



SPACE SHUTTLE PROGRAM
Space Shuttle KSC Integration Office
NASA Kennedy Space Center, Florida



STS-133 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **01-28-10**

Program Freeze Point

PRCB Presentation

S115133A



STS-133 Integrated Launch Site Requirements Review

Presenter	Kenneth Nowak	
Date	01-28-10	

Baseline the STS-133 Mission Specific Requirements and Flow Plans. This CR and the associated Data Package were reviewed at the 01-25-10 FRWG.

Flight Operation & Integration

MO3/USA-PI

Orbiter Engineering*

Requesting Approval

USA-OE

Payload/Cargo Engineering*

USA-PI

Status in Backup

KSC Integration*

MK-SIO

Flight Software

USA-FSW

Orbiter GFE*

MV5

EVA

XA

SSME

Status at LSFR

MP21

***Backup material included**



SPACE SHUTTLE PROGRAM
Space Shuttle Flight Operations and Integration Office
NASA Johnson Space Center, Houston, Texas



STS-133 LSRR

FRWG

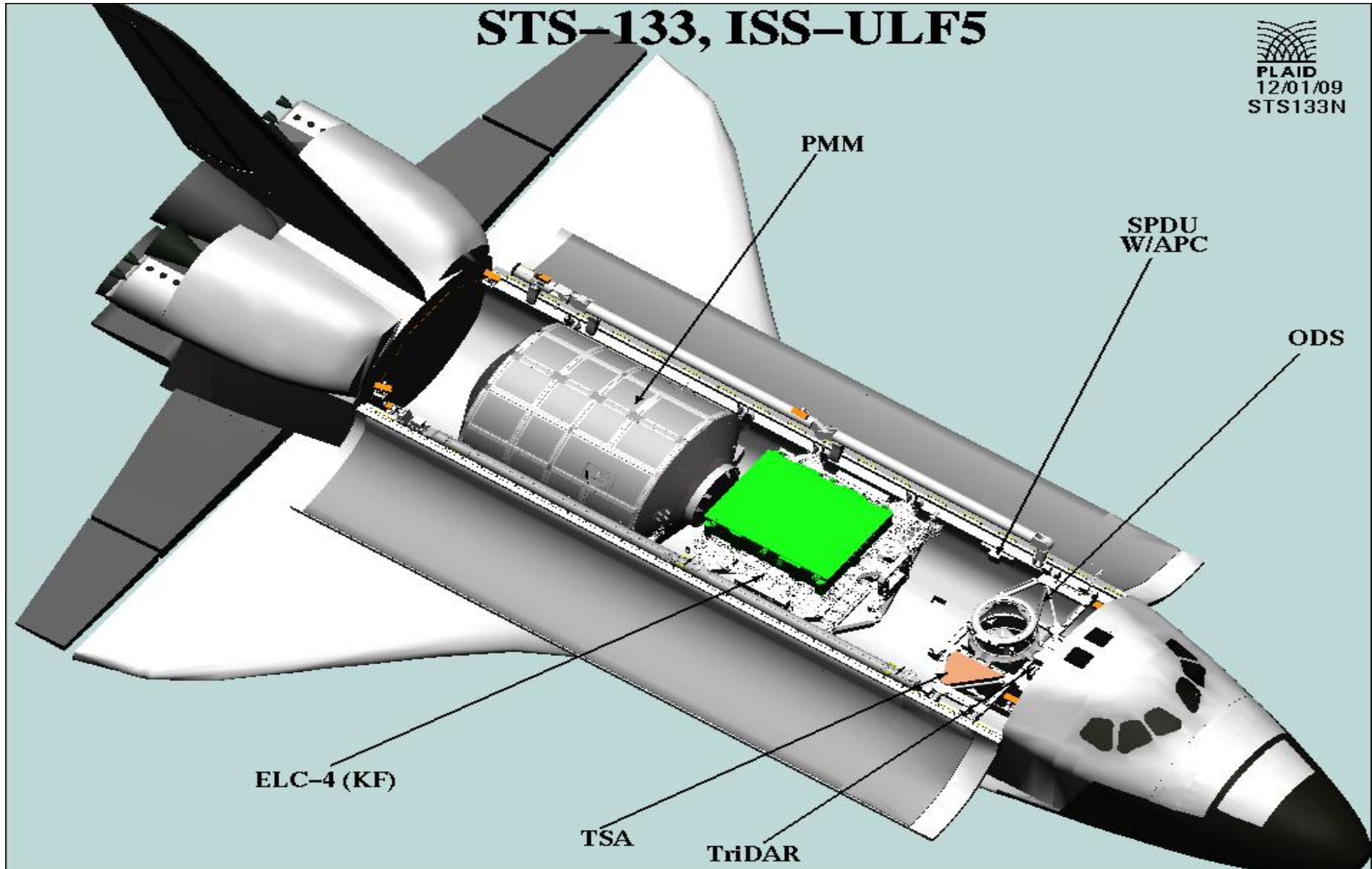
Flight Requirements Status

January 25, 2010

Michael Darnell, Lead MIM



On Orbit Cargo Bay Configuration		Presenter	Michael Darnell
		Date	1/25/2010





STS-133 Payload Integration Services/Interfaces		Presenter Michael Darnell
Date 1/25/2010	Page 3	

Middeck Powered Payloads

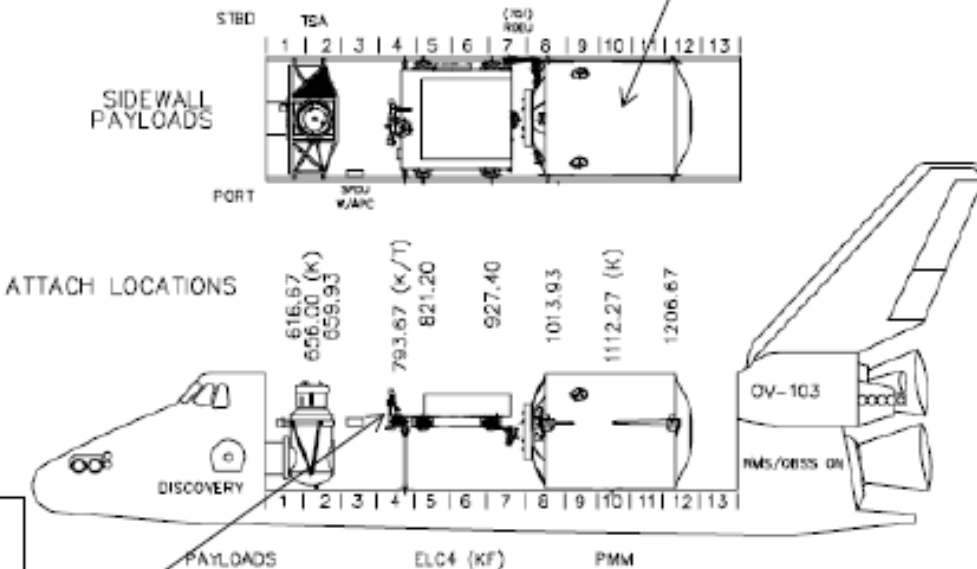
- GLACIER – rear breather (36 CFM) (Up/Dn) - 160 W
- CGBA-NLP - 65W
- Commercial Biomedical Testing Module 1 & 2 (CBTM1 & CBTM2) - 36W each
- Mouse Immunology (MI) Animal Enclosure Module (AEM 1 & AEM 2) - 36W each

MPLM (PMM)- 1st Flight this location

- 4 active longeron latches with aft primary
- 1 active keel latch with keel camera
- ROEU provides 28V heater power, 124V for temp and pressure checks, and 1553 for command / telemetry

OBSS

- Services - 124 VDC from PTU 2 (for LCS/IDC)
 - 28 VDC from MN A (for LDR/ITVC)
 - Ethernet line for LCS/IDC
 - LDR/ITVC video (VSU PL 2) and RCU CAM 4 Sync
 - RSC (Config 2) camera video to VSU PL 3
- Support Hdw – SPDU, PGSC, SPASP/OPP



ELC 4

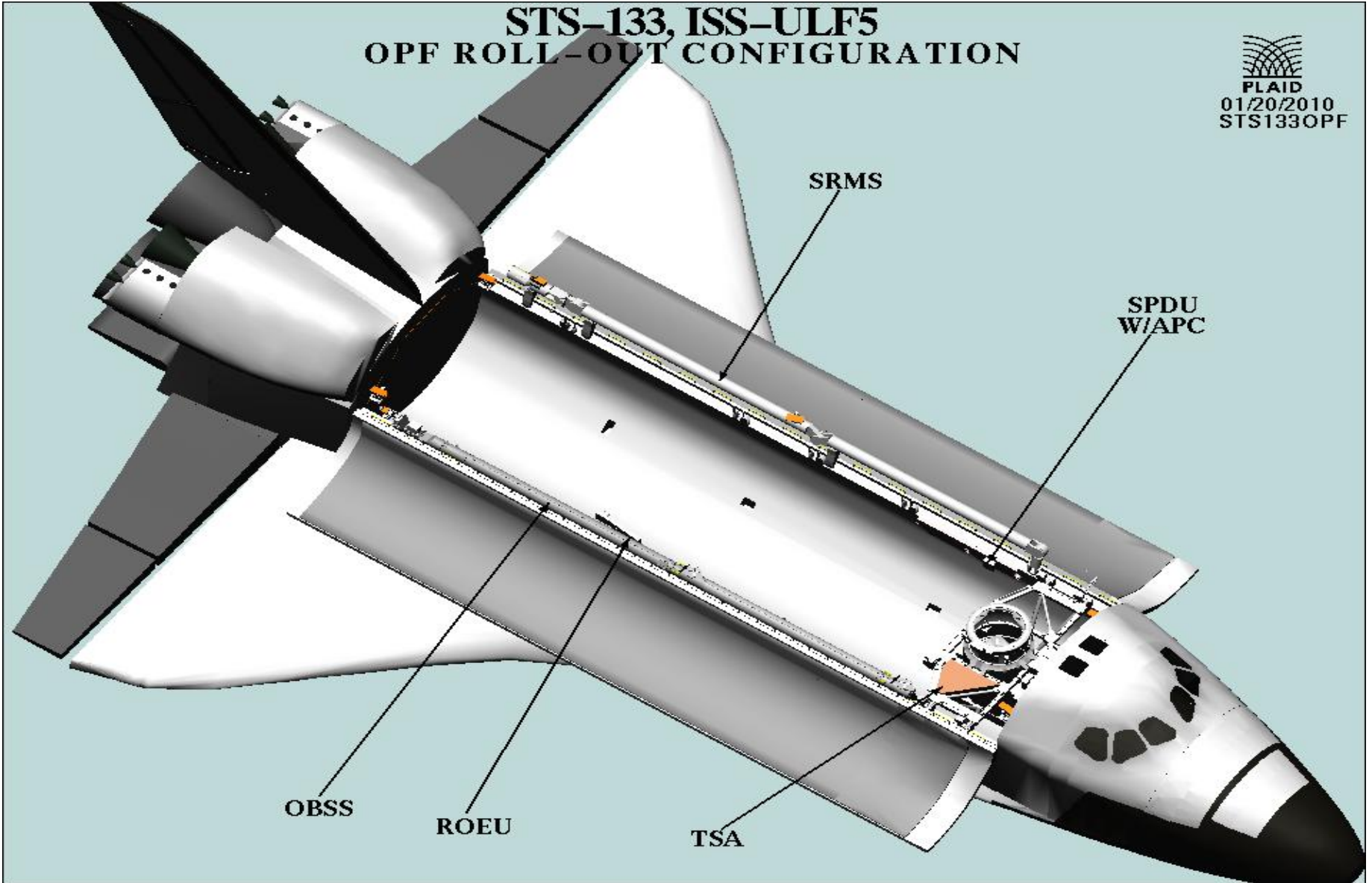
- Deck Assembly:
 - Deployable
 - 4 active longeron latches (fwd primary)
- Keel Assembly:
 - 2 passive longeron latches
 - 1 passive keel latch
- No power required for ELC4

Primary PLD/ORB Avionics Interfaces

- Payload Data Interleaver (PDI)
- Payload Signal Processor (PSP)
- Payload Data Interface Panel (PDIP)
- Standard Switch Panel (SSP)



Empty Cargo Bay Configuration		Presenter Michael Darnell
Date 1/25/2010	Page 4	





STS-133 LAUNCH SITE REQUIREMENTS REVIEW

Presenter

Michael Darnell

Date

January 25, 2010

LAUNCH

09/16/10
39A/ MLP2
CREW SIZE: 6UP/6DN

CONFIGURATION

OV-103(39)
LP01;RP03
ET-138
BI-145
RSRM-113
(1) TBD (2) TBD (3) TBD
OI-34
SRMS, OBSS, ODS, SSPTS

CARGO BAY PAYLOAD

ISS-ULF5
(ELC4, PMM)

MIDDECK PAYLOADS

ISS-ULF5
MAUI
SEITE
SIMPLEX
RAMBO-2

ORBIT

51.6 DEG
122 NM
DIRECT INSERTION
DURATION: 8 + 1 + 2 DAYS

CONSUMABLES

CRYO TANK SETS	4 (OFFLOAD)
GN2 TANKS	5 (FULL)
FWD RCS	1912# (OFFLOAD)
AFT RCS	4970# (FULL)
OMS	22760# (FULL)

LANDING

SITE	KSC
TAL	ZARAGOZA
ALT. TAL	MORON & ISTRES
SCA	911



STS-133 LAUNCH SITE REQUIREMENTS REVIEW

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Date	January 25, 2010

PERFORMANCE MARGIN

• SIMULATION MARGIN (SPLAF133)		+1578
• WEIGHT CHANGES SINCE SIMULATION		
• PAYLOAD	- 125	
• CREW COMPARTMENT	+350	
TOTAL WEIGHT CHANGES	+225	- 225
• OTHER PERFORMANCE PROJECTIONS		
• RENDEZVOUS ALT OF 200 NM		+580
• PROTECTION FOR DOL DISPERSIONS		- 700
• 09/16/10 LAUNCH DATE (PMBT&ATMOS)		+260
• SRB – M.P. UPDATES		- 2
• SRB – BR / 0.55 MIL LOWER THAN 0.3705 AVG		- 198
• PROJ TO 5 MIN WINDOW FROM INPLANE		- 600
• PERFORMANCE CHANGES ADJUSTMENT		+16
• CURRENT BASELINED APM (01/19/10)		+709

VOLUME III: ASCENT PERFORMANCE MANAGER'S RESERVE GUIDELINE AT FPSR/CIR IS 800 LBS



STS-133 LAUNCH SITE REQUIREMENTS REVIEW

Presenter Michael Darnell
Date January 25, 2010

FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	202444 (233000)	1080.2 (1075.7)
RTLS	240047 (245000)	1080.9 (1077.2)
TAL	237868 (244000)	1080.7 (1077.2)
AOA	232608 (242000)	1076.5 (1075.7)
CONT RTRN**	233786 (233000)	1078.1 (1075.7)

****CONT RTRN EXCEEDS 233K NEOM LIMIT (See Vol. X Bk. 1 Sec. 3.3.1.1.9)**

NOTE: 104 LBS AFT FUS. BALLAST (EMPTY BOXES)
RTLS INCLUDES 25 SEC FRCS DUMPS
TAL INCLUDES 65 SEC FRCS DUMPS

ESTIMATES BASED ON SPLAF133 AND MODIFIED FOR WEIGHT CHANGES THRU 01/19/10.

STS-133 LSRR

OV 103 / FLT 39

Belinda Soublet

USA Orbiter Element

January 28, 2010

STS-133 OV 103/FLT 39 – Orbiter LSRR Baseline

Modifications To Be Baselined at LSRR for OV 103 / FLT 39

- None

Potential modifications (info only)

STS-133 Weight Saver Mission Kit Changes (info only)

Opportunity modifications (info only)

Additional Requirements being tracked:

- STR/TPS Priorities
- Chits
- Obtain program authorization for STS-133 MECSLSI update to include tech order (M072-755113-002) for MEI instrumentation added to left OMS pod stinger

Backup

- TPS/STR Priority Backup Data

STS-133 Potential Mods /Under Review (Info Only)

- **TAD 30091 BLT FE DTO Flight 4**
 - Re-flight of protuberance tile and associated thermocouple instrumentation
 - Potential for protuberance height increase from the 0.35” height being flown on STS-131 – pending evaluation and analysis of STS-131 performance flight data
- **TAD 30246 Catalytic Coating DTO Flight 3**
 - Re-flight of catalytic coating applied to one tile in BLT DTO region of influence
 - Would require shelf life extension of existing lot of catalytic coating material or production of new lot of catalytic coating (age life limited) and reapplication to selected tile

STS-133 Weight Saver Mission Kit Changes (Info Only)

Changes currently authorized by STS-133 FRD NSTS 17462-133:

- **Removal of 5th PRSD Tank Set**
 - Tech order configuration updates incorporated in MECSLSI
- **Aft Winch Removal**
 - Currently removed for STS-131 to provide payload clearance
 - Removal tech order configuration to be added to MECSLSI
- **Aft Bulkhead Wireless Video System Antenna Removal**
 - Currently removed for STS-131 to provide payload clearance
 - Antenna coverage assessment complete; antenna will remain off for STS-133
 - Removal tech order configuration to be added to MECSLSI

Potential change under evaluation:

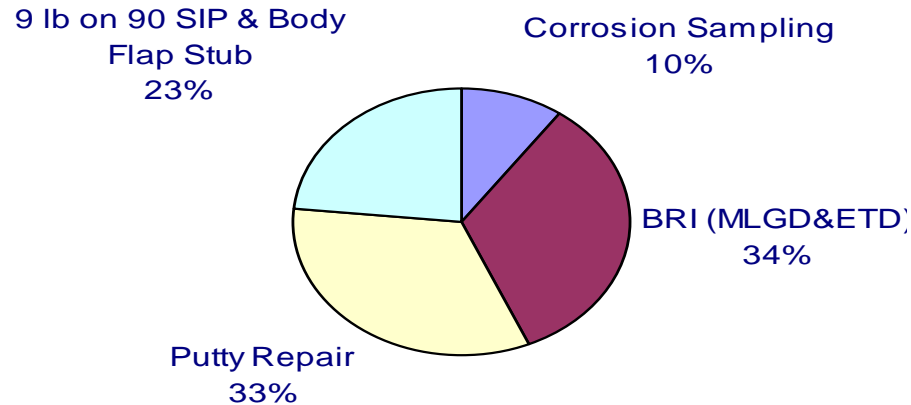
- **Aft Ballast Boxes Removal**
 - Not currently authorized by FRD – IPT decision regarding weight savings need versus processing effort to remove hardware (low potential due to forward CG)
 - **FRD authorization required to implement tech order configuration change to MECSLSI**

STS-133 Opportunity Mods (Info Only)

- **19735 WLE Spar “Sneak Flow” Protection**
 - Increases RCC panel damage tolerance by adding a flow restrictor to limit allowable plume flow to 50% across the flow restrictor
 - Mod completed at all panel locations with the exception of LH panels 2-4.
- **19763 Lower WLE Carrier Panel Horse Collar Gap Filler Redesign,**
 - Redesigns the lower WLE access carrier panel horse collar gap fillers with an enhanced design with additional sleeving
 - Mod completed at all panel locations with the exception of LH panels 2-4
- **23227 Connector Saver (ME414-0630) Redesign (OMS Pod, Ku Band)**
 - Connector Saver mod provides proper interfacial seal and wavy washer engagement retention force to reduce risk of inadvertent demate during use.
 - Only Left POD and KU band locations remain to be worked

STS-133 Risk Reduction ~ Percentages Shown

TPS Priorities



- Orbiter's expectations for the work areas are shown on the pie chart for STS-133
- Exact numbers are determined by the KSC Team based on vehicle configuration, access, and flow duration
 - Distribution provides data/risk reduction in all areas of the list and does not allocate all the resources in one area
- **Mandatory:**
 - **Flight damage, OMRS Requirements / Chits, LRU access, & deferred work**
 - Corrosion Sampling (10% of total tile allocation) Chit J6275A
 - Putty repairs in RCC & Window DTA Zones (23% with 10 tile min.) Chit Pending
 - Continue G/F R & R on a best effort basis – zones 2B
 - Deferred work may be re-deferred with acceptable inspection

STR/TPS Priorities Current Vehicle Status

STATUS AS OF 1-08-2010

Priority Number	Total	OV-103	OV-104	OV-105
1. BRI-18 Tile - MLGD FWD O/B Corner	28	complete	complete	complete
2. BRI-18 Tile - MLGD FWD Edge	22	complete	complete	complete
3. BRI-18 Tile - MLGD O/B Side	18	complete	complete	complete
4. BRI-18 Tile - STR side of ET Doors	20	complete	complete	complete
5. BRI-18 Tile – LESS Carrier Panels 8-10 (103 & 104)	24	complete	complete	n/a
6. BRI-18 Tile – STR side of ET Doors I/B	8	complete	complete	complete
7. Inboard Elevon "Hub" Tile Mod	4	complete	2	complete
8. I/B Elevon 9lb/90 SIP	34	complete	complete	complete
9. O/B Elevon 9lb/90 SIP	6	complete	complete	complete
10. MLGD – Outboard Middle 1/3	24	complete	complete	complete
11. ET Door remaining STR side	40	1	10	0
12. MLGD - Outboard AFT 1/3	22	0	0	9
13. Nose Area 9lb/90 SIP	14 (16 ^{OV103})	3	complete	7
14. Base Heat Shield 9lb/90 SIP	42	22	complete	complete
15. Body Flap Stub "Piano Key" tiles	40	18	20	18
16. Gap fillers in Subset 2B	5 Zones	2	1	0
17. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD	MLGD 100	MLGD 0	MLGD 1	MLGD 0
	NLGD 123	NLGD 19	NLGD 22	NLGD 52
	LESS 68 (92 ^{OV-105})	LESS 8	LESS 10	LESS 22
	ET Door 28	ET Door 5	ET Door 4	ET Door 1
18. Mod work LESS internal	44 locations	41	complete	complete
20. Remaining Gap Fillers & Window BRI-18	124	3	2	19



STS-133 Chits

- **Approved**

- J6275A Orbiter Structure IML Surface Corrosion Sampling Inspection
- J6526 Evaluation of OMS Pod LI-900 Tile Installed on 0.090" SIP
- J6531 Metris Scan of OV-103 Lower Surface
- J6534 Putty Repair Tile Replacement for Risk Reduction
- J6543 ET Ferry Flight Door Attach Fitting Inspection
- J6578 Capture OV-103 Output Waveforms to Address 1N3600 Diode Concerns
- J6585 Optigo and Z-scan of BLT Protuberance Tile
- K6516A Ground Lightning Monitoring System (GLMS) Installation
- K6566 SSME Nozzle Purge Hot Wall Corrosion Prevention

- **Pending**

- J6577 Ames Gap Filler Removal and Replacement
- J6587 R&R of Inertial Measurement Unit (IMU) S/N 213 with S/N 204 in slot 1
- J6589 Crew Module Contamination Sampling

- **Potentials**

- EVA Winch Attach Point Inspection

STS-133
ISS – ULF5 PMM, ELC4
Launch Site Requirements Review
Payload Cargo Engineering Status

ABBAS ELSABAGH

281.212.6186

01-28-2010

STS-133 LSRR

Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Released</u>
V072-200213	MECSLSI	11/18/09
VA72-200213	Cargo Arrangement	11/18/09
VD72-200213	Avionics Diagram	11/18/09
VS72-200213	Integrated Schematic	11/18/09
VS70-540423	Retention Schematic	11/10/09

– FRED Release is planned for 02-19-10

Engineering Open Work

- FRED ECD: 02-19-10
 - VD Drawing will be released on 04/02/10
 - WVS was not removed from the FRD – Engineering will show it installed

Standardization

- Configuration Waiver S070045 dated 9/21/09 to Orbiter/Payload Integration Standardization Document NSTS 60523. This is required to add the PPSU and to direct the Software to support it.
 - PPSU was removed from flight when ELC4 power requirement was deleted
 - No change to Software, due to late requirement change - Waiver is still applicable

STS-133 LSRR

ICD Status (* = Impact Flight Products)

<u>Document</u>	<u>Title</u>	<u>ECD</u>	<u>Status</u>
ICD-A-21403-ELC4A	ELC4		Baselined
Forward Work:	Incorporate 01/22/10 CAD model w/associated non-compliances*; Incorporate future CAD model updates*; Thermal properties/reports; Structural compatibility/reports		
ICD-A-21449-MPLMA	MPLM (PMM)		Baselined
- A05774	Update Grapple Fixture Figures	02/28/09	In Review
- A05793	Add non-compliances	01/29/09	In Review
- A05831	PMM/ELC-4 Envelope intrusion	02/22/10	Awaiting data
- A05832	ROEU/PDA Location	02/22/10	In Review
Forward Work:	Structural compatibility/reports; Thermal properties/reports; Update per PMM CAD model*		

Issues/Concerns

- ELC4 CAD model release too late to incorporate into ICD in time to support FRED
 - Impound required
- PMM configuration changes, late CAD model delivery - ICD impacts unknown
 - Decision on scuff plates removal

STS-133 LSRR

Cargo Close Clearance Process

- The following Close Clearance areas have been identified:
 1. ELC aft port and starboard scuff plate to MPM
 2. PMM to top centerline latches
 3. ASI flag (PMM) to sidewall
- A Chit will be developed to take Close Clearance Measurements of item 1 above
 - Other locations already measured or not accessible for as-installed measurements
- Chit measurements will be performed at the (PAD) after payload installation



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NASA Kennedy Space Center, Florida



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Backup Material

FRWG Presentation (With Minor Changes)



Flight Requirements Status	Presenter Michael Darnell	
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PRCB CR's

- None

ULF5 MIP (NSTS 21554):

- Current version available on PILS: Rev. A, January 11, 2010
- Recently approved MIP CRs:
 - 21554, MIP CR#0003 ULF5 generic MIP Update Including TriDAR, Control Weights, and PMM (Name change)
- Pending CRs:
 - 21554, MIP CR#0004 Update Utilization Payloads and Appendix E
 - 21554, MIP CR#0005 Update ULF5 MIP Priorities

Issues/Concerns:

- None Identified

STS-133 Flight Requirements Document (FRD) LSRR Status

James Flores

FRWG 01/25/10

PRCB 01/28/10

STS-133 FRD Status

- **STS-133 Latest FRD Revision**

- **Rev 005: Dated, December 2, 2009** (<https://sspweb.jsc.nasa.gov/efrd>)

Approved CR

- **FRD17462-133-0009: Add DTO 900 Shuttle RSRM Chamber Pressure, Strain Gauge, and Acceleration Rates Data Collection**

ECD: Approved 12/17/2009

Open CRs

- **FRD17462-133-0010: Move SAFER to Middeck**

ECD:

- **FRD17462-133-0011: Delete Aft WVS Antenna**

ECD:

STS 133 LSRR BACKUP

- TPS/STR Priority Backup Data

OV-103 STR/TPS Priorities

Prioritized Opportunity

1 – 10 1 thru 10 complete on OV 103

11. ET Door – Remaining STR side of door & leading edge on door – 40 tiles (24 STR/16 door) – **39 remaining**
12. MLGD – Outboard Aft (1/3 left) 6/door/6 STR)- 24 Tile – **None completed**
13. Nose Area 9lb/90 SIP Upgrade to FRCl-12 – 14* Tiles (7/side) – (*103 16 tiles, thruster) – **13 remaining**
14. Base Heat Shield Stinger 9lb/90 SIP Upgrade to AEBT-8 – 42 Tiles (32/stinger, 10/Box Attach point) – **20 remaining**
15. Body Flap Stub “Piano Key” Upgrade to AETB-8 – 40 Tile – **22 remaining**
16. Gap fillers in Subset 2B (Line across MLGD edge) – **3 zones remaining**

OV-103 STR/TPS Priorities (cont)

17. BRI-18 Tile – Remaining MLGD (top priority)/ET Door/LESS carrier panels/NLGD

1. MLGD (Inboard forward edge working to AFT door edge) – **None Completed**
2. ET Door – **23 remaining**
3. LESS - panels 8, 9, 10, 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order) – **60 tiles remaining**
4. NLGD (attrition – do leading edge first) – **104 tiles remaining**

18. Mod work (WLE sneak flow, WLE Horsecollar Gap Fillers) – **3 locations remaining**

19. MADS Instrumentation Failures (placeholder)

20. Remaining Gap Fillers & Window BRI-18 - **121 remaining**

Windows 2, 3, 4, & 5 Upper Carrier Panels (top priority)

Backup

STS-133 LSRR

OMRSD

- **FII V2 Payload (Post-Mate)**

 - Baselined Files

 - P350 MPLM Core Requirement (Permanent Multi-Purpose Module (PMM))

 - RCNs

 - PP18135 P554 – ISS-ULF5 (Baseline)
 - PP18177R1 P350 – Core MPLM (PMM) Update

 - ECD

 - 01/26/10
 - 02/02/10

- **FII V4 (Pre-Mate)**

 - RCNs

 - PS18163 Mission-Unique List
 - PS18164 FIII MUL
 - PS TBD Adjacent Pin Test

 - Release

 - 03/02/10
 - 03/02/10
 - 03/02/10

 - Baseline

 - 03/16/10
 - 03/16/10
 - 03/16/10

- **FII V6 (Shuttle Experiments)**

 - RCN

 - PX18172 TriDAR

 - 01//15/10A

 - 02/02/10

Issues / Concerns

 - None

STS-133 LSRR

Annex 1: ISS-ULF5-NSTS 21554-A01: Baselined on 11/12/09

L-4 M Update

ECD

- Customer submittal 04/23/10
 - Data needed: Weight and Mass Properties Update & Drawing Releases
- CR approval 05/14/10

L-1 M Update

- Customer Submittal 07/23/10
 - Data needed: Weight and Mass Properties
- CR Approval 08/16/10
- Final weight log 08/23/10

•Issues/Concerns

- None

STS-133 LSRR

Time-Critical Ground Handling Requirements

- | Activity | <u>ECD</u> |
|-----------------------------|-------------------|
| • Customer Submittal (L-4M) | 05/17/10 |
| • Release for review (L-3M) | 06/16/10 |
| • Baseline (L-60 Days) | 07/16/10 |
| • Issues / Concerns | |
| • None | |

STS-133 LSRR

Payload Integration Hardware Open Work

ECD

- **Cargo Integration Hardware Allocation Assessment**
 - **CIR Assessment**
 - **Bridge & Latch Allocation** **No Issues**
 - **FRED Assessment** **02/12/10**
 - **On-going assessment of Engineering releases**
- **New Build Hardware**
 - **Crows Foot – V826-340003-003 (New)** **04/18/10**
 - **Extended Fitting – V826-340003-003 (New)** **04/18/10**
- **Issues / Concerns**
 - **None**

STS-133

Launch Site Requirements Review

Flight Software Overview

Tom Stansel

USA FSW

PRCB 01/28/2010

STS-133 LSRR (FSW)

- **STS-133/OV-103 Flight Software (FSW) Versions**
 - Seventh scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS OI-34 content)
 - Fifth scheduled flight of MEDS IDP VI 07.01/Seventh scheduled flight of MDUF VI 06.00 (SASCB SCR 98113A documents content)
 - Eighth scheduled flight of MAGRS-3S Link 613-996-008 Software (Link-008) (SASCB SCR 98115 documents content)
- **STS-133/OV-103 Flight Software Payload Support:**
 - ISS ULF5
 - Orbiter Interface Unit (OIU)
 - Orbiter Docking System (ODS)
 - Sequential Still Video (SSV)
 - Payload Power Switching Unit (PPSU)
 - Trajectory Control System (TCS)
 - ISS Caution and Warning (ISSCW)
 - Permanent Multipurpose Module (PMM)
 - Assembly Power Converter Units (APCUs) & Station to Shuttle Power Transfer System (SSPTS) (generic support for both configurations)
- **Major New Flight Software Support Items:**
 - None

STS-133 LSRR (FSW)

- **STS-133 Source Changes/Edits for Primary Flight Software (Base)**
 - SCR 93211A Update of SSMEC Vehicle Data Table (VDT) for Enhanced Accelerometer Operations
 - SCR 93262A Film ET Camera
 - SCR 93267A Removal of the Set and Reset to False Cmds For the RCS Tank Iso Valves
 - SCR 93284 Update PASS HUD Body Flap Warning Limit K-Load
 - DR 126366 SM GPC Failure to Send GCIL Commands
- **STS-133 Patch Implementation for Primary Flight Software**
 - None.
- **STS-133 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - SCR 93282 Update PASS/BFS HUD Body Flap Warning Limit K-Loads
- **STS-133 Patch Implementation for Backup Flight Software**
 - None

STS-133 LSRR (FSW)

- **Products**

- **STS-133/OV103 Base delivery schedule (available to field)**
 - FPSB**
 - **Shuttle Data Tape** **March 04, 2010**
 - **Mass Memory Unit** **March 18, 2010**
- **An STS-133/OV103 ADTL SDT/Mass Memory is not planned**

- **Open Items**

- **None**

- **Concerns/Issues**

- **No issues or concerns with STS-133 at this time**



EVA Status STS-133/ULF5 Launch Site Readiness Review

**David Foltz
EVA Office
Johnson Space Center
January 29, 2010**

- **Forward Bulkhead PFR**
 - Portable Foot Restraint, SED33105308-307 installed on forward bulkhead.
 - Released T.O. M072-661568-029
 - Required to protect for contingency EVA TPS inspection
- **Lightweight Starboard TSA**
 - Starboard LWTSA installation – Tech Order: M072-660850-006
 - Starboard LWTSA Tools installation – Tech Order: M072-660858-001
- **No Port TSA**
- **Winches**
 - Winch P/N SED33101570-327 on Forward Bulkhead
 - No Aft Bulkhead Winch
 - Assessment underway to ensure contingency EVA operation can be performed without Aft Winch



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Date **01-28-10**

Backup Material

- **SSP Systems Drawings** Attachment 1
- **SSP Authorized Modifications/Non-Standard Work** Attachment 2
- **SSP OMRS Waivers and Exceptions** Attachment 3
- **Launch Window** Attachment 4
- **Open Configuration Waivers** Attachment 5



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Date	01-28-10	

Overview

- SSP System Drawings **No Issues***
- SSP Authorized Modifications/Non-Standard Work **No Issues***
- SSP OMRS Changes (RCNs) **No Issues***

* Backup material included



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Mandatory RCNs:

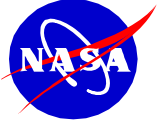
NONE

Non-Mandatory Value Added RCNs:

NONE



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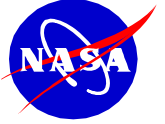
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STS-133 LSRR

FCE/GFE Status

Kenneth Brown
Manager, GFE and Flight Crew Equipment Office
Johnson Space Center

BACKUP



STS-133 LSRR
Flight Crew Equipment/GFE

Presenter MV6/Tom Goebel	
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- **All GFE hardware need dates and delivery dates were partnered at CIR**
- **Tech orders and hardware list noted in following 2 charts**



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 NASA Johnson Space Center, Houston, Texas



STS-133 LSRR
Flight Crew Equipment/GFE

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Tech Order numbers are identified for reference only. Report generated 1/19/10.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
CTVC A (port forward)	M072-750025-072	5/5/2010	1/7/2005	11/13/2009	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-132.	Randall Moore
ITVC B (port aft)	M072-750025-073	5/5/2010	1/7/2005	11/13/2009	C	6/5/2010	6/5/2010	OPF Instl for testing. PAD Installation. Assembly from STS-132.	Randall Moore
CTVC C (starboard aft)	M072-750025-074	5/5/2010	1/7/2005	11/13/2009	C	6/5/2010	6/5/2010	OPF Instl for testing. Pad Installation. Assembly from STS-132.	Randall Moore
CTVC D (starboard forward)	M072-750025-075	5/5/2010	1/7/2005	11/13/2009	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-132.	Randall Moore
SRMS elbow camera	M072-544504-013	5/5/2010	3/3/2008	11/13/2009	C	6/5/2010	6/5/2010	OPF Instl for testing. Pad Instl for flight. Assembly from STS-132.	Randall Moore
SRMS wrist camera	M072-544504-006	5/5/2010	3/3/2008	11/13/2009	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-132.	Randall Moore
Centerline Airlock Camera (stowed)	M072-660828-002, plus C CCD stow		3/17/1999	11/13/2009	C			OPF Installation mandatory for alignment. Assembly from STS-132.	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	7/2/2010	10/28/2004	11/13/2009	C	8/2/2010	8/2/2010	VAB installation mandatory.	Randall Moore
Righthand Umbilical Camera	M072-705001-028 M072-705001-027	7/10/2010	10/28/2004 10/28/2004	11/13/2009	C	8/2/2010	8/2/2010	VAB installation mandatory.	Randall Moore
Digital Television (DTV)	M072-710570-007		11/15/2007		C			Installed Hardware.	Larry Schmidt
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001		3/7/2000	11/13/2009	C			Installed Hardware.	Larry Schmidt
Tools for Rendezvous and Docking (TRAD)	M072-730021-019		7/20/2007	11/13/2009	C			Installed Hardware. Time Life Cycle is expired. Waiver in work (ECD:1/29/10)	Larry Schmidt



SPACE SHUTTLE PROGRAM
Space Shuttle Orbiter Project Office
 NASA Johnson Space Center, Houston, Texas



STS-133 LSRR
Flight Crew Equipment/GFE

Presenter MV6/Tom Goebel	
Date Jan 28, 2010	Page 4

Tech Order numbers are identified for reference only. Report generated 1/19/10.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
Video Processing Unit (VPU)	M072-710338-007		3/2/2008		C			Installed Hardware.	Larry Schmidt
Wireless Video System (WVS)	M072-344828-001 mount M072-744007-001 UHF M072-744004-012 S-BAND M072-744004-013 S-BAND M072-744004-014 S-BAND M072-744004-016 S-BAND M072-744004-017 S-BAND M072-744004-018 S-BAND	3/24/2010	8/24/2004 6/2/2004 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008 3/21/2008	11/13/2009	C	4/24/2010			Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 Harness		9/24/2004	11/13/2009	C			Installed Hardware.	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-006 camera	7/9/2010	11/24/2004	11/13/2009	C	8/9/2010	8/9/2010	Pad instl only. No OPF testing required. Assembly from STS-132 after return to JSC for repressurization.	Randall Moore
OBSS Sensor Package 1	M072-710282-008	5/5/2010	4/18/2008	11/13/2009	C	6/5/2010	6/5/2010	Unit from STS-132.	Russell Yates
TriDAR	M072-730021-021				C			Installed Hardware.	Larry Schmidt
OBSS Sensor Package 2	M072-710282-006		4/18/2008	11/13/2009	C			Unit from STS-131.	Larry Schmidt



STS-133 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **01-28-10**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115133 on TBD

- **V072-000001-290** (Rev. TBD) Space Shuttle System (Rel. TBD)
 - **V072-200213-001** (Rev. NC) Mission Equipment Cargo Support (Rel. 11-13-09)
 - **SGD32104456-301** (Rev. NC) Crew Compartment Configuration (Rel. TBD)
 - **-302** Descent
 - **V070-000001-003** Orbiter General Assembly
 - **V070-410100-017** SSME Installation
 - **10100-0061-182** Integrated SRB General Assembly (BI-145)
 - **80901000000-530** External Tank Assembly (ET-138)
- **STS-133 CIR + 70 days Mission Configuration Product Plan (MCP) will be published on 02-25-10 and will be republished at LSRR + 18 days on 02-15-10.**



STS-133 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **01-28-10**

SSP System Drawings – (Continued)

Ferry Configuration

- **V072-000001-291** (Rev. TBD) Space Shuttle System Drawing (Rel. TBD)
 - **V072-200213-002** (Rev. NC) Mission Equipment Cargo Support (Rel. 11-13-09)
 - **SGD32104456-001** (Rev. NC) Crew Compartment Configuration (Rel. TBD)
 - **V072-300055-015** (Rev. BU) Ferry Flight Configuration (Rel. 05-11-09)

SCA 911



STS-133 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **01-28-10**

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 1 MCR has been approved and/or pending mods**
- **Current MCR impact status:**
 - **No impacts for all six disciplines** **1**
 - **One or more disciplines with impacts, documentation approved and/or pending approval** **0**



STS-133 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **01-28-10**

Modification Impact Report – (Continued)

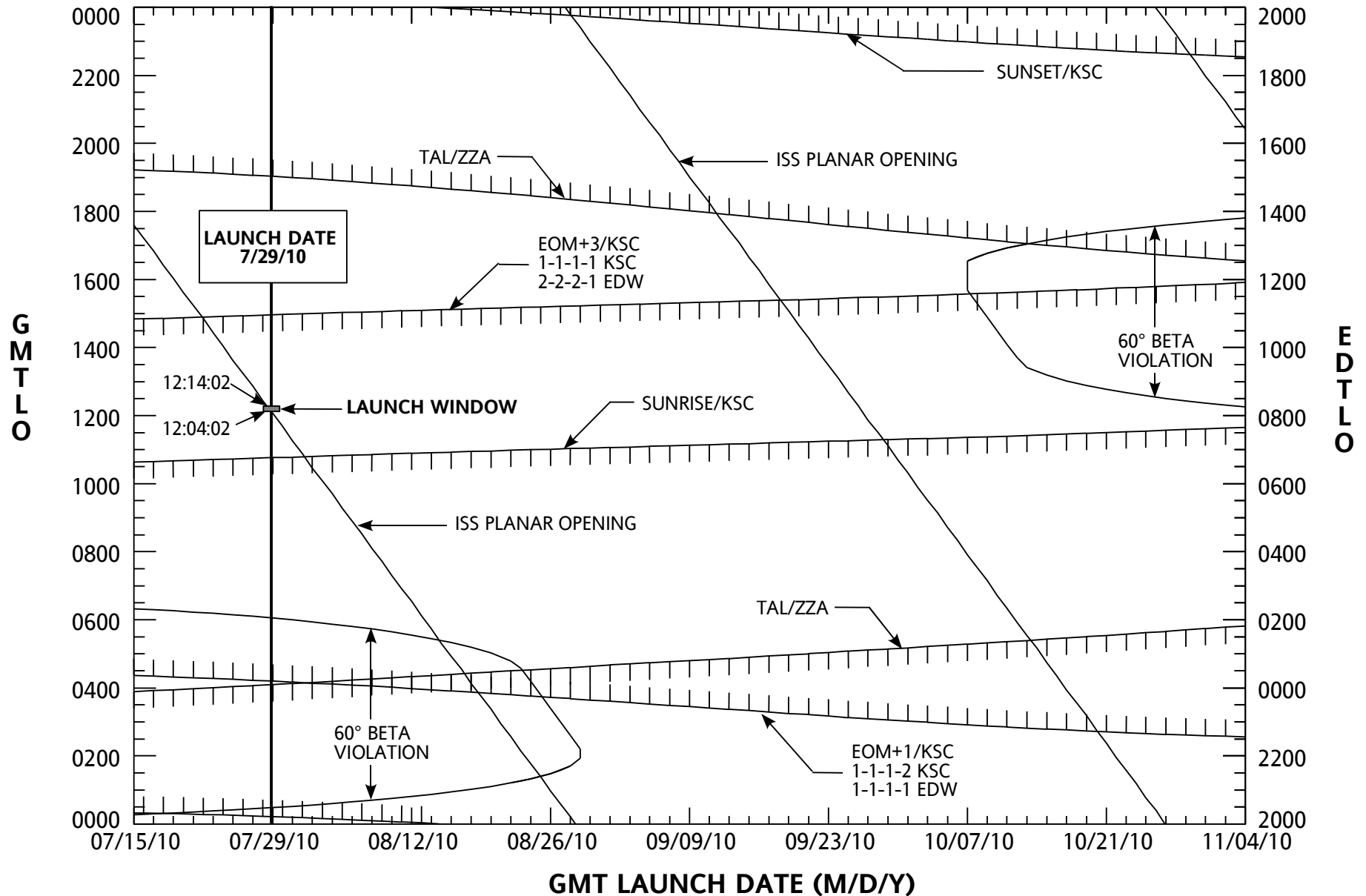
- Possible impacts still under review

0

Mission Duration = 10+1+2
 Inclination = 51.6°
 OMS2 ha/hp = 124 x 85 nmi.
 Target ha/hp = 208 x 202 nmi.

STS-133 OCF LAUNCH WINDOW

C. Osgood/USH-483L
 M. Jamroz/USH-483L
 September 22, 2009



Note: EOM lighting lines, based on an OMS2 phase angle of 251 deg, are representative only.
 The ISS beta angle ($|\beta| < 60^\circ$) for mated operation begins ~ 2/19:52:00 MET (FD4 Rendezvous) and ends ~ 8/13:52 MET.

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0133

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

09:49 DATE 01/20/2010

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIO	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
ORB-0090B	AUTH	J6163	0103 002	OV-103 BODY FLAP PDU GEARBOX FLUID LEVEL INSPECTION
2007-01-30	MAND			
	KSC		SPAR	
	039			
S-J6275A	AUTH	J6275A	0103 004	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
2008-02-26	MAND			
	KSC		SPAR	CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT LSFR,
	039			AND FINALIZED AT DLSFR FOR EACH FLOW.
S-J6526	AUTH	J6526	0103 001	EVALUATION OF OMS POD LI-900 TILE INSTALLED ON 0.090" SIP
2009-07-01	MAND			
	KSC		SPAR	EFFECTIVITY: OV-103, FLT. 39
	039			
S-J6531	AUTH	J6531	0103 002	METRIS SCAN OF OV-103 LOWER SURFACE
2009-06-26	MAND			
	KSC		SPAR	OV-103, FLT. 39
	039			
S-J6534	AUTH	J6534	0103 001	PUTTY REPAIR TILE REPLACEMENT FOR RISK REDUCTION
2009-07-29	MAND			
	KSC		SPAR	EFFECTIVITY: OV-103, FLTS 38 & 29
	039			
S-J6543	AUTH	J6543	0103 002	ET FERRY FLIGHT DOOR ATTACH FITTING INSPECTION
2009-09-17	MAND			
	KSC		SPAR	NDE OF FERRY FLT DOOR ATTACH FITTINGS WILL ONLY BE REQ'D
	039			FOLLOWING A F/FLT BACK TO KSC. F/FLT ONLY.

S-J6578	AUTH J6578	0103 000	CAPTURE OV-103 OUTPUT WAVEFORMS TO ADDRESS 1N3600 DIODE CON-
	MAND		
	KSC	SPAR	CERNS
2009-12-14	039		
S-J6585	AUTH J6585	0103 001	OPTIGO AND Z-SCAN OF BLT PROTUBERANCE TILE
	MAND		
	KSC	SPAR	BLT TPS SCAN HAS BEEN INTEGR'D INTO & IS ACCOMMODA TED BY
2010-01-14	039		CURRENT STS-131/STS-133 OPF PROCESS'G PLANS
S052924CZ	AUTH K6561A	0103 001	GROUND LIGHTNING MONITORING SYSTEM (GLMS) INSTALLATION
	SCHD		
	KSC	NSW	
2009-10-13	039		
S052924DA	AUTH K6566	0103 001	SSME NOZZLE PURGE HOT WALL CORROSION PREVENTION
	SCHD		
	KSC	NSW	
2009-10-13	039		
TOTAL MODS =		10	

1MRC5 REPT. 4650-1
PAGE NO. 2

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0133

PIH

ECP-MCR/KIT SEQUENCE

RUN TIME

09:49 DATE 01/20/2010

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
-----	----	-----	----	-----
008852	APPD	K826-340001-001	0001 000	ADDITIONAL HARDWARE TO SUPPORT STS-133
NOT REQD				
	KSC			ADDED PER V826-340001 B04
039				

TOTAL MODS = 1

Approved STS-133 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END	
+	E	RCS	S053296YK EK10327 (A)	OMRSD EXCEPTION REQUEST - RIGHT RC SOXIDIZER B-LEG PAD REGULATOR L OCKUPPRESSURE (EK10327)	0023	032 040
	W	ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET	099 999
		OMS	S053296UM WK10299 (A)	OMRSD WAIVER REQUEST - RP03 TK302 DYNATUBE LEAK RATE (WK10299)	0023	032 040
		ORB	S053298VM WK10557R1 (A)	OMRSD WAIVER REQUEST - FUEL CELL POWERPLANT 3 OXYGEN FLOWMETER LO WERLIMIT (WK10557R1)	103	033 042
			S053299BB WK10603 (A)	OMRSD WAIVER REQUEST - FORWARD OXYGEN REGULATOR LOCK UP PRESSURE(WK10603)	103	034 039
			S053299JU WK10653 (A)	OMRSD WAIVER REQUEST - WATER SPRAY BOILER #1 EXCEEDED 44 PSIA MAX IMUMLIMITATION (WK10653)	103	035 040
		RCS	S053298VTR1 WK10559 (A)	OMRSD WAIVER REQUEST - RIGHT RCS OXIDIZER B-LEG SECONDARY REGULAT ORLOCK UP HIGH (WK10559R1)	0023	035 043
		SRB	S053293WA WK03886 (A)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

(STS-103)

	Waivers	Except	Deviat	Cannib	Total
Total Extracted	7	1	0	0	8

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
47	S052310A	02/14/91	Fly with FRSI instead of tile	OV-103, Flight 12 & Subs (flight by flight evaluation)	OK TO RETIRE S061954B MV 4-2 RTF-130 Briefing
53	S052428A	03/27/91	Allows specified flights to fly with interim TPS repair after each mission to minimize damage to surrounding tile during ferry flight	STS-37, STS-39, STS-40, STS-42 thru STS-999	STAYS OPEN
101	S076972	11/19/91	Permit the modified GPCs (AP101-S) Battery Back-up Unit to fly with annotated fastener improvements without rolling the LRU Part Number	STS-42, STS-44, STS-47 and STS-49 thru STS-999	STAYS OPEN
327	S115114VR5	03/17/05	Partial installation of M072-784633-014 (harness installation - interface panel - MADS #3). The M072-784663-014 Technical Order was established to incorporate the crossover bracket modification at locations X0863 and X0750. The dash number configuration for the Technical Order was not baselined until January 25, 2005 (PRCBD S115114VR2). This area was closed out before this time and would cause significant impact to verify configuration of this Technical Order dash number -014. ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31 OV-103, Flight 32 WAIVER for STS-121	INS-3-28-279 (installed Tech Order)
328	S115114WR1	04/07/05	Partial installation of M072-794500-004, for Integrated Vehicle Health Monitoring (IVHM) harness installation, calls for the removal of the unused IVHM harness and routing hardware. This requirement was manifested after the Bay 13 Longerons Bridge installation was complete. With the installation of the bridge, the removal of the IVHM harness is no longer possible without the removal of the bridge. ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31 OV-103, Flight 32 WAIVER for STS-121	OEL-3-31-304 PTL OEL-3-31-4432 PTL

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
329	S115114AM	08/15/05	The following requirements are waived to allow OV-103, Flight 31 to fly (ferry) with the following out-of-configuration conditions: 1) V070-391139-025 (blanket under window #1 removed for ferry flight) 2) M072-421502-002 (did not perform acetone wipe prior to universal thruster plug assemblies - procedural omission) 3) V070-753110-003 (camera mount will not be installed for ferry flight) ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31	Ferry Flight from Dryden
330	S115114VR15	09/16/05	The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition: TCS blanket V070-362917-001 located at Door #44 NOT installed. ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31 Ferry Flight	Ferry Flight from Dryden

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
331	S115114VR15	09/16/05	<p>The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:</p> <ol style="list-style-type: none"> 1) Two switches on Panel A15 will ferry without switch guards (P/N G070-700904-001). In lieu of switch guards at two locations, tape was installed. 2) Eight GSE switch guards were left installed and not removed as required by Technical Order M072-710700-002 as called out in the ferry flight drawing. 3) Three switch guards are not installed on Panel L4 for TACAN circuit breakers. The procedure does not include the switch guard installation. <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 31 Ferry Flight	Ferry Flight from Dryden
332	S115121TR8	05/04/06	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200201 NOT removed from OV-103.</p> <p>During STS-114 processing this Tech Order configuration called for the removal of an un-used IVHM harness along with the routing hardware. At the time the Tech Order was made a requirement for Flight 31, the Bay 13 longeron had already been installed for flight. The harness was demated and stowed in place per MR and was deferred to a future flight at which time Bay 13 longeron will be removed since the Bay 13 longeron was not removed this flight, a configuration waiver is needed for STS-121.</p>	OV-103, Flight 32	

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
333	S115121TR8	05/04/06	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>Partial installation of M072-784633-014 (harness installation - interface panel - MADS#3). The M072-784633-014 Tech Order was established to incorporate the crossover bracket modification at locations X0863 and X0750. The dash number configuration for the Tech Order was not baselined until January 25, 2005 (PRCBD S115114VR2). This area was closed out before this time and would cause significant impact to verify configuration of this Tech Order dash number -014.</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 32	
335	S115116NR2	08/18/06	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200195 not removed from OV-103.</p> <p>During STS-114 processing, this Tech Order configuration called for the removal of an unused IVHM harness along with the routing hardware. At the time the Tech Order was made a requirement for Flight 31, the Bay 13 longeron had already been installed for flight. The harness was demated and stowed in place per MR and was deferred to a future flight at which time Bay 13 longeron will be removed since the Bay 13 longeron was not removed this flight, a configuration waiver is needed for STS-116.</p>	OV-103, Flight 33	

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
336	S115116NR2	08/18/06	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200201.</p> <p>During OMDP, the crossover bracket modification was successfully implemented at all four locations with no technical issues by engineering defined by Orbiter drawings as well as three Tech Orders (M072-794011, M072-794021 and M072-794051). The M072-784633-014 Tech Order was established to incorporate the crossover bracket modification at two locations (X0863 and X0750).</p> <p>At the X0863 location, M072-784633-014 called for the removal of a clamp and six screws to reflect the change harness mounting due to the new wire tray shape. TPS OEL-3-31-245 incorporated the electrical portion of this modification per the vehicle drawings as well as the three tank set harness Tech Orders. During STS-114 processing, the WAD was reviewed and it was determined that an error exists in the M072-784633 engineering. This Tech Order reflects harness routing at the X0863 that does not reflect the as-built configuration on the Orbiter. A one flight configuration waiver was processed and approved for STS-114 and STS-121. All hardware on this Tech Order supports MADS wire routing, there were no observed wire routing violations noted during Flight 31 midbody closeout and all MADS testing will be completed and verified. No technical issue with hardware, installation, or function of MADS. There was no access to this area this flow to perform wire routing as-designed condition. A configuration waiver is needed for STS-116 for this Tech Order.</p>	OV-103, Flight 33	

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
337	S115116NR4	10/27/06	<p>Tech Order M072-544501-087 - install, M072-544501-027 - remove, -087 configuration is for the new over-center stops being installed. Mission-unique loads will not require these new stops. Program decision was made to not remove the RMS.</p> <p>This configuration will incorporate the over-center stops mod, the change is to all four MPM locations. The new stops, replace existing GFE stops, incorporate a stronger design to address mission-unique loads that have a potential to exceed the current mechanism capability. The decision was made not to incorporate this mod during STS-116 flow due to the low potential for load exceedence. Since -087 established the over-center stops mod along with other mods that were completed for this flow,a configuration waiver is needed for STS-116. In addition the removal of the -027 from the previous mission was not completed.</p>	OV-103, Flight 33	
338	S115116NR4	10/27/06	<p>Tech Order M072-794021-026 install, M072-794021-019 remove, -026 configuration is for the new over-center stops being installed. The change is rerouting and retaping of the wire harnesses near the over-center stops to alleviate any interference. Program decision was made to not remove the RMS.</p> <p>This configuration would reroute and retape harnesses on the MPMs to support the over-center stops mod. Since -026 established a new configuration in support of the over-center stop mod and this was not worked this flight, a configuration waiver is needed for STS-116. In addition, the removal of the -019 from the previous mission was not completed.</p>	OV-103, Flight 33	

ACTIVE WAIVERS FOR
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
342	S115120DR3	09/12/07	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>Tech Order M072-784633-015 harness installation - interface panel - MADS#3 called out by MECSLSI V070-200199 was established to re-route MADS harness in support of SSPTS at location X0863. There was no access to this area this flow to re-route harness to meet as-designed congiguration. At this time there is NO plan to ever open up this area again.</p>	OV-103, Flight 34 thru OV-103, Flight 999	
344	S071024MP	12/20/07	<p>During maintenance of an Advanced Master Events Controller (AMEC) it was discovered that the module cards are able to translate upward, away from connectors. The cards are retained by friction applied by wedge-locks. An assessment determined a 0.070 upward card translation, would result in card disengagement from connectors. The wedge-lock system can not assure the cards will not translate upwards. The AMEC vendor (Boeing Autonetics) is no longer on contract supporting SSP. A design proposal is to provide a secondary connector retention using the AMEC covers. The new design new lids will limit the upward translation to 0.055. The new design will reduce the milled section of the cover and add silicone pads to provide shock absorption. Due to the absence of the original vendor and no current alternate drawings available for the AMEC the modification is being requested via a program directed Material Review (MR).</p> <p>P/N MC450-0016-0029</p> <p>S/N U6F0002, U6F0003, U6F0004, U6F0006, U6F0007, U6F0009, U6F0010 and U6F0011</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 35 OV-104, Flight 30 OV-105, Flight 21	

Item #	Authority	Date	Waiver Description	Effectivity	Wad
352	S115128CR6	10/05/09	<p>The Post-Landing/Ferry Flight Configuration requirement is waived to allow OV-103 to ferry from DFRC to KSC with out-of-configuration conditions for removal of FCV assemblies for ferry flight and install MPS cap and plug set GSE plugs:</p> <p>Three MPS GH2 FCV solenoid and poppet sleeve assemblies (P/N 80420-1301) for each engine.</p> <p>Engine 1 GH2 FCV LV56 Engine 2 GH2 FCV LV57 Engine 3 GH2 FCV LV58</p> <p>Note: The following MPS cap and plug set GSE plugs will be installed in place of the FCVs: 3 G070-602824-001.</p> <p>RATIONALE: There is adequate access and time to remove the requested parts. Removal of these parts is well within USA's experience base. These valves have been removed numerous times at KSC. Removal at DFRC will be no different than removal at KSC. There is no increase in risk performing this work at DFRC, and the early removal will better support the upcoming manifest. There is no GH2 FCV position specified for ferry flight, and no blanket pressure is required. The manifold is firmly mounted/restrained and requires no additional support due to removed FCV components.</p>	OV-103, Flight 37 Ferry Flight	

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 01/12/2010

NO.	SYS	REQT / PART DESC / PART NO	TOP / SEPAR	ANTICIPATED ACTION	CONSTR	ELE
1	PYRO	C00AA0.110.032 NASA STANDARD DET. SEB26100094-201	V5032.004 V5029.001	REMOVE/INSTALL	2	O
2	PYRO	C00AA0.110.033 CARTRIDGE SKD26100098-301	V5032.004 V5127	REMOVE/INSTALL	2	O
3	PYRO	C00AA0.110.034 AFT ATTACH BSTR CART. SKD26100099-401	V5032.004 V5029.001	REMOVE/INSTALL	4	O
4	PYRO	C00AA0.110.035 NLG THRUSTER CART. SKD26100100-301	V5032.004 V5127	REMOVE/INSTALL	2	O
5	PYRO	C00AA0.110.043 GAS PRESS CTG. SEB26100001-25X	V5056	INSTALL	4	O
6	PYRO	C00AA0.115.001 GAS SAMPLER BATTERY SED33101116-321	V5012.001 V5029.004	REMOVE/INSTALL	4	O
7	INS	C00AA0.140.004 MADS TAPE RECORDER ME435-0055-0003 THRU 0005	S0007 V1200 V1248	TEST	4	O
8	COM	C00AA0.160.001 GPS RECEIVER (GPS MAGR'S) MC478-0153-0001	V5A71 SEPAR-TBD	R/R BATTERIES EVERY 12 MONTHS	4	O
9	MEQLG	C00AB0.010.003 NLG TIRE MC194-0007-0006 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
10	MEQLG	C00AB0.010.004 MLG TIE BOLTS & NUTS MC621-0051-0038 (4 WHEELS)	V1165.001 V1165.002	REMOVE/INSTALL	2	O
11	MEQLG	C00AB0.010.005 MAIN WHEEL ASSEMBLY MC621-0051-0038 (4)	V1165.001 V1165.002	REMOVE/INSTALL	2	O

Constraints

1=ET/SRB MATE 3=VAB ROLL
2=OPF ROLL 4=LAUNCH

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 01/12/2010

12	MEQLG	C00AB0.010.006 NOSE WHEEL ASSEMBLY MC621-0050-0004 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
13	MEQLG	C00AB0.010.007 MLG CARBON BRAKE ASSY MC621-0075-0001 (4)	SEPAR TC09-077	R & R AFTER OV103/38 MISSION	2	O
14	MEQ-ST	C00AB0.070.101 -Y STAR TRACKER DOOR/PANEL V070-591403-004	SEPAR-TBD	PERFORM INSPECTION	2	O
15	MEQ-ST	C00AB0.070.102 -Z STAR TRACKER DOOR/PANEL V070-591402-004	SEPAR-TBD	PERFORM INSPECTION	2	O
16	PLM	C00AB0.160.019 TRAJECTORY CNTRL SENSOR SJD39123429-305	CM-3-39-TBD SEPAR - TC09-102	REMOVE/REFURBISH/INSTALL	2	O
17	PLM	C00AB0.160.020A VIDEOSPECTION CAMERA ASSY SED39125120-3XX	TPS-TBD	REMOVE/REFURB/INSTALL	4	M
18	TPS	C00AB0.170.001 RCC ARROWHEAD PLATE MC621-0007-7009	V5139.001 V5139.002	REMOVE/INSTALL	2	O
19	TPS	C00AB0.170.002 RCC ARROWHEAD PLATE MC621-0007-7010	V5139.001 V5139.002	REMOVE/INSTALL	2	O
20	TPS	C00AB0.170.018B THERMAL BARRIER (2) V070-398816-014	SEPAR TC09-083	REMOVE & REPLACE	2	O
21	TPS	C00AB0.170.023C THERMAL BARRIER (2) V070-398817-022	SEPAR TC09-083	REMOVE & REPLACE	2	O
22	TPS	C00AB0.170.023D THERMAL BARRIER (2) V070-398817-023	SEPAR TC09-083	REMOVE & REPLACE	2	O

Constraints

1=ET/SRB MATE 3=VAB ROLL
2=OPF ROLL 4=LAUNCH

Elements

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23	TPS	C00AB0.170.027A THERMAL BARRIER (2) V070-398818-012	SEPAR TC09-083	REMOVE & REPLACE	2	O
24	TPS	C00AB0.170.027B THERMAL BARRIER (2) V070-398818-013	SEPAR TC09-083	REMOVE & REPLACE	2	O
25	TPS	C00AB0.170.028 THERMAL BARRIER (2) V070-398819-028	SEPAR TC09-083	REMOVE & REPLACE	2	O
26	TPS	C00AB0.170.035D THERMAL BARRIER (2) V070-398819-029	SEPAR TC09-083	REMOVE & REPLACE	2	O
27	ECLSS	C00AB0.230.003 WASTE WATER TANK V070-623022-003	TPS-TBD SEPAR TC10-005	REMOVE & REPLACE	2	O
28	PYRO	C00AD0.030.009 SPHERICAL BEARING ASSY V070-562036-002	V5032.004 V5127	REMOVE/INSTALL	2	O
29	PYRO	C00AD0.030.012 PYRO CENTERING MECHANISM SKD26100098-501	V5032.004 V5127	REMOVE/INSTALL	2	O
30	MPS	C00BA0.010.045 1"GHE PD8 DISC SWIVEL ASSY 74332001-516	TPS-TBD SEPAR TBD	EXCEPTION BEING WRITTEN	2	O
31	MPS	C00BA0.020.005A FLOW CONTROL VALVE MC280-0017-1301	TPS-TBD	REMOVE & REPLACE	2	O
32	MPS	C00BA0.020.012 LO2 INBD FILL/DRAIN VLV (PV10) MC284-0397-0030	TPS-TBD SEPAR TBD	EXCEPTION BEING WRITTEN	2	O
33	MPS	C00BA0.020.013 LH2 FILL/DRAIN VLV (PV12) MC284-0397-0031	TPS-TBD SEPAR TBD	EXCEPTION BEING WRITTEN	2	O

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34	PLM	JSC24937.30 PORTABLE FOOT RESTRAINT ASSY SED33105308-307	TPS-TBD	REMOVE/REFURBISH/INSTALL	2	M
35	FCS	JSC24937.56 EMER EGRESS SLIDE SYS MC623-0015-0023	TPS-TBD	REMOVE/INSTALL	4	M
36	ECLSS	V61AIL.010-C LIOH CANNISTER MC621-0008-0409	TPS-TBD	INSTALL AT PAD	4	O
37	ECLSS	V61AIL.015-C HYDRAZINE (CO RMVL CART.) MC621-0008-0060	TPS-TBD	INSTALL AT PAD	4	O
38	ECLSS	V61AIL.016-C ATCO CARTRIDGE MC250-0024-0001	TPS-TBD	INSTALL AT PAD	4	O
39	ECLSS	V61AJ0.141 PPO2 SENSOR MC250-0002-3165	V1053.010	RECALIBRATE SENSORS AT PAD	4	O
40	FCS	V66AIL.060 POLE CREW ESCAPE SYS ASSY SED27101375-322	TPS-TBD	REMOVE/INSTALL	4	M
41	COM	V74AD0.130 MSBLS RF #1, 2 & 3 MC409-0017-0007	OMI-TBD SEPAR-TBD	PERFORM 15 MINUTE TEST	4	O

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