malfunction that the applicants had to choose from was a Pressurizer Vapor Space Leak, and since part (2) of answer choice C is incorrect, the only remaining answer choice would be D. In order for answer choice D to be a valid response to the question, the details in the stem of the question must provide the necessary technical information to indicate that a Pressurizer Vapor Space leak exists. In other words, selection of an answer simply because no other choice matches the symptoms is not a valid measure of the applicant's knowledge.

With Makeup System Flow at 25 gpm, and no indication that MU32, Makeup Flow Control Valve, is malfunctioning, it is reasonable to assume that MU32 has throttled closed in response to a rising Pressurizer Level signal as indicated by the ***selected*** Pressurizer Level instrument. The rise in indicated level could be due to an actual level increase (excess makeup or rising Reactor Coolant System temperature), an instrument malfunction, a rise in containment temperature (reference leg heat-up), or the formation of a steam bubble within the Reactor Coolant System (RCS) if RCS pressure drops to the Saturation Pressure ($P_{sat}$) for the current RCS Hot Leg Temperature ($T_{hot}$).

The first two possible causes for the rise in indicated level can be ruled out using the information (or lack of information) provided in the stem of the question as follows.

- A Pressurizer Level increase, due to RCS Temperature increase, is ruled out since $T_{ave}$ is assumed to be constant; there is no information provided in the stem to indicate otherwise.
- A Pressurizer Level increase, due to excess Makeup, is ruled out since actual Makeup Flow is less than "normal".
- There is no information provided in the stem of the question to support an assumption that the containment is heating up; therefore, an indicated rise in Pressurizer level due to a reference leg heat-up is ruled out.

A Pressurizer level instrument failing high would result in MU32 throttling closed, resulting in an actual decrease in pressurizer level due to a loss of RCS inventory at a rate of 15-20 gpm (the change in Makeup System flow rate). The resulting loss of inventory would also cause RCS Pressure to decrease and all Pressurizer Heaters to energize (they would remain energized due to the faulty level signal). The information in the stem of the question would support selection of this malfunction; however, an instrument malfunction was not listed as a possible choice.

The facility asserts that since the symptoms of a Pressurizer Vapor Space Leak listed in Step 2.7.1 of DB-OP-02513 — Pressurizer Level is rising (deduced from the given Makeup Flow value); RCS Pressure is lowering and all Pressurizer Heaters energized (given in the stem); constant $T_{ave}$ (no reason given in the stem to indicate that it is changing); and the Spray Valve being shut (expected for the given conditions) — that there must be a Pressurizer Vapor Space Leak. However, these symptoms alone do not indicate the presence of a leak. Section 2.7 of DB-OP-02513 lists additional symptoms; e.g., rising Containment Radiation Levels (Step 2.7.3) and a higher than normal leak-rate into the Containment Normal Sump (Step 2.7.4); that should also be present if there was a leak. Since a Pressurizer Vapor Space leak is also an RCS leak inside the Containment, other symptoms that would likely be present include rising Containment Pressure and Temperature; reference DB-OP-02522, "Small RCS Leaks." None of these symptoms is listed in the stem of the question. Therefore selection of answer choice D, is then dependent solely upon the validity of a rising Pressurizer Level indication as a possible symptom of a Pressurizer Vapor Space Leak.

With a leak from the Pressurizer Vapor Space, Pressurizer Level would initially decrease, just as in any other RCS leak. Pressurizer Level would continue to decrease until either Makeup System/ECCS flow exceeded the leak rate or until the RCS reached saturation conditions. In order for Pressurizer Level to be rising because of a Pressurizer Vapor Space Leak, Makeup System Flow would have to be higher than normal, or the RCS would have to be at Saturation Conditions. Since the stem states that indicated Makeup System flow is less than the "normal" flowrate, the information in the stem would need to indicate that the RCS was in a saturated condition in order for Pressurizer Level to be increasing. The information in the stem of the question does not support this assumption. At 100% power with $T_{ave}$ at the normal value of 582°F, $T_{hot}$ would be 606°F. $P_{sat}$ for a $T_{hot}$ of 606°F is approximately 1600 psig. This is well below the 2090 psig given in the stem of the question; therefore the RCS is still subcooled. Given these additional facts, a Pressurizer Vapor Space Leak is ruled out as a possible cause for the rising Pressurizer Level.

Since neither malfunction (Spray Valve failing open or Pressurizer Vapor Space Leak) given in Part 1 of the possible answer choices is supported by the symptoms given in, or deduced from, the stem of the question, there is no correct answer; therefore the question will be deleted from the examination.

**FACILITY SUBMITTED POST-EXAMINATION COMMENT:**

The facility recommends that no answer to question #89 is correct and the question is to be removed from the exam.

89. A Waste Gas Decay Tank release is in progress when the following occurs:

- Annunciator 9-1-G FIRE OR RADIATION TROUBLE alarms.
- Alarm 7-1-C, WST GAS SYS OUT RAD HI alarms.
- RE1822A Detector is observed to be failed high.
- RE1822B is indicating normal.

(1) What, if any, is the effect on the release, of this failed detector?
(2) What actions, if any, are required to continue the release?

A. (1) Release still in progress due to the redundant instrument operating correctly.
(2) Continue with the release. No additional action necessary, only one detector is required.

B. (1) Release still in progress due to the redundant instrument operating correctly.
(2) The release can continue after at least two independent samples of the tank's content are analyzed and at least two independent verifications of the release rate calculations and discharge valve lineups are performed per the Offsite-Dose Calculation Manual.

C. (1) The release is terminated by the failed detector.
(2) Disable the failed detector and restart the release. No additional action necessary, only one detector is required.

D. (1) The release is terminated by the failed detector.
(2) Disable the failed detector. The release can continue after at least two independent samples of the tank's content are analyzed and at least two independent verifications of the release rate calculations and discharge valve lineups are performed per the Offsite-Dose Calculation Manual.

Part (1) of the question requires the candidate to determine what, if any, is the effect on the release, of the failed detector. The two effects provided as options are “Release still in progress due to the redundant instrument operating correctly” or “The release is terminated by the failed detector.”

Per Operational Schematics OS-030 SH 2, Control Logic #1: WG1819, Waste Gas to Station Vent Isolation 1, and WG1820, Waste Gas to Station Vent Isolation 2, will both close when the radioactivity upstream from the valves exceeds the high level setpoint as sensed by RE1822A, Waste Gas System Discharge to Station Vent Radiation Element.

In the stem of the question, the RE1822A Detector is observed to be failed high, which will result in the release being terminated due to the automatic closing of WG1819 and WG1820. Therefore the correct answer to Part (1) of the question is “The release is terminated by the failed detector.” Answers A and B are incorrect due to stating that “Release still in progress due to the redundant instrument operating correctly.”

Part (2) of the question requires the candidate to determine what actions, if any, are required to continue the release.

Answer C, Part (2) is partially correct, but contains incorrect information. “Disable the failed detector and restart the release” is correct in that only one detector is required per Offsite Dose Calculation Manual (ODCM) Table 3-1. However, “No additional action necessary, only one detector is required” makes Part (2) of answer C incorrect. DB-OP-03012, Radioactive Gaseous Batch Release, is the governing procedure for Gaseous releases.

If the event described in the stem of the question were to occur, several additional actions would be required including:

- Disabling the failed detector in accordance with DB-OP-06412, Process and Area Radiation Monitor.
- Bypassing the failed detector as required by DB-OP-03012, Radioactive Gaseous Batch Release, step 4.3.5.
- Documenting the stop time of the release in the Unit Logs as required by DB-OP-03012, Radioactive Gaseous Batch Release.
- Writing a Condition Report and Submitting a Maintenance Notification.

Answer D, Part (2) is not correct for the event described in the stem of the question. The stem of the question indicates that RE1822A is failed high, which renders RE1822A Nonfunctional. The stem of the question states RE1822B is indicating normal, so RE1822B remains Functional.

The answer provided in D for Part (2) states the required actions per the Offsite Dose Calculation Manual Table 3-1 if no required channels are Functional (both RE1822A and RE1822B Nonfunctional).

Conclusion:

The event described in the stem of the question results in a termination of the Gaseous Release due to RE1822A Detector failing high and isolating the release by automatically closing WG1819 and WG1820. The information provided in the stem of the question indicates that RE1822A is Nonfunctional due to failing high and RE1822B is Functional due to indicating normal. Answers A and B are incorrect due to incorrectly stating that the release will still be in progress following RE1822A failing high. Answer C is incorrect due to stating that no additional action is necessary to continue the release, when multiple additional actions will be required to complete the release. Answer D is incorrect due to providing the required actions per the Offsite Dose Calculation Manual to perform a Gaseous Release with both RE1822A and RE1822B Nonfunctional.

Question #89 does not clarify if the knowledge topic being tested is the ODCM requirements or plant operating procedure requirements. If the stem of the question had asked, “in accordance with the ODCM, what actions are required,” then C would be a correct answer. Due to Part (2) of the question being nonspecific and additional actions are required to continue the release, C is not a correct answer. The facility recommends that no answer to Question #89 is correct and the question is to be removed from the exam.

**NRC EVALUATION OF COMMENT**

The facility asserts that answer choice C is only partially correct; that additional actions would be required by the facility's procedures and policies; and therefore the statement, "No additional action necessary," is an incomplete statement that was confusing and misleading; resulting in 3 of 4 applicants selecting a different, albeit incorrect, answer.

As stated in the facility's evaluation, answer choices A and B are incorrect because the condition described in part (1) is incorrect. The facility reaffirmed that the condition (termination of the release) identified in Part (1) of answer choices C and D is correct. Both WG1819, Waste Gas to Station Vent Isolation 1, and WG1820, Waste Gas to Station Vent Isolation 2, will close when the radioactivity upstream from the valves exceeds the high level setpoint as sensed by either Waste Gas System Discharge to Station Vent Radiation Element RE1822A or RE1822B. Closure of either WG1819 or WG1820 will isolate the release flow path.

The facility's evaluation also confirmed that the ODCM specified action in part (2) of answer choices B and D is incorrect since it is only applicable if both Waste Gas System Discharge to Station Vent process radiation monitors are inoperable or not in service. Therefore, there was no contention that answer choices A, B, and D are incorrect responses to the question.

The only contention is then, whether or not the statement – "No additional action necessary," – in the second sentence in part (2) of answer choices A and C, by itself invalidates choice C as a correct response.

If the statement "No additional action necessary," is looked at in the context of the entire part (2) response, including the entire second sentence, "No additional action necessary, only one detector is required," an assumption could be made that, while not specifically stated, part (2) examines whether or not there are ODCM required actions that must be completed to allow the release to continue, and not whether there are other administrative or procedurally specific requirements. However, since question (2) of the stem does specifically restrict the response to actions required by the ODCM, an equally valid assumption would be that the question also exams whether there are other procedural actions that must be completed in order to complete the release.

The facility response asserts that the first sentence in part (2) of answer choice C over-simplifies the actions needed to restart the release and provided several examples of additional actions that would be necessary. The NRC staff conducted a detailed review of the alarm response procedures for the alarms listed in the stem of the question and the procedures referenced in the facility response to validate the facility's assertion.

Three of the additional actions identified by the facility (documenting the start and stop times of the release, initiating a Condition Report, and submitting a Maintenance Notification), while procedurally required, are administrative in nature, and do not require physical manipulation of systems/components to continue the release.

With respect to the physical manipulations of the systems/components needed to continue the release, the following information was obtained from the procedure review.

> The Alarm Response Procedure DB-OP-02007 for Alarm Tile 7-1-C, "WST GAS SYS OUT RAD HI" directs the operator to: 1) verify that Waste Gas to Station Vent Isolation Valves WG1819 and WG1820 are closed; and 2) refer to DB-OP-03012, Radioactive Gaseous Batch Release.
>
> DB-OP-03012, "Radioactive Gaseous Batch Release" Section 4.3, "Performing a Waste Gas Decay Tank (WGDT) Release," contains the procedural direction for performing a release from the WGDT. After the release is started, there are five continuous action steps that are applicable while the release is in progress (Steps 4.3.23 through 4.3.27). Step 4.3.25 specifies the actions to be taken in response to a "WARN" or "HIGH" radiation alarm RE1822A or RE1822B, and echoes the action specified in the alarm response procedure to verify that WG1819 and WG1820 are closed, and also gives direction to notification the Shift Manager. There is no specific procedural direction on how to proceed from this point if the release is automatically terminated by a high rad condition. All subsequent steps within Section 4.3 (specifically steps 4.3.28 – 4.3.35) assume that the release has not been automatically terminated. The path going forward would have to be determined by the SRO in charge. The actions to restart the release would not be straight forward. Not only would the failed monitor have to be bypassed, the SRO would also have to determine what actions would be required to restore the system to a configuration where the release could be reinitiated.
>
> DB-OP-06412, "Process and Area Radiation Monitor," contains procedural guidance for placing and removing process radiation monitors RE1822A and RE1822B in and out of operation (specifically sections 3.10 and 3.32), but there are no specific steps detailing the actions necessary to disable a failed monitor. The words "disable" or "disabling" are not found anywhere within the procedure; therefore, additional guidance would have to be sought to determine the action(s) necessary to disable the detector.

Based on the information obtained from the detailed review of procedures referenced in the facility's response, the NRC: a) finds that question (2) of the stem is not specific enough to restrict the response to only those actions specified by the ODCM; and b) agrees that part (2) of answer choice C is incomplete and that there are several additional actions that would be required in order to reinitiate the release. Therefore there is no correct answer to question 89, and the question will be deleted from the examination.

## SIMULATION FACILITY FIDELITY REPORT

Facility Licensee: Davis-Besse Nuclear Power Station

Facility Docket No: 50-346

Operating Tests Administered: June 15 – 18, 2015

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 |
|---|---|
| NONE | |

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

***/RA Raymond Keith Walton Acting for/***

H. Peterson, Chief
Operations Branch
Division of Reactor Safety

Docket No. 50-346
License No. NPF-3

Enclosure:
Operator Licensing Examination Report (ER)
05000346/2015301 w/Attachments:
1. Supplemental Information
2. Post-Examination Comments and Resolution
3. Simulation Facility Fidelity Report

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