

# Draft Submittal

(Pink Paper)

1. Operating Test Simulator Scenarios

**WATTS BAR EXAM 2002-301**

**50-390**

**NOVEMBER 26 &  
DECEMBER 9 - 13, 2002**

Facility: Watts Bar Nuclear Plant Scenario No.: 1Op-Test No.: 301-2002

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions:

Rx Power 38%, **ramping up** per GO-4, Step 5.1.11

Imp-IN on turbine control

Turnover:

1A MDAFW out of service

Event No.	Malf. No.	Event Type*	Event Description
1	(RX11)	I (RO, SRO)	P imp falls low PT-1-73 Affects auto rod control Tref program Steam dumps Should require RO to take manual control of control rods. BOP may have to take actions for steam dumps, not sure. To continue ramp, with this instrument failed should require the RO to manually operate the rods. Tech Spec 3.3.1 condition S
2	(FW10)	C (BOP)	Condensate Pump Recirc valve fails open Failure should drop feed pressure low enough to get Main Feed Pump suction alarm. At the power level at this point, it shouldn't cause a ramp down or trip. Key is that suction pressure remain above 100 psig. The ARP provides some diagnostics but no guidance as to what to do with the valve. The expectation is that the BOP will close the valve. Otherwise, the continued ramp up may not be possible.
3		N (BOP)	Place 2 <sup>nd</sup> feed pump in service
4	(CV51)	I (RO)	Failure of FT-62-142 Inhibits ability to dilute This failure will affect the RO's ability to dilute. There are no alarms, so it will be necessary to require dilution in this timeframe for him to diagnose the failure. Also, it is unclear whether or not he can manually work around this problem. Otherwise, we may have to "fix" the problem to continue.
5	(TC02)	I (BOP)	Failure of EHC Auto control Turbine power begins to increase. The rate of increase be set by the simulator operator. The intent is to set the rate for a very slow increase. There are no alarms specific to this component failure. I would expect that the BOP would have some MCB capability to place the turbine in manual or some means to stop the increase. This is the last event prior to the Major Transient. So if they trip, we will go straight into the MT.
6	(MS02 C)	M(ALL)	Main Steam Line Break Outside Containment At the point that the crew either gets control of the turbine ramp or trips, this malfunction will be input. Assuming that they haven't tripped, the intent is to ramp this in starting at a rate similar to the rate that was caused by the EHC failure and increase it as necessary to drive them into the EOP's.

POST MT			MSIV 1C fails to close and 1B MDAFW pump fails to start
			The scenario ends after SI is reset and RCS parameters are stable.

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

Facility: <u>Watts Bar Nuclear Plant</u> Scenario No.: <u>2</u>			Op-Test No.: <u>301-2002</u>
Examiners: _____		Operators: _____	
Initial Conditions: Rx Power 100%			
Turnover: 1B MDAFW out of service			
Event No.	Malf. No.	Event Type*	Event Description
1	(MS20C)	C (BOP)	<b>#1C Heater Extraction valve fails closed</b> There are no alarms. It is expected that heater levels will begin swinging around and some efficiency loss. The BOP is expected to determine that the valve has shut and to reopen it. (can be any heater, want the one with the most visible effects)
2	(RX05A)	I (RO, SRO)	<b>Pressurizer Level Transmitter LT-68-339 Fails Low</b> Annunciators for PZR Level Hi/LO and PZR Level Lo-heaters OFF and Letdown Closed illuminate RO should determine an instrument failure and go to AOI 20, Malfunction of the PZR level control system. Manual control of charging should be taken, the channel transferred and letdown returned to service. SRO should review TS 3.3.1, condition X.
3		N (BOP, SRO)	<b>Event #3: Stroke IST AOV (TBD) and get OOS stroke time (Normal for BOP)</b> Exercise Tech Spec for SRO
4	(CV52)	I(RO)	<b>Event #4: Fail Letdown Pressure Control Transmitter PT-62-81 high</b> Annunciator for Letdown Hx return high temp illuminates. RO should recognize high letdown flow and take manual control.
5	(FW18)	(ALL)	<b>1A Main Feedwater Turbine Vibration High</b> Annunciators for 1A MFWPT Abnormal and Turbine Vibration high.
6	(ED12C)	C(SRO)	<b>Loss of 125VDC Vital Battery Board III</b> This event causes several annunciators, removes control power from the TDAFW pump and control power from the A train ESF bus. This, in effect, takes away the remaining two AFW pumps. It also starts all 4 EDG's. A number of TS's will apply, both electrical and AFW.
7	(TBD)	C (BOP, SRO)	<b>1B EDG failure</b> Need some kind of failure which requires the BOP to take action to shutdown EDG. This will also be a Tech Spec for the SRO (If BOP takes verifiable actions with the DC bus failure, this event could be dropped)

8	(FW93)	R (C for BOP?)	<b>#3 Heater Drain Tank Level reference leg failure</b> This event causes the #3 HDT to empty, causing HDT pump cavitation. This can result in a runback. If it doesn't, we will force a rampdown with 1A feed pump vibration.
9	(RD08)	C(RO)	<b>Rods fail to move on demand</b> Rods will fail to move in either auto or manual. RO will have to trip Rx due to inability to follow load reduction. May go to AOI-2, Malfunction of Rod control system prior to tripping. This is also a Tech Spec if we are here long enough.
10	(RPO1C)	M(ALL)	<b>ATWS</b> When RO attempts to trip the Rx, it will not trip either manually or by auto signal. Will need to manually open trip breakers or MG set breakers.
Post MT	(FW06)		<b>Post MT event: Standby Feedwater pump fails</b> At this point, there should be no feedwater available and drive the crew into FR-H.1. 1A MDAFW breaker has no control power, but can be started by manually closing the breaker at the SD board per Step 7 of FR-H.1. We will allow that success path, after an appropriate time to achieve the action locally. Rx trip breakers may require cycling, based on any SI status, to reset Feedwater Isolation. This will require local action at the switchgear based on the ATWS failure. If they go this path, the standby feed pump will trip. Any other procedural path to success is acceptable (ie. Main feedwater pumps, condensate pumps or feed and bleed)
			The scenario ends after a success path is demonstrated (eg. Feed and bleed, feeding with 1A MDAFW or any secondary pump)

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

Facility: Watts Bar Nuclear Plant Scenario No.: 3Op-Test No.: 301-2002

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions:

Rx Power 100%

Turnover:

1B MDAFW out of service

Event No.	Malf. No.	Event Type*	Event Description
1	(RP08)	I (SRO)	<b>Event #1: Permissive P-4 failure</b> There is no action to take other than the Tech Spec. However, this permissive affects the subsequent operation of Feedwater Isolation, SI block, Turbine Trip and Steam Dump control. Also, illuminates Auto SI Blocked annunciator.
2	(CV09)	I (RO)	<b>VCT Level Transmitter LT-62-130 Fails High</b> RO should have to take manual control of the VCT divert valve. Auto makeup and Charging pump suction roll to RWST defeated.
3		N (BOP)	<b>Shift on service orifices</b> Normal for BOP. May have to direct SRO to get BOP to do this
4	(CV16)	C (RO)	<b>Letdown Relief Valve fails open (CV16)</b> RO should isolate letdown and place excess letdown in service. Key annunciator will be Low Press Letdown relief high temp. Could let BOP do excess letdown as a normal and let the RO shift the orifices as a prelude to the relief valve lift.
5	(RW20)	C (BOP)	<b>RCW Pump Trip with standby pump failing to start</b> (Didn't see canned auto-start inhibit, need to discuss w/ simulator operator) BOP should start the standby pump.
6	(RW06)	R (ALL)	<b>Main Generator Field Temperature High</b> We want this temperature increase to be slow enough to give the crew and opportunity to diagnose the problem and perform a rapid ramp down to less than 50 % power and manually trip the turbine. Note: VCT level will not auto-roll to RWST if VCT level gets out of control.
7	(RX24)	I (BOP)	<b>Feedwater Header Pressure Transmitter fails high PT-3-1</b> This failure causes the main feed pumps to roll back to idle. BOP will be required to take manual control of feed pump speed. Ramp in slowly enough for crew to diagnose and take control. If crew trips the Rx above 50%, the steam dumps may behave differently than expected.
8	(TH05C)	M (ALL)	<b>Event # 8: Steam Generator Tube Rupture on 1C S/G</b> Ramp in after either Rx trip or turbine trip. Ramp rate sufficient to require expeditious action to prevent Steam Generator from going solid. Crew must recognize auto SI blocked and manually SI.

Post MT	(SI09K)		Failure of Control Room Isolation Train A BOP should pick this up during E-0. Also, look for effects on feedwater isolation due to P-4.
			Scenario End: Breakflow is stopped

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

Facility: Watts Bar Nuclear Plant Scenario No.: Spare Op-Test No.: 301-2002

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_

Initial Conditions:

Rx Power 100%

Turnover:

1B MDAFW out of service

Event No.	Malf. No.	Event Type*	Event Description
1			(TBD)
2	(NI08B)	I (BOP, SRO)	N42 channel fails low Will require manual control of C & D S/G by BOP (unclear as to how significant the impact is) TS for SRO
3	(RX18)	I (RO)	Tavg control fails low T <sub>AVG</sub> signal fails low (530 Deg. F), steam dumps will not open even if armed while in T <sub>AVG</sub> mode; control rods will step out until 220 steps, and Pzr level program will go to 24.7 %. Should require RO to take manual control of PZR level and control rods is IC has them less than 220 steps.
4	(CC07A) (CC03B)	C (BOP, SRO)	1A CCW pump trips w/ auto start of 1B blocked Requires BOP to manually start 1B CCW pump TS for SRO
5	(ED17A) (ED18A)	C (SRO)	Sudden Pressure Trip of C CCST transformer Coupled with the transformer trip, Rx MOV/Vent Board 1A1-A (ED18A) fails to auto transfer. This removes power from the A train BIT outlet which sets up the post MT event, along with MOV's in several other A train ESF systems. TS for SRO
6	(CV17)	R(ALL)	Event #6: A RCP #1 seal failure Should be ramped in at a rate that will require immediate, but controlled shutdown.
7	(RC05E)	I (RO)	PS 68-340H fails high Fails open spray valves, RO must take manual control
8	(SI06)	M (ALL)	Event #8: SI cold leg pipe break Small break LOCA ramped in slowly to allow diagnosis and manual trip and SI
Post MT	(CV21)		Train B BIT outlet isolation valve, FCV-63-25, fails to open Train A BIT outlet is de-energized due to lost Rx MOV board 1A1-1, therefore all flow is isolated through the BIT. Operators should catch this by Step 9 of E-0 or sooner.
			Scenario ends with transition to ES-1.2

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



Facility: Watts BarDate of Examination: 11/9-13/02Examination Level (circle one): RO / SROOperating Test Number: 1

	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Conduct of Operations	a. Calculate the Estimated Critical Position (NEW)
		b. Complete Shift Turn Over Checklist (NEW)
A.2	Equipment Control	Complete Shift Daily Surveillance Log Mode One and Evaluate Surveillance Log. (NEW)
A.3	Radiation Control	Access a High Radiation Area (NEW)
A.4	Emergency Plan	Classify the Event per the REP (Security Event)–SRO (NRC-JPM-NEW)
		Medical Emergency Response (RO) (NEW)