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# **STS-115 MOD FRR**

## **FLIGHT DESIGN AND DYNAMICS**

**August 2, 2006**

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### **DM Flight Design and Dynamics (ISS Trajectory Operations & Planning and Visiting Vehicle Status)**

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## Shuttle CoFR Status Summary

MOD Requirements Codes *	DM	USA FDD		
CRITICAL PROC./APPL	G	G	G	Ready to support flight or standard open work
NON-CRITICAL PROC/APPL	G	G		
FD-TRAJECTORY	N/A	G	Y	Non-standard open work with expected resolution
FD-ANALYST CERT	N/A	G		
FD-CTF	N/A	Y	R	Open work without expected resolution
FDF	Y	Y		
EMCC	G	G	N/A	Does not apply
TRNG-MCC/POCC	Y	Y		
FTP-NEW OPS	Y	G	None	None identified
FLIGHT ANOMALY RES	G	Y		
ANOMALY-PROCEDURE	Y	G		
EX/AI FROM PRIOR REVIEW	None	None		
NO CONSTRAINTS	None	None		
LEVEL II ACTIONS	None	None		
MISSION REQUIREMENTS	Y	Y		
CMD PROC	G	Y		
FPPP REQ MET	Y	Y		
CONTRACTOR PROCESS INSIGHT	G	N/A		

\* as defined in DA8-020 "MOD Certification of Flight Readiness Process" document

## Mission Overview Summary

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- **Insertion Altitude / Inclination** 122 nm / 51.6 deg
- **First Stage Design Criteria** DOLILU II / High Q
- **Launch Window Open/Close** August 28, 2006 19:59:04/20:09:04 GMT  
15:59:04/16:09:04 EDT
- **Landing Time (KSC)** September 8, 2006 16:15 GMT  
12:15 EDT
- **FD3 rendezvous opportunities are anticipated every day in the August/September launch period**
- **I-load Design APM** 1443 lbs (APM at open of a 3 minute window centered at in-plane)
- **Projected APM\*** 1423 lbs (APM at open of a 3 minute window centered at in-plane)
- \* **Based on 07/11/06 APM simulation and manifest changes since FRR (e.g FRCS, Cryogenic O<sub>2</sub>, middeck changes)**
- **Launch hold capability inside of drainback is dependent upon actual DOL performance. Abort coverage has sufficient overlap from liftoff to MECO**
- **August 27, 2006 launch window open** 20:24:47 GMT  
16:24:47 EDT

## Significant Requirements Changes Since Design Baseline

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- **Launch date change from NET 02/17/06 to NET 08/28/06**
- **MPS Inventory update (APM gain ~800 lbs)**
- **ET/SRB stack change**
- **Implementation of 30 second delay following MPS dump initiation for ET crew handheld photography**
  - **Decreased APM impact by ~93 lbs compared to STS-114 and STS-121**
- **OMS load to full (24931 lbm)**
- **FRCS load change from minimum (1912 lbm) to full (2446 lbm) load**
- **Deletion of one GN2 tank (offload decreased to 25 lbm)**
- **Eliminated O2 offload (full load)**
- **Late inspection of Orbiter TPS post-undock**
  - **Posigrade Sep2 burn to 40 nmi to allow possible re-rendezvous after late inspection**

## Significant Changes Since Design Baseline - Concluded

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### Pending Changes

- **Launch date change to August 27**
  - **NASA has negotiated close of launch window on September 7 to accommodate Soyuz launch opportunities on September 14 or 18**
  - **SSP wants to maximize launch opportunities**
  - **Imagery personnel latest lighting analysis predicts that August 27 provides acceptable lighting (possibly August 26 as well)**
  - **FDRD CR in work to include August 26 as potential launch date. Will be presented at August 3 PRCB**

## Significant Mission Firsts And Unique Items

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- **New weather balloons may be used on Ascent/Entry**
  - **AMPS low resolution balloon version LMS-5 (Lockheed Martin Sippican Model 5) will replace the current Mark2 data package**
  - **No impacts to DOLILU software or data**
- **Implementation of 30 second delay following MPS dump initiation for ET crew handheld photography**
- **50 degree Beta constraint for mated operations**
- **If performed, flyaround required to be at range > 600 ft (CG to CG) due to addition of outboard U.S. solar arrays**
  - **New Twice Orbital Rate Separation (TORS) used to transition to increased flyaround range**
  - **Shuttle Nose In-Plane (SNIP) breakout final SEP burn Delta-V increased**

## Significant Mission First And Unique Items - Concluded

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- **Implementation of the multi-stage de-orbit for the unplanned payload return cases**
  - **Ascent Performance Margin (APM) maximized by using available RCS margins to decrease OMS requirement**
- **First flight to incorporate GPS data into PASS during entry operations (2nd flight for GPS ramp-up)**
  - **GPS to Auto in PASS in MM301 until deorbit burn**
  - **GPS to Auto in PASS after confirmation with high-speed tracking**
  - **GPS to remain in Inhibit for BFS**
  - **GPS will be taken to AUTO in OPS 2 following undock to support Entry ramp-up plans**



## Exceedances And Deviations

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- **Contingency Abort Black Zone assessment was not required**
  - **Liftoff mass properties did not exceed NSTS-07700 Vol III criteria (Weight > 259,000 lb. and Xcg > 1115.0 in)**
    - **FRR cycle Liftoff Weight = 269,837 lbs, Xcg = 1112.7 in.**
- **Thermal Structural Envelope Program (TSEP) version 3.6 was used for thermal assessment of EOM, TAL, ATO, and AOA trajectories**
  - **Violations of the chin panel thermal limits were noted (typical for OV-104)**
  - **Trajectories have been sent to Boeing for clearance (ref. OCR S164080BN)**
  - **Results show positive margins. Awaiting formal closure of OCR.**

## Exceedances And Deviations (continued)

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- **Landing weights for Unplanned Payload Return cases exceed 233 klbs NEOM downweight limit**
  - **Per NSTS-07700 Vol. X and Flight Rule A4-159, this case must be evaluated against the thermal criteria for a Nominal EOM**
  - **TSEP violations were noted and trajectories for the No-Dock PLS case (worst case) were sent to Boeing for evaluation**
  - **Results show positive margins. Awaiting formal closure of analysis from Orbiter element.**
  - **Flight rule will be submitted to document results of analysis (ECD 8/07/06)**
- **Low power output for new EDW TACAN (1 kW vs. 1.5 kW)**
  - **Primary TACAN at Edwards AFB, EDW 111, has been replaced with new hardware by Air Force**
  - **Flight specific rule submitted to allow use of low power TACAN on STS-115 (same approach as STS-121)**

## Exceedances And Deviations (continued)

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### Previous Mission Anomalies

#### – Previous mission (STS-121)

- DOL anomalies

- Data dropouts seen with some Jimsphere balloons

- Probable cause => radar tracking issues, MSFC investigating
- Backup radar data was used for wind data

- T1 line dropout

- Data was routed through alternate line and communication accomplished via phone instead of DVIS. MSOC investigating.

- PLOAD application calculation error

- Tank topping time was input incorrectly
- Error was not software related. Procedure and training issue will be corrected for STS-115
- NCR # 009614 has been initiated
- A/E Flight Techniques Panel recommended initiating an IFA on this item

## Exceedances And Deviations (continued)

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### Previous Mission Anomalies

- **Low-Speed C-band Tracking Data Loss at various radar sites**
  - Data circuit problems, transmitter and playback issues
  - All issues were resolved during flight
  - Navigation will follow up with the Network at the Post Mission Review
- **High-Speed tracking issues seen on STS-114 were not seen on STS-121**
  - Flight rule submitted making high speed tracking data mandatory
  - All procedural workarounds approved for STS-121 are in effect to support STS-115
- **GPC BFS Nav errors following wheel stop**
  - No issue from guidance perspective
  - Known condition documented in user note DR 109707
  - No issues for STS-115
- **Heater failure on L5L vernier jet identified prior to launch**
  - Attitude chosen to ensure heater viability for RPM operations
  - Post undock operations used PRCS jets only
  - No issues for STS-115. Operational procedures in place to accommodate loss of jets.

## Exceedances And Deviations (concluded)

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### Previous Mission Anomalies

- **Air data probe deploy anomaly during entry**
  - Starboard air data probe deployed late
  - Delayed air data to Nav call
  - No issues expected for STS-115. Appears to be a vehicle-specific anomaly.
- **Brake Pressure Anomaly**
  - Variation in brake pressure noted following landing
  - No issues expected for STS-115. Human related anomaly.
- **Previous flight of OV-104 (STS-112 October 2002)**
  - **Primary thruster L4D and F3F failed**
    - Thrusters removed and replaced post flight

## Issues And Concerns

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- None

## Exceptions and Standard Open Work

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- **Exceptions**
  - **None**
- **Standard Open Work (complete listing in backup charts)**
  - **All open work is scheduled to be completed per standard flight template**
  - **No issues have been identified**

## Non-Standard Open Work

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- **Non-standard Open Work – no concerns identified for completing any of the open work**
  - **Entry Console Operator (ECO) certification** **08/04/06**
    - Backup certified personnel are available if needed
  - **DOLILU Database Updates (MPS Budget)** **08/07/06**
    - Expect implementation prior to L-4 week database freeze and verification at L-3 week sim
  - **Targeting Officer certification** **08/07/06**
    - Backup certified personnel are available if needed
  - **Range Safety Officer certification** **08/07/06**
    - Backup certified personnel are available if needed
  - **Review ASAB28 stuck throttle status with Flight Director** **08/07/06**
    - Current product does not emulate stuck throttle crew checklist procedures
    - Current product results in conservative abort boundary calls for stuck throttle case
    - USA FDD/DM recommending no updates for STS-115. Flight Director will be briefed on differences.
  - **PLOAD procedure and training updates** **08/10/06**



## Rescue Mission Status

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- **FDD compared the expected OV-103 configuration to the existing suite of as-built OV-103 related products and I-Loads developed as part of the original STS-121 rescue mission effort**
  - **No FDD I-Load updates were required**
  - **Flight Design has identified and will redeliver several products (FDF format updates) as part of this LON effort**
  - **No other facility updates have been identified**
- **All pre-callup production has been completed with the exception of the FDF updates (ECD 8/03/06)**
- **Console staffing will be defined post callup – no issues anticipated**
- **MOD developed post-callup production schedule will be implemented, if required**
- **Baselined launch date is currently NET 11/11/2006**

# FLIGHT DESIGN AND DYNAMICS READINESS ACCOUNTABILITY STATEMENT

**☑ Software** : All software used to create mission products, and MCC software required for mission support including designated critical processors meets generic and mission-specific Program requirements, and is maintained under configuration control in accordance with the FDD Software Management Plan.

**☑ Flight Software** : All flight software Principal Functions (PFs) owned by FDD are ready for flight. All Discrepancy Reports and Program Notes and Waivers related to USA-owned PFs have been reviewed and appropriately dispositioned for this flight.

**☑ Anomaly Resolution** : All anomalies that could impact mission support have been closed, or have accepted and approved work-arounds in place.

**☑ Production** : All flight reconfiguration products and real-time console support products meet generic and mission-specific Program requirements.

**☑ Operations** : All mission support personnel are or will be certified and current prior to supporting mission related activities.

*The FDDOC Flight Readiness Review Process Plan (USA009229) and the Flight Operations Flight Preparation and Readiness Plan (USA008977; Appendix D) which defines the processes and products required for a successful flight have been executed and the applicable Program CoFR requirements satisfied.*

The undersigned certify that the Flight Design and Dynamics Department, upon satisfactory resolution of any noted exceptions, is ready to support flight STS-115.

Flight Design and Dynamics	A. F. Najarian Director	signature	Original signed by	07/20/06 date
Flight Design and Dynamics Software	F. M. Hamilton Software Project Manager	signature	Original signed by	07/19/06 date
Ascent/Descent Flight Design	D. J. Brockway Manager	signature	Original signed by	07/20/06 date
Orbit Flight Design	R. M. Hill Manager	signature	Original signed by	07/19/06 date
Navigation & Flight Design Integration	G. E. Schrage Manager	signature	Original signed by	07/19/06 date
Trajectory Operations & Software Development	F. M. Hamilton Manager	signature	Original signed by David K. Mains II	07/19/06 date
Management & Engineering Services	A. T. McDowell Manager	signature	Original signed by	07/19/06 date

## Flight Design And Dynamics Declaration Of Compliance With CoFR Endorsement Requirements For STS-115 Flight Readiness

☑ **Software** : All software used to create mission products, and MCC software required for mission support including designated critical processors meets generic and mission specific Program requirements, and is maintained under configuration control in accordance with the FDD Software Management Plan.

☑ **Flight Software** : All flight software Principal Functions (PFs) owned by FDD are ready for flight. All Discrepancy Reports (DRs) and Program Notes and Waivers (PNWs) related to USA-owned PFs have been reviewed and appropriately dispositioned for this flight

☑ **Anomaly Resolution** : All anomalies that could impact mission support have been closed or have accepted and approved work-arounds in place.

☑ **Production** : All flight reconfiguration products and real time console support products meet generic and mission specific Program requirements.

☑ **Operations** : All mission support personnel are or will be certified and current prior to supporting mission related activities.

**Requirements Compliance:** All requirements defined by the documents below (as required by the FIDP Compliance Matrix) have been or will be satisfied prior to flight.

DOCUMENT	VERSION	DATE
Flight Implementation Data Pack (FIDP) - Generic	GEN-HA	July 6, 2006
Flight Implementation Data Pack (FIDP) - Flight Specific	115-BASE2-AV	July 18, 2006

### Waivers & Exceptions:

*The FDDOC Flight Readiness Review Process Plan (USA009229, Rev. B) and the Flight Operations Flight Preparation and Readiness Plan (USA008977, Basic, Appendix D) which defines the processes and products required for a successful flight have been executed and the applicable Program CoFR requirements satisfied.*

*Original signed by D. Brockway for A. Najarian 07/24/06*

<b>Director</b>	<b>Date</b>
<b>Flight Design &amp; Dynamics Operations Center</b>	

*Pending completion of open work and closure of noted exceptions, if applicable, Flight Design & Dynamics Operations Center is ready to support STS-115.*

## DM Flight Design and Dynamics (Trajectory Operations) Significant Mission Firsts And Unique Items

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- Start of ET Photo Pitch Maneuver is delayed until 30 sec after beginning of MPS Dump
- SEP Posigrade and stationkeep to protect re-rendezvous (late inspection)
- If flyaround, it will occur outside 600 ft for outboard solar array
  - Use TORS (Twice Orbit Rate Sep) to transition to TORF (Go from 400' on +Vbar to 600' at -Rbar)
- GPS:
  - Post undocking: GPS to NAV for  $\geq 6$  hrs in MM201 (highly desirable)
  - Entry:
    - PASS:
      - GPS to NAV in MM301 (before deorbit burn)
      - GPS to NAV in MM304 after confirmation w/high speed tracking
    - BFS: GPS to NAV inhibited
    - Crew trained OPS 3 procedures during simulations

# Exceedances And Deviations

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## Previous Mission Anomalies

- **STS-121: Istres Status**
  - **Most distance remaining markers are destroyed**
    - Only 300, 600, & 900 m remaining markers are still in place (~ 1000, ~ 2000, and ~ 3000 ft)
  - **Expected fix date is September 2006**
    - Earlier fix not expected, though request is in work by KSC
  - **Rwy 33 overrun has edge lighting for the first 600 m (~ 2000 ft)**
  - **FMI = GO as a TAL site as-is (same config as STS-121)**

## Exceedances And Deviations (concluded)

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### Previous Mission Anomalies

- **STS-121: Radar Restrictions**

- **New, more restrictive ODS EMI limits received before flight**
- **Mission impacts:**
  - **KWAJ restricted during ISS tracking pass on Day of Rendezvous**
  - **Hindered spatula tracking; EOM-1 OA waved off due to uncertain spatula location**
- **Status for STS-115:**
  - **New ODS pyro testing has been completed.**
  - **EV analysis is in work & may result in less restrictive limits.**
  - **Partial OPS workaround: Consider restrictions when planning tracking on DOR.**
  - **Working with STRATCOM on possible power reductions**
    - **Can the radars track at reduced power?**
    - **At reduced power, can the radars still track small objects?**
    - **If answers = NO, same situation as STS-121**
- **Concern: Restrictive limits will impact ability of sensors to detect unexpected Orbiter debris.**

## Special Topics

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- **ISS altitude profile has been worked to increase number of flight day 3 rendezvous days in August-September.**
  - **First burn performed on July 26 (~ 1 mps)**
  - **2nd burn planned on August 23 (25 = bkup) (~ 2 mps)**
  - **2nd TIG will be optimized to minimize shuttle deorbit costs**
  
- **Solar Array Jettison – Safe Sep**
  - **Working on a baseline procedure (non-published) which can be modified to accommodate the actual flight situation (config/condition of the array)**
  - **Will write a FR to document jettison attitude, attitude control constraints, and the minimum required reboost Delta-V**

## Special Topics (concluded)

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- **AR 038078 (STS-121) – GNC ISP SERVER LOST MULTIPLE TIMES**
  - **Trj Server performance was not affected by loss of GNC ISP connection**
  - **No change required to DM OPS for STS-115**
    - **Will be connected to public GNC server**
    - **Same path as previously used**
  
- **RGPO ISP Server**
  - **Potentially susceptible to same problem as the GNC ISP server**
  - **Number of connections will be monitored/managed for STS-115**
  - **STS-121 used only one third of available connections during the undock time period (data not available for rendezvous/docking)**



## Issues And Concerns

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- **Trj Server ARs**
  - **AR 036699 (05-09-2006) – TRS3 “Silent” FAILURE**
    - **IMPACT:** Primary Trj Server fails; workaround is to selectover to the backup
    - **ROOT CAUSE:** Unknown
    - **RECOVERY:** Power cycle the server
    - **LIKELIHOOD:** Has occurred every 1 to 11 months since 2002
- **Is not be a constraint for STS-115 (same status as STS-121).**

## Exceptions and Standard Open Work

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- **Exceptions**
  - **None**
- **Standard Open Work (complete listing in backup charts)**
  - **All open work is scheduled to be completed per standard flight template**
  - **No issues have been identified**

## Non-Standard Open Work

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- **FDF**

- **RNDZ C/L PCN-1**                      **August 9, 2006**
- **ASCENT C/L PCN-1**                    **August 14, 2006**
- **Generic Entry C/L PCN-6**        **August 14, 2006**

- **Flight Controller Certification**

- **Lead LSO certification expected on 8/11/2006**

- **Flight Rules**

- **STS-115:**
  - **A4-3 Shuttle EOM Orbit Adjust Burns (ECD August 3, 2006)**
  - **C2-X SAW Jettison Trajectory Operations (ECD August 4, 2006)**
  - **CR Landing weights for unplanned Payload Return cases (ECD 8/07/06)**
- **Vol. A: A2-109 Preferred Attitudes for Water Dumps (ECD August 1, 2006)**

# STS-115 Flight Design & Dynamics Division Readiness Statement

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The Flight Design and Dynamics Division has performed the reviews necessary to assess the flight readiness relating to flight design requirements definition, trajectory operations, and flight software MMU reconfiguration. We have determined all applicable responsibilities acceptable for flight pending closure of the identified open work and issues.

*Original signed by* *07/21/06*

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**Barbara A. Conte**  
**Chief, Flight Design Requirements and Integration Office**

*Original signed by G. Oliver for M. Collins* *07/21/06*

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**Michael F. Collins**  
**Chief, Flight Design and Dynamics Division**

**As compiled by: FDM/R. Moreno**  
**FDO/D. Theis**



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# STS-115/12A Mission TOPO Readiness FDDD FRR

DM33 / W. A. Seay  
ISS Trajectory Operations & Planning  
(281) 483-1971

# TOPO Readiness: STS-115 / 12A



Item	Closed or Expected Close Date	Notes/Comments																				
<b>Flight Controller Status</b>																						
Flight Controller Certifications Complete	08/15/06	<table border="1"> <thead> <tr> <th>POSITION</th> <th>NAME</th> <th>CERT</th> <th>PRP</th> <th>PHYSICAL</th> </tr> </thead> <tbody> <tr> <td>TOPO Orbit 1</td> <td>TBD</td> <td>---</td> <td>---</td> <td>---</td> </tr> <tr> <td>TOPO Orbit 2</td> <td>Will Seay</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>TOPO Orbit 3</td> <td>Larry Strimple</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> </tbody> </table>	POSITION	NAME	CERT	PRP	PHYSICAL	TOPO Orbit 1	TBD	---	---	---	TOPO Orbit 2	Will Seay	Yes	Yes	Yes	TOPO Orbit 3	Larry Strimple	Yes	Yes	Yes
POSITION	NAME	CERT	PRP	PHYSICAL																		
TOPO Orbit 1	TBD	---	---	---																		
TOPO Orbit 2	Will Seay	Yes	Yes	Yes																		
TOPO Orbit 3	Larry Strimple	Yes	Yes	Yes																		
<b>Documentation</b>																						
TOPO Console Handbook	Closed	TCHB Rev-M PCN 01, May 17 2006																				
OIP's Ready to Support	Closed	No Updates from last Shuttle Flight																				
Flight Rules Ready to Support	Closed	Volume B: Final, PCN 4, June 23, 2006 Volume C: Final 2006, PCN-1, June 13, 2006 STS-115/12A 12A-12.1A Stage: Basic, Rev. A, May 11, 2006																				
New Applicable Flight Rules	07/27/06	Mated Attitude Rule Being Finalized																				
<b>Trajectory Software Application (TSA) v. 6.0.1</b>																						
Non-critical ISS Trajectory Processors	Closed	Major ARs: None																				
Critical ISS Trajectory Processors	Closed	Critical Applications (Vector, Ephemeris, Maneuver, Pc) TSA Critical ARs: None TSA Major ARs: None																				
Mission Configuration Test (MCT)	7/31/06																					

# TOPO Readiness: STS-115 / 12A (cont)



Item	Closed or Expected Close Date	Notes/Comments
<b>ISS Trajectory Operations and Planning</b>		
ISS Translation Maneuvers	Closed	ISS Reboost on July 26 and August 25 to set phasing for 12A Launch, 13S Launch and 12S Landing.
Shuttle Data Exchange	08/15/06	To be provided per OIP agreements
ISS Altitude Strategy	Closed	Minimum operating altitude: No violations Maximum rendezvous altitude: (185 nmi /343 km)
Joint Underspeed Recovery (JURe) Estimated Max Capability (RSA Plng - TBS kg/MSFC 50% - TBS kg Prop)	08/15/06	<u>Mnvs JURe ΔV JURe Prop Rec ΔV Rec Prop Tot ΔV Tot Prop</u> In Work
Mated Reboosts	08/23/06	Discussion of possible 2 m/s mated reboost to assist with phasing Debris Avoidance Maneuver (DAM): If FRCS Prop Avail - will use Config 3 If FRCS Prop Unavail - will use Config 4

# MISSION OPERATIONS DIRECTORATE

FLIGHT DESIGN AND DYNAMICS DIVISION  
ORBIT DYNAMICS BRANCH  
AUTOMATED VEHICLES & ORBIT ANALYSIS

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## STS-115 (12A) MOD FRR Flight Readiness Review

### Agenda Item 5 - Visiting Vehicle Status

DM35 (VVO)/R. Parker

August 2, 2006





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(End Notice)

# Visiting Vehicle Status

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- Visiting Vehicle Flights for ISS Stage 12A
  - ↗ Soyuz TMA-9 (13S), Launch on 14 or 18 September 2006
    - ↗ Dependant on 12A Launch
    - ↗ Additional details to be provided at 13S/Increment 14 FRR
  - ↗ Progress M-56 (21P), Departure from SM aft on 15 or 19 September 2006
    - ↗ Will occur between 13S Launch and Docking
- Open Issues
  - ↗ None for 21P Undock
- Standard Open Work
  - ↗ Standard OIP data exchange
- Console Support
  - ↗ No issues with maintaining currency, proficiency or certifications
  - ↗ No work guidelines violations
- Software Issues
  - ↗ None; no critical processors

## Back-Up

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- **Flight Readiness Open Work**
- **PLOAD Issue**
- **Low-Speed C-band Tracking Data Loss**

### **Separate pdf files:**

- **Launch Window Summary**
- **Digital Launch Window**
- **Launch Date Summary**
- **Abort Regions**
- **Nominal ET Impact Area**
- **Ascent/Descent Flight Critical Software**

## Flight Readiness Open Work

Item	Responsible	Due Date	Status	Closure Rationale
<b>USA Flight Design Standard Open Work:</b>				
DATA43 FDD FRR Data Pack	FDM	07/28/06	Completed	Delivered
RNDZ02 RNDZ/Prox Ops Target Drag Characteristics	Orbit	07/28/06		
Review of ICHA Report	Orbit	07/28/06		
Level 8 test results review	Orbit	07/28/06	Completed	
RNDZ/FDO Phasing Plan Meeting	Orbit	07/28/06		
SAIL/SPF	ADFD	07/28/06	Completed	
DATA45 FDD FSW PF Sign-off	FDM	07/28/06	Completed	
CM FOE L-30 day audit	J. Bedford	07/28/06		
ONOR29B RNDZ Launch Target Data	Orbit	07/31/06		
ASCT43 MPS Minimum Sigma Level	ADFD	07/31/06		
L-4 week LDO Database Freeze	ADFD	07/31/06		
RNDZ08 RNDZ Phasing Limits	Orbit	08/03/06		
ASCT04 Uplink APM	ADFD	08/04/06		
ONOR37B Daily Planar/Phase Windows	Orbit	08/07/06		
NAVO16B GPO COTM Data Pack	Navigation	08/07/06		
NAVO18B GPO/ONAV Ops Memo	Navigation	08/07/06		
ONOR27 Launch and Landing Data	Orbit	08/09/06		

## Flight Readiness Open Work - Continued

Work Item	Responsible	Due Date	Status	Closure Rationale
<b>USA Flight Design Standard Open Work - Continued:</b>				
LDO: L-3 week LDO Checkout/TCDDT Sim	ADFD	08/10/06		
ASCT44 DOL Uplink I-loads	ADFD	08/11/06		
ONOR29C RNDZ Launch Target Data	Orbit	08/18/06		
Dial Down Decision FIDP	FDM	08/18/06		
BuCrit Process Start	ADFD	08/19/06		
DSCT17 Landing Site Tables	ADFD	08/21/06		
C-Band tracking Scheduling Message	Navigation	08/21/06		
ONOR37C Daily Planar/Phase Windows	Orbit	08/22/06		
ASCT99 OMS Assist - ATO Update	ADFD	08/22/06		
RNDZ09 Rendezvous COLA Plans	Orbit	08/23/06		
SRB and ET RTLS Impact Point Update Memo	ADFD	08/25/06		
ASCT42 Collision Avoidance Data	ADFD	08/25/06		
ASCT47 Final MCC Trajectory Inputs	ADFD	08/25/06		
DSCT66 Real-Time Support Files	ADFD	08/25/06		
Range Safety Launch Window Cutout	ADFD	08/25/06		
ASAB32B AME MCC Support Tables	ADFD	08/26/06		
L-2 day DOLILU System Checkout	ADFD	08/26/06		

## Flight Readiness Open Work - Continued

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Work Item	Responsible	Due Date	Status	Closure Rationale
<b>USA Flight Design Standard Open Work - Continued:</b>				
DSCT05 Maximum Crossrange	ADFD	08/26/06		

## Flight Readiness Open Work - Continued

Work Item	Responsible	Due Date	Status	Closure Rationale
<b>USA Flight Design Non-Standard Open Work:</b>				
Entry Console Operator Certification	ADFD	08/04/06		
DOLILU Database Updates (MPS budget)	ADFD	08/07/06		
Targeting Officer Certification	ADFD	08/07/06		
Range Safety Operator Certification	ADFD	08/07/06		
Review ASAB-28 / Stuck Throttle Product with DA8	ADFD	08/07/06		
PLOAD procedure and training updates	ADFD	08/10/06		

## Flight Readiness Open Work - Continued

Item	Responsible	Due Date	Status	Closure Rationale
<b>Trajectory Operations Standard Open Work</b>				
Flight Load Checklist Complete	Orbit FDO	07/25/06		
Flight Load Checklist Complete	RGPO	07/26/06		
L-30 HA Server Audit	TOCSS	07/28/06		
Generic Rules CR: A2-109	OFDO	08/01/06		
FDO Close to Launch Trajectory Data	OFDO	08/03/06		
Annex Rules CRs	OFDO	08/04/06		
Flight Load Checklist Complete	AE FDO	08/07/06		
Flight Load Checklist Complete	AE GPO	08/10/06		
TCDT Checkout in Ops Cert Mode	AE GPO	08/10/06		
Flight Load Checklist Complete	Navigation	08/13/06		
Flight Load Checklist Complete	DOLILU	08/13/06		
Flight Load Checklist Complete	Entry Support	08/13/06		
Flight Load Checklist Complete	Orbit-RNDZ	08/13/06		
DOD Support Readiness	OFDO	08/13/06		
Flight Load Checklist Complete	LSO	08/15/06		
Close-to-Launch update to Mass Properties & FDO Console Data Book	OFDO	08/25/06		



## Flight Readiness Open Work - Continued

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Item	Responsible	Due Date	Status	Closure Rationale
<b>Trajectory Operations Standard Open Work</b>				
Present new Ops notes at DM Trench tagup	TOCSS	08/18/06		
L-5 HA Server Audit	TOCSS	08/23/06		

## Flight Readiness Open Work - Concluded

Item	Responsible	Due Date	Status	Closure Rationale
<b>Trajectory Operations Non-Standard Work:</b>				
SAW Jettison Procedures and Flight Rule	FDO	08/04/06		
FDF : RNDZ C/L PCN-1	RGPO	08/09/06		
Unplanned Payload Return landing weight Flight Rule	FDO	08/07/06		
Lead LSO certification	FDO	08/11/06		
FDF : Ascent C/L PCN-1	AFDO	08/14/06		
FDF : Generic Entry C/L PCN-6	EFDO	08/14/06		
<b>Flight Software Standard Open Work:</b>				
None				
<b>DM Standard Open Work:</b>				
Abort Readiness Statement	FDRIO	08/08/06		
Orbiter Readiness Statement	FDRIO	08/08/06		
Range Safety Readiness Statement	FDRIO	08/12/06		

## PLOAD Issue

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- **Post-Flight comparison of PLOAD results with MSFC PLOAD POC**
  - 600 pound difference in LOX loading estimate seen between MCC and HOSC PLOAD results
  - Traced to a MCC PLOAD initialization problem
    - Topping time set incorrectly due to procedural error
- **PLOAD LOX estimate was high by about 600 pounds**
  - Converts to a 270 pound performance hit when assessed with the STS-121 MPS budget
  - Roughly a 30 second reduction in launch window and 1 to 2 seconds loss in uphill abort capability
  - STS-121 budget was extremely sensitive to LOX loading change due to low fuel bias
- **Procedures calling for verification of “Topping Time” were misplaced in the PLOAD operator checklist**
- **SSP DOLILU Anomaly and a FDD AR were opened to document this problem**

# Low-Speed C-band Tracking Data Loss

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- **Low-Speed C-band Tracking Data Loss**
  - Kaena Point radar KPTC
    - Data circuit problem prevented transmission of data
    - Playback issues
  - Ascension radar ASCC
    - Data circuit problem prevented transmission of data
    - Transmitter issue resulted in partial loss of data on multiple passes
    - Playback issues
  - Antigua radar ANTC
    - Timing hit that prevented transmission of data
    - 1 second time bias occurred on two passes
  - Wallops radars
    - Data sent in bursts
  - All of these issues were resolved during the flight
  - Navigation will follow up with the Network at the Post Mission Review