GRT #1 Requirements															
12/10/04															
Requirement				**Planned Verification**								**Results**			
Requirement ID	**Requirement Text**	**MSS Source ID**	**Critical**	**Test**							**Method**	**Comments**	**Status**	**Signature**	
			Launch or Mission	**G1**	**G2**	**G3**	**G4**	**G5**	**G6**	**ETE**	Test, Analysis, Inspection, Demonstration	If Fail Discrepancy Number mandatory	Pass / Fail/ Untested/ Deferred, % complete	Who passed requirement.	
SYS0010	The ground system shall observe the current NASA policy directive, NPD 8010.2C, Use of the Metric System of Measurement in NASA programs.	3.5.1.12	L	X							I		U		
SYS0020	The ground system shall process observatory telemetry that is compliant with the CCSDS Packet Telemetry Recommendations as defined in the Series 100 Blue Books.	3.1.2.5.1.1 3.1.4.3.1.2 3.5.2.4.1	L	X							T	Decompose sys level to element level. Others are already decomposed.	U		
SYS0040	The ground system shall use Universal Time Coordinated (UTC) time as the time base for all operations activities.	Derived	L	X							T		U		
SYS0060	The ground system shall generate and send commands to the observatory.	3.5.2.2 3.5.2.3	L	X						X	T		U		
SYS0070	The ground system shall process and archive all telemetry received from the observatory.	3.5.2.2 3.5.2.3 3.5.2.4	M	X		X				X	T		U		
SYS0090	The ground system shall provide the ground communications network for the exchange of mission data among the ground system elements.	3.5.1.11	L	X							T		U		
SYS0100	The ground system shall perform health and safety monitoring of the observatory.	3.5.2.2	L	X							T		U		
SYS0110	The ground system shall process and archive all science data received from the observatory.	3.5.2.4	M	X			X				T		U		
SYS0190	The ground system shall use the J2000 inertial coordinate system.	3.5.1.10	L	X							T		U		
SYS0500	The ground system shall comply with Information Technology (IT) security requirements specified in NPG 2810.1.	3.5.1.2	L	X							A, T	Network Scans will be performed by IT Security.	U		
SYS1010	The ground system shall use communication links that provide error-free data transmission and delivery.	3.5.1.11	L	X	X	X	X	X	X	X	A, D		U		
SYS1050	The ground system shall provide a reliability of 99.98% for launch critical functions.	Derived	L	X	X	X					A		U		
SYS2020	The ground system shall process data with an orbit average generation rate of 1.2 Mbps for LAT, 25.5 kbps for GBM, and 51 kbps observatory housekeeping data.	3.1.1.5.1.3	L	X			X				T		U		
SYS3000	The ground system shall provide the unique capabilities to support pre-launch testing.	3.5.1.6 Derived	L	X							A		U		

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SYS9000	The ground system shall ensure that no single point of failure exists for launch critical functions.	3.3.1.5	L	X	X						A	derived from observatory requirement	U		
GCOM0010	The ground communications network shall transmit voice and data among all elements of the ground system.	Derived	L	X	X	X	X	X	X	X	T				
GCOM0050	During the pre-launch, launch, and early orbit phases, the ground communications network shall provide secure dedicated Closed Circuit Loop (CCL) or Station Conferencing and Monitoring Assembly (SCAMA) voice communications between the MOC and: Ground Stations, WSC, FDF*, GSSC*^^, GCN*^^, LAT IOC^^, GBM IOC^^, Spacecraft I&T Facility, KSC	Derived	L	X	X		X			X	T				
GCOM0060	During the normal operations phases, the ground communications network shall provide secure dedicated CCL or SCAMA voice communications between the MOC and: Ground Stations: WSC, FDF*, GSSC*^^, GCN*^^, LAT IOC^^, GBM IOC^^	Derived	M	X	X		X			X	T				
GCOM1000	The ground communications network shall ensure that all circuits supporting real-time operations have the capability to fail-over within 1 minute.	Derived	L	X	X	X	X	X			T, A		U		
GCOM5000	The GCOM shall transmit real-time data within 1 second between the MOC and the SN.	Derived	L	X							T	Time begins when first bit of the CADU hits the network and ends when the transmission of that bit reaches the MOC.	U		
GCOM9000	The ground communications network shall support troubleshooting and resolution of voice and data anomalies.	Derived	L	X	X						D		U		
SN3000	The SN shall provide the personnel and facilities to support pre-launch interface and system test activities	Derived	M	X							D	This includes planning, performing and assessing the tests.	U		
SN5140	The SN shall provide an S-band Multiple Access return link service at rates of 1 and 2 kbps.	3.4.2.3	L	X							T	Support for lower rates (e.g., 1, 0.500, 0.250 kbps) may be required.	U		
SN5150	The SN shall provide an S-band Single Access forward link service at a rate of 4 kbps.	3.1.1.5.1.2	L	X	X						T		U		
MOC0020	The MOC shall be the sole interface for commands between the elements of the ground system and the space-ground communications links.	3.5.3.1.1	L	X	X	X	X	X	X		T		U		
MOC0040	The MOC shall allow authorized remote users to access system functions for viewing RT and historical data.	3.5.1.2 3.5.3.5 derived	M	X							T		U		

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MOC0060	The MOC shall process observatory telemetry that is compliant with the Consultative Committee for Space Data Systems (CCSDS) Packet Telemetry Recommendations as defined in the Series 100 Blue Books.	3.5.2.4.3.1	L	X				X			T	Telemetry will be compliant with AOS Version 2.	U		
MOC0070	The MOC shall implement observatory commanding that is compliant with the CCSDS Telecommand recommendations as defined in the Series 200 Blue Books.	3.4.1.5 derived	L	X	X						T	Commanding will follow COP-1 protocol.	U		
MOC0080	The MOC shall utilize the COP-1 protocol to verify correct receipt of commands on the S/C.	3.4.1.5 derived	L	X							T		U		
MOC0200	The MOC shall maintain electronic documentation of operating procedures to specify the tasks to be performed for routine operational and contingency activities.	Derived	M	X							D		U		
MOC0210	The MOC shall maintain configuration control of the electronic documentation.	Derived	L	X							D		U		
MOC0220	The MOC shall restrict access to the electronic documentation to authorized operations personnel.	3.5.1.2	M	X							T		U		
MOC0250	The MOC facility shall restrict physical access to allow entry to authorized personnel only.	3.5.1.2 derived	L	X							D		U		
MOC0280	The MOC facility shall provide UTC clock and countdown clock displays.	3.3.1.12 derived	M	X							D	Not having a display would not prevent launch.	U		
MOC0290	The MOC facility shall provide a master time signal for the MOC systems.	3.3.1.12 derived	L	X							D	e.g. NASA 36	U		
MOC0300	The MOC facility shall provide an uninterruptible power supply (UPS) to all the MOC systems.	Derived	L	X					X		D	This is to provide the opportunity to gracefully shutdown non-critical functions and allow backup power to be supplied.	U		All MOC systems will not be in place until MOC release 3 (GRT 6). Also, verify by Test. The facility should have all of the UP systems in palce prior to bringing in the MOC boxes so from the firstGRT onward everything that comes in should be on UPS.

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MOC0310	The MOC facility shall access a backup power capability in the event of a utility power outage.	Derived	L	X							D	Current plans are to access diesel power in building 14.	U		
MOC0320	The MOC facility shall provide black/white and color printers to generate reports, printouts, and plots as required.	Derived	M	X							D	Look at the screens provided.	U		
MOC0400	The MOC shall ingest and verify the observatory telemetry & command (T&C) database provided by the S/C vendor.	Derived	L	X					X		T	Verification includes syntax level checking of database, Ex. Command mnemonic created expected bit sequence.	U		
MOC0410	The MOC shall construct the ground segment database to define any ground commands or parameters to be processed by the MOC.	Derived	L	X							T	Ground parameters are items such as ground station statistics and ground commands are those needed to control the MOC system.	U		
MOC0420	The MOC shall construct a Project Database (PDB) that consists of the observatory T&C database and the ground segment database.	Derived	L	X							T		U		
MOC0440	The MOC shall maintain configuration control of the PDB, command PROCs, display page definitions and configuration monitor definitions.	Derived	L	X						X	D		U		
MOC0500	The MOC shall restrict computer access to authorized personnel	3.5.1.2 derived	L	X							D		U		
MOC0510	The MOC shall monitor the MOC network and log all network security violations.	3.5.1.2 derived	M	X							T		U		
MOC1020	The MOC shall be maintained for the entire mission lifetime with no loss in MOC capability or performance.	Derived	M	X							A		U		
MOC1580	The MOC shall exchange telemetry and command data with the GLAST S/C as specified in the GLAST *Spacecraft-MOC ICD* .	3.5.3.1.2 derived	L	X	X	X	X	X	X	X	T		U		
MOC2000	The MOC shall perform Level 0 processing using observatory data files received from the ground stations and TDRSS.	3.5.1.3 derived	L	X			X				T		U		
MOC2010	The MOC shall generate Level 0 files for each contact that contain error free, time ordered non-duplicate series of packets.	3.5.1.3 derived	L	X		X					T	Each file may have one or multiple application identifications (APIDs). MOC will not merge dump files from multiple contacts meaning that there may be duplicate data across files.	U		
MOC2040	The MOC shall maintain a record of the quality and completeness of the telemetry for the duration of the mission.	3.5.2.11 derived	M	X	X	X		X			D		U		

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MOC2050	The MOC shall distinguish between test data and operational data.	Derived	M	X						X	T	Dependent upon having appropriate flags set in the data. May not even be defined in the data so how can this be critical.	U		
MOC2060	The MOC shall generate meta-data for each Level 0 file that describes the characteristics of the file.	3.5.1.3 derived	M	X		X					T		U		
MOC3000	The MOC shall provide the personnel and facilities to support pre-launch interface and system test activities.	3.5.1.6 derived	L	X							T	This means that the personnel and system resources are provided as needed for the test activities	U		
MOC3010	The MOC shall ingest telemetry and command databases directly from the IOCs for test support.	3.5.1.6 derived	M	X							T		U		
MOC4010	The MOC shall schedule all S/C and instrument engineering events within the constraints of the S/C and instruments.	3.5.2.2 derived	L	X	X		X				T	This applies to non-science related activities needed for observatory HK.	U		
MOC5000	The MOC shall receive, process and monitor telemetry data from the GLAST observatory.	3.5.1.3	L	X						X	T		U		
MOC5010	The MOC shall ingest and store all CCSDS transfer frames received.	3.5.2.11 derived	L	X							T		U		
MOC5120	The MOC shall archive all incoming frame telemetry data for the life of the mission.	3.5.2.11	M	X							A		U		
MOC5320	The MOC shall display telemetry data plots via screen plots.	Derived	M	X							T	Data can be exported to cretae plots if necessary. Did not make Launch critical.	U		
MOC5350	The MOC shall generate and display time-tagged event messages indicating all command activity, telemetry processing status, limit violations, configuration changes, and all error and warning conditions.	Derived	L	X							T		U		
MOC5360	The MOC shall log all event messages to a history file in the chronological order in which they are generated.	3.5.2.11	M	X							T	Project wants Launch critical.	U		
MOC5370	The MOC shall retrieve and display logged system event messages.	3.5.2.11	M	X							T	Project wants Launch critical.	U		
MOC5430	The MOC shall generate R/T commands based on a combination of the definitions in the PDB and user input.	Derived	L	X							T	This includes R/T commands	U		
MOC5470	The MOC shall provide protection against the unintentional issue of a critical command, as indicated in the PDB by requiring the operator to explicitly allow the command to be sent.	Derived	L	X							T		U		
MOC5480	The MOC shall archive all executed commands for the life of the mission.	3.5.2.11 derived	M	X							D	Project wants Launch critical.	U		

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MOC5490	The MOC shall provide a user interface language for system configuration and control, telemetry monitoring and commanding.	Derived	L	X							T		U		
MOC9020	The MOC shall enter and manage S/C and ground system anomaly reports.	Derived	M	X					X		D	NOT Launch critical.	U		
MOC9030	The MOC shall maintain for the life of the mission the database of all S/C and ground anomalies for both pre-launch and post-launch operations.	3.5.2.11 derived	M	X							D		U		
MOC9050	The MOC shall maintain a log of all user notifications sent and acknowledgements received.	3.5.2.11 derived	M	X							T		U		
GSSC0030	The GSSC shall adhere to mission specified data formats and standards.	3.5.1.5	M	X							D, T	The standards and formats for transferring data within the ground system will be documented in the Science Data Products ICD.	U		
GSSC1550	The GSSC shall interface with the MOC for the exchange of mission planning and data products.	Derived	M	X	X	X	X	X	X		T	Mission planning and data products include for example instrument flight software loads and ToOs.	U		
GSSC2000	The GSSC shall maintain an archive of level 0, level 1 and level 2 products it receives.	Derived	M	X	X	X	X	X			T		U		
GSSC2010	The GSSC shall provide the capability to receive and archive Level 0 data for the life of the mission.	Derived	M	X							T, A	The GSSC does not have to worry about overlaps among Level 0 files.	U		
GSSC2020	The GSSC shall be responsible for producing and maintaining databases of the data products either received or produced.	Derived	M	X	X	X	X	X	X		T		U		
GSSC3000	The GSSC shall provide the personnel and facilities to support pre-launch interface and system test activities.	3.5.1.6	M	X	X	X	X	X	X	X	D	This includes planning, performing and assessing the tests.	U		
GSSC7000	The GSSC shall support autonomous data transfers to and from the MOC.	3.5.1.3	M	X	X	X	X	X	X	X	T		U		
SAI1520	The Spacecraft I&T Facility shall provide the MOC with a validated Observatory T&C Data Base.	Derived	L	X						X	T		U		
Note: GRT 7 is reserved for all regression testing not completed by GRT-6.															
GSRD Matrix based on 433-RQMT-006 Rev A CH-02															
Updated to reflect CCR 433-0255															