



STS-124 GSFC Operational Readiness Review (ORR)

April 7, 2008

Baseline May 9, 2008



Agenda



1000	1010	Welcome/Introduction <ul style="list-style-type: none">- Review Board- Review Process	J. Bangerter/GSFC
1010	1020	STS-124 Mission Overview <ul style="list-style-type: none">- Mission Highlights- Mission Objectives- ISS Assembly Sequence	C. Smith/NENS
1020	1100	Integrated Network Overview <ul style="list-style-type: none">- Requirement Changes- Network Changes	C. Smith/NENS



Agenda (cont'd)



1020	1100	Integrated Network Overview (cont)	C. Smith/NENS
		- STS-124 Network Test Plan	
		- Open Work	
		- Documentation	
		- Potential Launch Conflicts	
		- Risks	
1100	1110	GSFC Base Utilities	T. McCain/NASA
1110	1310	Integrated Network Elements	
1110	1120	- NIC	M. Calhoun/NENS
1120	1130	- FDF	P. Powers/MOMS
1130	1140	- NISN	S. Damiano/UNITeS
1140	1150	- WLPS	M. Harris/NENS
1150	1200	- AGO	P. Castro/AGO
1200	1210	- MILA/PDL	R. Boatwright/NENS
1210	1220	- SN	R. Gonzales/NENS



Agenda (cont'd)



1110	1310	Integrated Network Elements (cont)	
1220	1230	- KSC CD&SC	M. McLamb/NASA
1230	1240	- ER Resources	M. Gawel/ER
1240	1250	- AFSCN	Lt. U. Tobey/USAF
1250	1300	- DFRC	L. Hodges/NASA
1300	1310	- WSSH	D. Shoup/WSTF
1310	1320	Action Item Summary	S. Testoff/PAAC
1320	1330	STS-124 Readiness Assessment	Review Board



Welcome/Introduction – Review Board



- **Carolyn P. Dent, Chairperson, GSFC, Code 301 Systems Review Office**
- **Madeline J. Butler, GSFC, Code 500, Deputy Chief Engineer, Applied Engineering and Technology Division**
- **Scott A. Greatorex, GSFC, Code 450.1, Chief, Networks Integration Management Office**
- **Thomas H. Stengle, GSFC, Code 595, Flight Dynamics Analysis Branch**
- **Joe Stevens, GSFC, Code 730, Systems Management Division**
- **Joseph M. Aquino, JSC-DV14, Manager, Space Communications Integration Office**
- **Gary A. Morse, KSC, Space Communications Integration**
- **Roger N. Clason, GSFC, Code 453, Ground Network Project**
- **Roger J. Flaherty, GSFC, Code 452, Space Network Project**
- **Mike Yettaw, DFRC Range Technical Monitor, Western Aeronautical Test Range**



Welcome/Introduction – Review Process



- **STS-124 GSFC Space Shuttle
Operational Readiness Review
(GSFC/Code 450/ORR) 04/07/08**
- **STS-124 JSC Mission Operations Directorate
Flight Readiness Review
(JSC/MOD/FRR) 04/29/08**
- **STS-124 KSC SSP
Flight Readiness Review (FRR) 05/13-14/08**



STS-124 Mission Overview



C. Smith/NENS



STS-124 ORR Scope



- **This Operational Readiness Review (ORR) covers changes planned after the STS-123 mission**
 - **Network changes planned prior to STS-123 were discussed in the STS-123 ORR**
 - **Disposition of any significant Network issues experienced during STS-123 will be discussed in the Post Mission Review (PMR) and carried forward by the Network Director (ND) as required**
 - **Network status current as of 03/28/08**
 - **Changes to Network status after the STS-124 ORR will be coordinated with and carried forward by the ND as required**



STS-124 Mission Overview – Mission Highlights



- **Launch Date/Time** May 31, 2008/2100 GMT
- **Launch Window** 10 minutes
- **Launch Vehicle/Site** Discovery / KSC, Pad 39A
- **Crew Size** 7 crew members (1 up/1 down)
- **Ascent Profile** 51.6 degrees
- **Frequency** Low
- **Insertion/Rendezvous Altitude** 122 Nautical Miles
- **Mission Duration** 11 Days
- **Primary Payload** Kibo Pressurized Module, Japanese Remote Manipulator System
- **Landing Date/Time** June 13, 2008/1600 GMT
 - Prime** **WX Alternate**
 - EOM KSC EDW
 - TAL ZZA MRN/ISTRES
 - AOA KSC WSSH



STS-124 Mission Overview - ISS Assembly Sequence



Date	Flight	Launch Vehicle/Elements
06/08/07	13A Space Shuttle (STS-117)	ITS S3/S4 and solar arrays
08/06/07	26P Russian Progress	Logistics and Resupply
08/08/07	13A.1 Space Shuttle (STS-118)	ITS S5 and Spacehab
10/10/07	15S Russian Soyuz	Crew transport; Logistics and Resupply
10/23/07	10A Space Shuttle (STS-120)	Node 2 Module
12/23/07	27P Russian Progress	Logistics and Resupply
02/07/08	1E Space Shuttle (STS-122)	Columbus Module
02/07/08	28P Russian Progress	Logistics and Resupply
03/09/08	Automated Transfer Vehicle (ATV)	Logistics and Resupply
03/11/08	1J/A Space Shuttle (STS-123)	Japanese (KIBO) Logistics Module
04/08/08	16S Russian Soyuz	Crew Transport; Logistics and Resupply
05/31/08	1J Space Shuttle (STS-124)	Japanese Experiment Module
09/10/08	HST/STS-125	Hubble Space Telescope
10/16/08	ULF2/STS-126	Crew Transport, Logistics and Resupply
11/06/08	Soyuz 17/EXP 18	Logistics and Resupply
12/04/08	15A/STS-119	Crew transport; Logistics and Resupply
03/12/09	2JA/STS-127	Crew transport; Logistics and Resupply
03/25/09	Soyuz 18/Exp 19	Logistics and Resupply



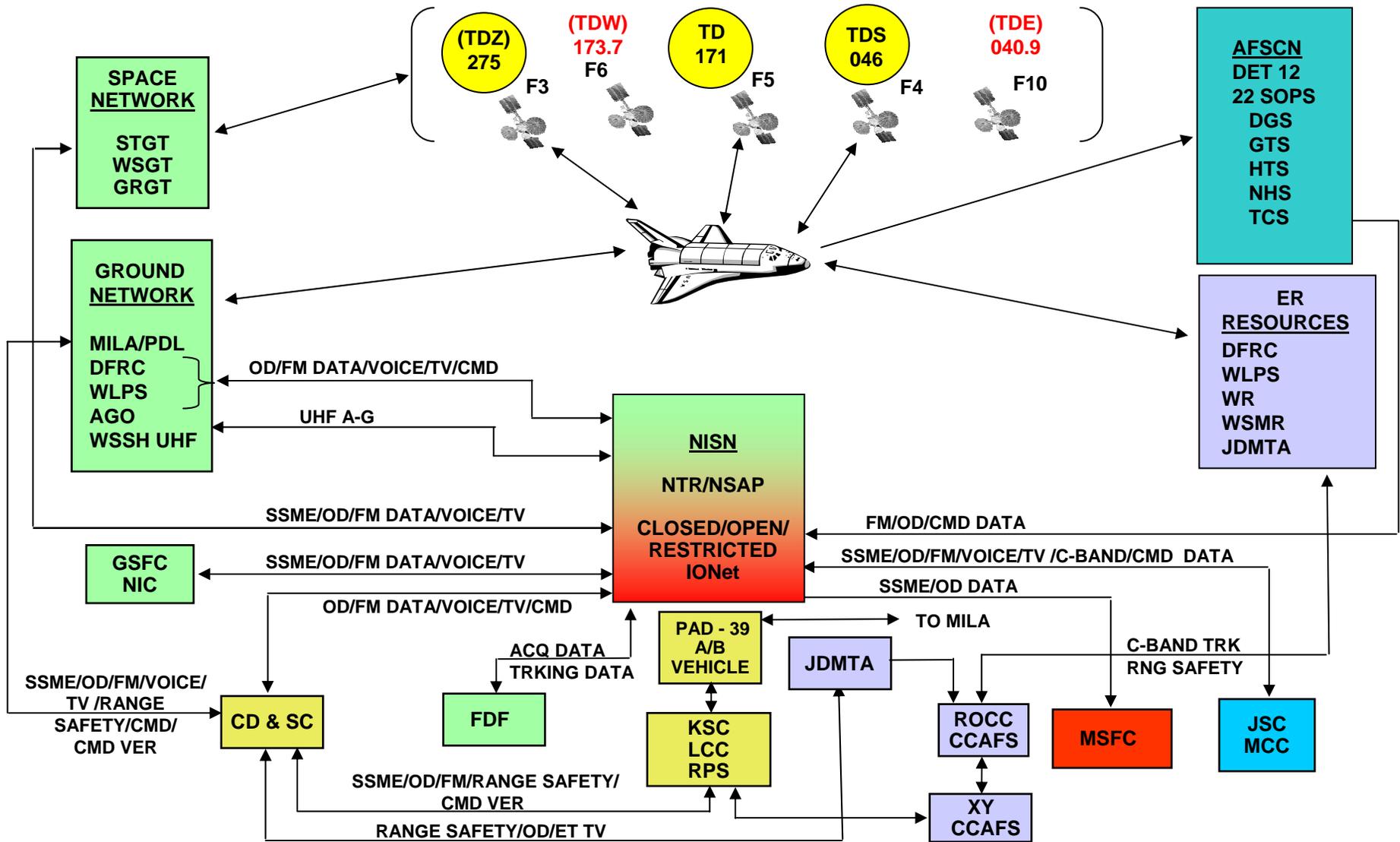
Integrated Network Overview



C. Smith/NENS

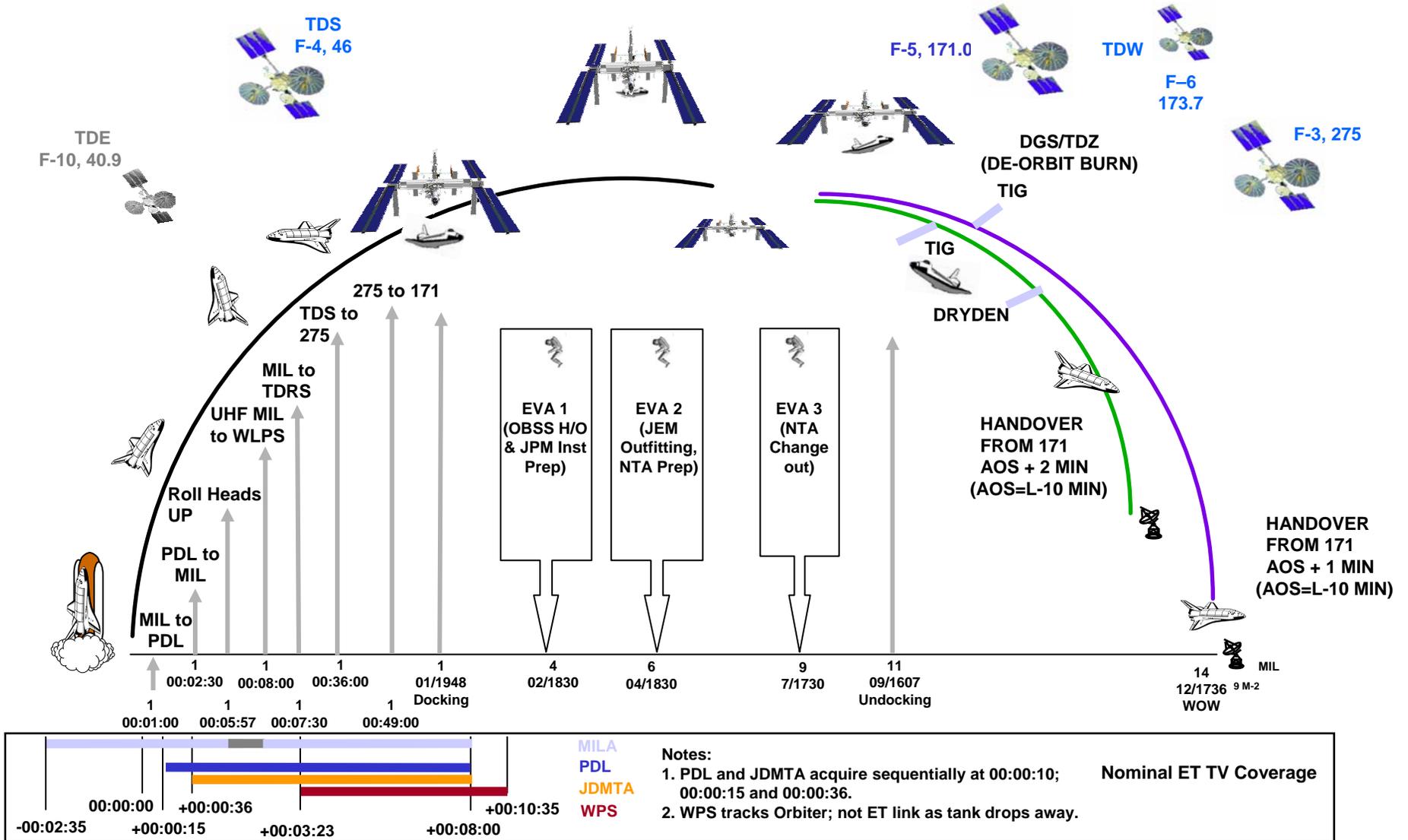


Space Shuttle Integrated Networks Overview





STS-124 Mission Overview - IN Coverage





Integrated Network Overview – Significant STS-123 Anomalies



- **Network In-Flight Anomaly (IFA) STS-0123-G-001:
Internal SONet Ring problems at KSC impacted voice communications on the Shuttle Flight Director Coord/SSPO Coord/OIS 232 and OIS 214 at L-3 hours**
 - Voice communications was impacted on redundant T-1s between KSC and MILA from 03/11-0330Z-0430Z
 - Support moved to redundant T-1 at 03/11-0430Z
 - Problem linked to faulty Synchronous Optical Network (SONet) controller cards
 - System stable after replacing two redundant SONet controller cards on 03/12/08



Integrated Network Overview – Significant STS-123 Anomalies (cont'd)



- **Corrective Actions (Network IFA STS-0123-G-001):**
 - Tiger Team formed (at Launch Director request) by KSC NTD Office with representatives from KSC, JSC, and GSFC
 - CD&SC given action to develop contingency voice loop capability to be used for OIS 232, SSPO and Flight Director, as well as additional fault isolation procedures to allow for quick identification and resolution of this type of anomaly
 - Increased emphasis to be placed on communicating with off-site personnel in the future when there is a problem
 - Point-to-point ring down between Flight Director and Launch Director has been requested by the Launch Director
 - Maximo Work Order (MWO) 497426 opened in conjunction with this IFA and will be used for tracking until closure



Integrated Network Overview – Significant STS-123 Anomalies (cont'd)



- **Network In-Flight Anomaly (IFA) STS-0123-G-002:
MSFC/KSC KMTS-A lost continuity impacting multiple Voice Circuits
between KSC and JSC during de-orbit prep**
 - Impacted JSC/KSC voice circuits (OIS-173 NAV/AIDS, Landing Field Prime 1 and 2, DoD Coord, DDMS Coord, OIS-254 P/C-4, Mission Comm Coord and OIS-322 ETL Ice)
 - Services switched to KMTS-B
 - Service was restored on KMTS-A after AT&T reset an ML-IP card and a VF-48 compression card at KSC
 - **Corrective Actions:**
 - NISN worked with the vendor to identify fix. Replacement of cards at KSC scheduled 04/16-18/08
 - NISN opened Problem Message Dispatch System (PMDS) 677085; problem remains under investigation



Integrated Network Overview – Significant STS-123 Anomalies (cont'd)



- **Network In-Flight Anomaly (IFA) STS-0123-G-003:
GUAM SGLT antenna went to standby mode just prior to the de-orbit burn**
 - Ground Antenna would not respond to ADPE generated commands
 - Antenna manually pointed to TDZ after Antenna Controller Unit (ACU) reset and prime antenna equipment failover were unsuccessful
 - TDZ supported the de-orbit burn event
 - Diego Garcia (REEF) RTS site was configured to support two-way pass if TDZ did not acquire
 - **Corrective Actions:**
 - Post pass maintenance bypassed the failed UPS protection circuit to allow faults to clear
 - Configured ACU to Standby/Command Position and antenna autotrack restored
 - CDS 49685 opened and problem remains under investigation



Integrated Network Overview – Significant STS-123 Anomalies (cont'd)



- **Network In-Flight Anomaly (IFA) STS-0123-G-004:
JSC to KSC command handover was delayed 8 minutes due to Shuttle Forward Link (SFL-1) misconfiguration during post-landing activities**
 - SFL-1 incorrectly configured to Exciter 3 instead of Exciter 4, resulting in command handover delay
 - Equipment check appeared good and a re-patch of configuration did not resolve the problem
 - Command switch check revealed wrong exciter selection
 - Exciter 4 selected and the uplink handover was successful
 - **Corrective Actions:**
 - Operator error. DR 49686 opened, RCCA 000452 in work
 - Network and post-landing handover support simulations to be scheduled



Integrated Network Overview – Significant STS-123 Anomalies (cont'd)



- **Network In-Flight Anomaly (IFA) STS-0123-G-005:
JSC to KSC UHF Air-to-Ground handover delay during post-landing support**
 - **Handover took 50 minutes to complete**
 - Handover delay due to incorrect patch connection at the Comm Patch Panel
 - Operator Error
 - **Corrective actions**
 - Crew changes made to more evenly balance crew skills and experience
 - Mission Support Plan (MSP) corrected and process for review and approval of MSP under review/rewrite
 - Network and post-landing support simulations to be scheduled for both shifts
 - DR#49693 and RCCA#000453 opened



Integrated Network Overview – Requirement Changes for STS-124



- There are no new Program Requirement Document (PRD) changes for STS-124



Network Changes KFRL Status



- **KSC Forward Return Link (KFRL) will be prime for KSC post-landing command support (except in case of EMCC)**
- **KFRL was developed to offload all of the throughput functions currently performed by today's MILA. Those functions are:**
 - **Building the KSC command stream**
 - **JSC 72KB commands to the KSC Record and Playback Facility (RPF)**
 - **JSC OD (SKR) Data to LCC/RPS**
 - **Post-launch dumps from MSFC or WSC to RPS**
 - **Post-landing OD from DFRC to LCC/RPS**
 - **Post-landing Dump from DFRC to RPS**



Network Changes KFRL Status (cont'd)



- Although KFRL will eventually have the ability to perform all of the MILA throughput functions, the project scope was revised to limit primary KFRL role to KSC command support functions
- Once operational, KFRL will be prime for the KSC command function during TCDT, Launch scrub turnaround, post-landing, and EMCC
- Testing
 - Performed preliminary command and telemetry test with MILA in the clear mode on 01/30/08 and 01/31/08
 - Encrypted command and telemetry test accomplished on 04/03/08 - 04/04/08



Network Changes KFRL Status (cont'd)



- **STS-124 Plan**
 - **Pending successful completion of pre-mission testing and resolution of KFRL network issues:**
 - **KFRL will be backup for KSC commanding during TCDT**
 - Record KFRL commands at MILA MPS and RPS for post test evaluation
 - **Command the Orbiter from KFRL at the completion of S0017**
 - **KFRL will be backup for KSC commanding during scrub T/A**
 - Record KFRL commands at MILA MPS and RPS for post-launch evaluation
 - **KFRL prime for KSC commanding during post-landing**
 - **MILA SFL prime for EMCC**



STS-124 Integrated Network Testing Overview



- **The Space Network (SN) and Ground Network (GN) are verified and validated for the mission using a standard sequence of tests:**
 - **Test 1101/1102: Real-time Ground Station OD Pulse Code Modulated (PCM) and FM telemetry data flow**
 - **Test 1108: Shuttle Ground Station range safety telemetry remote data flow**
 - **Test 2102: Ground Station command uplink data flow**
 - **Test 4101/4102: Ground Station Ultra High Frequency (UHF) uplink/downlink data flow**
 - **Test 1201: SN Space Shuttle Verification/Validation test**
 - **Test 3201: SN Vector Verification**
 - **Test 5202: JSC Mission Control Center (MCC)/GN Television Validation test**
 - **Terminal Countdown Demonstration Test (TCDT)**



Network Test Plan based on Launch of 05/31/08



ID	Task Name	Start	Finish	% Complete	Feb '08	Mar '08	Apr '08	May '08	Jun '08	Jul '08	Aug '08
					Feb	Mar	Apr	May	Jun	Jul	Aug
1	TO15 Human Spaceflight Support (CY05)	Thu 2/14/08	Mon 6/23/08	11%	[Gantt bar]						
2	STS-124	Thu 2/14/08	Mon 6/23/08	11%	[Gantt bar]						
3	Requirements Verification	Thu 2/14/08	Mon 4/21/08	15%	[Gantt bar]						
4	Operational Readiness Reviews	Fri 3/14/08	Mon 4/7/08	84%	[Gantt bar]						
5	GSFC ORR	Fri 3/14/08	Mon 4/7/08	84%	[Gantt bar]						
6	GSFC ORR Request for Information	Fri 3/14/08	Fri 3/14/08	100%	[Gantt bar]						
7	GSFC ORR Package Work-up and Distribution	Sat 3/22/08	Wed 3/26/08	100%	[Gantt bar]						
8	GSFC ORR Dry run	Thu 3/27/08	Thu 3/27/08	100%	[Gantt bar]						
9	GSFC ORR	Mon 4/7/08	Mon 4/7/08	0%	[Gantt bar]						
10	JSC MOD FRR	Wed 4/9/08	Tue 4/29/08	1%	[Gantt bar]						
11	JSC MOD Package Work-up and Distribution	Wed 4/9/08	Mon 4/21/08	0%	[Gantt bar]						
12	JSC MOD FRR	Tue 4/29/08	Tue 4/29/08	5%	[Gantt bar]						
13	KSC SSP FRR	Fri 5/2/08	Tue 5/20/08	0%	[Gantt bar]						
14	KSC SSP FRR Package Work-up and Distribution	Fri 5/2/08	Tue 5/13/08	0%	[Gantt bar]						
15	KSC SSP FRR	Mon 5/19/08	Tue 5/20/08	0%	[Gantt bar]						
16	Message Distribution Mission (ISIs)	Fri 4/18/08	Wed 6/11/08	0%	[Gantt bar]						
26	Message Distribution (OPNs)	Fri 4/18/08	Fri 5/23/08	0%	[Gantt bar]						
33	Integrated Network Testing	Mon 3/31/08	Thu 5/22/08	18%	[Gantt bar]						
34	KFRL Mission Testing	Mon 3/31/08	Thu 4/10/08	33%	[Gantt bar]						
35	KFRL Pre-Test Teleconference	Mon 3/31/08	Mon 3/31/08	100%	[Gantt bar]						
36	KFRL Testing with MILA	Thu 4/3/08	Fri 4/4/08	100%	[Gantt bar]						
37	KFRL Testing with MILA and JSC	Mon 4/7/08	Mon 4/7/08	0%	[Gantt bar]						
38	KFRL Testing with WLP	Tue 4/8/08	Tue 4/8/08	0%	[Gantt bar]						
39	KFRL Testing with MILA and JSC	Wed 4/9/08	Thu 4/10/08	0%	[Gantt bar]						
40	KFRL Testing with WSC	Thu 4/10/08	Thu 4/10/08	0%	[Gantt bar]						
41	KFRL Testing with DFRC	Thu 4/10/08	Thu 4/10/08	0%	[Gantt bar]						
42	Kirtland and JSC Simulation	Mon 4/21/08	Mon 4/21/08	0%	[Gantt bar]						
43	KSC S0044	Tue 4/22/08	Tue 4/22/08	0%	[Gantt bar]						
44	TCDT	Thu 5/8/08	Thu 5/8/08	0%	[Gantt bar]						
45	DFRC with JSC	Wed 5/14/08	Wed 5/14/08	0%	[Gantt bar]						
46	AGO with JSC	Thu 5/15/08	Thu 5/15/08	0%	[Gantt bar]						
47	STS PSS Calibration Event	Mon 5/19/08	Mon 5/19/08	0%	[Gantt bar]						
48	1108 Range Safety	Wed 5/21/08	Wed 5/21/08	0%	[Gantt bar]						
49	Launch Simulation	Thu 5/22/08	Thu 5/22/08	0%	[Gantt bar]						
50	Verification Testing	Fri 5/16/08	Tue 5/27/08	0%	[Gantt bar]						
51	Space Network Ver/Val (1201/5202)	Fri 5/16/08	Fri 5/16/08	0%	[Gantt bar]						
52	5202	Wed 5/21/08	Tue 5/27/08	0%	[Gantt bar]						
53	Guam Ver/Val	Wed 5/21/08	Wed 5/21/08	0%	[Gantt bar]						
54	SN Ver/Val	Thu 5/22/08	Thu 5/22/08	0%	[Gantt bar]						
55	Vector /Ver	Fri 5/23/08	Fri 5/23/08	0%	[Gantt bar]						
56	Shuttle TV	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
57	ET TV	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
58	MILAPDL	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
59	WPS	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
60	JDMTA	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
61	Premission Teleconference	Mon 4/28/08	Tue 5/27/08	0%	[Gantt bar]						
62	Premission Teleconference Data Accumulation	Mon 4/28/08	Fri 5/9/08	0%	[Gantt bar]						
63	Premission Teleconference	Fri 5/23/08	Fri 5/23/08	0%	[Gantt bar]						
64	Premission Board Meeting	Tue 5/27/08	Tue 5/27/08	0%	[Gantt bar]						
65	Mission Support	Fri 5/30/08	Wed 6/11/08	0%	[Gantt bar]						
66	Launch	Sat 5/31/08	Sat 5/31/08	0%	[Gantt bar]						
67	Console Support	Fri 5/30/08	Wed 6/11/08	0%	[Gantt bar]						
68	Landing	Wed 6/11/08	Wed 6/11/08	0%	[Gantt bar]						
69	STS-124 Post Mission Review	Thu 6/12/08	Mon 6/23/08	0%	[Gantt bar]						
70	Postmission Teleconference Data Accumulation	Thu 6/12/08	Wed 6/18/08	0%	[Gantt bar]						
71	Postmission Teleconference	Mon 6/23/08	Mon 6/23/08	0%	[Gantt bar]						



Integrated Network Overview – Service Requirements/Test Matrix



STS-124 Network Requirement Test Matrix (Revised: 03/28/2008) Green (G) - Successful Yellow (Y) - Partially Successful Red (R) - Failed Grey/Hashed - Not Applicable White - To Be Tested	AFSCN RTS Testing (05/13/08)	AGO/JSC Sim (05/15/08)	DFRC/JSC Sim (05/14/08)	MILA/PDL PSS Test (5/13/08)	TCDT / KSC S0017 (05/08/08)	KSC S0044 (04/24/08)	KSC S0009 (w/ETTV) (PADVAL) (TBD)	Range Safety - 1108 (05/21/08)	Launch Sim (05/22/08)	Vector Proficiency Sim (TBD)	SN 1201 (Ver/Val) (05/21-22/08)	FDF 3201 (Vector Ver) (05/23/08)	SN 5202- Guam and WSC (05/19/08)	MILA/PDL 5202 (05/19/08)	DFRC 5202 (05/19/08)
GSFC NIC Requirements															
<i>GN Verification</i>															
<i>SN Verification</i>															
NISN Requirements															
<i>NTR</i>															
<i>Closed IONet</i>															
<i>Tracking Data System</i>															
GSFC FDF Requirements															
<i>Generate/Distribute GN Acquisition Data</i>															
IIRV															
IRV															
INP															
<i>Generate/Distribute SN Acquisition Data</i>															
<i>Generate/Distribute TDRS Vectors</i>															
<i>Evaluate Tracking Data</i>															
LS UDTF															
HS UDTF															
TDM															
MDDF															



Integrated Network Overview – Service Requirements/Test Matrix (cont'd)



STS-124 Network Requirement Test Matrix (Revised: 03/28/2008) Green (G) - Successful Yellow (Y) - Partially Successful Red (R) - Failed Grey/Hashed - Not Applicable White - To Be Tested	AFSCN RTS Testing (05/13/08)	AGO/JSC Sim (05/15/08)	DFRC/JSC Sim (05/14/08)	MILA/PDL PSS Test (5/13/08)	TCDT / KSC S0017 (05/08/08)	KSC S0044 (04/24/08)	KSC S0009 (w/ETTV) (PADVAL) (TBD)	Range Safety - 1108 (05/21/08)	Launch Sim (05/22/08)	Vector Proficiency Sim (TBD)	SN 1201 (Ver/Val) (05/21-22/08)	DFD 3201 (Vector Ver) (05/23/08)	SN 5202- Guam and WSC (05/19/08)	MILA/PDL 5202 (05/19/08)	DFRC 5202 (05/19/08)
WSSH Requirements															
<i>Acquisition Data Processing</i>															
LTAS															
INP															
IIRV															
<i>UHF A-G Communications</i>															
ER Requirements															
<i>Range Safety</i>															
<i>C-band Radar Tracking</i>															
<i>LTAS Data Generation/Distribution</i>															
SN Requirements															
<i>Telemetry</i>															
<i>Command</i>															
<i>Tracking (TDM)</i>															
<i>Vector Processing (Nominal and Contingency)</i>															
<i>TV</i>															



Integrated Network Overview – Service Requirements/Test Matrix (cont'd)



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AGO Requirements															
<i>FM Telemetry</i>															
<i>OD Telemetry</i>															
<i>Command</i>															
<i>Acquisition Data Processing (IIRV)</i>															
DFRC Requirements															
<i>FM Telemetry</i>															
<i>OD Telemetry</i>															
<i>Command</i>															
<i>UHF A-G Communications</i>															
<i>Tracking</i>															
<i>SSM Creation/Distribution</i>															
<i>Acquisition Data Processing</i>															
ATF1															
ATF2															
ATF3															
TV															



Integrated Network Overview – Service Requirements/Test Matrix (cont'd)



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	MILA/PDL Requirements														
<i>FM Telemetry</i>															
<i>OD Telemetry</i>															
<i>Command</i>															
<i>UHF A-G Communications</i>															
<i>Tracking</i>															
<i>Range Safety</i>															
<i>SSM Creation/Distribution</i>															
<i>Acquisition Data Processing</i>															
<i>9M1</i>															
<i>9M2</i>															
<i>Best Source Select</i>															
<i>KSC RPS</i>															
<i>TV</i>															



Integrated Network Overview – Service Requirements/Test Matrix (cont'd)



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	WLPS Requirements														
<i>FM Telemetry</i>															
<i>OD Telemetry</i>															
<i>Command</i>															
<i>UHF A-G Communications</i>															
<i>Range Safety</i>															
<i>Acquisition Data Processing</i>															
<i>11M</i>															
<i>7.3M</i>															



Integrated Network Overview – Service Requirements/Test Matrix (cont'd)



STS-124 Network Requirement Test Matrix (Revised: 03/28/2008) Green (G) - Successful Yellow (Y) - Partially Successful Red (R) - Failed Grey/Hashed - Not Applicable White - To Be Tested	AFSCN RTS Testing (05/13/08)	AGO/JSC Sim (05/15/08)	DFRC/JSC Sim (05/14/08)	MILA/PDL PSS Test (5/13/08)	TCDT / KSC S0017 (05/08/08)	KSC S0044 (04/24/08)	KSC S0009 (w/ETTV) (PADVAL) (TBD)	Range Safety - 1108 (05/21/08)	Launch Sim (05/22/08)	Vector Proficiency Sim (TBD)	SN 1201 (Ver/Val) (05/21-22/08)	FDF 3201 (Vector Ver) (05/23/08)	SN 5202- Guam and WSC (05/19/08)	MILA/PDL 5202 (05/19/08)	DFRC 5202 (05/19/08)
	AFSCN Requirements														
HULA															
Telemetry															
Command															
BOSS															
Telemetry															
Command															
REEF															
Telemetry															
Command															
LION															
Telemetry															
Command															
GUAM															
Telemetry															
Command															
Kirtland AFB															
Acquisition Data Processing															
OAS															
Acquisition Data Processing															



Integrated Network Overview – Documentation



- **Generic mission documentation is up to date; mission-specific documentation will be transmitted as indicated**

Document Title	Status	Published Date
<i>Tracking and Data Relay Satellite System Network Operations Support Plan for Space Shuttle, 450-TNOSP-Space Shuttle</i>	Complete DCN 003	11/03 06/07
<i>HSF Emergency Mission Control Center Activation and Operations Procedure and Supplement, 450-CAP-EMCC</i>	Revision 2 DCN 001	07/06 12/07
<i>Network Operations Support Plan for the Space Shuttle Program, 450-NOSP-Space Shuttle</i>	Revision 1	02/08
<i>Network Verification Manual for the Space Shuttle Program, 450-VTR-STDN</i>	Complete DCN 002 Revision 1	12/04 03/06 Planned 09/08
<i>TDRSS Network Operations Support Plan for International Space Station, 450-602/ISS (to be superseded by 450-TNOSP-ISS)</i>	Complete DCN 013 Rewrite	10/98 09/03 Planned 07/08
<i>Network Verification Manual for the Space Shuttle Program, AFSCN Annex, 450-VTR-STDN, AFSCN Annex</i>	Complete	02/05
<i>Space Shuttle Network Operations Support Plan, AFSCN Annex, 450-NOSP-Space Shuttle AFSCN Annex</i>	Complete	03/06
<i>Network Operations Procedures for Television and Display Console Systems, 450-NOP-TV/DS (formerly STDN No. 502.25)</i>	Complete DCN 001	05/05 Planned 12/08



Integrated Network Overview – Documentation (cont'd)



Document Title	Status	Published Date
<i>GSFC HSF Contingency Action Plan, 451-CAP-GSFC-HSF</i>	Complete	04/05
<i>TDRSS NOSP for the ISS, VHF Annex, 450-TNOSP-ISS, VHF Annex</i>	Complete	09/06
<i>TDRSS NOSP for the ISS, ATV Annex, 450-TNOSP-ISS, ATV Annex</i>	Complete	06/07
<i>TDRSS NOSP for the ISS, HTV Annex, 450-TNOSP-ISS, HTV Annex (ss Appendix C to 450-602/ISS)</i>	Rewrite	Planned 10/08
<i>Configuration Management Freeze Policy for Integrated Networks and Supporting Elements, 450-CMFP-HSF/ELV</i>	Complete	06/07
<i>Network Integration Center Standard Operating Procedures, 451-SOP-NIC</i>	Complete Rev 1	06/04 04/07
<i>Ground Network (GN) Users Guide, 453-GNUG</i>	Complete Rev 2	02/05 05/07
<i>Ground Network Tracking and Acquisition Data Handbook, 453-HNDK-GN (ss STDN No. 724)</i>	Complete	05/07



Integrated Network Overview – Documentation

(cont'd)



Document Title	Status	Published Date
Interim Support Instruction (ISI) – Prepermission Status	In Work	L-30 days
STS Launch Count	In Work	L-20 days
Prepermission Acq Data	In Work	L-14 days
Mission Status	In Work	L-10 days
ET TV Digital File Transfer Procedure	In Work	L-10 days
FDF Staffing	In Work	L-10 days
Prepermission Acquisition Data Sequence Numbers	In Work	L-10 days
Nominal Mission Support Frequencies	In Work	L-10 days
DFRC UHF Delay Verification (Manual Mode at JSC)	In Work	L-10 days
WSSH MOU	In Work	L-10 days
Critical Mission Period	In Work	L-10 day
Network Configuration	In Work	L-10 days
HW/SW Freeze	In Work	L-7 days
High Data Rate Receiver	In Work	L-7 days
SN TV Over Mod	In Work	L-7 days



Integrated Network Overview – Documentation

(cont'd)



Document Title	Status	Published Date
WSMR T-1 TTY RDR CKT Procedures for FAX Backup	In Work	L-7 days
TXPNDR 5 Video Mission Codes and Private Medical Conference Codes	In Work	L-7 days
Private Medical Code Configurations	In Work	L-7 days
KSC Landing Count	In Work	L-5 days
Edwards Landing Count	In Work	L-5 days
Mission Site Release		WOW
Mission Termination		WOW +2 days



Integrated Network Overview – Potential Launch Conflicts



- The following Expendable Launch Vehicle (ELV) launches are scheduled as follows:
 - DELTA-III/OSTM 06/15/08 (WR)
 - GSFC/NIC, FDF, WR, PF1, PF2, AWOTS (data only), and NISN
- SN resource conflicts are addressed according to the SN Priority List
- Human Space Flight (HSF) Network Operations Managers (NOM) and ELV/Robotics NOMS work closely together to de-conflict shared resources during Shuttle Testing/Mission support periods



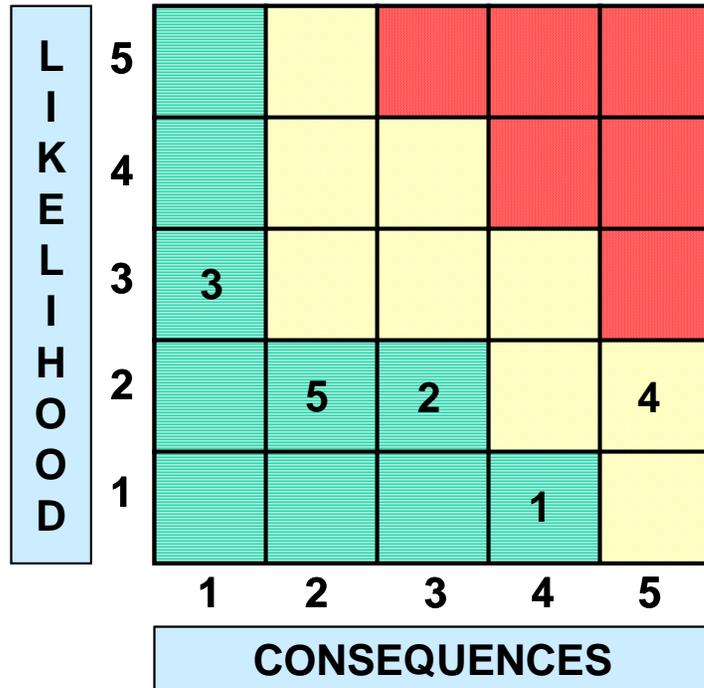
Integrated Network Overview – Freeze Plan



- **Hardware/software freeze will be implemented for the Integrated Network (IN) resources as follows:**
 - **MILA/PDL: TCDT 05/08/08**
 - **AGO, DFRC, NIC, WPS, WSSH, SN, and FDF: L-7 days**
 - **Air Force Satellite Control Network (AFSCN): L-2 days**
 - **NISN and GSFC Base Utilities/Facilities: L-5 days**
 - **Eastern Range (ER) Resources: After completion of L-1 day checks**
- **The ND coordinates all freeze waivers for necessary work**



Integrated Network Overview – Risks



LxC Trend	Rank	Approach	Risk Title
➡	1	M	Staff Fatigue
➡	2	M	NTR Voice
➡	3	M	Count Down Timing
➡	4	M	Schriever/Kirtland Transition
*	5	M	WLPS 11 M Antenna Halt

Criticality	L x C Trend	Approach
High	⬇ Decreasing (Improving)	M – Mitigate
Med	⬆ Increasing (Worsening)	W – Watch
Low	➡ Unchanged	A – Accept
	* New since last mission	R – Research



Integrated Network Overview – Risks (cont'd)



Rank	Risk Statement	Approach & Plan	Comments
<p>1</p> 	<p>If the frequency and duration of Shuttle Missions increase, there will be an increase in operator errors and unresolved issues due to staff fatigue, personnel stress and health problems, and decreased staff morale</p>	<p>Mitigate (short-term)</p> <ul style="list-style-type: none"> Supplement NIC Console staff with former operators (certified) as well as experienced engineers to meet minimal staffing levels and eliminate need for excessive hours for personnel. This approach was utilized for STS-120 <p>Mitigate (long-term)</p> <ul style="list-style-type: none"> Increase in SMM/NOM staffing to meet current and future mission requirements has been approved. Two new personnel hired and will start in 01/08. Short-term mitigation will be utilized until personnel certified 	<p>LxC remained unchanged, because while additional staff started in 01/08, their training and certification are still ongoing</p>

Risk Criticality   



Integrated Network Overview – Risks (cont'd)



Rank	Risk Statement	Approach & Plan	Comments
2 	If an NTR compressed voice service experiences sporadic voice problems, then voice conferences could experience degraded voice quality or loss of voice conference	<p>Mitigate (short-term)</p> <ul style="list-style-type: none">A workaround procedure has been developed to restore service by moving to a spare channel <p>Resolution (long-term)</p> <ul style="list-style-type: none">Implement vendor-recommended upgraded hardware and firmware in phases. Initial phase will accomplish upgrade for 43 prioritized devices, and additional devices will be upgraded subsequently as work-windows permit	<ul style="list-style-type: none">Random and sporadic voice problems experienced on NTR voice services (VF24/48 compression cards), have resulted in Tone, Noise, or no continuity in one or both directionsVendor recommended fix: upgrade VF24/48 voice compression cards, requiring/including Common Logic firmware and RADView software upgradesDeployment schedule of VF-48 cards is targeted for April 7 thru April 25, 2008, and contingent upon mission work freezes

Risk Criticality   



Integrated Network Overview – Risks (cont'd)



Rank	Risk Statement	Approach & Plan	Comments
3 	If JSC should lose the countdown clock from KSC, the associated troubleshooting and possible time involved in rebuilding internal clocks, could result in interruption and loss of focus to mission operations	Mitigate <ul style="list-style-type: none">JSC would rebuild clocks internally	JSC upgrade underway, the SR was approved. Materials received and the circuit is under test. S/W development and testing should be complete 05/23/08. S/W acceptance 06/20/08. OPS Step-up typically 2 months after SRT. However, firm date not available Count Down Timing Modification upgrade in process. Problem/NME equipment identified and slated for replacement. Online operations planned for October 2008

Risk Criticality   



Integrated Network Overview – Risks (cont'd)



Rank	Risk Statement	Approach & Plan	Comments
4 	If the Kirtland personnel are not certified for shuttle support prior to STS-124, then the possibility exists that the support from the AFSCN/RTS sites may be impacted	Mitigate <ul style="list-style-type: none">• Two weeks of intense training• Personnel from Schriever are slated to travel to Kirtland to assist in training	Coordination with JSC, Schriever and Kirtland personnel is underway to ensure the training is completed

Risk Criticality   



Integrated Network Overview – Risks (cont'd)



Rank	Risk Statement	Approach & Plan	Comments
5 	If the WLPS 11 meter antenna should fault while pre-positioning for a support or during then the support could be impacted or lost.	Mitigate <ul style="list-style-type: none">• Short term workaround to restore by power cycling the antenna pedestal.• Long term identify cause and repair	Station is currently investigating the intermittent problem.

Risk Criticality   



Integrated Network Overview – Risk Likelihood Rating Definitions



Likelihood Rating	Likelihood of Occurrence
1 – Very Low	0 – 20% The team’s process is sufficient to prevent this event
2 – Low	21 – 40% The team’s process is usually sufficient to prevent this type of event
3 – Moderate	41 – 60% The team’s process may prevent this event, but additional actions will be required
4 – High	61 – 80% The team’s process cannot prevent this event, but a different approach or process might prevent it. Requires management attention
5 – Very High	81 – 99% The team’s process cannot prevent this event. Requires immediate management attention



Integrated Network Overview – Risk Likelihood Rating Definitions (cont'd)



Consequence Rating	Technical/Performance
1 – Very Low	Minor or no impact to full mission or technical success/exit criteria or margins. Same approach maintained
2 – Low	Minor or no impact to full mission or technical success/exit criteria, but can handle within established margins. Same approach maintained
3 – Moderate	Moderate impact to full mission or technical success/exit criteria, but can handle within established margins. Workarounds available
4 – High	Major impact to full mission or technical success criteria, but still meets minimum mission success/exit criteria; threatens established margins. Workarounds available
5 – Very High	Loss of life, vehicle, spacecraft, or cannot meet minimum mission or technical success/exit criteria. No alternatives exist



GSFC Base Utilities and Mission Support Facilities



T. McCain/NASA



GSFC Base Utilities and Mission Support Facilities



- Facilities Overview – West Campus

Facility	Status	Comments
Chilled Water	G	“GO” to support mission
Steam	G	“GO” to support mission
Commercial Power	G	“GO” to support mission. (3 PEPCO Feeders Available)
Building 24 Boilers	G	“GO” to support mission
Building 24 Chillers	G	“GO” to support mission. Chillers #3 and 4 are out of service through June 2007 for replacement of cooling tower. Chillers 7 and 8 have been configured to diesel power. Chillers 5, 6, 7 and 8 are available to support mission
Building 24C Diesel Generators: 6+1 (N+1)	G	“GO” to support mission
Building 3/13/14 UPS	G	“GO” to support mission. All UPS operational. Quarterly PMs completed in December
Building 28	G	“GO” to support mission. Temporary generator will be connected to Building 28 to support FDF and Goddard TV functions



GSFC Base Utilities and Mission Support Facilities (cont'd)



- Facilities Overview – East Campus

Facility	Status	Comments
Chilled Water	G	“GO” to support mission
Steam	G	“GO” to support mission
Commercial Power	G	“GO” to support mission. (3 PEPCO Feeders Available)
Building 31 Chillers	G	“GO” to support mission
Building 31 Diesel Generators: 4+1 (N+1)	G	“GO” to support mission
Building 25 - Backup OCR	G	“GO” to support mission. All UPS operational. Quarterly PMs completed in December
Building 32	G	“GO” to support mission. All UPS operational. Quarterly PMs scheduled to be complete by end of January



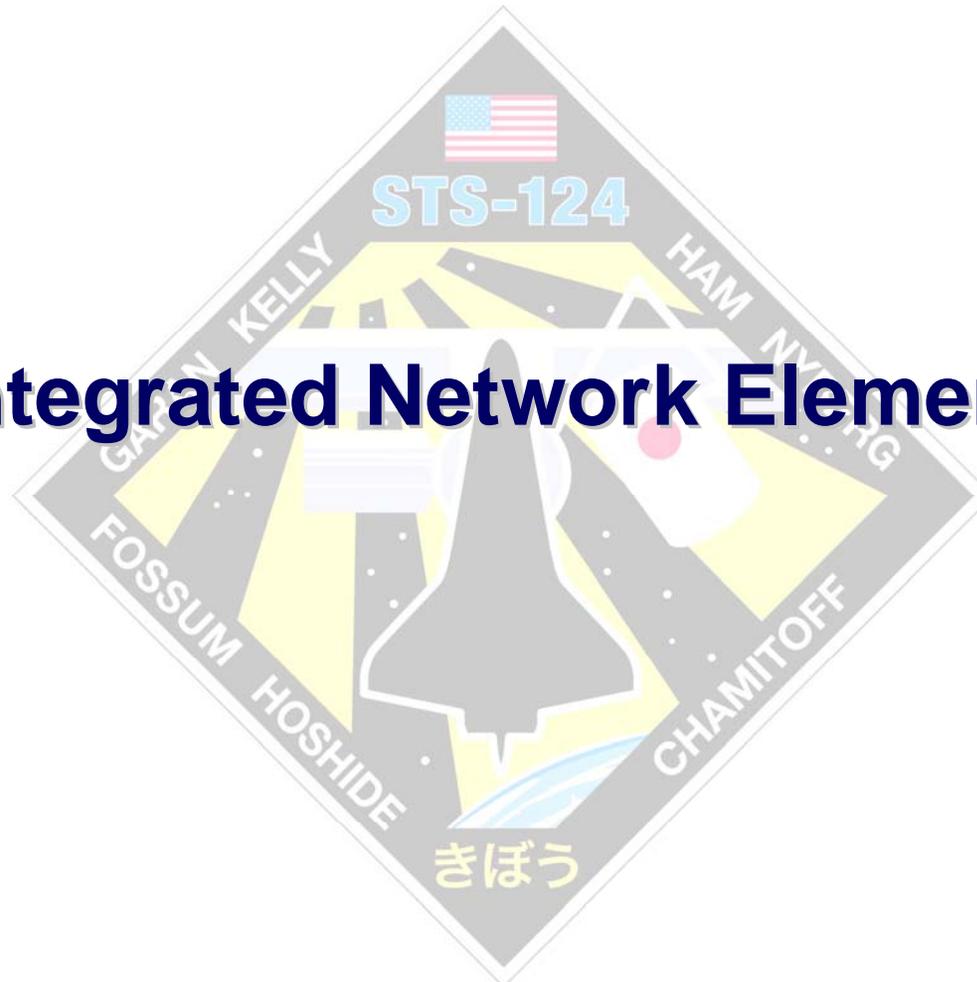
GSFC Base Utilities and Mission Support Facilities (cont'd)



- **Staffing, Training, and Certification**
 - **Mission Support Group Staffing**
 - Staffing level is sufficient to meet all requirements
 - Building 3/13/14 – Staffing consists of a minimum of 1 Electrician, 1 HVAC Technician, and 1 Supervisor at all times
 - Building 32 – Staffing consists of a minimum of 1 Electrician at all times
 - High Voltage – Supplement shifts to minimum of 2 Electricians at all times
- **Readiness Assessment/Remarks**
 - New emergency chiller configuration in place for STS-124 mission
 - GSFC Base Utilities and Mission Support Facilities are ready to support STS-124



Integrated Network Elements







IN Elements – GSFC NIC



- **Operational Changes since STS-123**
 - **Hardware:**
 - Replace 6 Automatic Transfer Switches in the NIC (04/9-11)
 - **Software**
 - Site Status Message (SSM) S/W to update SSM displays
- **Open Discrepancy Reports (DR)**

Shuttle Impact (Y/N)	DR#	System/ Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
N	6965	Unknown	NIC unable to receive low speed tracking data with DD header from MILA. NIC was able to receive the low speed tracking data with JJ header	Instruct MILA to utilize JJ when performing tracking interface checks with the NIC	In work	April 30, 2008



IN Elements – GSFC NIC (cont'd)



- **Staffing, Training, and Certification**

- **NIC Facilities/Support Staff**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
3	3/3	0	3/3

- **SMM/GNOM**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
6	4/4	2	4/4 * GNOM
6	4/4	2	4/4 * SMM

(*) GNOM and SMM staffing will be supplemented with certified or knowledgeable personnel as discussed in staffing fatigue risk



IN Elements – GSFC NIC (cont'd)



- **Open Work**

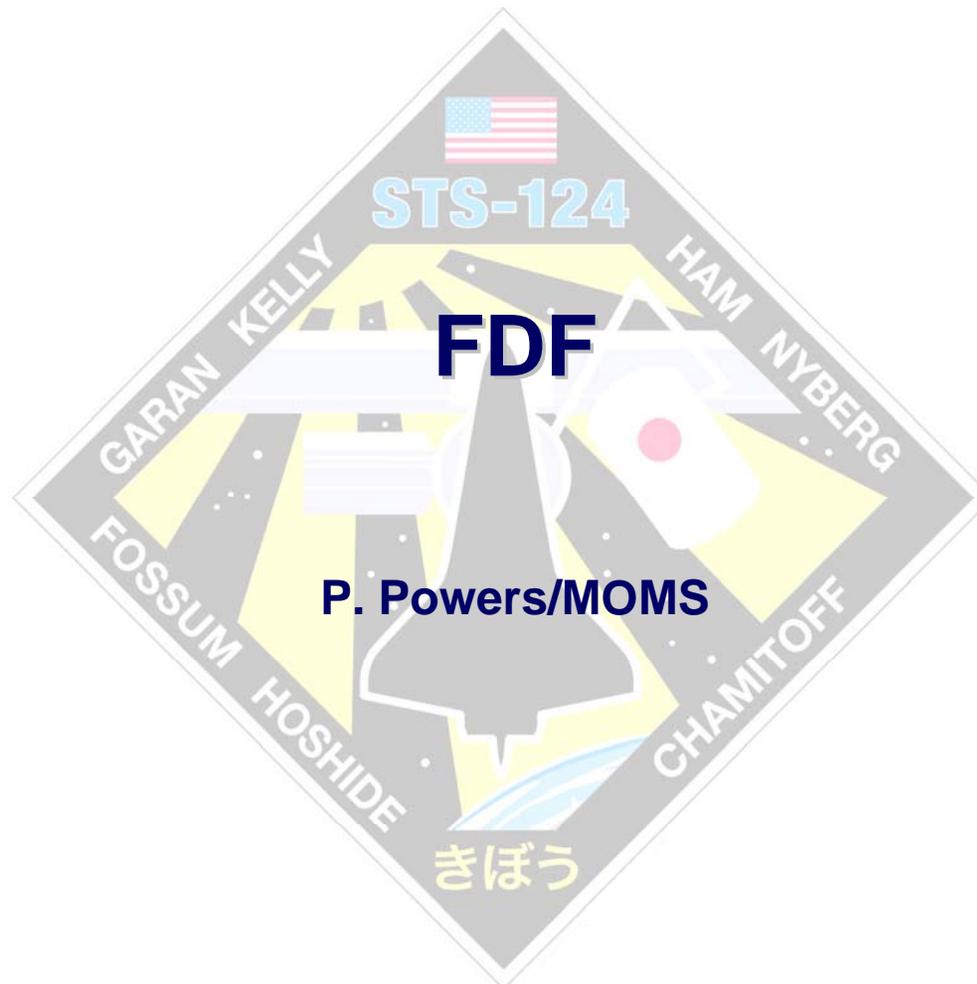
- Investigate and resolve a problem with the GSFC NIC receiving low speed tracking data with a DD header. The GSFC NIC will be working with GSFC NISN on this matter

- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	Replaced 6 Automatic Transfer Switches in the NIC
Generator	G	
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**

- The NIC is ready to support STS-124





IN Elements – FDF



- **Operational Changes since STS-123**
 - **Hardware**
 - Migrated FDF X-Terminal console workstations to PCs that use Exceed to interface with UNIX servers
 - Eliminated the use of “Anonymous FTP” for accessing FDF systems
 - Removed remaining CCTV equipment
 - Installed new video switch gear to manage how and where various video media (GSFC TV, PCs, DVD, etc.) are displayed within FDF
 - Replaced overhead projector in the FDF operations room with a new projector
 - **Software**
 - TRAMP 2008.1: Allows creation of Solar Lunar Planetary (SLP) files using the JPL DE4xx ephemeris for LRO support
- **Current Status: Green**
- **Staffing, Training, and Qualification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
9	9/9	0	9/9



IN Elements – FDF (cont'd)



- **Open Work: None**
- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	Available and ready if required
UPS	G	
HVAC	G	

- **Open Discrepancy Reports (DR)**
 - None
- **Readiness Assessment/Remarks**
 - FDF is ready to support STS-124





IN Elements – NISN



- **Operational Changes since STS-123**
 - **Hardware**
 - **Tracking Data System (TDS)**
 - **Prime and Backup systems will use new Avtec boards**
 - » **The Avtec board replaces aging hardware**
 - » **Performed successfully during STS-123**



IN Elements – NISN (cont'd)



- **Operational Changes since STS-123**
 - **Software**
 - **TDS**
 - **Prime and Backup will use 2.1H software**
 - » **New version provides fixes for JSC data length problem and establishes priority of STS tracking data**
 - » **Prime system successfully supported STS-123**
 - **DFRC Small Conversion Device (SCD)**
 - **SCD 6.2G release will be deployed to DFRC only and will support STS-124 in this configuration**
 - » **SCD 6.2G release will detect and reset a hung port condition within 30 seconds**
 - » **SCD 6.1L version will be available as a backup on the offline partition of the hard drive**



IN Elements - NISN (cont'd)



- Staffing, Training, and Qualification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
50	50/50	0	50/50

- **NOMC Consoles are staffed 24x7 x 365**
- **Management, Section Leads and GCC-IP Network Engineers are on console for all Critical Coverage Periods and on call 24x7 x 365**
- **All NISN support personnel are trained and certified**



IN Elements – NISN (cont'd)



- **Open Work**
 - **32kb/72kb MILA Command Lines**
 - **MILA Prime and Backup will be on NTR for STS-124**
 - NSAP satellite services and associated terrestrial will be disconnected prior to STS-124
 - One NSAP terrestrial path will remain until post STS-124
 - **Onizuka AFSCN Support**
 - **STS-124 Configurations**
 - The backup/alternate service will be supported on NTR pending successful testing during open work windows and on-orbit engineering passes
 - NSAP backup/alternate path will be available if necessary



IN Elements – NISN (cont'd)



- **Open Work (continued)**
 - **RAD Channel Bank Software/Firmware Upgrade**
 - Upgraded VF 24/48 voice compression cards replace existing cards that will be returned to the manufacturer for upgrade on a rotating basis until the deployment is complete
 - Deployment schedule is targeted for April 7 through April 25, 2008, and contingent upon mission work freezes
 - **Voice Sparring of E&M Signaling Services**
 - NISN has conducted analysis of spare E&M services between the major centers to ensure adequate make-goods are available
 - (2) KSC, (2) JSC, (1) VAFB, and (1) WSC spare E&M services will be wired and configured for make-goods contingent upon mission work freezes



IN Elements - NISN (cont'd)



- NISN HSF Data/Voice Services Final NTR Transition Schedule**

NISN Service Type	Transition Date
MSFC/MAF DACS: MAF STS DATA	4/7/08
KSC/DACS: MAF COUNTDOWN TIMING	4/8/08
MSFC/DACS: HVODS JSC TO MSFC; KSC/DACS: FAA TO JSC	4/9/08
MSFC/DACS: UT/MPRO, MMCD; KSC/DACS: US WEATHER SERVICE	4/10/08
GSFC/OAFB: BACKUP COMMAND TO OAFB, GSFC/KSC: BACKUP 72KB COMMAND, 72KB FWD COMMAND ALTERNATE: GSFC/WSC: OPEN IONET; MSFC/DACS: MSFC OPTIMIZED CT-1 SERVICES	4/11/08
JSC/KSC: PRIME GNC/FCO FAILSAFE, MER DATA	4/15/08
MSFC/KSC: VIDEO SWITCH, KMTS-B, MIDDS, VIDEO SWITCH, PC GOAL	4/21/08 - 4/24/08



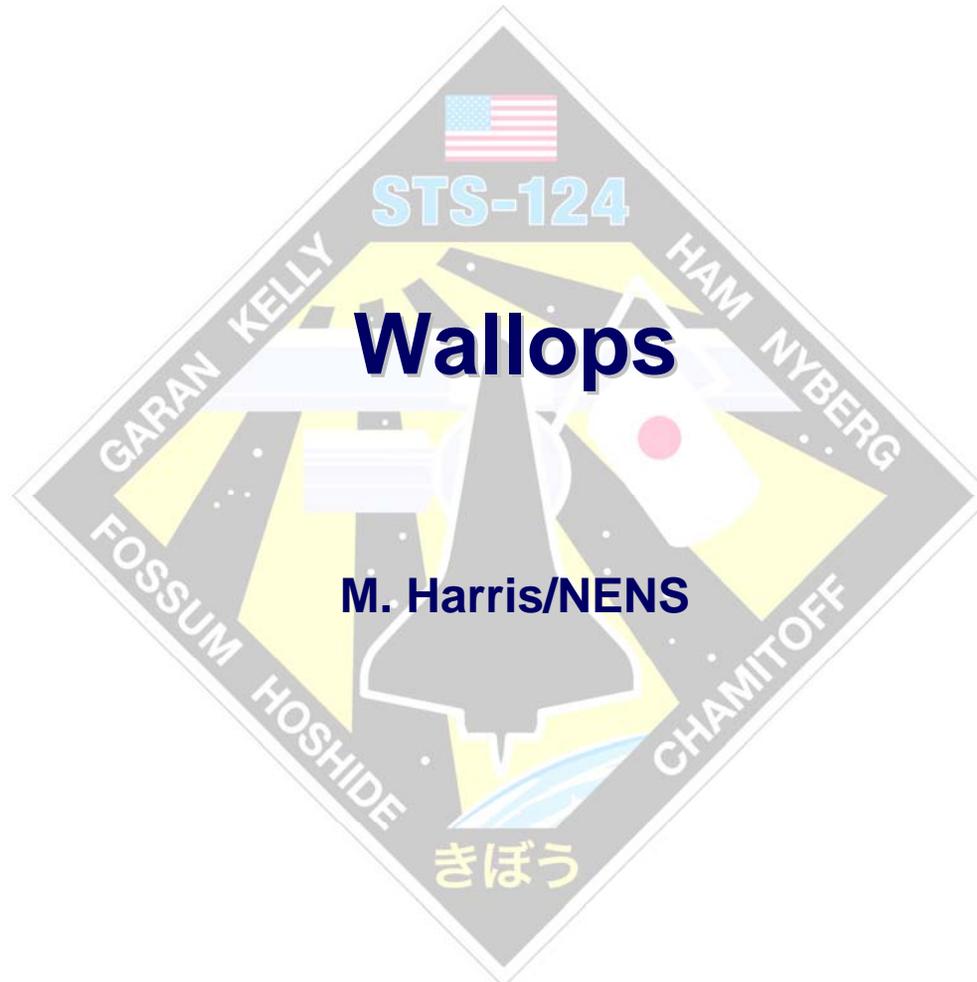
IN Elements – NISN (cont'd)



- **Facilities Overview for the NISN/NASCOM Network Infrastructure in GSFC Buildings 3/14, 28, and 32**

Item	Status	Comments
Commercial Power	G	GSFC Facilities Management reports PMs are Current
Generator	G	GSFC Facilities Management reports PMs are Current
UPS	G	GSFC Facilities Management reports PMs are Current
HVAC	G	GSFC Facilities Management reports PMs are Current
NOMC PDU's	G	GSFC Facilities Management reports PMs are Current

- **Readiness Assessment/Remarks**
 - NISN will process all FERS during mission IAW NISN SOP-002, CCB approved November 2007
 - NISN is ready to support STS-124





IN Elements - WPS



- **Operational Changes since STS-123**
 - **Hardware: None**
 - **Software: Installed a patch to the SCC Hwnctrl software on April 01, 2008**
- **Station Configuration (Prime/Backup System Configuration for STS-124)**
 - **Launch**
 - **Prime**
 - **11M Enertec for CMD/TLM, SSME, and Uplink**
 - **Microdyne Receivers will be used for ET TV and “B/U to TDRS” mode and Backup Enertec overall**
 - **Backup**
 - **7.3M downlink for data and ET TV (no command)**



IN Elements – WPS (cont'd)



- **Station Configuration (continued)**
 - **On-orbit**
 - **Prime**
 - 11M Enertec for CMD/TLM, FM dumps, and uplink
 - Microdynes for “B/U to TDRS” mode and B/U Enertec overall
 - **Backup: None**



IN Elements – WPS (cont'd)



- Open Discrepancy Reports (DR)**

Shuttle Impact (Y/N)	DR#	System/ Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
Y	45131	System Computers / Slaving	"Blue Screen" anomaly on 01/17/07. Last recurrence 06/06/07	Redundant system	In work	June 30, 2008
N	48652	Enertec Down Converter	Loss of communication, 12/19/07	Reset and resend configuration	In Work	Unknown
Y	49543	Antenna	Antenna halted during setup, 3/16/08. Last recurrence 3/26/08	Recycle antenna pedestal power	In Work	Unknown
Y	49675	Antenna	Antenna failed to setup correctly, 3/26/08	Recycle ACU and antenna	In Work	Unknown

- Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
10	4 Launch, 2 Orbit /10	0	4/8



IN Elements – WPS (cont'd)



- **Open Work**
 - Update local STS-124 Launch Support Plan by 04/17/08

- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	Backup generators will be online
Generator	G	Backup generators will be online
UPS	G	The antenna drive equipment does not have UPS protection
HVAC	G	No known problems; additional staff will be standing by

- **Readiness Assessment/Remarks**
 - WPS is ready to support STS-124





IN Elements - AGO



- **Operational Changes since STS-123**
 - **Hardware**
 - **New Symmetricom CS-4000 Cesium Standard installation**
 - **New Clear-Com VCS system installation**
 - **Software**
 - **None**
- **Station Configuration (Prime/Backup System Configuration for STS-124)**
 - **Prime: 9M antenna, Mfr for FM Dump and OD GN Mode, Microdyne RCVR for OD TDRS Mode monitoring, XP-PTP #2, and redundant B&H RCDR**
 - **Backup: 12M antenna for downlink, 7M antenna for uplink, NT PTP #1**



IN Elements – AGO (cont'd)



- **Open Discrepancy Reports (DR)**
 - None
- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
17	17/17	0	15/15

- **Open Work**
 - None



IN Elements – AGO (cont'd)

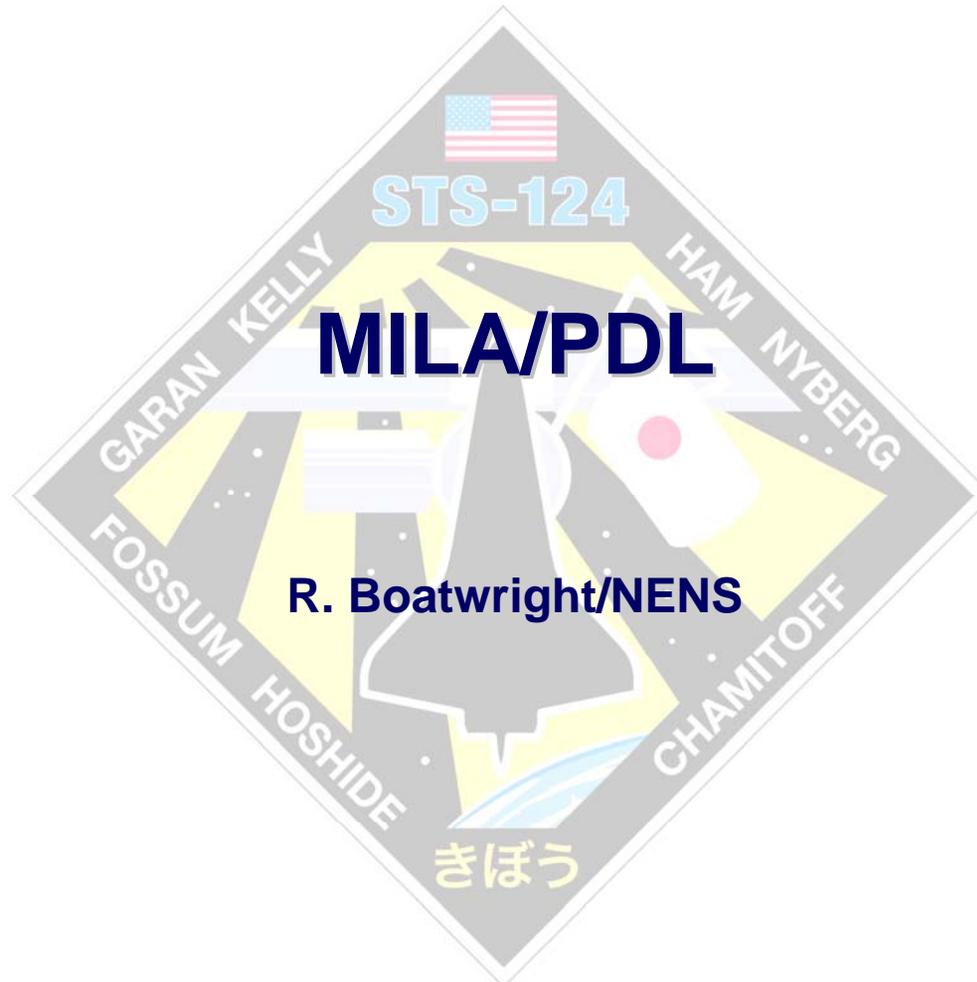


- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Diesel Generator	G	100% available and ready for support if required
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**

- Santiago is ready to support STS-124





IN Elements – MILA/PDL



- **Operational Changes since STS-123**
 - **Hardware**
 - MILA Commands circuit transition to NTR from NSAP. MILA will support STS-124 throughout all phases with NTR on the Prime and Backup Command lines
 - New RCI computers were installed in positions 2, 4, and 7 at MILA and position 2 at PDL. The new computers replace obsolete RCI computers
 - KFRL anticipate using KFRL to support post-landing activities for STS-124. KFRL is not used for JSC operations. KFRL is used for TCDT, Scrub Turnaround, EMCC activation, and post-landing support
 - **Software**
 - Air-to-Ground software 4122.013 and 4130.008 for the Subsystem Controller (SSC) Antenna Control Unit was implemented in the TELTRAC UHF system. This completes the upgrade to new antenna control unit
 - Data Generator Replacement System (DGRS) Engineering Changes (EC) 7155 and 7156
 - Site Status Message (SSM) S/W 4107_039 to update SSM



IN Elements – MILA/PDL (cont'd)



- Open Discrepancy Reports (DR)

Shuttle Impact (Y/N)	DR#	System/Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
Y	48172	Shuttle Forward Link (SFL)	NSP unable to achieve frame sync and COMSEC lock in CODING ON mode	The optical transceiver between the RED and BLACK SFL rack was bypassed	Green with optical transceiver patched out. Patch will remain in place until completion of STS-124	TBD
Y	49686	Shuttle Forward Link-1 (SFL-1)	Post-landing support JSC to KSC command handover took longer than expected due to an O/E	Incorrect exciter was selected, made correct exciter selection	RCCA 000452	TBD
Y	49693	Shuttle UHF A-G	Post-landing support JSC to KSC UHF handover took longer than expected to complete due to an O/E	Incorrect patch was made at Comm patch panel, made correct patch	RCCA 000453	TBD



IN Elements – MILA/PDL (cont'd)



- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
24	25/25	+1	25/21 (note)

Note: 1 RF technician and 2 Data/Comm technicians in training

One Operation Supervisor scheduled to leave our staff, no replacement hired yet. New Deputy Operations Manager began work 03/27/08

Site Engineers and Goddard Engineers will provide technical direction as required



IN Elements – MILA/PDL (cont'd)



- **Open Work**

- **Network In-Flight Anomaly (IFA) STS-0123-G-004:
JSC to KSC command handover was delayed 8 minutes due to Shuttle Forward Link (SFL-1) misconfiguration during post-landing activities**
 - SFL-1 incorrectly configured to Exciter 3 instead of Exciter 4, resulting in command handover delay
 - Equipment check appeared good and a re-patch of configuration did not resolve the problem
 - Command switch check revealed wrong exciter selection
 - Exciter 4 selected and the uplink handover was successful
 - **Corrective Actions:**
 - Operator error. DR 49686 opened, RCCA 000452 in work
 - Network and post-landing handover support simulations to be scheduled



IN Elements – MILA/PDL (cont'd)



- **Open Work (continued)**
 - **Network In-Flight Anomaly (IFA) STS-0123-G-005:
JSC to KSC UHF Air-to-Ground handover delay during post-landing support**
 - **Handover took 50 minutes to complete**
 - Handover delay due to incorrect patch connection at the Comm Patch Panel
 - Operator Error
 - **Corrective actions**
 - Crew changes made to more evenly balance crew skills and experience
 - Mission Support Plan (MSP) corrected and process for review and approval of MSP under review/rewrite
 - Network and post-landing support simulations to be scheduled for both shifts
 - DR#49693 and RCCA#000453 opened



IN Elements – MILA/PDL (cont'd)



- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	PDL Switchgear problem; load sharing problem resolved. Reverse power relays replaced. No problems seen during STS-123 support
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**
 - MILA is ready to support STS-124





IN Elements – SN



- **Operational Changes since STS-123**
 - **Hardware**
 - **WSGT Central Antenna Cable Refurbishment**
 - **KSAR-IF HW Installation**
 - **NCCDS K-Server memory upgrade – increase memory from 2G to 4G**
 - **GN Scheduling Computer upgrade**
 - **Software**
 - **WSC 08002 - Delivered to WSGT on 04/02/08 and STGT on 04/09/08**
 - **No HSF specific fixes**



IN Elements – SN (cont'd)



- **TDRS Fleet Management**
 - **TDRS-4 KSA-F/R Polarization restriction removed**
 - **No constraint on polarization scheduling during the forecast time frame or prior to the start of an active event in the real time period**
 - **Continue to monitor TDRS-3 SSA1 Forward helix current**
 - **Procedures on-console to configure to redundant TWTA if required**
- **Projected Changes**
 - **Hardware**
 - **WSGT North Antenna Pintle Bearing Replacement – 06/02/08 through 08/01/08**
 - **Software**
 - **WSC 08003 – Delivery projected for WSGT/STGT in May 2008**
 - **NCC 0801 – Delivery projected for May 2008**



IN Elements – SN (cont'd)



- Open Discrepancy Reports (DR)

Shuttle Impact (Y/N)	DR#	System/Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
Y	CDS-40275 DR-47467	USS KSAR	IR/HDRR False/No Lock	ISI issued to inform all parties and provide corrective action	SW development	TBD
Y	CDS-40305 DR-46602 DR-46603	DIS	Events experience slow connections for shuttle video/data service paths (video switch, command echo, etc). The slow connections have been observed STGT/WSGT systems	ISI issued that provides guidance for JSC Command to verbally coordinate all GCMR transmissions with the WSGT/STGT SS	Monitor – Transition to Alpha may alleviate problem	None
Y	CDS- 43446	DIS	WSGT HDDR does not failover to second recorder	Perform manual failover to second recorder. AN #570	Monitor	TBD - Transition to LORR
N	CDS- 47099	GRGT TV	GRGT Shuttle Frame Sync “B” chain Reset	Problem clears with reset	In work	TBD – awaiting checkout
N	CDS- 47100	GRGT TV	GRGT KSAR-1 “B” TV Signal Low	No apparent impact	In work	TBD
Y	CDS- 49130	GRGT TV	SGLT-6 KSAR-1B chrominance to luminance gain out of spec	Adjustments will be made real-time as required	In work	TBD



IN Elements – SN (cont'd)



- **Staffing, Training, and Certification**

- **Operations**

- **Numbers reflect per shift minimum staffing requirement (4 shift rotation)**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
12	12/12	0	12/12

- **Maintenance**

- **Numbers reflect per shift minimum staffing requirement (3 shift rotation)**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
9	9/9	0	9/9



IN Elements – SN (cont'd)



- **Staffing, Training, and Certification (continued)**

- **Guam**

- **Numbers reflect per shift minimum staffing requirement (4 shift rotation)**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
2	2/2	0	2/2



IN Elements – SN (cont'd)



- **Open Work**
 - **HRDS maintenance is on-going**
 - **ADPE Upgrade (ADPE-U)**
 - **TOCC-2 Reconfiguration (3/08 – 7/08)**
 - **New console installation, controller position relocation**
 - **SGAS Antenna Implementation (2/08 – 5/08)**
 - **EC Installation, 16.5 meter antenna re-assembly, system test**
 - **STGT Chiller Replacement - CP-51**
 - **WSGT Central Antenna Pintle Bearing Replacement – 04/07/08 through 05/30/08**



IN Elements – SN (cont'd)



- **Open Work (continued)**
 - **GDIS Replacement – TO-104**
 - **Phase I Timeplex Removal – Move Voice circuits and Admin LAN to router, encryptor (5/20 – 5/31)**
 - **Phase IIA Network Migration – unencrypted network type services moved off the MDM and on to the encrypted routers**
 - **Phase IIB Megamux Replacement - phase eliminates the MM+ equipment and replaces it with Low Speed (LS) serial to IP encapsulators**



IN Elements – SN (cont'd)



- Facilities Overview

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	Capacity will be maintained during chiller replacement, CP- 51

- Readiness Assessment/Remarks
 - SN is ready to support STS-124





IN Elements – KSC CD&SC



- **Operational Changes since STS-123**
 - **Hardware**
 - Replaced two faulty SONet controller cards on prime and B/U systems on 03/12/08 to restore redundancy to SONet. SONet failure caused the noise problems on redundant T-1 voice circuits between KSC and MILA (Reference: STS-123 IFA-001)
 - **Software: None**
- **Open Discrepancy Reports (DR)**
 - Interim Problem Report (IPR) 84 was opened at the on-set of the voice loop problem and subsequently closed when voice comm presented to the Test team a plan to block out the noise if it reoccurred. Maximo Work Order (MWO) 497426 was opened in conjunction with IFA STS-123-001 and will be used for tracking until closure
- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
30	30/30	0	30/30



IN Elements – KSC CD&SC (cont'd)



- **Open Work**

- Tiger Team formed (at Launch Director request) by KSC NTD Office with representatives from KSC, JSC, and GSFC to work through lessons learned and implement procedures to prevent a recurrence
- CD&SC given action to develop contingency voice loop capability to be used for OIS 232, SSPO, and Flight Director, as well as additional fault isolation procedures to allow for quick identification and resolution of this type of anomaly

- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**

- KSC CD&SC is ready to support STS-124



DoD Range Resources

M. Gawel/ER



IN Elements – DoD Range Resources



DoD Radars (ER/WR/WSMR) / Telemetry (JDMTA)

- **Operational Changes since STS-123**
 - **Hardware: None**
 - **Software: None**
- **Open Discrepancy Reports (DR) (ROCC Only)**

Shuttle Impact (Y/N)	DR#	System/ Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
Y	RS0600084EOL	FOV 1	Data output not updating on every cycle	DRSD being evaluated as workaround	In Process	2009
Y	RS0600151EOL	FOV 1	FOV 1 applies refraction correction to all radar data	YES, JSC NAV will not correct track data	Closed	19 Mar 08
Y	RS0600149EOL RS0700232EOL	FOV 1	Software does not down weigh optics source at proper time	YES, FOV 1 Operator will manually inhibit	In Process See Note	Unknown

NOTE: This is a Level 2 Configuration File Modification by Spacelift Range Systems Contract (SLRSC) local contractor CSR has requested permission to perform this task; awaiting AFSC approval



IN Elements – DoD Range Resources (cont'd)



DoD Radars (ER/WR/WSMR) / Telemetry (JDMTA) continued

- **Staffing, Training, and Certification**
 - Staffing level is sufficient to meet all requirements
 - All personnel are trained and certified
- **Open Work**
 - None
- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	



IN Elements – ER Resources (cont'd)



NASA Radars (DFRC/WLPS)

- **DFRC Operational Changes since STS-123**
 - **Hardware**
 - DFRC Radar Low-speed RS-232 switches (second line being established)
 - Tested and awaiting Network approval to close CCR
 - WLPS None
 - **Software**
 - DFRC awaiting Engineering document for Network approval
 - WLPS None
- **Open Configuration Change Requests (CCR)**
 - **None**



IN Elements – ER Resources (cont'd)



NASA Radars (DFRC/WLPS) continued

- **Open Discrepancy Reports (DR) (DFRC Only)**

Shuttle Impact (Y/N)	DR #	System/ Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
N	1520	Radar/ Camera	No zoom or focus control	Use "as-is" until replacement available	Functional, with limitations	Unknown
N	1554	Radar	Power Programmers malfunctioning, causing attenuation	Monitor at transmitter and switch to "local" mode if occurs	No spares waiting on vendor for repair solution or replacement	Unknown



IN Elements – ER Resources (cont'd)



NASA Radars (DFRC/WLPS) continued

- **Staffing, Training, and Certification**
 - Staffing level is sufficient to meet all requirements
 - All personnel are trained and certified
- **Open Work**
 - None
- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	



IN Elements – ER Resources (cont'd)



- **DoD Range Readiness Assessment/Remarks**
 - ER Resources are ready to support STS-124



AFSCN
Lt. Tobey/USAF



IN Elements – AFSCN



- **Operational Changes since STS-123**
 - **Hardware**
 - Supporting STS-124 from SOC-97 at Kirtland, New Mexico, with the same ground system (COBRA)
 - **Software**
 - Adding shuttle support software at SOC-97
 - **Week of Ops testing of SOC-97 set to start on 05/05/08**
 - **Connectivity, procedure updating, and training of personnel to be completed NLT 05/23/08**
- **Station Configuration (Prime/Backup System Configuration for STS-124)**
 - **Prime**
 - BOSS, LION, and REEF prime for launch. BOSS, LION, REEF, HULA, and GUAM available for on-orbit support
 - **Backup: Not Applicable**



IN Elements – AFSCN



- **Open Discrepancy Reports (DR)**
 - Not Applicable
- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
4	4/4	0	4/5*

*One SOC-96 Certified Operator will help for launch and landing of STS-124 at SOC-97

- **Open Work**
 - Certification of SOC-97 personnel at Kirtland (to be complete NLT 05/23/08)



IN Elements – AFSCN (cont'd)



- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**
 - AFSCN is ready to support launch





IN Elements – DFRC



- **Operational Changes since STS-123**
 - **Hardware**
 - None
 - **Software**
 - None

- **Station Configuration (Prime/Backup System Configuration for STS-124)**
 - **Prime: ATF-1**
 - **Backup: ATF-2**
 - **Backup Landing Contingency: ATF-3**



IN Elements – DFRC (cont'd)



- Open Configuration Change Requests (CCR)

Shuttle Impact (Y/N)	CCR #	System/Subsystem	Change Description	Operational Workaround	Projected Closure Date
N	4244	ATF/ATF-2	Video Filter Test and Installation for Shuttle Video	N/A	Post STS-124
N	4271	DGRS	Avtec to Monarch card replacement	N/A	Post STS-123
N	4272	DARS	2048/1024Kbs desktop scenario addition	N/A	Unknown
N	4274	Data Rack	STS 125/400 Data Rack console upgrade – dual mission enhancement	N/A	Post STS-123



IN Elements – DFRC (cont'd)



- Open Discrepancy Reports (DR)

Shuttle Impact (Y/N)	DR #	System/ Subsystem	Problem Description	Operational Workaround	Current Status	Projected Closure Date
Y	1593	SCDs	SCD port control lost during GSFC port disabling	ISI procedure in place for reboot of SCD for remote control	Functional, but temporary loss of control	Unknown
N	1566	ATF3	ATF 3 Exciter GPIB Communication Problem Exciter 1	Software setups to Exciter 2 as default instead Exciter 1	Vendor working on software fix	Unknown
N	1602	DARS	2048 sim data lock problem	N/A	Awaiting support from GSFC (Ken Clark)	Unknown
N	1621	ATF-3	Stow-pin release failure	Disabled mechanism	Awaiting parts	04/04/08



IN Elements – DFRC (cont'd)



- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
28	28/28	0	20/20

- Increase staffing requirements in support of ATF-3

- **Open Work**

- None

- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	The WATRs concerns with proper upkeep of the UPS and other systems has been taken to the highest level of the Facilities management for disposition
HVAC	G	



IN Elements – DFRC (cont'd)



- **Readiness Assessment/Remarks**
 - **DFRC is ready to support STS-124**





IN Elements - WSSH



- **Operational Changes since STS-123**
 - Hardware: None
 - Software: None
- **Open Discrepancy Reports (DR)**
 - None
- **Open Work**
 - None
- **Staffing, Training, and Certification**

STS-123 Staffing	STS-124 Staffing (Required/Staffed)	Deltas (Staffed)	Certified Personnel (Required/Staffed)
3	3/3	0	3/3



IN Elements – WSSH (cont'd)



- **Facilities Overview**

Item	Status	Comments
Commercial Power	G	
Generator	G	
UPS	G	
HVAC	G	

- **Readiness Assessment/Remarks**

- Ready to support STS-124



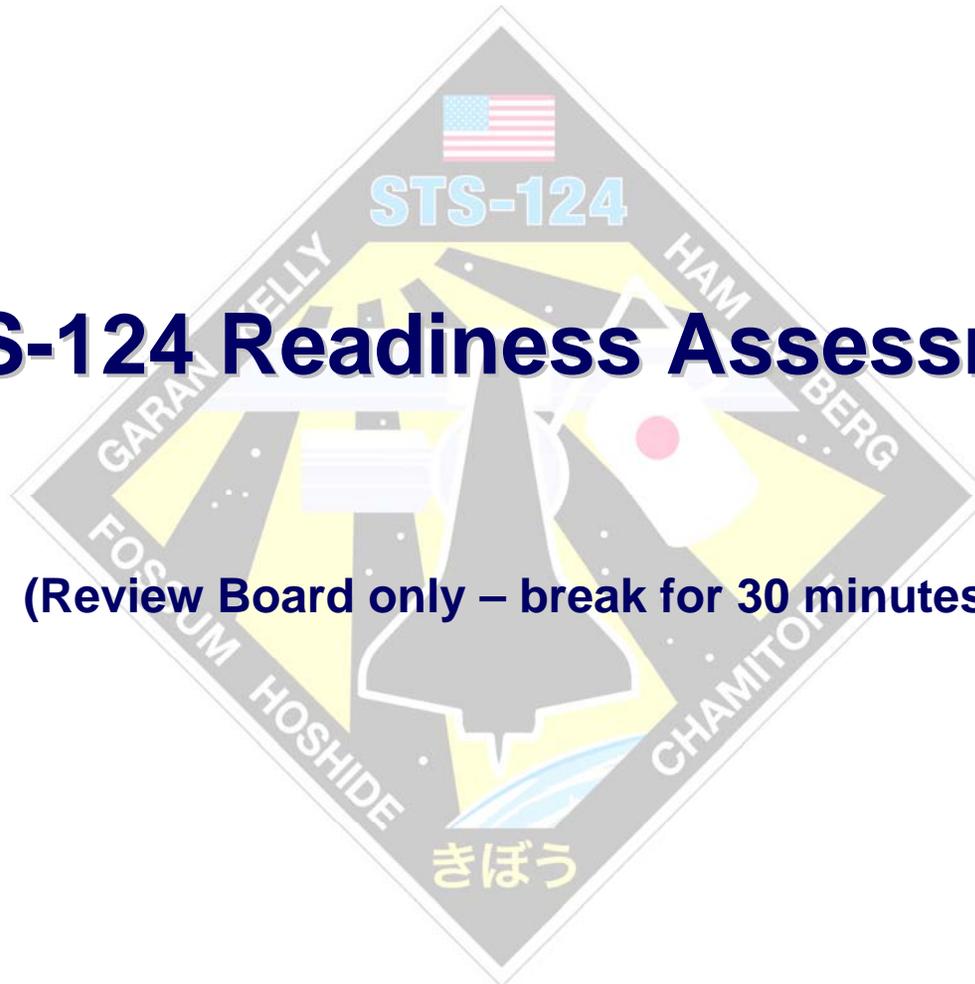
Action Item Summary

S. Testoff/PAAC



STS-124 Readiness Assessment

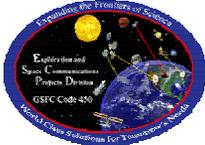
(Review Board only – break for 30 minutes)





Appendix A. CoFR Signature Sheet





Exploration and Space Communications Projects Division



Certificate of Flight Projects Directorate Networks Readiness

*This is to certify that with successful completion of flight readiness preparations and closure of associated action items,
all integrated network elements are ready to support the
STS-124 Flight*

Carolyn Dent, Code 301
Chairperson
GSFC, Systems Review Office

4/7/08
Date

Scott Greatorex, Code 450.1
GSFC, Chief, Networks Integration
Management Office

4/07/08
Date

Madeline Butler, Code 500
GSFC Deputy Chief Engineer
Applied Engineering and Technology Division

4/7/08
Date

Joe Stevens, Code 730
GSFC, Systems Management Division

4/7/2008
Date

Joe Aquino, JSC - DV 14
Manager
Space Communications Integration Office

4/7/08
Date

James A. Bangerter, Code 450.1
GSFC, Human Spaceflight Network Director

4/7/08
Date

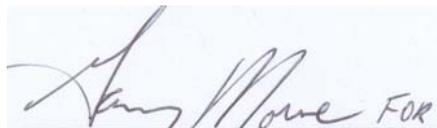


Exploration and Space Communications Projects Division

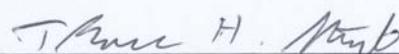


Certificate of Flight Projects Directorate Networks Readiness

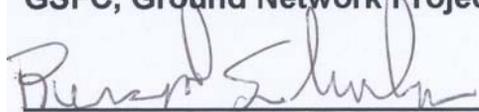
*This is to certify that with successful completion of flight readiness preparations and closure of associated action items,
all integrated network elements are ready to support the
STS-124 Flight*



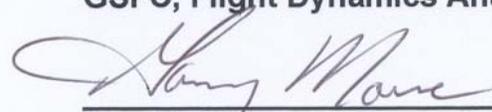
Roger N. Clason, Code 453 Date 4/7/08
GSFC, Ground Network Project



Thomas H. Stengle, Code 595 Date 4/7/08
GSFC, Flight Dynamics Analysis Branch



Roger J. Flaherty, Code 452 Date 4/7/08
GSFC, Space Network Project For



Gary A. Morse Date 4/7/08
KSC, Space Communications and Integration



Mike Yettaw/DFRC Date 4/7/08
Range Technical Monitor
Western Aeronautical Test Range



Integrated Network Overview

Backup Slides





IN Elements – FDF



- **Access to the Flight Dynamics Products Center (FDPC)**
 - Log in at <http://fdf.nascom.nasa.gov>
 - Select Products and follow the directions to register
 - Once registered return to the FDPC:
 - Click on Products
 - Click on Retrieve Other Products
 - Click on TBA Status Page to log in and view the TBA display
 - Even if you are registered for access to HSF products you should verify that you can access the TBA display



SSP Flight Rules



ASCENT AND INTACT ABORT LANDINGS AT KSC							
Site	Station ID	Type	Rqmt.	Ascent/RTLS		TAL	(Post Launch) KSC AOA & 1st Day PLS
				28.5 Inc.	Higher Inc.		
Jonathan Dickinson Missile Tracking Annex (JDMTA)	JDIS	S-BD	TLM D/L Voice	1 of 2 M	1 of 2 M		
Ponce de Leon	PDL	S-BD 14	CMD U/L Voice	1 of 2 HD [1]	1 of 2 [2]		
	Fixed Dipole	UHF	Voice				
MILA	MILS	S-BD 30-1	CMD TLM Voice	1 of 2 M	1 of 2 M		1 of 2 HD
	MLXS	S-BD 30-2	UHF Voice				
	TELTRAC Quad Helix	UHF	Voice	1 of 2 M	1 of 2 M		1 of 2 HD
TDRSS	WSC	S-BD	CMD TLM Voice	M [3]	M [3]	M	M [6]
			TRK	HD	HD		M [5]
Wallops	WLPS	S-BD 34	CMD TLM Voice		HD		
	QUAD HELIX	UHF	Voice		1 of 1 HD		
Merritt island	MLAC MLMC MMTC	FPQ-14 MCB-17 MOTR	Radar TRK	2 of 7 M	2 of 7 M		Not Scheduled Accept Best Effort Call up
Patrick	PATC	FPQ-14	Radar TRK				
Canaveral	CNVC	FPS-16	Radar TRK				
Jonathan Dickinson	JDIC	FPQ-14	Radar TRK				
MILA	MILS OR MLXS	S-BD	Ranging TRK				
Wallops	WLPC WLRC WLIC	FPQ-6 FPS-16 FPS-16 RIR-778	Radar TRK				
Air Force Satellite Communications Network (AFSCN)	NHS (BOSS)	S-BD	TLM CMD Voice				
	TCS (LION)						
	DGS (REEF)						

END OF MISSION - 2ND DAY PLS THROUGH NOMINAL EOM						
Site	Station ID	Type	Rqmt.	KSC	Edwards	WSSH
TDRSS	West	S-BD	TLM CMD Voice	M	M	M
	East		TRK	M	M	M
	Any		TRK	M	M	M
MILA		Ranging	TRK	HD		
	MILS	S-BD 30-1	TLM CMD Voice	1 of 2 HD [7]		
	MLXS	S-BD 30-2	UHF Voice			
	Teltrac Quad Helix	UHF	Voice	1 of 2 HD		
Merritt Island	MLAC	FPQ-14	Radar TRK	2 of 5 HD		
	MLMC	MCB-17				
	MMTC	MOTR				
Patrick	PATC	FPQ-14				
Canaveral	CNVC	FPS-16				
Dryden	ATF1	S-BD	TLM CMD Voice		1 of 2 HD [8]	
	ATF2		Voice		1 of 3 HD	
	Parabolic Dish	UHF				
Pt. Pillar	PTPC	FPQ-6	Radar TRK			
Vandenberg	VDHC	FPQ-14	Radar TRK		2 of 7 M	
	VDSC	TPQ-18				
	VDMC	MOTR				
Dryden	FRCC	RIR-716	Radar TRK			
	FDRC	RIR-716				
*WSSH	WSSH	UHF HELIX	Voice		1 OF 1 HD [9]	[9]
White Sands Missile Range	HOLC	FPS-16	Radar TRK			2 of 3 M
	WSSC	FPS-16				
	WSMC	MOTR				

HD = Highly Desirable
M = Mandatory



SSP Flight Rules (cont'd)



Notes

1. For missions with an inclination of 28.5 deg, PDL S-band and UHF uplink is highly desirable. ®[062702-5502C]
2. For missions with an inclination greater than 28.5 deg, PDL CMD or UHF uplink is required since MIL UHF is blocked by the SRB plume
3. Any TDRS East is mandatory
4. WLPC and WLRC are scheduled for all missions greater than 28.5 deg. WLIC only scheduled for 57-deg missions or when WLPC or WLRC are unavailable
5. One TDRS required to ensure pre-burn state vector accuracy for 1st day PLS de-orbit if onboard GPS is failed
6. Any TDRS West is mandatory for AOA and 1st day PLS
7. Any TDRS East or MILA is mandatory to cover the last phase of KSC landing and post-landing support until vehicle is handed over to GOM
8. Any TDRS West or DFRC is mandatory to cover the last phase of EDW landing and post-landing support until vehicle is handed over the GOM
9. For all WSSH landings (AOA, PLS, EOM), the prime communication coverage through wheelstop is S-band comm through TDRS. As a backup comm source, the NASA steerable Helix UHF at WSSH is highly desirable. ®[022405-6626]
10. Point Pillar radar may be scheduled in place of Vandenberg radar when expected maximum elevation is greater than 5 degrees. ®[062702-5502C]



Integrated Network Overview – Risk Likelihood Rating Definitions



Likelihood Rating	Likelihood of Occurrence
1 – Very Low	0 – 20% The team’s process is sufficient to prevent this event
2 – Low	21 – 40% The team’s process is usually sufficient to prevent this type of event
3 – Moderate	41 – 60% The team’s process may prevent this event, but additional actions will be required
4 – High	61 – 80% The team’s process cannot prevent this event, but a different approach or process might prevent it. Requires management attention
5 – Very High	81 – 99% The team’s process cannot prevent this event. Requires immediate management attention



Integrated Network Overview – Risk Likelihood Rating Definitions (cont'd)



Consequence Rating	Technical/Performance
1 – Very Low	Minor or no impact to full mission or technical success/exit criteria or margins. Same approach maintained
2 – Low	Minor or no impact to full mission or technical success/exit criteria, but can handle within established margins. Same approach maintained
3 – Moderate	Moderate impact to full mission or technical success/exit criteria, but can handle within established margins. Workarounds available
4 – High	Major impact to full mission or technical success criteria, but still meets minimum mission success/exit criteria; threatens established margins. Workarounds available
5 – Very High	Loss of life, vehicle, spacecraft, or cannot meet minimum mission or technical success/exit criteria. No alternatives exist



Appendix B. Abbreviations/Acronyms





Abbreviations/Acronyms



ADG	Acquisition Data Generator	FM	Frequency Modulated
AFSCN	Air Force Satellite Control Network	FOV	Flight Observation Version
A/G	Air-to-Ground	FRCC	Dryden Western Range Radar
AGO	Santiago, Chile	FRR	Flight Readiness Review
AI	Action Item	FY	Fiscal Year
AOA	Abort Once Around	GDIS	Guam Data Interface System
AOS	Acquisition of Signal	GN	Ground Network
ASCC	Ascension Eastern Range Radar	GRGT	Guam Remote Ground Terminal
ATF	Aeronautical Tracking Facility	GSFC	Goddard Space Flight Center
CAP	Contingency Action Plan	HSF	Human Space Flight
CDMGR	CD Manager	HTSI	Honeywell Technology Solutions, Inc.
CD&SC	Communications Data & Switching Center	HVAC	Heating, Ventilating, and Air Conditioning
CMD	Command	ICD	Interface Control Document
DFE	Data Flow Engineer	IFA	In-Flight Anomaly
DFRC	Dryden Flight Research Center	IIRV	Improved Interrange Vector
DGS	Diego Garcia, AFSCN RTS	IN	Integrated Network
DGRS	Data Generator Replacement System	INP	Internet Predict
DIS	Data Interface System	IP	Internet Protocol
DLL	Dynamic Link Library	IONet	Internet Protocol Operational Network
DR	Discrepancy Report	ISI	Interim Support Instruction
DRSD	Distributed Range Safety Data	ISS	International Space Station
EC	Engineering Change	ITS	Integrated Truss Segment
EDW	Edwards	JDMTA	Jonathan Dickinson Missile Tracking Annex
ELV	Expendable Launch Vehicle	JOP	Joint Operations Procedure:
EOM	End of Mission	JPL	Jet Propulsion Laboratory
ER	Eastern Range	JSC	Johnson Space Center
ETE	End-to-End	KFRL	KSC Forward Return Link
ET TV	External Tank Television	KPTC	Kaena Pt Eastern Range Radar
ETN	Engineering Test Notice	KSA	K-band Single Access
EVA	Extravehicular Activity	KSC	Kennedy Space Center
FDF	Flight Dynamics Facility	LAN	Local Area Network



Abbreviations/Acronyms (cont'd)



LIMO	Live Interview Media Channel	OD	Operational Downlink
LOP	Local Operating Procedure	OJT	On-the-job Training
LRR	Launch Readiness Review	OPN	Operations Procedure Notice
LTAS	Launch Trajectory Acquisition System	ORR	Operational Readiness Review
MCC	Mission Control Center	ORT	Operational Readiness Test
MER	Mission Evaluation Room	PAO	Public Affairs Office
MILA	Merritt Island Launch Annex	PCM	Pulse Code Modulated
MOD	Mission Operations Directorate	PDL	Ponce de Leon
MOMS	Mission Operations and Mission Services	PM	Preventive Maintenance
MPLM	Multi-purpose Logistics Module	POC	Point-of-Contact
MRN	Moron, Spain	PRD	Program Requirements Document
MSFC	Marshall Space Flight Center	PSS	Portable Spacecraft Simulator
MSP	Mission Support Plan	PTP	Portable Telemetry Processor
NASA	National Aeronautics and Space Administration	RCCA	Root Cause and Corrective Action
NAV	Navigation	RCI	Remote Control Interface
NCCDS	Network Control Center Data System	RF	Radio Frequency
NCPS	Network Command Processing System	RFA	Request for Action
ND	Network Director	RFS	Radio Frequency Subsystem
NENS	Near Earth Networks Services	RPS	Remote Planning System
NET	No Earlier Than	RSS	Rotating Service Structure
NIC	Network Integration Center	RTS	Remote Tracking Station
NISN	NASA Integrated Services Network	SA	Single Access
NOD	Network Operations Directive	SARJ	Solar Alpha Rotary Joint
NOM	Network Operations Manager	SCD	Small Conversion Device
NOR	Norway	SMM	STDN Mission Manager
NOSP	Network Operations Support Plan	SN	Space Network
NRZ-L	Non-return-to-zero Level	SORR	Stage Operations Readiness Review
NSAP	Network Services Assurance Plan	SSC	Service Specification Code
NSR	NISN Service Request	SSME	Space Shuttle Maine Engine
NTR	NSAP Technology Refresh	SSM	Site Status Messages
OAS	Onizuka Air Station	SSP	Space Shuttle Program



Abbreviations/Acronyms (cont'd)



STA	Shuttle Training Aircraft	WOW	Weight on Wheels
STGT	Second TDRSS Ground Terminal	WPS	Wallops Ground Station
STS	Space Transportation System	WR	Western Range
STDN	Space Tracking Data Network	WSC	White Sands Complex
S/W	Software	WSGT	White Sands Ground Terminal
TAL	Transoceanic Abort Landing	WSMR	White Sands Missile Range
TAP	Tracking Acquisition Processor	WSSH	White Sands Space Harbor
TBD	To Be Determined	WSTF	White Sands Test Facility
TCDT	Terminal Countdown Demonstration Test	WX	Weather
TCP	Transmission Control Protocol	ZZA	Zaragoza, Spain
T&DA	Tracking and Data Acquisition		
TDF	Tracking Data Formatter		
TDRS	Tracking and Data Relay Satellite		
TDRSS	Tracking and Data Relay Satellite System		
TID	Time Independent Data		
TLM	Telemetry		
TO	Task Order		
TRK	Tracking		
UDP	User Datagram Protocol		
UHF	Ultra High Frequency		
VDBC	Vandenberg Western Range Radar		
VHF	Very High Frequency		
UPS	Uninterruptible Power Supply		
WAN	Wide Area Network		
WANR	WAN Replacement		
WFEP	Wallops Front End Processor		
WLPS	Wallops		