



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

August 11, 2016

David A. Heacock
Virginia Electric & Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

**SUBJECT: NORTH ANNA POWER STATION – NRC OPERATOR LICENSE
EXAMINATION REPORT 05000338/2016301, 05000339/2016301**

Dear Mr. Heacock:

During the period June 21-28, 2016, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the North Anna Power Station. At the conclusion of the tests, the examiners discussed preliminary findings related to the operating tests and the written examination submittal with those members of your staff identified in the enclosed report. The written examination was administered by your staff on July 7, 2016.

All applicants passed both the operating test and written examination. There were three post-administration comments concerning the operating test. These comments, and the NRC resolution of these comments, are summarized in Enclosure 2. A Simulator Fidelity Report is included in this report as Enclosure 3.

The initial examination submittal was within the range of acceptability expected for a proposed examination. All examination changes agreed upon between the NRC and your staff were made according to NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10.

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 (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm.adams.html> (the Public Electronic Reading Room).

If you have any questions concerning this letter, please contact me at (404) 997-4662.

Sincerely,

/RA/

Eugene F. Guthrie, Chief
Operations Branch 2
Division of Reactor Safety

Docket Nos: 50-338, 50-339

License Nos: NPF-4, NPF-7

Enclosures: 1. Report Details
2. Facility Comments and NRC Resolution
3. Simulator Fidelity Report

cc: Distribution via Listserv

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 FORM 665 ATTACHED

OFFICE	RII:DRS	RII:DRS	TTC	RII:DRS			
SIGNATURE	BLC2	NTL2 VIA EMAIL	GWC VIA EMAIL	EFG			
NAME	CABALLERO	LACY	CALLAWAY	GUTHRIE			
DATE	8/11 /2016	8/11/2016	8/11/2016	8/11/2016	8/ /2016	8/ /2016	8/ /2016
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\OLEXAMS\NORTH ANNA EXAMINATIONS\INITIAL EXAM 2016-301 (BRUNO)\CORRESPONDENCE\NORTH ANNA 2016-301 EXAM REPORT FINAL.DOCX

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-338, 50-339

License No.: NPF-4, NPF-7

Report No.: 05000338/2016301, 05000339/2016301

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: North Anna Power Station, Units 1 & 2

Location: Mineral, VA 23117

Dates: Operating Test – June 21-28, 2016
Written Examination – July 7, 2016

Examiners: Bruno Caballero, Chief Examiner, Senior Operations Engineer
Gary Callaway, Senior Reactor Technology Instructor
Newton Lacy, Operations Engineer

Approved by: Eugene F. Guthrie, Chief
Operations Branch 2
Division of Reactor Safety

SUMMARY

ER 05000338/2016301, 05000339/2016301; operating test June 21-28, 2016 & written exam July 7, 2016; North Anna Power Station; Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 10, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." This examination implemented the operator licensing requirements identified in 10 CFR §55.41, §55.43, and §55.45, as applicable.

Members of the North Anna Power Station staff developed both the operating tests and the written examination. The initial operating test, written RO examination, and written SRO examination submittals met the quality guidelines contained in NUREG-1021.

The NRC administered the operating tests during the period June 21-28, 2016. Members of the North Anna Power Station training staff administered the written examination on July 7, 2016. All Reactor Operator (RO) and Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. All applicants were issued licenses commensurate with the level of examination administered.

There were three post-examination comments.

No findings were identified.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Operator Licensing Examinations

a. Inspection Scope

The NRC evaluated the submitted operating test by combining the scenario events and JPMs in order to determine the percentage of submitted test items that required replacement or significant modification. The NRC also evaluated the submitted written examination questions (RO and SRO questions considered separately) in order to determine the percentage of submitted questions that required replacement or significant modification, or that clearly did not conform with the intent of the approved knowledge and ability (K/A) statement. Any questions that were deleted during the grading process, or for which the answer key had to be changed, were also included in the count of unacceptable questions. The percentage of submitted test items that were unacceptable was compared to the acceptance criteria of NUREG-1021, "Operator Licensing Standards for Power Reactors."

The NRC reviewed the licensee's examination security measures while preparing and administering the examinations in order to ensure compliance with 10 CFR §55.49, "Integrity of examinations and tests."

The NRC administered the operating tests during the period June 21-28, 2016. The NRC examiners evaluated three Reactor Operator (RO) and nine Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. Members of the North Anna Power Station training staff administered the written examination on July 7, 2016. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the North Anna Power Station, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

The NRC evaluated the performance or fidelity of the simulation facility during the preparation and conduct of the operating tests.

b. Findings

No findings were identified.

The NRC developed the written examination sample plan outline. Members of North Anna Power Station training staff developed both the operating tests and the written examination. All examination material was developed in accordance with the guidelines contained in Revision 10, of NUREG-1021. The NRC examination team reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made per NUREG-1021 and incorporated into the final version of the examination materials.

The NRC determined, using NUREG-1021, that the licensee's initial examination submittal was within the range of acceptability expected for a proposed examination.

All applicants passed both the operating test and written examination. Three RO applicants and eight SRO applicants were issued licenses. Issuance of the license for one SRO applicant has been delayed pending receipt of additional information. Details concerning the need for additional information has have been sent to the individual applicant and the facility licensee.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation of weaknesses and determination of appropriate remedial training.

The licensee submitted three post-examination comments concerning the operating test. A copy of the final written examination and answer key, with all changes incorporated, and the licensee's post-examination comments may be accessed not earlier than August 1, 2018, in the ADAMS system (ADAMS Accession Numbers ML 16214A301, ML 16214A302, and ML 16214A304).

40A6 Meetings, Including Exit

Exit Meeting Summary

On June 28, 2016 the NRC examination team discussed generic issues associated with the operating test with Jerry Bischof, Site Vice President, and members of North Anna Power Station staff. The examiners asked the licensee if any of the examination material was proprietary. No proprietary information was identified.

KEY POINTS OF CONTACT

Licensee personnel

Jerry Bischof, Site Vice President
 Fred Mladen, Plant Manager
 Brian Scott, Acting Operations Manager
 Jim Schleser, Acting Director Safety & Licensing
 Don Taylor, Manager Nuclear Oversight
 Billy Standley, Training Manager
 Bryan Thompson, Operations Training Supervisor
 Jack Pfeiffer, Supervisor Shift Operations
 Randall Garrett, Exam Author
 John Kernisky, Instructor
 Ben Chang, Instructor

NRC personnel

Phil McKenna, Surry Senior Resident Inspector

FACILITY POST-EXAMINATION COMMENTS AND NRC RESOLUTIONS

A complete text of the licensee's post-examination comments may be accessed not earlier than August 1, 2018, in ADAMS under Accession Number ML16214A301. The licensee's post-examination comments were associated with the following three items.

ITEM #1: Scenario 4, Event 5, Letdown leak, isolable from control room

Post-Examination Comment

The licensee contended that the Form ES-D-2, Required Operator Actions, for Scenario 4 contained an error because Required Action "A" for Tech Spec 3.6.1, Containment, was listed for Event 5 on page 14. The licensee contended that Tech Spec 3.6.1, Required Action "A" was not required when the letdown pipe leak was isolated using the inboard containment isolation valve. The licensee contended that the only Tech Spec required actions for Event 5 were Tech Spec 3.4.13, RCS Operational Leakage, Required Action A (during the time the leak was occurring) and Tech Spec 3.6.3, Containment Isolation Valves, Required Action A.

NRC Resolution

The licensee's recommendation was accepted.

The symptoms of the letdown pipe leak were lowering letdown flow, lowering VCT level, and rising Auxiliary Building sump level. The crew was expected to enter 1-AP-16, Increasing Plant Leakage, and isolate letdown, in part, by closing 1-CH-HCV-1200B, Outboard Containment Isolation Valve. After the auxiliary operator dispatched to locally investigate the leak, the scripted cue from the auxiliary operator was "the leak was upstream of 1-CH-TV-1200B, between the containment wall and 1-CH-TV-1200B." The senior reactor operator (SRO) was then expected to isolate 1-CH-TV-1200A, Inboard Containment Isolation Valve, within 4 hours in accordance with Tech Spec 3.6.3, Required Action A.

Once the crew closed the inboard isolation valve (1-CH-TV-1200A) in accordance with Tech Spec 3.6.3, Required Action A, the containment remained operable; entry to Tech Spec 3.6.1, Containment, was not required. The licensee's post exam comment stated that this determination was the position of the Supervisor of Nuclear Shift Operations and was concurred by the site licensing department. Therefore, the only Tech Spec required actions for Event 5 were Tech Spec 3.4.13, RCS Operational Leakage, Required Action A (during the time the leak was occurring) and Tech Spec 3.6.3, Containment Isolation Valves, Required Action A.

ITEM #2: Radiation Control Administrative JPM A.3, Select appropriate Radiation Work Permit (RWP) and calculate stay time.

Post-Examination Comment

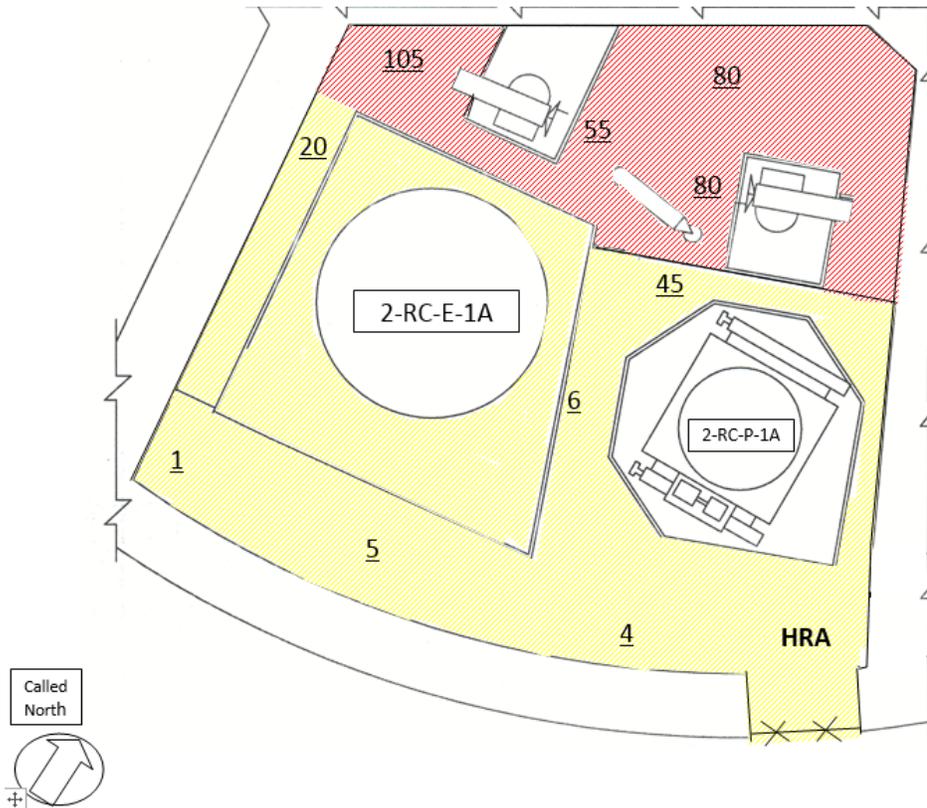
The licensee contended that RWP Task 1 or Task 2 were both acceptable for manually closing the "A" Cold Leg Loop Stop Valve. Specifically, the licensee contended that Task 1 was also acceptable because RP-AA-274, Radiation Work Permits, Step 5.16.5.d included an allowance for health physics (HP) supervisors to change the electronic dosimeter dose rate alarm, if necessary. The licensee contended that the JPM should be revised to allow either RWP Task 1

or Task 2 to be selected, and the corresponding stay times (80% of RWP dose allotment) must be 6 minutes and 12 minutes, respectively.

NRC Resolution

The licensee's recommendation was accepted.

The following survey map of the Unit 2 Containment, 262' elevation "A" RCP Motor Cube was provided to the applicants with a copy of RWP # 16-2229, which contained two RWP tasks.



The applicants were expected to:

1. Identify the location of the "A" Cold Leg Loop Stop Valve hand wheel on the survey map
2. Select ONE of the tasks listed on RWP# 16-2229 to perform the work
3. Calculate the maximum stay time, based on the selected RWP task's dose alarm set point and Worker Instruction #4 which stated:

"When 80% of the dose alarm set point is reached, leave work area in a safe condition and exit the RCA"

On the survey map, the "A" Cold Leg Loop Stop Valve hand wheel was the valve located closest to the reactor coolant pump, 2-RC-P-1A, and the dose rate at the hand wheel was 80 mr/hr.

RWP # 16-2229, included a Summary page that identified the following two RWP Tasks, including the associated values for the electronic dosimeter cumulative and dose rate alarm set points:

- Task 1, "Dose rates < 100 mr/hr" (Dose Alarm 10 mr, Dose Rate Alarm 50 mr/hr)
- Task 2, "Dose rates > 100 mr/hr" (Dose Alarm 20 mr, Dose Rate Alarm at 150 mr/hr)

Five of the twelve applicants chose Task 1. However, the JPM answer key indicated that Task 2 was the correct task because the electronic dosimeter dose rate alarm for Task 1 was only 50 mr/hr, which meant that the electronic dosimeter would continuously alarm at the "A" Cold Leg Loop Stop Valve hand wheel location if Task 1 was selected.

After the JPM was administered, the examiners asked follow up questions to identify why the applicants picked Task 1 instead of Task 2. The applicants stated that the name of Task 1 was "Dose rates < 100 mr/hr", which was consistent with the 80 mr/hr dose rate at the valve hand wheel, and showed the examiners the following NOTE in the Worker Instructions section of Task 1:

WORKER INSTRUCTIONS:

NOTE: ED dose rate alarm set-points are set conservatively at a low, yet feasible value for ALARA purposes. It is expected that some ED dose rate alarms may be received when dose rate alarm set-points are set below 100 mR/hr.

1.0) ED Alarms:

1.1) If ED dose rate alarm occurs, reposition yourself such that the alarm clears.

1.1.1) If ED dose rate alarm continues or three consecutive dose rate alarms occur, then leave area immediately and report to the HP Office.

1.2) If ED dose alarm occurs, then leave area immediately and report to the HP Office.

The applicants told the examiners that, although the Task 1 electronic dose rate alarm set point (50 mr/hr) was less than the dose rate at the "A" Cold Leg Loop Stop Valve hand wheel (80 mr/hr), the NOTE in the worker instructions for Task 1 indicated that the electronic dosimeter dose rate alarm was an expected alarm, and said that if the electronic dosimeter continuously alarmed, then the worker was required to exit the area and request health physics personnel to adjust the electronic dose rate alarm set point to a higher value. RP-AA-274, Radiation Work Permits, Attachment 5, Briefing Attendance Roster, included a column labeled "Revised ED Alarm Set point", and stated that electronic dosimeter alarms can be revised from default settings only if the RWP task is controlled by entering Plan ID numbers in the HIS-20 and authorized by HP Supervision.

On the other hand, the entrance to the Unit 2 Containment, 262' elevation "A" RCP Motor Cube was a High Radiation Area, as indicated on the survey map with the "HRA" designator at the doorway. High Radiation Areas are defined as areas with > 100 mr/hr dose rates, and one of the motor cube areas' dose rate was 105 mr/hr, which was consistent only with RWP Task 2. However, RWP Task 1 also indicated that maximum posted area that could be entered was a Locked High Radiation Area, which also seemed to conflict with the title of Task 1 "Dose rates less than 100 mr/hr." Further discussion with the licensee's health physic staff indicated that entry to a Locked High Radiation Area, as stated in RWP 16-2229, Task #1, was permissible, and the reason this was permissible was because the lower electronic dosimeter set points associated with Task 1 were used as an ALARA tool at North Anna, even if a Locked High Radiation Area was entered, since not all locations within the Locked High Radiation Area were 1000 mr/hr. Therefore, this same logic applied even though the survey map had the "HRA" designator at the motor cube doorway and one of the areas' dose rate was 105 mr/hr.

Because the title of Task 1 was “Dose rates < 100 mr/hr”, the applicants were placed into a confusing situation during the administration of the JPM because the dose rate near the valve hand wheel was 80 mr/hr, which aligned with the title of Task 1, but the electronic dosimeter rate alarm set point was only 50 mr/hr. The Task 1 Work Instruction NOTE caused further confusion because it implied that some electronic dosimeter rate alarms were expected alarms when set points were conservative. Furthermore, RWP Task 1 indicated that maximum posted area that could be entered was a locked high radiation area, which also conflicted with the title of Task 1 “Dose rates less than 100 mr/hr.” Based on these items, the licensee’s recommendation to revise the JPM answer key to accept either Task 1 or Task 2 was accepted.

Regardless of whether Task 1 or Task 2 was selected, the discriminatory value of the remaining portion of the JPM remained acceptable because the applicants were still required to:

- identify the location of the “A” Cold Leg Loop Stop Valve on the survey map, and
- calculate the maximum stay time based on the applicable electronic dosimeter cumulative dose set point in Task 1 or Task 2 and the RWP NOTE which required exiting the area when 80% of the cumulative dose alarm set point was reached.

Therefore, the revised answer key to allow either Task 1 or Task 2 did not invalidate the JPM because the discriminatory and operational validity of the remaining portion of the JPM was still acceptable for the administrative portion of the operating exam.

ITEM #3: Emergency Plan Administrative JPM A.4, Determine updated protective action recommendations (EPIP-1.06)

Post-Examination Comment

The licensee contended that including previously evacuated Sectors F, G, and H on EPIP-1.06, Protective Action Recommendations, Attachment 3, Report of Protective Action Recommendation (PAR) was not a critical step for the JPM.

The licensee contended that the reason why previously evacuated sectors F, G, and H were not critical was because the applicants were placed in an awkward position during the JPM since they were expected to assume the duties of the site emergency director (SED), for a complicated event where two PARS had already been issued, without first receiving a turnover and time to review what had already transpired within the body of the EPIP-1.06 procedure. The licensee also contended that EPIP-1.06 could be enhanced.

NRC Resolution

The licensee’s recommendation was not accepted.

The applicant was presented with an “in-use” copy of EPIP-1.06, Protective Action Recommendations, which was used by the SED, including TWO PARS which were previously issued:

PAR #1: Issued at 13:42, after a general emergency (SG-1.1) was declared due to a station blackout; evacuate 0-2 mile radius, 2-5 miles downwind in sectors F, G, H

PAR #2: Issued at 14:12, after Unit 1's condition changed to loss of any two barriers AND loss or potential loss of third barrier (FG-1.1); evacuate 2 mile radius, 10 miles downwind in sectors F, G, H

The initial conditions on the JPM cue sheet included meteorological data at 14:45 (wind speed 25 mph, wind direction 280°), which was indicative of a wind shift that occurred after PAR #2 was issued.

The initiating cue for the JPM was "You are requested to perform EPIP-1.06, beginning at Step 11." Step 11 was:

11 CHECK EMERGENCY - TERMINATED RETURN TO Step 7.

The applicant was expected to return to Step 7, which was previously check marked by the prior SED for PAR #2 as indicated below:

7 CHECK THE FOLLOWING:

	IF:	THEN do the following:
<input checked="" type="checkbox"/>	Severe Accident Conditions: <ul style="list-style-type: none"> • CSFST Core Cooling RED <p style="text-align: center;"><u>AND</u></p> <ul style="list-style-type: none"> • Any Containment Loss Fission Product Barrier threshold met 	GO TO Step 8
<input type="checkbox"/>	Revised PAR provided by RAD/RAC IAW EPIP-4.07, PROTECTIVE MEASURES	GO TO Step 13
<input type="checkbox"/>	Average wind direction shifts to any new area(s) (refer to ATTACHMENT 2, AFFECTED SECTOR(S) MAP)	GO TO Step 17
<input type="checkbox"/>	PAR in effect - CONDITIONS UNCHANGED	GO TO Step 20

The applicant was expected to identify the wind shift change and go to Step 17, which stated, in part:

17. UPDATE ATTACHMENT 2, AFFECTED SECTOR(S) MAP: (Continued)

f) Mark new area(s) affected on map (use distinguishable markings from previous markings):

- Include all downwind sectors from previous PARs for this event

AND

- All new downwind sectors for the PAR

AND

- Any downwind sectors through which the wind shift occurred

The first “block” in Step 17.f required including all downwind sectors from previous PARs on the Sector Map.

The applicant was then expected to then initiate PAR #3 by completing Attachment 3, Report of PAR, within 15 minutes (time critical step), that included all previous downwind sectors and all new downwind sectors, in accordance with Step 18, which stated:

___ 18 COMPLETE PROTECTIVE ACTION RECOMMENDATION:

a) Complete ATTACHMENT 3, REPORT OF PROTECTIVE ACTION RECOMMENDATION

- 1) Mark appropriate PAR box(s)
- 2) Record Mile radius and Miles downwind
- 3) Record Downwind Sectors
- 4) Record Potassium Iodide (optional)
- 5) Record Remarks (optional)
- 6) Approve PAR (sign report)
- 7) Record date and time report approved

Specifically, the applicant was expected to identify “Evacuate 2 mile radius, 10 miles downwind in sectors D, E, F, G, H” (critical step) on Attachment 3. Seven of the 9 SRO applicants did not include previously evacuated Sectors F, G, and H on Attachment 3; they only included Sectors D and E.

The following NOTE was included prior to Step 17:

NOTE: A new PAR is only issued for wind shifts, based on the conditions below, in new affected sectors that have NOT been included in a previous PAR.

The intent of the NOTE was to ensure that the new sectors associated with a wind shift were marked in a distinguishing manner on the Sector Map, such that the new sectors could be

readily identified from previous sectors already marked on the Sector Map. After the exam was administered, the licensee initiated corrective action report (CR) # 1041252 to enhance the wording in EPIP-1.06.

Consistent with Regulatory Issue Summary 2003-12, Clarification of NRC Guidance for Modifying Protective Actions, the regulatory position is that licensees develop and communicate an updated PAR that takes into account previous PARs. By not including previously evacuated sectors on the updated PAR, the SED could create a situation that decreased the effectiveness of the PAR due to the confusion it could have created. Offsite officials would have had to rescind the Emergency Alert System (EAS) message and issue a new EAS message that conflicted with the previous message. Redirecting traffic flow and emergency resources once evacuation had been initiated would have been difficult. Such changes could lead to a lack of confidence in protective action decisions issued by the offsite officials and hamper the orderly implementation of protective actions. Therefore, the licensee's recommendation was not accepted.

SIMULATOR FIDELITY REPORT

Facility Licensee: North Anna Power Station

Facility Docket No.: 50-338, 50-339

Operating Test Administered: June 21-28, 2016

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and, without further verification and review in accordance with Inspection Procedure 71111.11 are not indicative of noncompliance with 10 CFR 55.46. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating test, examiners observed the following:

<u>Item</u>	<u>Description</u>
1-CN-LI-100A	Condensate storage tank level indicator very dim, difficult to read. Problem is internal to the vacuum fluorescent diode tube. Item entered into North Anna's Simulator Modification Process as SWR # 201606211613.