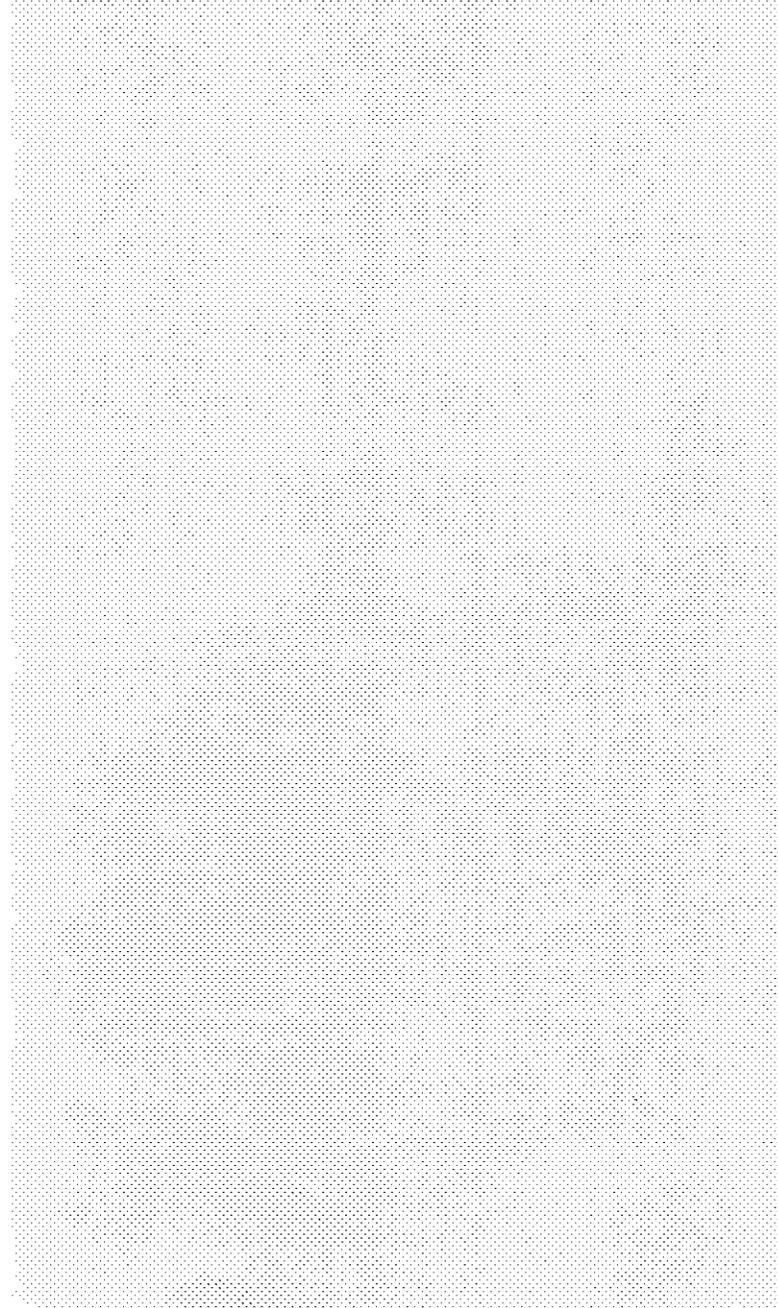# Final Submittal

OCONEE JUNE 2005 EXAM
50-269, 270, & 287/2005-301

JUNE 20 - 24, 2005
JUNE 30, 2005 (WRITTEN)

1.   As Given Simulator Scenario Operator Actions ES-D-2

| Facility: **Oconee** | Scenario No.: **1 fnl r1** | | Op-Test No.: **1** |

Examiners: _____   Operators: _____

_____   _____

_____   _____

Initial Conditions:
- 100% Reactor Power (Snap 203)

Turnover:
- SASS in MANUAL for I&E troubleshooting
- AMSAC/DSS bypassed
- After turnover, the crew should place 1A Main FDW Pump on Handjack

Event No.	Malf. No.	Event Type*	Event Description
0a	Pre-Insert		SASS in manual
0b	Pre-Insert		AMSAC/DSS bypassed
1		N, BOP, SRO	Place 1A Main FDW Pump on Handjack
2	MPI150	I, BOP, SRO	PZR "A" RTD Fails LOW (TS)
3	MPS450 (33-72%)	C, BOP, SRO	1B1 RCP High Vibration (ramp over 15 minutes)
4	MCS004	I, OATC, SRO	Controlling Tave fails HIGH
5	MPS020, 2	C, ALL	1B SG tube leak 8 gpm (TS)
6		R, OATC, SRO	Manual unit shutdown due to SG tube leak
7	MSS010 MSS020 Override	C, OATC, SRO	Both Main FDW pumps trip ATWS
7a	Override		1FDW-316 fails closed
8	MPS020, 50	M, ALL	1B SG tube leak increases to 200 gpm
9	MSS285		1B TBVs Fail OPEN

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: _____	Scenario No.: **1**	Event No.: **1**	Page 1 of 1
Event Description:	**Place 1A Main FDW Pump on Handjack: (N, BOP, SRO)**		

Time	Position	Applicant's Actions or Behavior
	BOP	**Crew response:** Use Enclosure 4.10 (Placing 1A FDWPT On Handjack) of OP/1106/002 B • Ensure 1A MAIN FDW PUMP (ICS) in "HAND". • Run 1A FDWPT Motor Speed Changer down to control 1A FDWPT. • Turn FPT 1A HANDJACK switch to "ON". • 1A FDWPT speed now controlled with 1A FDWPT Motor Speed Changer. • Record on Turnover Sheet control of 1A FDWPT on Motor Speed Changer. • Place "T/O SHEET" CR tag on 1A MAIN FDW PUMP (ICS) station.
		When 1A Main FDW Pump has been placed on Handjack this event is completed.

Event Description: **PZR "A" RTD Fails LOW: (I, BOP, SRO) (TS)**

Time	Position	Applicant's Actions or Behavior
	BOP SRO BOP	**Plant response:** Statalarms: • 1SA-2/C-3, RC Pressurizer Level Hi/Low • OAC, RC PZR level 1&3 mismatch • OAC, RC PZR level 2&3 mismatch Board indications: • PZR level 1 and 2 indicates ≈ 133 inches • PZR level 3 indicates ≈ 220 inches and slowly increasing **Crew response:** Refer to the ARG: • Check alternate PZR level indications. • Check for proper Makeup/Letdown flows and adjust to restore proper level. o RO may take 1HP-120 to manual to control PZR level. • Refer to Technical Specification 3.4.9, Pressurizer. • Refer to Technical Specification 3.3.8, PAM Instrumentation. o Condition H applies • Refer to PT/1/A/0600/001 (Periodic Instrument Surveillance). o Select PZR level 3 for level control. • Call SPOC to repair PZR "A" RTD
		This event is complete when PZR level 3 has been selected and 1HP-120 returned to AUTO or when directed by the lead examiner.

Event Description: 1B1 RCP High Vibration (ramp over 15 minutes): (C, BOP, SRO)

Time	Position	Applicant's Actions or Behavior
	BOP SRO/BOP	**Plant response:** Statalarm 1SA-9/D-2 (RC PUMP VIBRATION HIGH) will alarm. **Crew response:** 1. The BOP should refer to the ARG 2. Verify RCP vibration conditions by using RCP OAC Display Group RCP 3. Refer to AP/16, Abnormal Reactor Coolant Pump Operation. • Determine RCP immediate trip criteria are not met by referring to Enclosure 5.1 (RCP Immediate Trip Criteria). • Notify the OSM to request an evaluation of the RCP vibration condition by the RCP Component Engineer. • GO TO Section 4B, Abnormal Vibrations • Verify RCP vibration indication is available for monitoring in Control Room. • Monitor RCS flow for indications of degradation. • Monitor RCP parameters for operational abnormalities: • Motor bearing temperatures • Seal return temperature • Seal return flow • Computer points O1A0061, O1A0062, O1A0063, O1A0781 (RCP MTR INPUT POWER) • Loose Parts Monitor ***Cue: If asked, indicate that there are no alarms on the Loose Parts Monitor.*** • Determine high vibration exists and vibration continues to increase. • Secure the 1B1 RCP as follows: • Verify four RCPs operating. • Verify Rx power is **NOT** ≤ 70% as indicated on all NIs. • Direct an RO to initiate Encl. 5,2 (Rapid Power Reduction)

Time	Position	Applicant's Actions or Behavior
	BOP	4. Encl. 5,2 (Rapid Power Reduction) will direct the BOP to:
		• Verify ICS in AUTO.
		• Initiate MAXIMUM RUNBACK to ≤ 70% as indicated by all NIs.
		• **WHEN** Rx Power ≤ 80%, **THEN** stop the 1E1 and 1E2 HTR DRN PUMPs.
		• **WHEN** Rx Power is ≤ 70% as indicated by all NIs, **THEN** press MAXIMUM RUNBACK to stop runback.
		• Notify CR SRO that Rx Power is ≤ 70%.
		• Adjust CTPD SET to match CTP DEMAND.
	SRO	5. Direct the BOP to stop the 1B1 RCP.
		6. Verify ICS re-ratios feedwater to establish ≈ 0° ΔTc.
		7. Initiate Encl 4.3 (Special Instructions for < 4 RCP Operation) of OP/1/A/1102/004 (Operation at Power).
		When the 1B1 RCP has been secured or when directed by the lead examiner this event is completed.

Event Description: **Controlling Tave fails HIGH: (I, OATC, SRO)**

Time	Position	Applicant's Actions or Behavior
	OATC SRO	**Plant response:** • 1SA-02/A-12, ICS Tracking, will actuate due to neutron and feedwater cross-limits. • Controlling Tave will indicate ≈ 596.4° F. • Actual loop A & B Tave will decrease until operator stops transient. • RCS pressure and temperature will decrease. **Crew response:** • When the ICS TRACKING alarm is received, the candidates should utilize the "Plant Transient Response" process to stabilize the plant and recognize that the controlling Tave has failed. RX will trip on variable low pressure with no operator action. • Verbalize to the SRO reactor power level and direction of movement. • Place the FDW Masters and Diamond in manual and stabilize the plant. Use control rods and FDW to stabilize the plant • The SRO should: • Refer to AP/28, ICS Instrument Failures o Transfer to Section 4A, Controlling Tave • Contact SPOC to repair controlling Tave. **Note: The ICS will remain in manual for the remainder of the scenario.**
		When the SRO reaches the WHEN step in Section 4A or when directed by the lead examiner this event is completed.

| Event Description: | **1B SG tube leak 8 gpm: (C, ALL) (TS)** |

Time	Position	Applicant's Actions or Behavior
	ALL SRO	**Plant response:** Statalarms: • 1SA-8/A-9, RM AREA MONITOR RADIATION HIGH • 1SA-8/B-9, RM PROCESS MONITOR RADIATION HIGH • 1SA-8/D-10, RM CSAE EXHAUST RADIATION HIGH • 1SA-8/E10, N16 RM PRI TO SEC TUBE LEAK Control board indications: 1. PZR level will decrease. 2. RIA CRT – 1RIA-60 ≈ 3.5 gpm increasing **Crew response:** 1. Diagnose and take actions for a tube leak in the 1B SG: 2. Refer to the ARG for the following above alarms: 3. Refer to AP/31 (Primary to Secondary Leakage) • Monitor primary parameters; PZR Level and LDST level or RIAs to determine that gross leakage exist and transfer to step 4.80. • Greater than 25 gpm will require entering the EOP. • Make notifications of primary to secondary leakage per OMP 1-14 (Notifications). • Log RIA readings (a rough log is adequate) • Initiate a Unit shutdown to met requirements of Encl. 5.1 (Unit Shutdown Requirements). (Per Enclosure 5.1 reduce power < 50% in 1 hour and TS 3.4.13 applies). ➢ Initiate a unit shutdown using OP/1/A/1102/004 (Operation At Power)
		Event is complete when a unit shutdown is directed by the SRO or when directed by the Lead Examiner.

| Event Description: | **Manual unit shutdown due to SG tube leak: (R, OATC, SRO)** |

Time	Position	Applicant's Actions or Behavior
	SRO	**Crew response:** 1. Direct unit shutdown per OP/1/A/1102/004 (Operation At Power) Encl. 4.2, Power Reduction.
	OATC	2. OP/1/A/1102/004 (Operation At Power) Encl. 4.2, Power Reduction • Review Limits and Precautions • Notify OSM to contact NRC if required. • Refer to OP/1106/001 (Turbine Generator) to ensure operating limits are NOT exceeded during shutdown. • **IF** reducing CTP > 6%, notify Secondary Chemistry of power reduction.
		NOTE: Absence of a Maneuvering Plan should **NOT** delay an unplanned CTP reduction.
		• **IF** available, refer to Maneuvering Plan to view guidelines for power decrease. • 2.4.1 **IF** CTP will be changed ≥ 15% within a 1 hour period, notify Primary Chemistry to perform TS SR 3.4.11.2 as required. • Notify System Operations Center (SOC) or lead reduction. • **IF** required, advise plant personnel of load reduction. • Notify WCC SRO to review Hot List for items to be worked during power reduction or Unit shutdown. • Start the 1A and 1B FDWP SEAL INJECTION PUMPs • Reduce reactor power in manual by inserting control rods with the Diamond, controlling FDW flow with the FDW Masters.
		Event is complete when reactor power has been reduced 5% or when directed by the Lead Examiner.

| Event Description: | **Both Main FDW pumps trip**
ATWS: (C, OATC) |

Time	Position	Applicant's Actions or Behavior
	OATC	Recognize that the Reactor should have tripped and begin performing Immediate Manual Actions. • Depress REACTOR TRIP pushbutton • Verify reactor power < 5% FP and decreasing The OATC should recognize that Power Range NIs are not < 5% FP and perform Rule 1. (**CT-24**) • Verify that at least one Power Range NI is ≥5% FP. • Initiate manual control rod insertion to the IN LIMIT. • Open 1HP-24 & 1HP-25 (1A and 1B BWST Suction) • Ensure 1A or 1B HPIP is operating. • Start 1C HPIP. • Open 1HP-26 & 1HP-27 (1A and 1B HP Injection) • Dispatch operators to the Cable Room and to the 600V Load Centers 1X9 and 2X1 to de-energize the CRD System. • Notify the SRO to **GO TO** UNPP tab.
	BOP	The BOP: • Performs a Symptoms Check and then may perform Rule 3 based on loss of Main FDW. • Takes manual control and throttles 1FDW-315 and 1FDW-316 to reduce EFDW header flow < 1000 gpm/header per Rule 7.
	SRO	Transfer to the UNPP tab from IMAs and direct the following actions: • Announce plant conditions • Ensure Rule 1 is in progress or complete. • Verify Main FDW available. • **IAAT** all power range NIs are <5% FP, **THEN** trip the turbine-generator. • Verify any wide range NIs ≥1% FP. • Open 1RC-4 and 1HP-5 • Maximize letdown.

Event Description:	**Both Main FDW pumps trip** **ATWS: (C, OATC)**

Time	Position	Applicant's Actions or Behavior
	SRO	• Verify overcooling **NOT** in progress. • Secure makeup to the LDST. **Note: The CRD breakers will be opened in four minutes.** • **WHEN** all NIs are <1% FP, **AND** decreasing, **THEN** continue in this tab. • Adjust SG pressure as necessary to stabilize RCS temperature using TBVs. • Throttle HPI per Rule 6 (HPI). • Adjust letdown flow as desired. • Verify RCP seal injection available. • **GO TO** Subsequent Actions tab.
		This event is complete when the SRO transfers to Subsequent Actions tab or when directed by the lead examiner.

| Event Description: | **1FDW-316 fails CLOSED** |

Time	Position	Applicant's Actions or Behavior
		Note: After transfer is made to Subsequent Action, 1FDW-316 will fail closed. RO should diagnose the failure of 1FDW-316 and re-perform Rule 3. Rule 3 will direct the RO to Enclosure 5.27 which will align flow through the startup control valve. Enclosure 5.27: 1. Verify EFDW is being supplied by an alternate unit. **GO TO** Step 7. 2. Stop MD EFDWP in all headers with malfunctioning EFDW control valve. 3. Place 1 TD EFDW PUMP in PULL TO LOCK. 4. Place 1FDW-44 controllers in HAND and set demand to 0%. 5. Place control switch for 1FDW-421 and FDW-382 in CLOSE. 6. Place control switch for 1FDW-384 in OPEN. 7. Place control switch for 1FDW-45 in CLOSE. 8. Place control switch for 1FDW-47 in OPEN. 9. Verify 1FDW-315 failed. **GO TO** Step 22. 10. Verify 1FDW-316 failed. 11. Verify 1FDW-47 open, 1FDW-45 closed, 1FDW-44 closed, and 1FDW-42 closed. 12. Verify 1FDW-382 closed. 13. Verify both of the following: • 1FDW-384 open • 1B MD EFDWP available 14. **GO TO** Step 30. 15. Verify AFIS actuation has occurred (either statalarm on): • AFIS HEADER A INITIATED (1SA-2/C-8) • AFIS HEADER B INITIATED (1SA-2/D-8) 16. **GO TO** Step 34. 17. Place control switch for 1FDW-401 and FDW-42 in CLOSE. 18. Place the following in HAND with demand at zero: • __ 1FDW-35 • __ 1FDW-44 19. Select OFF for both Digital Channels 1 & 2 of AFIS on headers to be fed.

Op-Test No.: _____	Scenario No.: 1	Event No.: 7a	Page 1 of 1
Event Description:	**1FDW-316 fails CLOSED**		

Time	Position	Applicant's Actions or Behavior
		20. Verify an operator has been sent to locally position any FDW valves: • 1FDW-94 or 1FDW-96 • 1FDW-315 or 1FDW-316 21. **GO TO** Step 36. 22. Verify 1FDW-315 failed open. (not failed) 23. **IF** 1FDW-315 has **NOT** failed, **THEN GO TO** Step 41. 24. Verify 1FDW-316 failed open. (not failed open) 25. **IF** 1FDW-316 has **NOT** failed, **THEN GO TO** Step 46. 26. **IF** lineup to feed through 1B S/U Control Valve was successful, **THEN GO TO** Step 42. (lineup was successful) 27. Verify an operator has been sent to locally open 1FDW-96. (no) 28. **GO TO** Step 45. 29. Start 1B MD EFDWP. 30. Verify HPI forced cooling in progress. (no) 31. **GO TO** Step 48. 32. Verify LOHT tab is in progress. (no) 33. **GO TO** Step 51. 34. Verify 1FDW-315 failed. (no) 35. **GO TO** Step 57. 36. Verify 1FDW-316 failed. (yes) 37. Verify one of the following: • Lineup to feed through 1B S/U Control Valve was successful (yes) • Operator sent to locally throttle 1FDW-316 (no) 38. Verify an operator has been sent to locally control 1FDW-316. (no) 39. **GO TO** Step 62. 40. Throttle 1FDW-44 to obtain desired flow rate and/or SG level per Rule 7 (SG Feed Control). 41. **IAAT** auto control of a S/U control valve is desired, **THEN** place desired valve in AUTO
		This event is complete when the SRO transfers to Subsequent Actions tab or when directed by the lead examiner.

Event Description:	**1B SG Tube Leak increases to 200 gpm: (M, ALL)**

Time	Position	Applicant's Actions or Behavior

	SRO	**Plant response:**
		1. Control board indications:
		   • PZR level will decrease due to the leak.
		
		Crew response:
		1. The SRO should transfer to the SGTR tab of the EOP based on a Parallel Action page.
		
		2. SGTR tab will:
		   • Verify Rx tripped.
		
		   • Maintain Pzr level 140" - 180" by initiating Encl 5.5 (Pzr and LDST Level Control).
		
		   • Start the A/B and 3A/3B Outside Air Booster Fans. **(CT-27)**
		
		   • Monitor RIAs 16 and 17 to SGs with a tube rupture.
		
		   • Dispatch an operator to open the A and B TURB BLDG SUMP PUMP BKRs.
		
		   • Notify RP to survey both MS lines for radiation.
		
		   • Secure any unnecessary offsite release paths. (Main Vacuum Pumps, TDEFDWP, Emergency Steam Air Ejector, etc.).
		
		   • Open 1HP-24 and 1HP-25

<table>
<tr><td colspan="1">NOTE</td></tr>
<tr><td>If normal pzr spray is available, efforts should be made to minimize core SCM ≤ 15°F. Otherwise, minimize core SCM as low as safely achievable.</td></tr>
</table>

   • Minimize core SCM using the following methods: **(CT-07)**
      ➢ De-energize all Pzr heaters
      ➢ Use Pzr spray
      ➢ Maintain Pzr level 140" - 180

| Event Description: | **1B SG Tube Leak increases to 200 gpm: (M, ALL)** |

Time	Position	Applicant's Actions or Behavior
		• Maintain RCP NPSH by using the OAC and/or Encl 5.18 (P/T Curve.
		• Verify 1MS-24 or 1MS-33 open.
		• Open 1AS-40 while closing 1MS-47.
		• Close 1MS-76, 1MS-84, and 1MS-36
		• Close 1SSH-1, 1SSH-3, and 1SSH-9.
		• Select OFF for both digital channels on AFIS HEADER A and B.
		• Initiate a cooldown as follows:
		• Decrease SG pressure to 835 - 845 psig using any of the following: o TBV setpoint adjustment o TBVs in manual o ADVs
		• Maximize cooldown rate limited only by the ability to maintain Pzr level > 100".
		• **WHEN** SG pressure is 835 - 845 psig, **THEN** adjust SG pressure as necessary to maintain an RCS temperature band of 525°F - 532°F.
		This event is complete when a cooldown has been initiated or when directed by the lead examiner.

Time	Position	Applicant's Actions or Behavior
	ALL	**Plant response:** • 1B main steam line pressure will decrease. **Crew response:** 1. Crew should determine that an Excessive Heat Transfer event is in progress. 2. An RO should perform Rule 5 (Main Steam Line Break). **(CT-17)** 3. The SRO should transfer to EHT tab of the EOP based on the Parallel Actions page. 4. EHT tab will: • If any SG pressure < 550 psig, Ensure Rule 5 (Main Steam Line Break) in progress or complete. • Place 1FDW-41 and 1FDW-44 in HAND and decrease demand to zero. • Close 1FDW-382, 1MS-26, 1MS-76, 1MS-36, 1MS-84, and 1FDW-369. • **IAAT** core SCM is > 0°F, **THEN** Throttle HPI to stabilize RCS pressure and maintain Pzr level > 100″. • Verify letdown in service. • Feed and steam all intact SGs to stabilize RCS P/T using either of the following: **(CT-11)** o TBVs o Dispatch two operators to perform Encl 5.24 (Operation of the ADVs).
		This event and the scenario is complete when the "B" SG has been isolated and the plant stabilized or when directed by the Lead Examiner.

CRITICAL TASKS

1. CT-24, Shutdown Reactor - ATWS

2. CT-07, Minimize SCM

3. CT-17, Isolate Overcooling SG

4. CT-11, Control SG pressure to Maintain RC Temperature Constant.

5. CT-27, Implementation of Control Room Habitability Guidance