Swift Simulation Summaries

Ops Exercises	Description	Duration	I&T Activity	Resources				Tool/Configuration			
				GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFIs	HB
Pre-1	Various Instrument and Spacecraft Bus Tests		General Testing			X		X		X	X
1 and 2	Standard Test Set: • Day-in-the-Life type activities • FOM Test with ToO Commanding • Other instrument/Science Activities • Normal Ops Activities	~6 hours	Observatory Integrated Systems Test (IST) Dry Run	X		X		X		X	
3	L&EO Dry Run to prepare for 1st L&EO Simulation	12 hours		X		X					X
4 and 6	Solar Array Deployment Tests One of the few opportunities for FOT to see the realistic telemetry from this activities before launch	~2 hours	Solar Array 1st Motion Deploy	X		X		X	X	X	
5	Repeat OE#1	~6 hours	Observatory IST	X		X		X	X	X	
7	NFI Door Deployments One of the few opportunities for FOT to see the realistic telemetry from these activities before launch	~4 hours	NFI Deployment Tests	X		X		X	X	X	

NOTE: ALL Sim activities must use **FLIGHT OPERATIONS PROCEDURES/STOL PROCS** unless waived on a case-by-case basis –I&T procedures used for initial sim configuration only.

8	Repeat OE#4	~2 hours	Solar Array 1st Motion Deploy		X*		X	X	X	X	
9	Repeat OE#1	~6 hours	Observatory IST		X*		X	X	X	X	

* Telemetry Monitoring Only

L&EO Ops Sims	Description	Duration	I&T Activity	Personnel	Resource(s)				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFIs	HB
1a_1	Exercise 1st 2-3 days of L&EO Timeline/Script (compressed) • SSOH via TDRSS link post-separation • Monitor Solar Array Deployment (RTS execution) • Initial Acquisition with Malindi Subsystem Checkout • Clock Update • Ephemeris Update • CPU RAM Dumps • SSR Configuration and Dumps • EPS/AHI Configuration • Star Tracker Power On/Checkout • ACS Mode Transition (Inertial Pt.)	2 days, 12 hours/day	Pre-BAT Delivery	FOT L&EO Dir. Sim Eng. MORL SA Sys. Eng.	X		X		X			

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Swift Simulation Summaries

L&EO Ops Sims	Description	Duration	I&T Activity	Personnel	Resource(s)				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFIs	HB
1a_2	Exercise ACS Slew Testing performed during L&EO (compressed) • ACS Mode Transition • Ephemeris Update • CPU RAM and SSR Dumps • Slew Tests • Torque Rod Compensation (TBD)	1 day, 12 hours	Pre-BAT Delivery	FOT L&EO Dir. Sim Eng. MORL SA Sys. Eng. ACS Eng.	X		X		X			
1b_1	L&EO NFI Activation Sequence (compressed) • S/C begins in Mission Mode and Inertial Point Mode • Box Power On • Telescope Configuration • Simulated door opening (as allowed) • Activation activities interleaved to simulate L&EO sequence • Power down due to SH • SH Recovery • Emergency Power Down	3 days, 12 hours/day	Pre-BAT Delivery	FOT SA Sys. Eng. UVOT Eng. XRT Eng.	X		X		X		X	

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Swift Simulation Summaries

L&EO Ops Sims	Description	Duration	I&T Activity	Personnel	Resource(s)				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFIs	HB
1b_2	L&EO FoM/ACS Interface Testing • FoM Checkout • Slew Tests with NFI boxes powered on (no telescopes) • Power on Telescopes • Run Open Door procs (no actual door opening) • Post-UVOT Door Open Slew Tests	1 – 2 days, 12 hours/day	Pre-BAT Delivery	FOT SA Sys. Eng. ACS Eng. UVOT Eng. XRT Eng.	X		X		X		X	
1b_3	L&EO Timeline/Script Sequence (compressed) • NFI Box Activation Activities • BAT Activation Activities (through 1 – 2(?) DM Blocks) • SADA Characterization • Antenna Switch Test (?) Nominal Slews requiring SADA motion	3 transitions, ~12 hours per transition	Thermal Vacuum (TVAC) Transitions	FOT SA Sys. Eng. ACS Eng. NFI Engs. BAT Eng.	X		X		X	X	X	
1c	Final Full L&EO Simulation before Launch Site • Repeat Sim 1a_1 • Include minimum Instrument Electronic Box Power Up (XRT, UVOT, BAT)	2 days, 12 hours/day	L&EO Rehearsal	All engineers supporting L&EO		X	X		X	X	X	
1d	Final Full L&EO Simulation (Repeat Sim 1a_1)	2 days, 12 hours/day	Observatory ETE	All engineers supporting L&EO		X		X	X	X?	X?	

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Swift Simulation Summaries

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Swift Simulation Summaries

Post-L&EO Ops Sims	Description	Duration	I&T Activity	Personnel	Resource(s)			Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	S/C Bus	BAT	NFIs	HB

2a	Enhanced "Day-in-the-Life" Simulation
	• Instrument Power On (SH Recovery)
	• Stimulate Instruments, as available
	• FOT Routine Operations Activities
	  ○ ATS upload
	  ○ CPU RAM/SSR Playback
	  ○ Clock & Ephem Updates
	• Science Plan/Replan/Timeline Delivery
	• Nominal Instrument Commanding
	• 72-hour "hand off"/weekend ops with PSU automation (?)
	• 73-hour time-out with SH Recovery
	• BAT FoV/Source Test (BAT ETE)
		2 days,
		24 hours/day
			Observatory Operations Test (formerly, Observatory Science End-to-End Test)	FOT
				SA Sys. Eng.
				Inst. Engs.
				SDC(?) – depends on PSU MOC
					X?	X?	X	X	X	X	

2b	" Day-in-the-Life" Test • FOT Normal Operations Activities (see 2a) • Routine Instrument Commanding	~12 hours	Thermal Balance	FOT All Subsystem Engs. Inst. Engs.	X		X	X	X	X	
2c	Paper Simulation of Daily Operations (using the PSS or Recorded Data) • Coordinate Operational Product Deliveries • Science Planning/Replanning • FOT/SOT Nominal Activities • File Transfers • Other Activities as needed	2 days, 8 hours/day		FOT Inst. Engs. SDC Data Centers		X					

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Swift Simulation Summaries

NOTE: ALL Sim activities must use **FLIGHT OPERATIONS PROCEDURES/STOL PROCS** unless waived on a case-by-case basis –I&T procedures used for initial sim configuration only.

Swift Simulation Summaries

Contingency Sims	Description	Duration	I&T Activity	Personnel	Resources				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFI	HB
3a_1	Special Operations Simulation • Observatory configured for normal operations with NFIs online • CPU RAM/SSR Playback • RTS Load/Dump • NFI FSW and Table Uploads/Dumps • SOH Verification (S/C Bus, NFIs)	3 days, ~8 – 10 hours/day	SCIF #4A	FOT S/C Bus Sys. Eng. Support NFI Engs.		X	X		X		X	
3a_2	Special Operations Simulation • Observatory configured for normal operations with instruments online • CPU RAM/SSR Playback • ATS and RTS Loads/Dumps • S/C Bus and BAT FSW and Tables Uploads/Dumps • S/C Bus and Instrument Real-Time commanding • TDRSS Burst Messages • SOH (Observatory)	1.5 days, ~12 hours/day	SCIF #4B	FOT S/C Bus Engs. Inst. Engs.		X	X		X	X	X	

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Swift Simulation Summaries

Contingency Sims	Description	Duration	I&T Activity	Personnel	Resources				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFI	HB
3a_3	Special Operations Simulation • HB configured for normal operations with instrument ETUs online • CPU RAM/SSR Playbacks • S/C Bus and Instrument FSW and Table Loads/Dumps • S/C Bus and Instrument Real-Time commanding • TDRSS Burst Messages • SOH (Observatory)	2.5 days, ~12 hours/day	SCIF #4C	FOT SA Sys. Eng.		X						X
3b	L&EO Contingency Sim – 1st Anomaly Simulation • Details developed at later date by ○ Simulation Engineer ○ Observatory Systems Engineer ○ Observatory I&T Manager • MOT participants will not be briefed on details for training purposes	~12 hours		FOT All S/C Bus Engs. supporting L&EO Inst. Engs.		X	X					X

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Swift Simulation Summaries

Contingency Sims	Description	Duration	I&T Activity	Personnel	Resources				Tool/Configuration			
					GSFC MOC	PSU MOC	GSFC I&T	KSC	S/C Bus	BAT	NFI	HB
3c	L&EO Contingency Sim 2nd Anomaly Simulation (Repeat Sim 3b with different anomalies)	1 day, ~12 hours	L&EO Contingency Rehearsal	FOT All S/C Bus Engs. supporting L&EO Inst. Engs.		X	X		X	X	X	

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Swift Simulation Summaries

Ops Readiness Test	Description	Duration	Resources					Tool		
			PSU MOC	KSC	Malindi	USN	TDRSS	Observatory	PSS	Tape

1 and 2	Nominal Pass Ops
	• Voice Communications
	• Pre-pass ground system configuration and connection w/ station
	• Real-Time Commanding Activities
	  ○ No-ops
	  ○ Clock Update
	  ○ ATS Load
	• Post-pass activities
	  ○ Data Transfer
		~4-8 hours	X		X				X	

3 and 4	Contingency Pass Ops • Activities from ORT #1 • Blind Acquisition • Negative Acquisition	~4-8 hours	X		X				X	
5 and 6	Nominal Pass Ops • Same as ORT #1	~4-8 hours	X			X				X
7 and 8	Contingency Pass Ops • Same as ORT #3	~4-8 hours	X			X				X
9 (TBD)	Nominal Pass Ops • Voice Communications • Pre-pass ground system configuration and connection w/ station • Real-Time Commanding Activities ○ No-ops • Post-pass clean-up	~4-8 hours	X	X			X	X		

NOTE: ALL Sim activities must use **FLIGHT OPERATIONS PROCEDURES/STOL PROCS** unless waived on a case-by-case basis –I&T procedures used for initial sim configuration only.