

## PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY

U.S. Nuclear Regulatory Commission Individual Examination Report						
Applicant's Name: [REDACTED]				Docket Number: [REDACTED]		
I	R	Examination Type (Initial or Retake)		Facility Name: <b>Vogtle</b>		
X		Reactor Operator		Facility Description	X Hot	
		Senior Reactor Operator (SRO) Instant				Cold
		SRO Upgrade				BWR
		SRO Limited to Fuel Handling			X	PWR

Written Examination Summary					
NRC Author (Reviewer) <b>Daniel X. Bacon</b>			RO/SRO/Total Exam Points: <b>73 / N/A / 73</b>		
NRC Grader/Reviewer: <b>Phillip G. Capehart</b>			Applicant Points: <b>55 / NA / 55</b>		
Date Administered: <b>04/01/2011</b>			Applicant Grade (%): <b>75.34 / NA / 75.34</b>		
Operating Test Summary					
Administered by: <b>Michael K. Meeks</b>			Date Administered: <b>03/16 - 24/2011</b>		
Walk-Through (Overall)					S
Administrative Topics					S
Simulator Operating Test					S
Examiner Recommendations					
Check Blocks	Pass	Fail	Waive	Signature	Date
Written Examination		X		<i>Phillip G. Capehart</i> Phillip G. Capehart	05/02/2011
Operating Test	X			<i>Michael K. Meeks</i> Michael K. Meeks	05/02/2011
Final Recommendation		X		<i>Phillip G. Capehart</i> Phillip G. Capehart	05/02/2011
License Recommendation					
	Issue License	<i>Malcolm T. Widmann</i> Malcolm T. Widmann			Date
✓	Deny License				05/02/11

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Applicant Docket Number: [REDACTED]		
Walk-Through Grading Details	Evaluation (S or U)	Comment Page Number
<b>Administrative Topics</b>		
a. Critical Safety Function Status Tree Evaluation	U	4
b. AFD Monitoring (Administered by P. Capehart)	S	
c. Determine mode change requirements	S	
d. Stay time calculation for emergency exposure to protect valuable equipment	S	
e. NA		
<b>Systems - Control Room</b>		
a. Emergency Borate due to Rods below insertion limits (RIL) (Administered by P. Capehart)	S	5
b. Establish Safety Grade Letdown (Administered by J. Hopkins)	S	6
c. Depressurize RCS to Reduce Break Flow to Ruptured Steam Generator-Normal Pressurizer Spray Not Available	S	
d. Isolate a Faulted Steam Generator (Administered by J. Hopkins)	S	
e. Place Containment Hydrogen Monitors in service using 13130-1 (Administered by P. Capehart)	S	
f. DG Parallel Operation with voltage regulator failure (Administered by P. Capehart)	S	
g. Perform Power Range NI ACOT	S	
h. Place Containment Main Purge in Service (Administered by P. Capehart)	U	7
<b>Systems - In-Plant</b>		
i. Establish RWST Gravity Drain Through RHR Pumps	S	
j. Response to the Inability to Reset or Block SI (Administered by J. Hopkins)	S	
k. Locally Remove Diesel Generator From Service (Administered by J. Hopkins)	S	

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Applicant Docket Number: [REDACTED]					
Senior Reactor Operator Simulator Operating Test Grading Details					
Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.
1. Interpretation/Diagnosis					
a. Recognize & Verify Status	0.40	3	1.20		
b. Interpret & Diagnose Conditions	0.30	3	0.90	3.00	
c. Prioritize Response	0.30	3	0.90		
2. Procedures/Tech Specs					
a. Reference	0.30	3	0.90		
b. Procedure Compliance	0.40	1	0.40	2.20	8,9
c. Tech Spec Entry	0.30	3	0.90		
3. Control Board Operations					
a. Locate & Manipulate	0.40	2	0.80		10
b. Understanding	0.30	2	0.60	2.00	11
c. Manual Control	0.30	2	0.60		12
4. Communications					
a. Provide Information	0.34	3	1.02		
b. Receive Information	0.33	3	0.99	3.00	
c. Carry Out Instructions	0.33	3	0.99		

[Note: Enter RF Weights (nominal, adjusted, or "0" if not observed (N/O)), RF Scores (1, 2, 3, or N/O), and RF Grades from Form ES-303-4 and sum to obtain Competency Grades.]

## PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY

APPLICANT DOCKET NUMBER [REDACTED]

**CROSS REFERENCE:**

Administrative JPM "a"

**JPM/TASK:**

Monitor / Evaluate CSFSTs—Integrity

**EXPECTED ACTION/RESPONSE:**

Given a data sheet listing various plant parameters and data points, the applicant was expected to properly identify the status of all Critical Safety Function Status Trees (CSFSTs) in accordance with Vogtle procedure 19200-C, "F-0 CRITICAL SAFETY FUNCTION STATUS TREES." The applicant was expected to evaluate the F-0.1, SUBCRITICALITY, status tree as follows:

- (1) Power Range Greater than 5%? No – Power Range (PR) Nuclear Instruments (NIs) were given as 0% on all four channels;
- (2) Intermediate Range (IR) Start-Up-Rate (SUR) Positive? No – IR SUR were given as -0.1 Decades Per Minute (DPM) and -0.12 DPM;
- (3) Int. Range P-6 Present? Yes – IR NI readings were given as  $3.0 \times 10^{-4}\%$  and  $3.2 \times 10^{-4}\%$ , which are both above the nominal P-6 interlock setpoint of  $2.0 \times 10^{-5}\%$  as listed in Technical Specifications;
- (4) Int. Range SUR Greater Than -0.2 dpm? Yes – IR SUR were given as -0.1 DPM and -0.12 DPM.

This flow path directs the operator to transition to YELLOW Path procedure 19212-C, "FR-S.2 RESPONSE TO LOSS OF CORE SHUTDOWN." Correctly evaluating the SUBCRITICALITY status tree was a critical step in the JPM.

**APPLICANT ACTION/RESPONSE:**

The applicant answered the (3) Int. Range P-6 Present? decision block as "No," and ultimately declared that the SUBCRITICALITY critical safety function was "SAT" (Green).

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, and containment conditions (K/A G2.4.21). Specifically, the applicant did not correctly evaluate the SUBCRITICALITY critical safety function status tree. The applicant did not correctly perform a critical step of the JPM. Therefore, the applicant did not successfully complete the JPM.

**PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY****APPLICANT DOCKET NUMBER** [REDACTED]**CROSS REFERENCE:**

Simulator JPM "a"

**JPM/TASK:**

Emergency Borate due to rods below insertion limits (RIL)

**EXPECTED ACTION/RESPONSE:**

The applicant was directed to emergency borate the RCS using 13009-1 to clear the rod bank Lo-Lo Limit alarm. At step 4.9.3.2, the applicant was expected to realize that after attempting to open 1-LV-0112D that he should continue with the next bulleted step and open 1-LV-0012E. Since these valves are in parallel, the applicant was expected to realize at this point that a flow path is established from the RWST to the charging pump suction and continue with the remaining steps.

**APPLICANT ACTION/RESPONSE:**

The applicant failed to realize at step 4.9.3.2 that he should continue to the next bulleted step and attempt to open the other valve in parallel to the RWST. The applicant instead went to the next section (4.9.4). This section also required the same RWST suction valves to be opened. At this point, the applicant realized that he should go back to the previous section and attempt to open the other RWST suction valve (1-LV-0112E). The applicant successfully completed all of critical steps; therefore, the applicant was evaluated as satisfactory on this JPM.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant displayed a weakness in his ability to verify status and operation of a system and understand how his actions affected system conditions (K/A G2.2.44). Specifically, the applicant demonstrated a lack of knowledge of the flowpaths available from the RWST that establish emergency boration to the suction of the coolant charging pumps.

**PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY****APPLICANT DOCKET NUMBER** [REDACTED]**CROSS REFERENCE:**

Simulator JPM "b"

**JPM/TASK:**

Establish Safety Grade Letdown

**EXPECTED ACTION/RESPONSE:**

The applicant was expected to open reactor head vent to PRT flow control valves (HV-0442A and/or HV-0442B) as necessary to establish 40 gpm safety grade letdown flow using 19001-C, Step 10.a RNO. The applicant was expected to use flow indicator (FI) FI-406A and FI-407A to determine that flow was 40 gpm. The applicant was expected to know that the flow indicators were in series and would indicate the same amount of flow when HV-0442A or HV-0442B were open.

**APPLICANT ACTION/RESPONSE:**

The applicant initially opened flow control valves HV-0442A and HV-0442B and established 40 gpm flow as indicated on FI-406A and FI-407A. The applicant incorrectly stated that safety grade letdown flow was 40 gpm through each flow control valve. The applicant self-identified the error and the correctly stated that total safety grade letdown flow was 40 gpm because FI-406A and FI-407A were in series. Since the applicant successfully completed the critical step by establishing 40 gpm safety grade letdown flow, the applicant's performance was rated as satisfactory for this JPM.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant initially displayed a lack of ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions (K/A G2.2.44).

**PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY**  
**APPLICANT DOCKET NUMBER [REDACTED]**

**CROSS REFERENCE:**

Simulator JPM "h"

**JPM/TASK:**

Place Containment Main Purge in Service

**EXPECTED ACTION/RESPONSE:**

The applicant was directed to place the Containment Main (Preaccess) Purge in service using procedure 13125-1, Containment Purge System. At step 4.1.2.1, the applicant was informed to NOT start a Main Purge Supply Fan if the Containment Equipment Hatch is open. This information was provided as part of the initial conditions for the JPM. Based on this step, the applicant was expected to mark step 4.1.2.9 as NA and NOT start the Supply Fan (Critical Step).

**APPLICANT ACTION/RESPONSE:**

The operator failed to readdress step 4.1.2.1 and started the Main Purge Supply Fan at step 4.1.2.9. This created a critical step in the JPM that was not met by the applicant. The failure to perform this critical step resulted in the applicant receiving a grade of unsatisfactory on this JPM.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant displayed a lack of ability to interpret control room indications to verify the status and operation of a system, and understand how operator actions and directives affect plant and system conditions (Generic K/A 2.2.44). Specifically, the applicant did not take the necessary actions to ensure that equipment was in the position required by procedure 13125-1, Containment Purge System.

## PRIVACY ACT INFORMATION - FOR OFFICIAL USE ONLY

APPLICANT DOCKET NUMBER [REDACTED]

**CROSS REFERENCE:**

2. b. Procedures/Tech Specs – Procedure Compliance

**SCENARIO/EVENT:**

Scenario 4 / Event 6, 7, 8, 9 and 10: A Loss of All Auxiliary Feedwater (AFW) caused a RED path on HEAT SINK.

**EXPECTED ACTION/RESPONSE:**

In accordance with RNO step 11.a. of Vogtle procedure 19231-C, "FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK," the applicant was expected to re-start the turbine-driven AFW Pump (TDAFWP) using procedure 13610-1, "AUXILIARY FEEDWATER SYSTEM." Procedure 13610-1 specifies the following sequence in order to properly re-start the TDAFWP following an overspeed trip:

- 4.4.7.9 IF AFW Actuation signal is present, hold 1HS-5106A in the CLOSE position until completion of Step 4.4.7.10.
- 4.4.7.10 Place Handswitch 1HS-15111 (QMCB) in OPEN, THEN release.
- 4.4.7.11 WHEN the Trip and Throttle (T&T) Valve is fully open as indicated at MLB13-4.2 OR 1HS-15111 (QMCB), release 1HS-5106A IF applicable.

Holding 1HS-5106A in the CLOSE position allows the speed controller startup logic to reset when the T&T valve is electrically opened. When handswitch 1HS-15111 is placed in OPEN, the T&T valve latches and then opens; and steam admission valve 1-HV-5106 will open when 1HS-5106A is released if an open signal is present. An open signal (TDAFWP auto-start) will be present due to the low S/G levels on all S/Gs.

**APPLICANT ACTION/RESPONSE:**

During the first attempt to re-start the TDAFWP, the applicant, as Unit Operator (UO), initially held 1HS-5106A in the CLOSE position, but then released the 1HS-5106A switch to operate the 1HS-15111 handswitch. Because the speed controller startup logic was not correctly reset, the TDAFWP failed to re-start.

During post-scenario follow-up questions, the examiner asked the applicant why there had been a difficulty in re-starting the TDAFWP. The applicant stated: the first time I just didn't understand the notes that said to hold the switch over in CLOSE the whole time.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of ability to interpret and execute procedure steps (K/A 061G2.1.20), and a lack of ability to perform specific system and integrated plant procedures during all modes of plant operation (K/A 061G2.1.23), as related to the AFW system. The applicant made two non-critical errors associated with this rating factor, and was therefore evaluated with a score of "1" for this rating factor.



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**APPLICANT DOCKET NUMBER** [REDACTED]**CROSS REFERENCE:**

2. b. Procedures/Tech Specs – Procedure Compliance

**SCENARIO/EVENT:**

Scenario 1 / Event 5: Return normal charging and letdown to service.

**EXPECTED ACTION/RESPONSE:**

Step 4.4.13.1 of Vogtle procedure 13006-1, "CHEMICAL AND VOLUME CONTROL SYSTEM," reads as follows: "PRIOR to starting the pump and based on the conditions described in the first caution above, a slight boration should be anticipated and a briefing on compensatory actions to offset the boration should be conducted." In accordance with this step, the applicant, as Unit Operator (UO) performing the procedure, was expected to notify the Shift Supervisor (SS) of the requirement to conduct a brief.

**APPLICANT ACTION/RESPONSE:**

The applicant read the step silently, then signed it off as complete. The applicant did not notify the SS of the procedure step, and the operations team did not conduct a brief on compensatory actions to offset the boration, as specified in the procedure.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of ability to interpret and execute procedure steps, as related to the CVCS system (K/A 004G2.1.20). The applicant made two non-critical errors associated with this rating factor, and was therefore evaluated with a score of "1" for this rating factor.

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APPLICANT DOCKET NUMBER [REDACTED]

**CROSS REFERENCE:**

3. a. Control Board Operations – Locate &amp; Manipulate

**SCENARIO/EVENT:**

Scenario 4 / Event 6, 7, 8: During power ascension, turbine-driven Main Feedwater Pump (MFPT) Train A developed a sheared shaft, resulting in a loss of all Feedwater (FW). The Reactor failed to automatically trip, and did not manually trip, which caused an Anticipated Transient Without Trip (ATWT) condition.

**EXPECTED ACTION/RESPONSE:**

Step 5 RNO of Vogtle procedure 19211-C, "FR-S.1 RESPONSE TO NUCLEAR POWER GENERATION/ATWT," directs the operators to manually initiate a Containment Ventilation Isolation (CVI) by closing 20 valves given in a bulleted list. The applicant was expected to locate and operate all 20 valves to ensure a complete CVI occurred.

**APPLICANT ACTION/RESPONSE:**

When the applicant, as Unit Operator (UO), was directed by the Shift Supervisor (SS) to perform step 5 of 19211-C, the applicant was unable to locate and close valves 1-HV-12596, RECYCLE HOLD-UP TK-1 ISO VENT VALVE TRAIN A, and 1-HV-12597, RECYCLE HOLD-UP TK-1 ISO VENT VALVE TRAIN B. The handswitches to operate these valves were located on a back panel in the control room, and were labeled with "CVI" stickers as an operator aid.

During post-exam follow-up questioning, the applicant was able to locate the correct switches, and stated: I just couldn't find them [during the scenario run-time].

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of ability to locate control room switches, controls, and indications, as associated with the CVI system following an ATWT (K/A 029EG2.1.31). The applicant made one non-critical error associated with this rating factor, and was therefore evaluated with a score of "2" for this rating factor.

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APPLICANT DOCKET NUMBER [REDACTED]

**CROSS REFERENCE:**

3. b. Control Board Operations – Understanding

**SCENARIO/EVENT:**

Scenario 4 / Event 2: Reactor power ascension from 33% RTP to 100% RTP.

**EXPECTED ACTION/RESPONSE:**

The applicant, as Unit Operator (UO), was expected to correctly operate the main turbine generator in order to raise load.

**APPLICANT ACTION/RESPONSE:**

The applicant, as UO, was directed by the Shift Supervisor (SS) to increase turbine load by 10 MWe. The applicant attempted to raise turbine load using the load limit potentiometer; however, load did not change, because the load limit setpoint was set to 33% (i.e., actual load at the time). The applicant appeared confused by the turbine response, and the SS and operator-at-the-controls (OATC) needed to intervene to direct the applicant to raise the load limit setpoint above current load, in order to successfully raise load using the load limit potentiometer.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of ability to operate the turbine controls (K/A 045G2.1.30). The applicant made one non-critical error associated with this rating factor, and was therefore evaluated with a score of "2" for this rating factor.

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APPLICANT DOCKET NUMBER [REDACTED]

**CROSS REFERENCE:**

3. c. Control Board Operations – Manual Control

**SCENARIO/EVENT:**

Scenario 1 / Event 2: Steam Generator (S/G) loop 1 controlling pressure channel PT-514 failed high.

**EXPECTED ACTION/RESPONSE:**

The applicant, as Unit Operator (UO), was expected to correctly operate the main feedwater pump (MFP) speed controller in manual, and the #1 Feedwater Regulating Valve (FRV) in manual, in order to maintain S/G levels in the normal band of 60-70% narrow range. These were immediate operator actions from Vogtle AOP 18001-C, "SYSTEMS INSTRUMENTATION MALFUNCTION," section F, "FAILURE OF STEAM GENERATOR PRESSURE INSTRUMENTATION."

**APPLICANT ACTION/RESPONSE:**

The applicant, as UO, placed the MFP speed controller in manual, and also placed the #1 FRV in manual. With controls in manual, the applicant allowed all S/G levels to lower below the nominal 65% level setpoint, and continue to trend downwards. Later, at the direction of the Shift Supervisor (SS), the applicant restored MFP speed control to automatic and then returned #1 FRV to automatic. However, the S/G levels for #1 S/G and the other S/Gs were diverging, and the #1 S/G level began to rapidly drop. The alarm for STM GEN 1 HI/LO LVL DEVIATION came in, and the applicant was required to place the #1 FRV back in manual to mitigate the transient.

During post-scenario follow-up questioning, the examiner asked, why did you need to put the #1 FRV back in manual? The applicant stated: I don't think levels were matched when we took it back to auto.

**LACK OF ABILITY/KNOWLEDGE:**

The applicant demonstrated a lack of ability to operate the MFP speed controls and #1 FRV in manual (K/A 035A4.01). The applicant made one non-critical error associated with this rating factor, and was therefore evaluated with a score of "2" for this rating factor.

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