



KSC Space Station and Payloads Processing ISS-LF1

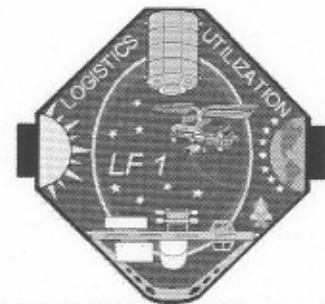
Multi-Purpose Logistics Module "Raffaello"

External Stowage Platform 2

Lightweight MPESS Carrier



Scott Higginbotham / UB-N
LF1 NASA-KSC Mission Manager
June 29, 2005



Agenda



- | | |
|--|---------------|
| • Acronyms | In Back-Up |
| • Completed Processing Milestones | In Back-Up |
| • Remaining Processing Milestones | To Be Briefed |
| • Middeck Experiment Requirements | To Be Briefed |
| • Launch Delay Requirements | None |
| • Engineering Status | To Be Briefed |
| • Issues / Concerns | None |
| • Certificate of Flight Readiness Exceptions | None |
| • Readiness Certification | To Be Briefed |



Remaining LF1 Processing Milestones



Pad B

- Flight Crew Payload Bay Inspection
- Launch Package Closeouts
- Payload Bay Door Closure
- Launch

ECD

30 June 2005
 30 June 2005
 30 June 2005
 13 July 2005



Middeck Experiment Requirements



Payload (Up)

None

Turnover to KSC

N/A

Power/IVT

N/A

Launch Delay

N/A

Payload (Down)

PCG-STES #10

HRF Urine Tube Assy

Yeast-GAP

Turnover to Customer

<= Landing + 6 Hours

<= Landing + 6 Hours

Nominal

Power

Yes

No

No



Engineering Status



Technical Requirements (OMRSD)

- No open Waivers or Exceptions
- One Pending Change: MA16791 – A024, File 10, Volume 3
 - Adds requirements for post-mission ECLSS valve cleaning/bagging
- A review of the Requirements Allocation Matrix has confirmed that all remaining open requirements have been incorporated into the appropriate scheduled procedures for satisfaction

Nonconformances

- All Problem Reports have been closed or deferred

Procedures

- All Payload processing procedures have either been released or are scheduled to be released in time to support all applicable "on the shelf" requirements

Configuration Management

- No issues

Launch Commit Criteria

- None



Readiness Statement



Pending successful completion of the remaining scheduled Pad B operations, both the NASA-KSC International Space Station / Payloads Processing Directorate and the Boeing-Checkout, Assembly, and Payload Processing Services (CAPPs) contractor are ready to proceed with the launch of ISS-LF1/STS-114.

ready to proceed with the launch of ISS-FLIGHT-114 Payload Processing Services (CAPPSS) contracts to the Directorate and the Boeing-Creston, Assembly, and International Space Station Payloads Processing scheduled payload operations, with the NASA-KSC pending successful completion of the remaining



Readiness Statement



- No Air Force Contingency Plans
 - No Air Force Configuration Management Requirements
 - All Payload Processing Procedures have either been released or are in process
 - All Payload Robots have been closed or deleted
 - All Payload Processing Procedures for verification including open requirements have been incorporated into the
 - A review of the Requirements Allocation Matrix has confirmed that all
 - One Pending Change: NASA-101 - 1014, EIR 10, Volume 3
 - No Open Matters or Exceptions
- Technical Requirements (OWRSD)



Engineering Status





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STS-114 Flight Readiness Review

MS/John F. Muratore

29 Jun 2005



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Agenda

- Exceptions and Open Work
- Integrated Hazards
- ECO Sensor UA
- Lox Geyser Analysis
- Flight Software
- Personal General Support Computer



Systems Engineering & Integration Exceptions

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- Completion and closure of Integrated Hazards
 - Updates due to LO2 Feedline Bellows Heater implementation – ECD 7/7/05
 - IEPD-01: Inability to Power Critical Functions
 - IMPS-15: LO2 Geyser Event During Cryo Loading
 - ISPR-02: ET Vent Arm System Umbilical Malfunction
 - Modification to integrated system risk increase associated with ECO sensor UA – ECD 7/7/05
 - IMPS-03: Improper IMPS Configuration During Engine Operation
 - Adding new control for late checkout of sensor functionality
 - Development, review and approval of integrated debris hazard (IDBR-01) – ECD 7/7/05
- NSTS 08303, Ice/Debris Inspection Criteria, update for allowable ice as result of DVR – ECD 7/7/05
- CR S062528, Update 07700 Vol X to exempt specific element interfaces and ET instrumentation from the NSTS 08080-1 deadfacing requirements – ECD 7/7/05



Systems Engineering & Integration Exceptions

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- Complete integration, review and approval of open RCNs – ECD 7/1/05
 - MS16795R1 S00-ET BIPOD MANUAL HEATER CONTROL
 - KG16723R1 544.31- MSLBS AND TACAN, CLS-FRANCE P
 - KG16763 012.00 HYPERGOL VAPOR DETECTION, PADS R
 - KG16794 554.31 TACAN CIRCUIT BREAK., CLS-ISTRES R



Integrated Hazard Report Risk Distribution

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Likelihood	Probable			
	Infrequent	2		22
	Remote	2	7	168
	Improbable	15	24	410
		Marginal	Critical Severity	Catastrophic

Hazard Report #	Accepted Risk integrated Hazard Reports	Controlled				Accepted Risk									
		Controlled Risk	remob-marg	improb-marg	improb-critical	Accepted Risk	prob-marg	infreq-marg	remote-critical	remote-cat	prob-critical	infreq-cat			
ICBR-01	Exterior Debris Impact to SSV	29				43						13			
IMEE-01	Adverse Electromagnetic Effects (EME)	1				22						22			
IEPD-01	Inability to Power Critical Functions	16		12		4			3	5		2			
IFSI-01	ET/Orbiter System Interface Failure	7		7		2			2			2			
IGNC-01	Ascent Trajectory Event Anomaly	15				18						1			
IMEC-01	Hazardous Environment in the AE Compartment	7		2		7			1	3		3			
IMPS-01	Contamination in the Integrated MPS H2 System	1				3				5					
IMPS-02	Contamination in the Integrated MPS O2 System	1				3				5					
IMPS-03	Improper IMPS configuration during S0ME Operation	15		1		17				5					
IMPS-04	CR-Normal Purges	13				13				1					
IMPS-09	Hazardous Environment due to H2 External to SSV *	4				6				4		1			
INEV-01	Exposure to Natural Environment Exceeds Capability of the Space Shuttle SSV Elements	17	1	1		15	45		1	1	43				
ISPR-03	T-0 Service Mast (T-0) Limbical System Malfunction	67	2	7		51				1		1			
ISPR-04	SRB Hold Down Post (HDP) System Malfunction	2				2				2					
ISPR-05	SRB Umbilical System Malfunction	5				5				2					
ITHM-01	Exposure to Thermal Environment Exceeds Capability of SSV	17	1	6		7	3		1	1	1				
IVLD-01	Exposure to Inertial Environment Exceeds Structural Capability of SSV	41				41	35			1	24				
SLIT-01	Failure to Avoid Lightning	2				2				6		4			
IH Risk Distribution Totals		201	2	15	24	220	196		0	2	7	165	0	0	22

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Integrated Hazard Report Risk Distribution

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Hazard Report #	Controlled Integrated Hazard Reports	Controlled				
		Controlled Risk	remob-marg	improb-marg	improb-critical	improb-cat
IARO-01	Aerodynamics Environment not per Specified Design	1				
ICOM-01	Adverse Effects due to Intentional RF Environment	3				3
IFSI-02	ET/Orbiter System Interface Failure	11				11
IFSI-03	SSME/Orbiter System Interface Failure	16				16
IFSI-04	Outer Mold Line Configuration Error	3				3
IFSW-01	Flight Software Generic Problems can cause loss of vehicle command and control	2				2
IMEC-02	Malfunction of Integrated Hydraulic System (Systems 1, 2 and 3)	5				5
IMEC-03	SSME Nozzle/OMS Pod/ Body Flap Interference	3				3
IMPS-05	Over pressurization of the integrated MPS H2 System	20				20
IMPS-06	Under pressurization of the integrated MPS H2 System	15				15
IMPS-07	Over pressurization of the integrated MPS O2 System	17				17
IMPS-08	Under pressurization of the integrated MPS O2 System	14				14
IMPS-12	Excessive O2 from ET/Orbiter/SSME External to SSV **	10				10
IMPS-15	LO2 Geyser Event during Cryo Loading	13				13
IMPS-16	Loss of MPS He System	4				4
IMPS-17	Inadvertent SSME Shutdown	5				5
IPYR-01	Pyrotechnic System Malfunction	21				21
ISPR-02	ET Vent Arm System (ETVAS) Umbilical System Malfunction	16				16
IVLD-02	System Instability Results in Structural Failure of SSV	20				20
IH Risk Distribution Totals		199	0	0	0	199



Integrated Hazard Open Work

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- 37 Integrated Hazard Reports Identified for STS-114.
 - 36 dispositioned by PRCB.
 - The CR S050425BZ IDBR-01 "External Debris Impacts SSV" Integrated Hazard Report is released and in review. (SICB 07/05/05, PRCB 07/07/05)
 - All Open Work classified as RTF Constraints during the Integrated Hazard development process has been completed and the Integrated Hazard Reports are Closed.
- 4 Additional Hazard Report Changes were identified following the Systems DCR.
 - CR S050425CL documents the 3 Integrated Hazard Report updates required as a result of the ET LO2 Feedline Bellows Heater modification. (SICB 07/05/05, PRCB 07/07/05)
 - IEPD-01, Inability to Power Critical Functions
 - ISPR-02, ET Vent Arm System (ETVAS) Umbilical Malfunction
 - IMPS-15, LO2 Geyser Event.
 - CR S050425CN documents the Integrated Hazard Report IMPS-03 "Improper IMPS Configuration during Engine Operation" changes identified as a result of the STS-114 Tanking Test LH2 ECO Sensor Anomaly. (SICB 07/05/05, PRCB 07/07/05)
 - Adding control for late checkout of sensor



Infrequent/Catastrophic Causes

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Hazard Report	Hazard Report Title	Cause/Description	Post RTF Actions
IGNC-01	Ascent Trajectory Anomaly	Critical Math Models used for design/verification do not match flight conditions causing an ascent trajectory anomaly.	Develop an Integrated Hazard Report to better define the risk for Intact Aborts
IMEO-01	Hazardous Environment in the Aft Compartment	Hot Surface Temperatures (Ignition Sources) in the Aft Compartment from Improper Design/ Interface Characteristics.	Define the overall induced environment in the aft compartment. This includes identifying potential instrumentation changes to monitor and understand the aft compartment environment and warning systems to reduce the risk of current undetectable catastrophic failure modes such as SSME hot gas leaks.
		Leakage in the Aft Compartment from External Sources.	Determine if ingestion of Hazardous fluids in the Aft compartment is credible
		Ignition Sources in the Aft Compartment due to External Sources	Determine if ingestion of Hazardous fluids in the Aft compartment is credible



Infrequent/Catastrophic Causes

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Hazard Report	Hazard Report Title	Cause/Description	Post RTF Actions
ILIT-01	Failure to Avoid Lightning	Failure to Avoid Lightning During Prelaunch Operations Between the VAB and the Launch Pad	Perform a fleet assessment of the Program capabilities for vulnerability and protection
		Failure to Avoid Lightning During Prelaunch Operations at the Launch Pad	Review existing OMRSDs considering the risk throughout the entire period of ET Propellant Operations.
		Failure to Avoid Lightning During Entry/Descent/Landing	Review existing flight rules and OMRSDs considering the risk throughout the entire period of post-landing ground operations.
		Failure to Avoid Lightning During Post-Landing Through OPF Roll-In	
IMPS-09	Hazardous Environment due to H2 External to SSV	H2 Concentrations above LFL External to the SSME due to Failure to Disperse Lag H2 during Pad Shutdown	Determine if imagery analysis and CFD analysis can conclude lag H2 is consumed and not trapped in a pad shutdown. Evaluate mechanisms for closing the gap between engine shutdowns and the initiation of Firex to reduce the risk of lag H2.



Infrequent/Catastrophic Causes

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Hazard Report	Hazard Report Title	Cause/Description	Post RTF Actions
IDBR-01	External Debris Impacts SSV	ET Foam - PDL-1034 Located at the LO2 Ice/Frost Ramps Impact to Orbiter Tile During Ascent	ET project to continue the ice liberation testing to better define the size and amount of ice liberated from the feedline brackets.
		ET Foam - PDL-1034 Located at the LO2 Ice/Frost Ramps Impact to Orbiter Special Tile During Ascent	SE&I, KSC L&L and ET, IPWG to use flight imagery to help better define the size and amount of ice liberated during liftoff from bellows, brackets and umbilicals.
		ET Foam - PDL-1034 located on the Intertank Ice/Frost Ramps Impact to Orbiter Tile During Ascent	SE&I to update probabilistic analyses if/when additional data on ice is available. This would include ice density, ice quantity, shape and size.
		ET Foam - PDL-1034 located on the Intertank Ice/Frost Ramps Impact to Orbiter Special Tile During Ascent	SE&I to improve aerodynamic prediction capability of ice release during transonic Mach numbers with emphasis on ice debris crossrange capability.



Infrequent/Catastrophic Causes

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Hazard Report	Hazard Report Title	Cause/Description	Post RTF Actions
IDBR-01	External Debris Impacts SSV	ET Ice Located on the LO2 Feedline Brackets Impact to Orbiter Tile During Ascent	SSP to gather additional flight data on umbilical ice build up, baggie release and track ice damage on adjacent tile area.
		ET Ice Located on the LO2 Feedline Brackets Impact to Orbiter Special Tile During Ascent	
		ET Foam - PDL-1034 located on the Intertank Ice/Frost Ramps Impact to Orbiter Special Tile During Ascent	SE&I to update analysis for special tile impacts with updated capability
		LO2 Feedline Bellows Ice Impact to Orbiter Tile During Ascent	
		LO2 Feedline Bellows Ice Impact to Orbiter Special Tile During Ascent	
		Orbiter/ET Umbilical Ice Impact to Orbiter Tile During Ascent	
		Orbiter/ET Umbilical Ice Impact to Orbiter Special Tile During Ascent	



Infrequent/Catastrophic Causes

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Hazard Report	Hazard Report Title	Cause/Description	Post RTF Actions
IDBR-01	External Debris Impacts SSV	ET Foam - BX 265 Located on the LO2 to I/T Flange Closeout Impact to Orbiter Special Tile During Ascent	
		Miscellaneous Ice from ET Defects and ET/SRB Interfaces Impact to Orbiter Tile During Ascent	