



STS-116/12A.1 MOD FRR FLIGHT DESIGN AND DYNAMICS

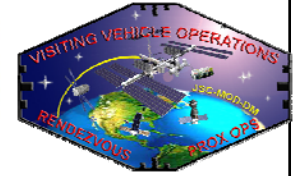


November 8, 2006

TOPO/R. Morgan: 281-483-1938

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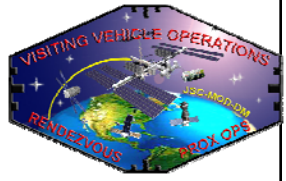
Status

Documentation

Standard Open Work

Open Issues

CoFR Status Summary



MOD Requirements Codes *	TOPO	VVO
CRITICAL PROCESSORS/APPLICATIONS	G	G
NON-CRITICAL PROCESSORS/APPL.	G	G
EMERGENCY MCC	G	G
TRAINING-MCC	G	G
FTP-NEW OPERATIONS	G	G
FLIGHT ANOMALY RESOLUTION	G	Y
ANOMALY-PROCEDURE	G	Y
EX/AI FROM PRIOR REVIEW	None	None
NO CONSTRAINTS	Y	None
LEVEL II ACTIONS	None	None
MISSION REQUIREMENTS	G	G
COMMAND PROCEDURES	N/A	N/A
FPPP REQUIREMENTS MET	G	G
CONTRACTOR PROCESS INSIGHT	G	G

G	Ready to support flight or standard open work
Y	Non-standard open work with expected resolution
R	Open work without expected resolution
N/A	Does not apply
None	None identified

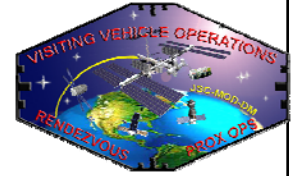
* as defined in DA8-020 "MOD Certification of Flight Readiness Process" document

DM FDD Trajectory Operations Significant Mission Firsts and Unique Items



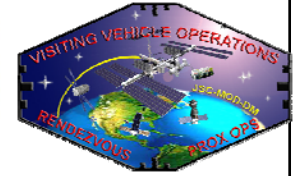
- First flight for a planned ISS Solar Array retraction.
- First flight/stage modeling ISS trajectory with new solar array articulation.
- First flight since return to flight which does not protect for Orbiter re-rendezvous after undock.

Exceedances and Deviations



- None noted

Special Topics



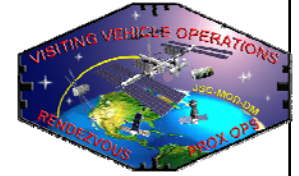
- The ISS altitude profile is being worked to increase number of flight day 3 rendezvous days in December, currently from 12/7 to 12/19 GMT.
 - ISS Reboost burn on November 29 (currently 4.0 mps)
 - Burn plan still under review; may require a mid December ISS reboost to avoid losing FD3 rendezvous capability late in the season.
- Contingency P64B Solar Array Wing (SAW) Jettison
 - Proximity Ops team analyzing ISS/Orbiter stack Torque Equilibrium Attitude (TEA) jettison options. To be complete before launch.
 - Long term recontact analysis complete, no concerns.

Issues and Concerns



- **STP-H2 Deployable Relative Motion versus ISS**
 - **RAFT on Undock Day (FD10): TOPO, FDO and FD will verify the deploy timing and direction insures no long term recontact issues with ISS.**
 - **MEPSI on Undock Day (FD10): no concerns**
 - **ANDE on FCS Checkout Day (FD 11): no concerns**

Standard Open Work

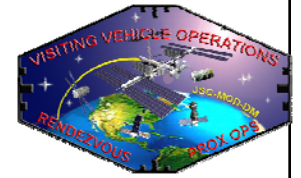


- **Standard Open Work**

- **ISS phasing maneuver November 29, 2006: set Shuttle FD3 opportunities.**
- **Mission Configuration Test (MCT): scheduled to be complete NLT November 20, 2006.**
- **Shuttle Data Exchange with Russian Ballistics: Shuttle flight data per OIP agreements completed L-20 hours.**

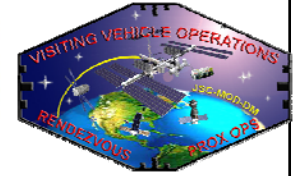
All open work is scheduled to be completed per standard flight template

Non-Standard Open Work



- STP-H2 Deployable (RAFT) optimization.

Exceptions



- None noted.

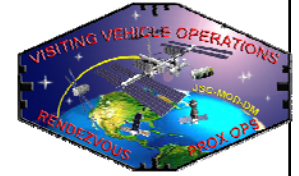
MISSION OPERATIONS DIRECTORATE
FLIGHT DESIGN AND DYNAMICS DIVISION
ORBIT DYNAMICS BRANCH
AUTOMATED VEHICLES & ORBIT ANALYSIS



STS-116 (12A.1) FDDD Flight Readiness Review
Agenda Item 5 - Visiting Vehicle Status
DM35 (VVO)/R. Parker
October 30, 2006



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The bottom line is that the RSC-Energia data may not be used for purposes of manufacture and may not be shared with contractors except in direct support of the ISS Program.

Open Issues



- 24P docking date does not provide proper lighting for approach
 - Insufficient insolation (≈ 5 min) to perform flyaround prior to RGS AOS
 - VIPER request to Team 0 and MMC request to Russian planners to slip launch/docking by 4-5 days to mitigate this issue
- SM Kurs-P antenna [AKP-BKA] No.1 signal acquisition problems
 - This transient anomaly occurred only on 7P and 5S
 - Unable to reproduce the anomaly in multiple tests
 - Beginning with 10P, the docking attitude has generally been chosen to keep the incoming vehicle within the main lobe of SM [AKP-BKA] No.2
 - During 13P docking the Russians tested the capability to connect a docked Soyuz/Progress antenna [AKP-BKA] to the SM Kurs-P system to provide supplemental coverage if one of the SM antennas suffers a hard failure
 - Post-flight analysis showed the 7S [AKP-BKA] No.3 performance was acceptable; RSC-E considers this only a backup capability because the cable connect/disconnect process limits this to 3 uses
 - RSC-E proposal to test the use of the port SM Regul antenna in place of [AKP-BKA] No.1 was discussed at AR&D Mini-TIM #10 and will be brought to Team 0
- Russian vehicle docking attitudes
 - Only approved attitude envelope is +XVV +ZLV due to EATCS activation
 - Severely limits docking opportunities for Russian vehicles, especially for dockings to the nadir ports
 - ISS Program working on providing a short term solution – approval of 5 alternate attitudes that would be used for Russian vehicle dockings (-XVV +ZLV, \pm XVV \pm YLV) through Stage 17A
- USOS solar array positioning for Russian vehicle dockings during Stage 12A.1
 - Conflict between positions required to minimize Kurs blockage and multipath, and positions required to meet erosion and loads limits
 - AR&D Mini-TIM #10 action to RSC-E to assess VIPER proposal