



STS-123/1JA Flight Readiness Review



**JSC Mission Operations Directorate
Flight Director Office**

**DA8/D. Weigel, M. Moses, B. Lunney, R. Jones , H. Ridings
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**Mission Operations Directorate
Flight Director Office**

Agenda



- DA8 COFR Requirements/Endorsements
 - COFR Requirements/Endorsements Summary
 - New Operations – A/E Topics, MCC, Flight Techniques & Joint Operations Panels
 - Items of Interest
 - Safety Status Review
 - Flight Rules (Generic Volumes A, B, C, D, E; STS-123/1JA Annex)
 - FDF/ODF/SODF
 - Mission Staffing: Training/Certification/Work Guidelines Compliance
 - Non-Critical Processors/Applications
 - Emergency Mission Control Center (EMCC)/Backup Control Center (BCC)
 - Command Procedures
 - Contingency Shuttle Crew Support/Rescue Flight (STS-324)
 - Level II Actions
- Standard Open Work
- Non-Standard Open Work
- Exceptions
- Flight Readiness Summary



DA8 COFR Requirements/Endorsements Summary



DA8 COFR Requirements/Endorsements



REQUIREMENT (SHUTTLE)	Flight Director	Program Integration	Ops Safety	SPAN	Space Flight Meteorology	Team 4						
Non-Crit Processors/Applications	G				G		G	Ready to Support Flight/Only Standard Open work				
EMCC	G				G	G						
Certified Flight Controllers	G			G	G	G						
Flight Rules	Y											
FDF	G	G*										
FTP - New Ops	G						Y	Non Standard Open work with expected resolution prior to flight.				
Flight Anomaly Resolution	G			G								
Anomaly - Procedure	G											
Exceptions/Action Items From Prior Readiness Reviews	G	G	G	G	G	G						
CIL/Hazards	G		G				R	Open work without expected resolution without assistance, prior to flight, or unavoidable constraint violation.				
No Constraints	G	G										
Level II (Program) Actions	Y	G										
Mission Requirements	G											
Exception/Resolution	G	G										
Command Procedures	G											
Flt Prep Process Plan Requirements Met		G						N/A				
Contractor Process Insight		G										

* FCOH



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DA8 COFR Requirements/Endorsements



REQUIREMENT (STATION)	Flight Director	Program Integration	Ops Safety	SPAN	Team 4						
Non-Crit Processors/Applications	G							G	Ready to Support Flight/Only Standard Open work		
BCC	G				G						
Certified Flight Controllers	G			G	G						
Flight Rules	Y										
ODF/SODF	G										
JOP - New Ops	G							Y	Non Standard Open work with expected resolution prior to flight		
Flight Anomaly Resolution	G			G							
Anomaly - Procedure	G										
Exceptions/Action Items From Prior Readiness Reviews	G	G	G	G	G						
CIL/Hazards	G		Y					R	Open work without expected resolution without assistance, prior to flight, or unavoidable constraint violation.		
No Constraints	G	G									
Level II (Program) Actions	Y	G									
Flight/Increment Planning (Mission Requirements)	G										
Exception/Resolution	R	G									
Command Procedures	G								N/A		
Contractor Process Insight		G									





New Operations

(FTP and JOP Summaries in Backup Charts)



Ascent/Entry Topics



- ET Photography/Launch Window
 - Will be addressed once STS-122 launch date and other trajectory events leading up to STS-123 are determined
- MPS Low Level Cutoff Sensors
 - Any possible operational changes will be discussed following STS-122 resolution
- DOLILU Ops Block Update
 - Flight critical software has been updated for new ET/SRB attach point limits
 - Checkout of certified software will be completed by Jan 15
- Second flight of 3-string GPS ramp-up plan
 - STS-123 EOM operations exactly the same as STS-118
 - STS-123 is the last 3-string GPS ramp-up flight



Spaceflight Meteorology Group (SMG)



- All NWS/SMG software used to create mission critical products or required for mission support is ready for STS-123/1JA
- All SMG forecasters required to support STS-123/1JA meet currency requirements listed in SMG Training & Certification plan
- No non-standard open work or exceptions
- The following issues are actively being worked by SMG:
 - Spanish Weather Service radar issues continue to impact use of rainshower exception flight rule
 - » Zaragoza radar remains out of service
 - Surrounding area radars provide full volume scan radar data except for southern portion of ZZA 20 nm circle
 - » Moron composite reflectivity product remains unavailable
 - Rota radar data via the internet encompasses MRN 20 nm circle and may be considered if applying the rain shower exception flight rule
 - Istres HANDAR low wind speed bias with winds 340 - 040 degrees
 - » Short-term Workaround: If wind is from 340-040 degrees, Handar observations will be modified/scaled using Metar observations
 - » Investigation underway to discover cause of bias
 - Moron HANDAR not reporting since 12/19/07
 - » Will be addressed during STS-122 deployment

The undersigned certifies that the Spaceflight Meteorology Group is ready to support the STS-123/1JA flight.

/s/ Frank C. Brody

Frank C. Brody

Chief, Spaceflight Meteorology Group

Mission Operations Directorate
Flight Director Office



New Operations - MCC



- MCC Linux Server Upgrades
 - STS-123 will utilize a Linux-based servers
 - » STS-122 utilized Linux-based Trajectory server
 - All STS-123 flight-specific ascent/entry/orbit simulations to date have utilized the Linux server configuration



New Operations



- JAXA IP
 - Japanese JOP has been incorporating JAXA into Flight Operations for many years
 - All generic support products (Flight Rules and OIP's) for SSIPC to MCC-H interactions have been coordinated through the JJOP
 - Open work includes final approval for Vol C and generic OIPs.
 - Details of the JJOP's accomplishments are in the backup slides
- Japanese Logistics Module – Pressurized (JLP)
 - JLP Launch to Activation thermal clock shows good margins
 - JLP has no smoke detection in its temporary location
 - » JLP fan is considered the only fire source and will be activated/deactivated via a special laptop
 - JLP outfitting and prep for 1J tasks were moved into docked mission from stage to offload the stage and alleviate JAXA team workload



New Operations



- Special Purpose Dexterous Manipulator (SPDM) – Docked operations
 - Basic checkout of SPDM only
 - » Checkout verifies power and data functionality, ORU health, brakes, joint motion, and LEE
 - SPDM arm brake run-in performed to ensure brake functionality following launch vibrations
 - SPDM relocated to Lab PDGF following assembly
- SPDM - Stage Monitoring
 - SPDM has no automatic power source switchover in response to power source failures
 - Operational workaround will be in place to leave the Robotic Workstation (RWS) Control Electronics Unit (CEU) powered 24/7 to identify failures
 - Upon failure identification, ROBO will manually swap the power source
 - MOD monitoring plans only reduce the risk of loss since there is no telemetry available for TDRS LOS or ground LSOS maintenance periods
 - Method of protecting for this failure is manual and not ideal. Future work will pursue software fixes

New Operations



- Payload and ORU Accommodation (POA)
 - First loaded use of the POA
 - POA will be passing power and data to/from the SLP
 - » POA is 2 fault tolerant for power and data and mechanically identical to an SSRMS LEE
 - Initial “unloaded” POA checkout performed during Increment 5, August 2002, with nominal results
 - Second “unloaded” POA checkout performed September 2007 with nominal results
 - Pre-launch POA checkout will be performed post MSS R5 uplink



New Operations



- SSPTS following Node 2 relocation
 - First use of SSPTS following Node 2 relocation (1E will mate SSPTS connections)
 - Without SSPTS, mission duration is 12+0 (loss of 2 EVA's)
 - » Content loss would include TRAD DTO, RPCM S02B_D R&R, all ORU transfers, and SPDM final outfitting (e.g. cameras)
- DTO 848 Tile Repair Ablator Dispenser (TRAD)
 - Crew Training
 - » Two timeline runs completed, one remaining run on 1/28 (3:1 versus 5:1)
 - » Standard TPS training completed
 - » 1-G T-RAD class in B9 on 1/10 (becoming part of standard TPS training)
 - » Dual glove box on 1/31 (unique for DTO)
 - Open work to determine acceptable worksite
 - » Lab Nadir site from 10A is a contamination issue for SPDM
 - » CSA assessing Lab Zenith site for SPDM, SSRMS and MBS contamination
 - » TRAD team assessing Lab Zenith site for thermal requirements
 - T-RAD is zero fault tolerant to a toxic leak unless knob is removed
 - » To minimize exposure to this risk, the knob will be removed pre-flight, and re-installed during EVA 4 in-suit pre-breathe (same mitigation plan as 10A)



New Operations



- Docked Late Inspection
 - Late MMOD TPS inspection will occur while docked to ISS on Flight Day 11
 - » OBSS is being left on ISS for use on STS-124/1J
 - Uses earlier version (pre-STS-117) of inspection procedure for Port Wing and Nosecap and newly developed procedure for Starboard Wing
 - » Adequate camera views exist for clearance monitoring
 - » Procedure times account for increased clearance monitoring
 - Inspections will be done in ISS mated TEA attitude
 - » Will switch between $-XVV$ and $+XVV$ to prevent OBSS sensor lighting violations
 - Orbiter will perform the mnvrs and attitude hold will be on ISS CMG's
 - OBSS transfer to ISS will occur on FD12 EVA5
 - » Will have only completed 24 of the allotted 36 hours of imagery analysis prior to OBSS transfer
 - Slight risk that TPS will not have been 100% cleared before transferring OBSS to ISS



New Operations



- OBSS stow on ISS
 - OBSS will be stowed on ISS on the S1 truss in Orbital Support Equipment (OSE) stanchions (installed during STS-118/13A.1)
 - » Requires OBSS handoff from SRMS to SSRMS, SSRMS mnvr, SSRMS handoff to EV crew and EV crew installation into OSE
 - Redundant keep-alive power to the OBSS will be provided via an avionics box and umbilical cable from ISS Camera Port 4 to the OBSS Forward Transition X-Guide Connector
 - There is very little margin between the Robotics and EVA time required for OBSS transfer and the unpowered OBSS thermal clock
 - » In order to minimize the unpowered duration, the keep-alive umbilical will be connected and powered while the OBSS is still grappled to the SSRMS, prior to being installed in the OSE by the EV crew.
 - SRP review is still in work
 - » An OBSS sensor thermal cover is available for installation prior to transfer if needed (Beta dependent)
 - To provide MMOD protection while on ISS, the OBSS sensor thermal cover will remain on during the 1JA stage



New Operations



- Modified Worst-Case Forward Ballast (WCF) Protection
 - Level B Groundrules & Constraints protect the worst case forward ballast
 - » SLP still in bay, JLP removed
 - In order to increase payload mass to orbit, it was agreed to take advantage of the operational timeline which has SLP being removed on FD3 before JLP removal on FD4
 - » Change eliminate 1000+ lbs of lead ballast and enabled launching with 6 sidewall payloads
 - » Modified WCF ballast scenario is the JLP removed and an empty SLP in the bay with all forward ORU's still in the bay
- Shuttle PGSC Ethernet Network
 - STS-123 is the first flight of the new on-board Shuttle Ethernet LAN configuration
 - Procedures and training are in-place
- Shuttle Ammonia Detection Kits
 - First flight of new Extended Range Ammonia Detection Kit
 - Procedures and training are in-place



New Operations



- ATV Impacts – 123 and ATV in orbit together
 - There is an issue with TDRS resources because network allotment during an ISS/Shuttle mission is 2 Single Access (SA) antennas and ATV needs TDRS SA assets during dynamic flight
 - If ATV is at the station keeping point, ATV can use the TDRS Multiple Access (MA) antenna with periodic SA use
 - » There are no expected issues with simo Shuttle, ISS and ATV TDRS sharing for this scenario
 - If ATV is phasing, ATV needs the TDRS SA antenna which results in ISS and Shuttle sharing an SA – termed “virtual” spacecraft
 - Plans for STS-123/1JA virtual spacecraft have been discussed at a high level, but the detailed assessment is open work
 - » If both vehicles need comm, ISS will use S-band and STS will use Ku-band
 - » There may be brief periods when ISS uses both S and Ku
 - » Virtual spacecraft does not support flight phases when both vehicles need S-band (e.g. docking and undocking) or when Shuttle and ISS are not in close proximity
 - » Virtual spacecraft will also impact ground situational awareness during key flight phases due to loss of video or telemetry (e.g. JLP installation)
 - Open work includes detailed timeline/comm assessment for virtual spacecraft, and trajectory analysis to ensure compatible phasing and burn plans



Items of Interest



- EVA 2 Duration Greater than 6:30
 - EVA 2 duration is Beta dependent and varies between 6:45 and 7:05
 - For certain Beta ranges (~ -65 to -25), SPDM arm 2 thermal covers can be removed on EVA 1 resulting in a 6:45 EVA
 - If covers cannot be removed on EVA 2, due to robotic access limitations, there is risk that either they cannot be removed during 1JA or that a DSCU would not be transferred
 - » Results in SPDM powered on time limitations
 - Waiver is required and scheduled for approval at the JMICB on 1/11
- JLP PPRV
 - JLP PPRVs are likely to crack after heater activation which is 2 hours after payload bay door opening
 - » JLP PPRV cracks at 15.05 +/- 0.05 psid
 - » JLP close-out pressure was 14.95 psi at 70F
 - » Heater ON setpoint is < 77F, OFF setpoint is 84.2F
 - Cracking expected around 72F
 - Maximum gas loss is estimated to be 4.5 lbs

Items of Interest



- Powerdown for RPCM S02B_D R&R
 - Upstream DDCU S02B is the single required inhibit
 - Results in powerdown of a number of items including a string of SARJ and TRRJ, S-band string 2, EATCS Loop B (loss of cooling to Node 2 LTL)
 - » If Loop B down for more than 1 hour, will need to re-pressurize the loop
 - Open work to determine Node 2, S-band, and truss thermal clocks
- JLP Vestibule Condensation
 - Expect to have some condensation in the Node 2 to JLP vestibule
 - ISS dewpoint will be lowered pre-JLP install to ensure no condensation freezing upon vestibule pressurization
 - SCR 9540A allows 72 hours of condensation in a vestibule
 - Analysis predicts condensation would be gone within 6 - 24 hours with no crew action
 - » Crew procedures include condensation inspection and drying/wiping



Items of Interest



- EMU Overglove Preparations
 - Flight Rule 1JA_C15-X addresses EVA termination for vectran damage
 - Crew trained with modified overgloves in the glovebox and old overgloves in the NBL (EVAs 1, 3, 4 and 5)
 - NBL experience with overgloves showed EVA time increase for EVAs 1 and significant hand fatigue
 - » EVA 1 times were ~15% longer (i.e. would need a 35% versus 20% adjustment factor). Expect EVA 2 results to be similar
 - » Use of overgloves in the NBL may be more challenging and have contributed to unrealistic time increase
 - » Flight times have not been adjusted based on this single NBL data point
 - Each EV has 3 pairs of gloves
 - Glove photos will be taken post EVA and downlinked that evening for assessment



Items of Interest



- EMU Overglove Plan
 - Crew plans to wear overgloves for all EVAs, but will remove them if needed for the following:
 - » Trouble completing Category 1, 2 or the RPCM R&R tasks
 - Most but not all CAT 1 and 2 tasks are on new hardware or in the payload bay
 - Significant vehicle powerdowns required to support RPCM S02B_D R&R task
 - » Safety issues (tether swap, ability to safely translate to airlock etc)
 - MOD recommends that tasks considered low priority (category 3 and get aheads) will be deferred if they cannot be completed with overgloves
 - » Node 2 nadir LL removal, pip pin inspection, Lab MMOD shield R&R, and get aheads

NOTE: This plan is consistent with MOD's recommended overglove policy which is still in work. Adjustments to the 1JA plan will be made as needed.



Items of Interest – 1E Stage



- Post 1E, “Road to 1JA” items must be completed to support STS-123/1JA.
- Four weeks is the current estimate for the time required between 1E undock and 1JA dock.
 - This estimate includes standard “Road to” items (hardware checkouts, crew conferences, EMU preparations, etc), prepack and MSS 5.0 uplink and checkout.
 - This estimate also includes the Columbus activation time required for WAICO (4 weeks).
 - » Additional Columbus Commissioning would be used to backfill the timeline when the crew gets ahead and placed on the task list.
 - If WAICO preparations are removed, the Road To requires two weeks
 - » Crew efficiencies may reduce the two weeks, but turn around of operational products (rule updates from analysis delivery) will still require a minimum of two weeks
 - This estimate assumes that no other big activities such as a 1E stage EVA, ATV, or a Progress exchange occur during the 3 weeks.



SAFETY ISSUES



- SLP on POA post Orbiter departure
 - There are several single point failures that would preclude the SLP from being able to be placed in a safe configuration for payload bay return.
 - » SLP would remain on the POA
 - With the SLP on the MBS, there are clearance concerns for MT translation to worksites 1 – 3
 - As a result, some of the Big-14 contingency EVAs may be impacted
 - Due to the low likelihood of having one of these single point failures, and the high likelihood that a SLP jettison plan could be worked in real-time, MOD recommends that this is classified as an acceptable risk



Flight Rules



- All required generic volume A, B, C, D and E flight rules have been developed, reviewed, and approved by the appropriate Flight Techniques Panels, JOPs, and the FRCB
- The following generic publications are applicable for STS-123/1JA
 - Volume A (STS), Final PCN-8 dated 5/24/07
 - » PCN-9 scheduled for PRCB approval on 1/24/08
 - Volume B (ISS), Final PCN-7, Errata dated 12/14/07
 - » PCN-8 scheduled for SSPCB approval on 1/22/07
 - Volume C (Joint), Final PCN-3, dated 10/18/07
 - Volume D (Soyuz/Progress), Final PCN-4, dated 9/18/07
 - Volume E (ATV), Basic , Rev A, dated 5/10/07
 - » Final scheduled for SSPCB approval on 1/22/08
 - » PCN-1 scheduled for SSPCB on 2/14/08
- STS-123/1JA flight rule annex
 - Final version will be scheduled for JPRCB approval the week of 1/21/08
 - PCN-1 targeted for JPRCB approval the week of 2/18/07



FDF/ODF/SODF



- DA8 has participated in FDF/ODF/SODF processes and procedure reviews as required
- FDF/ODF will be ready to support STS-123/1JA
 - New US procedures are primarily for JLP installation/operations and SPDM operations



Flight Director Mission Staffing: Training/Certification/Work Guideline Compliance



- All STS-123/1JA Flight Directors are certified per Flight Director Certification Guide (DA8-00010), Final, dated September 24, 2007
- Additional certified Flight Directors are available to support Team 4, EMCC, and STS-324, as required
- All MOD Work Guidelines are met: Due to the expected mission duration, Shuttle and Station teams are covered by 2 Flight Directors each (see below)

Flight Director	Position	Flight Specific Cert Status
Mike Moses / TBD	Shuttle Lead, Orbit 1	Anticipated Jan. 31, 2008
Bryan Lunney	Ascent	Anticipated Jan. 31, 2008
Rick LaBrode / TBD	Shuttle Orbit 2	Anticipated Jan. 31, 2008
Matt Abbott / TBD	Shuttle Planning	Anticipated Jan. 31, 2008
Richard Jones	Entry	Anticipated Jan. 31, 2008
Dana Weigel	Station Lead, Orbit 2	Anticipated Jan. 31, 2008
Kwatsi Alibaruho / Heather Rarick	Station Orbit 1	Anticipated Jan. 31, 2008
Ginger Kerrick / Robert Dempsey	Station Planning	Anticipated Jan. 31, 2008



SPAN Mission Staffing: Training/Work Guideline Compliance



- Sufficient personnel will be provided by the Organizations to properly staff all SPAN positions without violating Work Guidelines
 - Reduced SPAN Manning will be in effect for this mission (began with STS-120/10A)
 - » STS-120/10A reduced support resulted in no issues
 - » STS-122/1E pre-launch support resulted in no issues



Non-Critical Processors/Applications



- All DA8 Non-Critical Applications certified
- Flight Director “Entry” Display Updates
 - Certification completion date scheduled as 1/15/08
 - Replaced TACAN telemetry with GPS telemetry
 - Changes made allow comm-faulted parameters to be displayed as “bad” data
 - Not mandatory for STS-123
- No other Flight Director applications changed



EMCC/BCC



- No changes to EMCC procedures since STS-118
- Personnel identified to support EMCC

- No changes to BCC procedures since 13A.1
- Personnel identified to support BCC



Command Procedures



- Personnel are prepared and ready to execute the command procedures as documented per MOD Command Policy/Flight Rules



Contingency Shuttle Crew Support/STS-324



- Contingency Shuttle Crew Support (CSCS) /Rescue Flight Resource Book is located at http://mod.jsc.nasa.gov/da8/rules/CSCS_Rescue_Flight_Resource_Book/cover.htm
- STS-123 Ascent/Entry Team will support STS-324
- STS-123/124 Teams will support Orbit Operations as required



Level II (Program) Actions: Constraint to Flight



- There are no Space Shuttle Program Open Actions that are a Constraint to Flight assigned to MOD for STS-123/1 J/A
- As of 1/9/08, there is one Space Station Program Open Action assigned to MOD that is related to STS-123/1JA.
 - **SSPCB Action 052907-001**, "Discuss the timeframe for dealing with the communication problems between multiple spacecrafts."
 - This action deals with the TDRS SA resource conflicts that arise if STS-123/1JA is flying at the same time as ATV Jules Verne
 - This action will be closed prior to the 1/30 ATV SORR





Standard Open Work



Standard Open Work



- ISS reboost plan will be worked once 122 and 123 launch dates are finalized
- STS-123/1JA Flight Rules Annex
 - Final targeted for a special JPRCB on 1/22 or 1/23
 - PCN-1 targeted for JPRCB presentation the week of 2/18
 - Many open CRs and PCN inputs are dependent on analysis that will not be complete in time for the Final
- FDF/SODF
 - Final FDF updates (482 cutoff 1/24)
 - Final SODF CRs in review/approval cycle
- Training
 - Complete STS-123 Ascent/Entry simulations (L-7 days) and Orbit integrated simulations (ECD 1/30 pending 122 launch)
 - Complete Flight Director flight specific certifications (1/31 ECD)
- Pressure profile
 - Complete coordination of pressure management plan with MCC-M (ECD L-1wk)



Standard Open Work



- Complete “Road To” Items and Prepack
 - MSS R5 uplink, MT translate to worksite 6 and checkout, CBCS install, POA checkout, Columbus WAICO activation, and timeline review with E16 crew
- Incorporate 122/1E post flight lessons learned as required (ECD Landing +2 wks)
- Generic JJOP Products
 - 3 Vol C OIP CRs (ECD 1/31)
 - 63 generic OIPs and FRIO-J (ECD early February)
- EBIT analysis for SRMS CBM berthing with 3 of 4 RTLs (ECD TBD)
 - CBM berthing with SRMS nominally includes analysis for 3 of 4 versus 4 of 4 RTLs
 - If 4 of 4 required, only minor modifications to procedures and crew training will be required
- EBIT analysis for SSRMS Safing (“brakes-on”) during SLP installation in PL Bay (ECD TBD)
 - EBIT analysis in work to determine if loading acceptable
 - Could result in change to SLP installation technique and additional crew training



Standard Open Work



- Safety assessment for tethered OBSS (ECD TBD)
- MOD Integrated Experiment Hazard Assessment (IEHA)
 - ISS FLT 1JA VERIFICATION TRACKING LOG (ECD: L-2)
- Independent Safety Verification Review
 - SHUTTLE ISVR REPORT (ECD: L-2W)
 - ISS ISVR REPORT (ECD: L-2W)



Standard Open Work – NASA OCADs



- EVA (12)
 - Keep Out Zone
 - Touch Temp
 - 1819 Data
 - Pull Test
 - Tether Protocol
- PHALCON (2)
 - Mate Demate
- ROBO (3)
 - Commanding Constraints
 - Energy management constraints
 - OBSS Rate Limits
- OSO (2)
 - CEVIS Torque limits
 - Pull test
- ECLSS (2)
 - PPRV Cap
 - CO2 Monitoring
- ISO (1)
 - A31P TT limits





Non-standard Open Work



Non Standard Open Work



- Thermal Analysis
 - LTA clocks for JLP and ORU transfers (ECD mid January)
 - Clocks to support RPCM S02B_D R&R (ECD TBD)
- Solar array plan and power profile
 - Finalize power profile plan and powerdowns for docked mission, including detailed SSPTS analysis (dependent on delivery of solar array constraints matrix) (ECD L-2 wks)
 - If needed, assess BGA 1A impact to power plan
- Docked loads
 - Products may be affected by final analysis (e.g. MDF and shortened mission planning products assume SLP on POA is good for undocking and future docking (ECD TBD)

NOTE: These items become exceptions if data delivery date does not support product development (ECD for data delivery schedule 1/9)



Non Standard Open Work



- Contingency JLP power plan (ECD 1/10)
 - JLP power through nominal source is zero fault tolerant
 - In the event that the nominal activation cannot be performed (e.g. RPCM failure), contingency activation requires use of a UOP
 - ISS analysis for UOP use for JLP loads is incomplete
 - Inability to use UOP would require a plan for a quick turn around RPCM R&R
- MSS Contamination from T-RAD (ECD TBD)
 - The Lab Nadir DTO worksite planned for use on 10A results in contamination issues for SPDM which is on the Lab during EVA 4
 - » Current plan cannot support SPDM relocation (no time available, clearance issues with SPDM on MBS)
 - Alternate worksite at Lab Zenith is under assessment for MSS contamination and thermal acceptability for DTO samples



Non Standard Open Work



- OBSS Stow Second Inhibit (ECD 1/15)
 - Flight rules require two inhibits for the OBSS keep alive umbilical mates to ISS camera port 4
 - Second inhibit requires significant ISS powerdowns
 - » Deactivates EATCS Loop A, S-band string 1, both strings of Loop A TRRJ, S1 and P1 cameras, a number of other items, and results in loss of all insight into the S1 truss.
 - NCR to eliminate second inhibit is scheduled for the SRP on 1/15
- EVA 2 duration waiver scheduled for JMICB on 1/11
- Mission duration increase from 15+1 to 16+1
 - Plan currently meets SCSC requirements, but intensive robotic operations are scheduled every day and off-duty is split with only 4 hours of off-duty during the 5 EVA's
 - JOP and CB recommend an additional day to provide a full off-duty day mid-mission and to help load-level the robotics plan
 - Scheduled for JMICB on 1/11



Non-Standard Open Work



- ATV and STS-123/1JA impacts - Free Flight
 - Virtual Spacecraft Assessment (ECD 1/30 ATV SORR)
 - » Open work to develop a virtual spacecraft plan for TDRS sharing between ISS and STS
 - » When virtual spacecraft can't be supported, use of a third SA antenna will need to be negotiated with the Network
 - » If an additional SA is not available, TDRS sharing will be negotiated with ESA (will involve comparing ATV phasing and joint mission timelines)
 - Assess simultaneous Shuttle free flight/phasing/contingency deorbit and ATV phasing (ECD TBD)
- ATV and STS-123/1JA impacts - Docked (ECD TBD)
 - STS-123/1JA products assume ATV is not docked
 - With ATV docked, the TEA and ATL change affecting the solar array plan and thermal analysis
 - US to RS power transfer increases
 - ATV may be used for RS thruster control which will affect the solar array constraints matrix and docked loads



Exceptions



- SLP/POA Loads Exceedances

- EVA induced loads result in load limit exceedances at the POA interface
 - » Exceedances noted at the PDGF to SLP, the POA, MBS to MT and MT to truss
 - » Operational controls that are in place to mitigate additional exceedances include no quick grabs, no SPDM shaking, light APFR ingress, no max translation rates and use of WIFs 1 and 4 only
- Analysis is in work to determine if the limits and/or analysis are too conservative
- Violations exists for both translation and foot restraint (APFR) loads
 - » Limiting translation rate below the nominal or average rate is difficult to implement, difficult to verify and may not be reliable
 - MOD does not consider this a valid control
 - » Limiting dual EV translation or translation simultaneous with APFR loads would result in significant EVA timeline rework, delaying JLP installation, and crew training



Flight Readiness Summary



- Pending completion of all standard and non-standard open work, the Flight Director Office and Space Flight Meteorology Group are ready to support the STS-123/1JA mission
- All standard/non-standard open work will be closed out or have a closure plan prior to ISSP SORR (1/15/08) and SSP FRR (TBD) with the following exceptions:
 - SLP Loads Exceedances





Backup



Remaining STS-123/1JA Integrated Sims



- Orbit
 - 1/16 -1/17: FD3/FD4 Long Sim
 - » May be split into two sims depending upon 122/1E simulation conflicts
 - 1/23: EVA 4 RPCM S02B_D Mini Sim #1
 - 1/30: EVA 4 RPCM S02B_D Mini Sim #2
- Ascent/Entry
 - The following dates are all dependent on STS-122 mission
 - » TBD: S0044 with KSC
 - » 1/24: TCDT with KSC
 - » 1/29: Ascent #3
 - » 2/1: Post Insertion
 - » 2/4: Entry #3
 - » 2/8: Ascent #4





Ascent/Entry Flight Techniques Topics Applicable to 123/1JA



Ascent/Entry Flight Techniques Panel (AEFTP)



- Four Ascent/Entry Flight Techniques Panel (A/E FTPs) were held with topics supporting STS-123
 - A/E FTP #234
 - » STS-118 Post Flight Discussion for 3-string GPS performance
 - A/E FTP #235
 - » DOLILU ET/SRB Attach Point Updates
 - » Delayed AOA Burn Feasibility Assessment
 - A/E FTP #236
 - » ECO Sensors Voltage Instrumentation Flight Data
 - A/E FTP #237
 - » MPS Low Level Cutoff Sensor Failed Wet
- A/E FTP community ready to support STS-123 pending final disposition of ECO Voltage System and the completion of standard open work.



A/E FTP #234 Summary



- Reviewed 3-String GPS performance during STS-118 Post Flight Discussion
 - STS-118 was first flight where 3-string GPS flew as a primary onboard navigation system as a replacement for TACAN
 - 3-string GPS incorporated into onboard PASS navigation during FCS Checkout, MM301, and after high-speed C-band tracking confirmation in MM304
 - Degraded GPS performance observed during plasma region as expected
 - » QA4 (LRU-to-LRU check) dilemma flags set due to loss of satellite tracking in the plasma region between 250 kft – 220 kft in altitude
 - Exceptional performance observed throughout remainder of STS-118 entry trajectory
- A/E FTP #234 concluded 3-string GPS performance was very good during first ramp up flight and no deltas were identified for any subsequent ramp up single-string or 3-string flights



3-String GPS Operations for STS-123



- Second Flight of 3-String GPS Ramp Up Plan
 - GPS has performed very well on first 3-string ramp up flight (STS-118) and other single-string ramp up flights (STS-121, 115, 116, 117, & 120)
 - All operations products are ready to support 3-string GPS
 - Operational plan for STS-123:
 - » Launch with all 3 GPS receivers powered/available
 - Both PASS and BFS will incorporate GPS to support ascent aborts
 - » Power off GPS receivers 1 & 3 in post insertion
 - GPS receiver 2 remains powered throughout on-orbit
 - » During FCS Checkout on EOM-1, power on GPS receivers 1 & 3
 - Transition to OPS 301 for 10 minutes and incorporate 3-string GPS to PASS
 - For remainder of mission, highly desirable to leave all 3 GPS receivers powered on
 - » EOM operations exactly the same as STS-118
 - GPS to PASS in OPS 301 until TIG – 45 min
 - GPS to PASS only after high speed tracking confirms GPS solution for EOM, PLS
 - Manage BFS navigation with PASS to BFS state vector transfers
 - For BFS engage, evaluate GPS per PASS criteria and incorporate
 - Deltas to 3-string operations from STS-118
 - » 2 GPS receivers remain unpowered during on-orbit operations
 - » GPS antenna pattern data collection (power off pre-amps) is not required
 - » OI-32 auto time compensation for Master Timing Unit (MTU) failure is available
 - » GPS receivers may be powered off after deorbit waive-off to conserve power once daily encryption key is verified (1JA_8-3, GPS System Management)
 - STS-123 is the last 3-string GPS ramp up flight



A/E FTP #235 Summary



- DOLILU ET/SRB Attach Point Updates
 - ET/SRB Attach Point algorithm is owned/updated by MSFC ET Project
 - » Audit uncovered error in the attach point geometry assumption
 - JSC DOLILU group assessed algorithm change with a 12-month dispersed wind analysis
 - » Changes to loads algorithm are imperceptible from an overall DOLILU I-load design perspective
 - » Maximum observed load indicator increase was only 15%
 - STS-120 and STS-122 DOLILU operations incorporated manual limit checking against conservative load limits
 - A/E FTP #235 agreed to implement DOLILU Ops Block update on STS-123

- Delayed AOA Burn Feasibility Assessment
 - Delayed AOA Burn option increases amount of time available to troubleshoot systems problem
 - » AOA burn performed at ~1 hour MET after a nominal OMS-2 perigee raising burn to 85 nm
 - Technique is very similar to a performance AOA that is performed after an OMS-1 burn for an underspeed condition
 - Entry thermal analysis for delayed AOA option shows acceptable results
 - A/E FTP #235 agreed to implement 482 with Ascent Checklist procedure changes



A/E FTP #236 Summary



- Early Cutoff Voltage System Discussion
 - Booster presented the performance of the ECO voltage instrumentation system during STS-118 and STS-120.
 - STS-122 superseded much of the discussion at A/E FTP #236.
 - » The ECO Voltage Instrumentation System failure definition Flight Rule was introduced at A/E FTP. The rule utilizes standard concepts for declaring instrumentation Go/No-Go.
 - » This failure definition FR was subsequently approved for use during STS 122 at the 12/8/08 MMT.
 - » An ECO system management Flight Rule was also introduced at this A/E FTP and subsequently approved at the STS-122 12/8/07 MMT. This Flight Rule provided guidance to the Flight Control Team in the event the LH2 ECO system was declared non-functional due to 3 or more sensors failing “Wet”.
 - » Subsequent troubleshooting performed for STS-122 determined that the ECO system issues during STS-122 were at the feedthrough connector and have been fixed.
 - » In addition, detailed discussions regarding the impacts if the ECO system were lost determined that the impacts are very significant to fundamental operating philosophies.
 - The effort to update these philosophies and associated Flight Rules was tabled due to the troubleshooting work performed in support of STS-122.



A/E FTP #237 Summary



- A/E FTP #237 discussed how to manage the loss of the LH2 ECO system post launch. The intent was to refine the previously approved Flight Rule regarding LH2 ECO failures in flight.
 - Significant issues and changes to current operations were uncovered as the topic was discussed further.
 - Most significant was the impact to abort boundaries and how those are defined if a guided MECO is required.
 - A/E FTP did not resolve these issues, but did conclude the ECO system is an essential safety system that must be functional to be go for launch.





Orbit Flight Techniques and Generic JOP Topics Applicable to 123/1JA





- The Orbit Flight Techniques Panel (OFTP) and Generic Joint Operations Panel (GJOP) conducted an STS-120/10A Post-Flight Review on 11/15/07
 - No actions applicable to STS-123/1JA were assigned
 - Four Orbit-related MOD IFA's were brought forward from STS-120
 - » STS-120-D-001: RMS Joint Angle Ground Display Error
 - » STS-120-D-002: Missing Step in OBSS Starboard Survey Procedure
 - » STS-120-D-003: MCC Wall Clocks Application Failures with Audible Alarms
 - » STS-120-D-004: Orbit Ops Checklist Book Error - IMU Align Procedure
 - None of these IFA's are a constraint to STS-1221E or STS-123/1JA
- GJOP on EVA Overgloves, 1/8





STS-123/1JA Joint Operations Panel Topics



STS-123/1JA JOP Topics



- SLP Loads
 - JOP discussion included gaining an understanding of the operational assumptions in the analysis and iterating as required to make the analysis better reflect the actual operations
 - Operational controls for ruling out many of the loads cases were identified
 - Alternate assembly options for SPDM including PLB assembly were discussed
 - » PLB assembly was not pursued due to access limitation in the bay, EVA timeline exceedances, and the SLP being left in an unsafe configuration in the bay overnight
- JLP 2 ingress, leak check and ECLSS management
 - The plan and techniques for ingressing the JLP while installed on Node 2 was reviewed at multiple STS-123/1JA JOPs
 - JOP discussion included ventilation hardware configuration and constraints for number of crew inside JLP
 - Plans for managing the fan based on lack of smoke detection were developed
 - Stowage for JLP PBAs and the PFE without ventilation was addressed
 - Leak check plans for JLP are similar to Node 2. JLP is in a temporary location and needs only a gross leak check
- CMG controllability and attitude control plan
 - Attitude control plan and backup attitude control modes for JLP installation, SLP install, and docked late inspection were discussed



STS-123/1JA JOP Topics



- SPDM Checkout
 - Plans for perform a brake run in to ensure SPDM brake functionality were developed
 - Discussed SPDM checkout plan and maximizing checkouts during Flight 1JA
- JLP Ingress
 - Crew will wear PPE during the initial JLP ingress on FD5
 - » PPE no longer required after JLP volume is turned over three times (30 minutes)
 - JLP will have functional heaters and fan for inter and intra module ventilation
 - JLP has no smoke detection; crew prime for smoke detection
 - » Fan is considered the only fire source
 - » Fan will be controlled via Minimum Keep Alive Monitoring (MKAM) laptop which also provides JLP temperature insight
 - » Fan is only active when crew is in JLP
- TRAD Contamination
- JLP Condensation Management
- SPDM Assembly
 - Task duration, splitting up over multiple EVAs
- OBSS Thermal Clock and Risk Mitigation Measures
- Docked Late Inspection
- RPCM S02B_D Powerdown Preparation





Japanese Joint Operations Panel Topics



Japanese JOP Topics



- OIPs
 - Generic OIPs
 - Vol C OIPs (3 in final approval)
- Voice Loop configurations for nominal operations, simulations, LSOS and simultaneous operations
- Flight Rules





Russian Joint Operations Panel Topics

Applicable to 123/1JA



RJOP Topics



- Russian air sampling for JLP ingress
 - Discussed Russian request to perform one real-time air sample and one grab sample upon JLP ingress
 - Data will not be used for Ingress Go/No-Go determination
 - Procedures for Russian air sampling will be via RS radiogram, not in Ingress procedure
- STS-123/1JA Briefings to Russian Teams
 - In work and expected to be completed by launch minus 1 week



1E Stage Additions



- If a Progress exchange occurs during 1E stage then add 4-5 days
 - 27P undocks from DC1 on 2/6/08, 28P docks at DC1 on 2/9/08; TBD sleep shift
- If a 1E Stage EVA occurs then add 7-10 days
 - Maturity of products prior to 1E and early 1E stage EVA decision will drive time required
- If ATV occurs then add ~1 week
 - Current work to dates show ATV docking after 1JA launch.
- Adding Columbus Commissioning (CC) critical path activities adds ~4 weeks
 - Not all of this time is serial with the time estimates for other activities
 - Could be impacted by BMRRM EVA; Channel 1A provides power to Columbus systems and payload racks
 - 4 weeks allows for the setup, execution, and return of the WAICO experiment in MERLIN on 1JA. MERLIN is not an option for 1J.
- Other Considerations:
 - There is currently no documented minimum required Columbus Commissioning.
 - Garrett and Peggy are both trained for Columbus Commissioning.
 - To be go for the rack moves on 1JA, ITCS samples must be returned on 1E and analyzed. The estimate for this analysis is 1E Landing + 10 days.

SPAN Manning



- ISS SPAN Support: Manning provided by USA CAF Personnel
- ISS SPAN Systems: Manning provided by DI plus support from DA8 and DA7 if required
- SSP SPAN Support: Manning **POSITION DELETED WITH 120/10A**
- SSP SPAN Systems: Manning provided by DS plus support from DA8 and DA7 if required
- SPAN DO: Manning provided by DO **SUPPORT REDUCED with 120/10A**
- SPAN DM: Manning provided by DM **SUPPORT REDUCED with 120/10A**
- SPAN DX: Manning provided by DX **SUPPORT REDUCED with 120/10A**
- SPAN Managers: Manning provided by DM, DO, DX. Additional ad hoc support from DA8, DA7, DS, and DI.



OPEN HAZARD REPORTS



- Shuttle Open Hazard Reports
 - None
- ISS Open Hazard Reports
 - COL-1002
 - COL-1006 *
 - ECL-0213
 - ENV-1102
 - EPS-0207
 - EPS-0309
 - EPS-0503
 - MCH-0051 *
 - MCH-0109
 - NASDA-0007
 - NASDA-0011
 - NASDA-0029
 - SLP/SPDM/SAPHIA-01
 - SLP/SPDM/SAPHIA-04

* Pre-verified



GFE OPEN HAZARD REPORTS



• STS

- **LI-BCX D CELL (ECD – TBD)** (NT received revised RAESR on 11/15. Final comments were provided to EP5 on 12/3. A waiver to NSTS 07700 Vol. V will most likely be required based upon STS-123 FRR.)
- **LIBCX II C CELL (ECD-TBD)** (NT received revised RAESR on 11/15. Final comments were provided to EP5 on 12/3. A waiver to NSTS 07700 Vol. V will most likely be required based upon STS-123 FRR.)
- **AMMONIA DETECTION KIT (ECD – 01/15/2008)**
- **ACTEX (ECD – 01/10/2008)**
- **MINICAM (ECD – TBD)**
- **CTVC ASSEMBLY (ECD – TBD)**
- **TEPC BAG ASSEMBLY (MOUNTED) (ECD – TBD)**
- **HAND HELD MICROPHONE (ECD – TBD)**

• ISS

- **WATER MONITORING SUBSYSTEM (ECD – TBD)**
- **ORBITER BOOM SENSOR SYSTEM (ECD – TBD)**
- **SUBJECT LOAD DEVICE (ECD – 01/09/2008)**
- **CREW CARE PACKAGE - 1J/A (ECD – TBD)**



PAYLOAD OPEN HAZARD REPORTS



- **ISS**

- **European Technology Exposure Facility (EuTEF) (ECD: 11/06/07)**
 - » **EVA kickloads NCR pending Shuttle/ISS Program signatures**
- **Optimization of Root Zone Substrate (ORZS) (ECD: 11/07/07)**
 - » **Late manifest, awaiting hazard reports from RSC-E**
- **WAICO (BIOLAB Experiment) (ECD: 11/15/07)**
 - » **Late manifest, awaiting hazard report from ESA**



ISS OPEN NCRS



- **NCR-NASDA-PMKH-08 Incomplete Structure Verification prior to launch in case of JEM PM/EF Berthing Mechanism (EFBM) Structural Latch Jamming.**
- **NCR-NASDA-PMMN-08 Power supply side of EVA connectors (JTVE: JEM TV Camera Electronics) terminated in pins rather than sockets.**
- **NCR-NASDA-PMMN-09 Noncompliance of the connector design.**
- **NCR-NASDA-PMMS-09 Internal Active Thermal Control System (IATCS) Gas Trap Maximum Design Pressure (MDP).**
- **NCR-ISS-219 Keep Alive Umbilical (KAU) Mate/De-mate for OBSS has a Downstream Load Greater than 180W.**

