



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



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

Program Freeze Point

PRCB Presentation

S115133C



STS-133 Delta Launch Site Flow Review

Presenter	Kenneth Nowak	
Date	05-20-10	

Baseline the STS-133 Mission Specific Requirements and Flow Plans.
 The STS-133 Integrated Launch Site Requirements were established by PRCBD S115133AR1 dated 03-04-10. This CR and the Associated Data Package were reviewed at the 05-17-10 FRWG.

Flight Operation & Integration

Orbiter Engineering*

Payload/Cargo Engineering*

SSME

KSC ISS and Payload Processing*

Launch Vehicle Processing

Requesting Approval

Status in BackUp

KSC Integration*

Flight Software

Orbiter GFE*

EVA

MO3/USA-PI

USA-OE

USA-PI

MP21

UB-R3

PH-A

MK-SIO

USA-FSW

MV5

XA

*Backup material included



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



STS-133 Delta LSFR

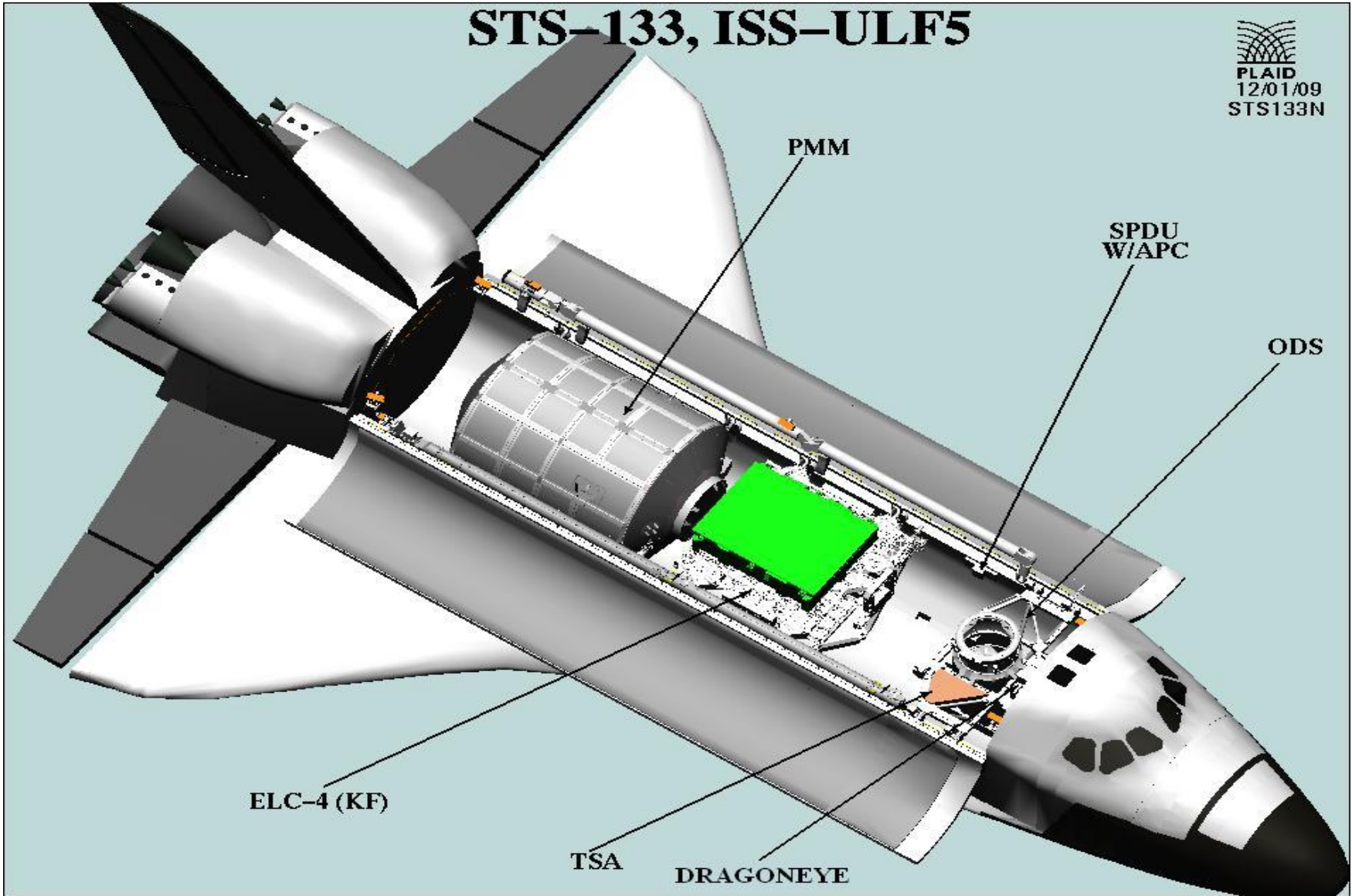
PRCB Flight Requirements Status

May 20, 2010

Michael Darnell, Lead MIM



On Orbit Cargo Bay Configuration		Presenter Michael Darnell
		Date 5/20/10 Page 2





STS-133Delta LSFR Flight Overview		Presenter Michael Darnell
Date 5/20/10	Page 3	

LAUNCH

09/16/10
***39A/ MLP3**
CREW SIZE: 6UP/6DN

CONFIGURATION

OV-103(39)
LP01;RP03
***ET-137**
***BI-144**
***RSRM-112**
***(1) 2048 (2) 2044 (3) 2058**
OI-34
SRMS, OBSS, ODS, SSPTS

PAYLOAD

ISS-ULF5	ISS-ULF5
(ELC4, PMM)	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

* per PRCBD S042013HZ (signed)



STS-133 Delta LSFR Performance Margin		Presenter Michael Darnell
Date 5/20/10	Page 4	

PERFORMANCE MARGIN

SIMULATION MARGIN (OCFAF133)		+2101
WEIGHT CHANGES SINCE SIMULATION		
PAYLOAD	+671	
OPERATOR	- 414	
ORBITER	+41	
CREW COMPARTMENT	+189	
ET	+154	
TOTAL WEIGHT CHANGES	+641	- 641
OTHER PERFORMANCE PROJECTIONS		
RENDEZVOUS ALT OF 190 NM		+1160
PROTECTION FOR DOL DISPERSIONS		- 700
SRB – M.P. UPDATES		- 106
SRB – BR / 0.80 MIL LOWER THAN 0.3705 AVG		- 288
NEW ISP/THST FOR ENG SET 2048/2044/2058		- 94
PROJ TO 5 MIN WINDOW FROM INPLANE		- 600
PERFORMANCE CHANGES ADJUSTMENT		+45
CURRENT GREENBOOK APM (05/18/10)		+877
ADD 191 LBS TO MIDDECK		- 176
ADD'L. 2100 LB OMS ASSIST (NO COPV)		+83
PROJECTED APM		+784
VOLUME III: ASCENT PERFORMANCE MANAGER'S RESERVE GUIDELINE AT LSFR/LSRR IS 400 LBS		



STS-133 Delta LSFR MASS Properties	Presenter Michael Darnell	
	Date 5/20/10	Page 5

FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5 X C.G. inches (LIMIT)</u>
NOMINAL	203122 (233000)	1080.2 (1075.2)
RTLS	240923 (245000)	1081.4 (1076.7)
TAL	238807 (244000)	1080.9 (1076.7)
AOA	233614 (242000)	1077.1 (1075.2)
CONT RTRN**	235056 (233000)	1078.7 (1075.2)

**** Contingency Return case exceeds 233K NEOM weight 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 60 SEC FRCS DUMPS

ESTIMATES BASED ON OCFAF133 AND MODIFIED FOR WEIGHT CHANGES THRU 05/11/10.



Flight Requirements Status	Presenter Michael Darnell	
	Date 5/20/10	Page 6

PRCB CR's

– None

ULF5 MIP (NSTS 21554):

– Current version available on PILS: Rev. A PCN-2, March 12, 2010

– Open CRs:

- 21554, MIP CR#0007 Update ULF5 MIP Priorities and Replace TriDAR DTO with Dragon Eye DTO



STS-133 Delta LSFR Potential Changes

Presenter **Michael Darnell**

Date **5/20/10**

Page **7**

Mission Content and Cargo Configuration

- **Addition of up to two EVA for ISS homeless EVA tasks**
 - **1 EVA drives mission duration to 10+1+2**
 - **2 EVAs drives mission duration to 11+1+2**
- **Addition of the LMC for Nitrogen Tank Assembly (NTA) and /or Light Weight Adapter Plate Assembly (LWAPA) return**
 - **OV-103 currently configured to support LMC. Decision needed by 6/1 to remove/retain the bridges and latches for LMC**
- **Addition of Bay 13 sidewall for LWAPA return if LMC not added**

Aft Ballast Boxes

- **Due to cargo manifest uncertainty, the Aft ballast boxes cannot be removed.**

STS-133 Delta LSFR

**OV 103 / FLT 39
PRCB**

**Belinda Soublet
USA Orbiter Element
May 20, 2010**

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

Mission Kit Modifications To Be Baselined at DLSFR for OV 103 / FLT 39

- TAD 30234 DragonEye DTO 701B Implementation
- PRSD Tank Set 3/5 LH Purge Duct Tech Order change

Potential Modifications (Info Only)

Additional Requirements being tracked:

- Tech Order Updates (Info Only)
- Chits
- STR/TPS Priorities Current Vehicle Status

•Backup

- Information previously presented at STS-133 LSRR/LSFR
 - STR/TPS Priorities Detailed List
 - Opportunity modifications previously presented (Info Only)
 - STS-133 Weight Saver Mission Kit Changes (Info Only)

Mission Kit Modifications To Be Baselined at STS-133 DLSFR

- **TAD 30234 Dragon Eye DTO 701B Implementation**

- Per STS-133 FRD, DragonEye will replace TriDAR DTO on OV-103
- DragonEye LRU mounts at same location as TriDAR on external airlock truss
- Authorization requested for mission kit end item mod record 030234,0103,0 to reflect the addition of the GFE DragonEye LRU to the mission kit
- Installation tech order M072-730021-023 to be manifested on STS-133 MECSLSI
- Engineering release ECD 5/20/10
- Hardware is provided by GFE; GO need date is July 14

- **PRSD Tank Set 3/5 LH Purge Duct**

- Tank set 5 to be removed per FRD requirements for APM
- Tech order M072-384006-002 is required to be added back to the STS-133 MECSLSI
 - This air duct is used to support both tank sets 3 & 5 and was inadvertently de-manifested as part of the tank set 5 removal - will leave installed to support tank set 3 LH purge

STS-133 Potential Modifications (Info Only)

- **TAD 30091 BLT FE DTO Flight 4**

- Re-flight of protuberance tile and associated thermocouple installation with likely protuberance height increase to 0.50”
- Thermal analysis results of flying 0.50” protuberance reviewed by thermal and aero panels week of May 10 and no issues were found
- Review of STS-131 BLT data is complete and STS-133 recommendation was presented at OCCB on May 18
- Targeting baselining at PRCB / DPRCB ~ June 10
- Protuberance tile with height options of 0.35”, 0.45” and 0.50” are being fabricated – engineering release for chosen option to be released by June 11 in support of GO implementation schedule

- **TAD 30246 Catalytic Coating DTO Flight 3**

- Re-flight of catalytic coating applied to one tile in BLT DTO region of influence
- Shelf life extension testing of existing lot of catalytic coating completed with no issues
- Thermal analysis shows no concern with heating from larger 0.50” protuberance
- No mod to baseline as there is no configuration change from previous flight
- Ground Ops to remove STS-131 catalytic coated tile and replace with new coated tile

STS-133 Potential Modifications cont'd (Info Only)

- **TAD 30286 Ceramic Insert Plug Mod**
 - TPS PRT recommendation for corrective actions related to ceramic insert plug loss / protrusion as seen on STS-131
 - Will address changes to the plug braided cord to reduce configuration variability and provide plug installation running torque consistency to improve plug retention
 - A multiple vehicle CR will be brought forward the first week of June
- **Port and Starboard Wing Leading Edge Reference Marks**
 - Imagery has determined the docked OBSS LDRI inspection involves different trajectories from the nominal OBSS survey, due to ISS hardware considerations.
 - Pan and tilt unit (PTU) adjustments for proper LDRI sensor pointing made during survey auto-sequences are based on visual cues from the LDRI imagery.
 - Because WLE surfaces viewed with these flight-specific pause points are fairly nondescript, adding the position identifying symbols on the starboard and the port WLE RCC panels or associated T-seals will facilitate the survey and help diminish the likelihood of missed coverage during a contingency docked late inspection
 - Reference marks will be applied with approved black Sharpie (similar to nose cap fiducial markings)
 - Program CR (similar to STS-134 CR) will be processed OSB at a later date

STS-133 Tech Order Updates (Info Only)

- **MEI Instrumentation Filter Tech Order Configuration**
 - Tech order M072-755113-004 update to be picked up in STS-133 MECSLSI (post STS-133 LSFR change)
 - -004 documents acoustic sensor filters added late in the STS-131 flow

STS-133 Chits

- **Approved**

- J6163 OV-103 Body Flap Power Drive Unit Gearbox Fluid Level Inspection
- 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
- J6577 Ames Gap Filler Removal and Replacement
- J6578 Capture OV-103 Output Waveforms to Address 1N3600 Diode Concerns
- J6585 Optigo and Z-scan of BLT Protuberance Tile
- J6587 R&R of IMU S/N 213 (MC409-0126) with S/N 204 on OV-103 in IMU slot 1
- J6589A Crew Module Contamination Sampling
- J6599 Pre-Flight Citric Acid Flush
- J6600 Orbiter Measurements for STS-133 (ELC MGSE Msmts)
- J6601 STS-133 Payload Close Clearance Measurements
- J6613 DTV MUX Bypass Switch Verification
- J6620 Evaluation of Clearance between Ceramic Plug and Carrier Panel Fastener
- J6622 OV-103 Thermal Windows Torque Evaluation
- J6625 STS-133 RSB TE Tile Inspection
- J6626 Waste Water Sample and Urine Solids Filter Request
- J6627 R2U, R2D, and R1R Thruster Flush (File IX requirement)

STS-133 Chits cont'd

- **Approved cont'd**

- K6516A Ground Lightning Monitoring System (GLMS) Installation
- K6566 SSME Nozzle Purge Hot Wall Corrosion Prevention
- K6610 Dual Docking Contamination Sampling

- **Pending/Draft**

- J6628 OV-103 Insert Removal due to Suspect Ceramic Adhesive

- **Potentials**

- Multiple Voltage Injection for new calibration curve
- EVA Winch Attach Point Inspection

STR/TPS Priorities Current Vehicle Status

STATUS AS OF 5-03-2010

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	12
12. MLGD - Outboard AFT 1/3	22	0	0	9
13. Nose Area 9lb/90 SIP	14 (16 ^{OV103})	10	complete	complete
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 20	NLGD 22	NLGD 55
	LESS 68 (92 ^{OV-105})	LESS 8	LESS 12	LESS 27
	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	23



**STS-133
ISS – ULF5 PMM, ELC4**

Delta Launch Site Flow Review (DLFR)

Payload Cargo Engineering Status

ABBAS ELSABAGH

281.212.6186

05-20-2010

STS-133 DLSFR

STS-133 Payload Integration Services/Interfaces

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 ↑↓

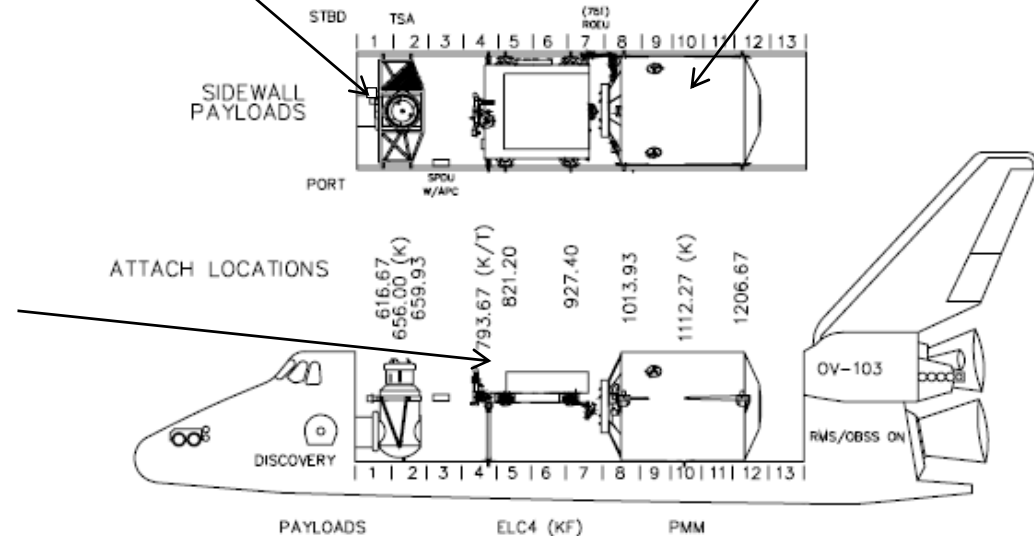
- ↑ **MPLM (PMM)- 1st Flight this location**
- 4 active longeron latches with aft primary
- 1 active keel latch
- ROEU provides 28V heater power, 124V for temp and pressure checks, and 1553 for command / telemetry

Dragon Eye (Pending MIP CR approval)

- 28 VDC for heater and avionics (Wavelength trans.)

ELC 4 ↑

- Deck Assembly:
 - Deployable
 - 4 active longeron latches (fwd primary)
- Keel Assembly: ↑↓
 - 2 passive longeron latches
 - 1 Active keel latch (Not wired to A6U panel)
- No power required for ELC4



STS-133 DLSFR

Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Released</u>
V072-200213	MECSLSI	02/18/10
VA72-200213	Cargo Arrangement	04/13/10
VD72-200213	Avionics Diagram	02/18/10
VS72-200213	Integrated Schematic	02/18/10
VS70-540423	Retention Schematic	02/11/10

Engineering Open Work

- V072-200213 MECSLSI Update ECD: 06/03/2010
 - DLSFR Mods
 - Add AFT Winch
 - Add New dash number for the return configuration of the drop bridge adaptor
 - Dragon Eye TO instead of TriDAR (will require VA/VS/VD updates)

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 DLSFR

Cargo Close Clearance Process

- The following Close Clearance areas have been identified:
 1. ELC aft port and starboard scuff plates to MPM
 2. PMM to top centerline latches
 3. ASI flag (PMM) to sidewall
- Chit 6601 was 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
- Chit 6600 was developed to measure the ELC4 longeron latch centerline locations to set-up CEWS for ELC MGSE installation (similar to STS-129/ULF3)
 - Same chit will also measure the ELC4 keel 'droop' when it arrives at the PAD prior to payload installation for the PGHM operators

Discovery STS-133
Delta Launch Site Flow Review
Space Shuttle Main Engine

SSME - KSC
Paul Brzeski
(321) 861-4064



STS-133 Delta Launch Site Flow Review

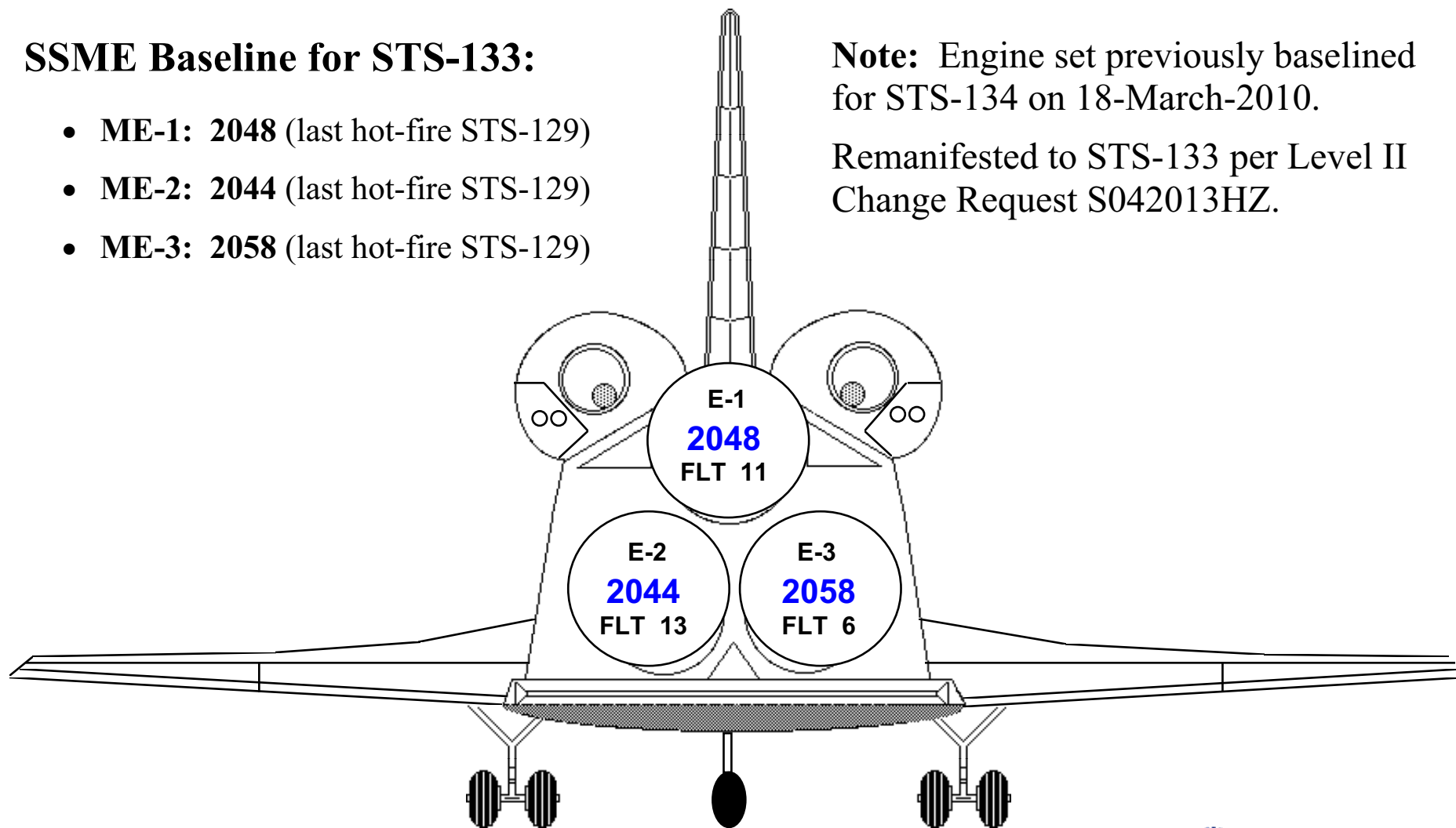
SSME Allocations / Locations

SSME Baseline for STS-133:

- **ME-1: 2048** (last hot-fire STS-129)
- **ME-2: 2044** (last hot-fire STS-129)
- **ME-3: 2058** (last hot-fire STS-129)

Note: Engine set previously baselined for STS-134 on 18-March-2010.

Remanifested to STS-133 per Level II Change Request S042013HZ.





STS-133 Delta Launch Site Flow Review

SSME Planned Modifications

Mods authorized by Shuttle Project Action Request (SPAR) or Level II Change Request (CR)

ECP	Title	Engine(s)	Kit Drawing	Weight Impact	SPARs / CRs	Status
1537	Joint F2 (LPFTP-to-LPF Duct) Liquid Air Insulation Redesign, with Helium supply.	2058	2R112833-010	+3.13 lbs	ME-0261 B	Complete
1544	Joint F5 (HPF Duct-to-MFV) Liquid Air Insulation Redesign.	2048 2044	2R112835-010	-0.15 lbs	ME-0260 B ME-0262 B	Complete Complete



STS-133 Delta Launch Site Flow Review

Rocketdyne Action Requests (RAR)

RAR	Title	Engine(s)	SPARs / CRs	Status
KLO-1645	Reallocate HPFTP.	2058	ME-0261 B	HPFTP 8031R1: Removed 14-Jan-2010. HPFTP 8121: Installed 21-Jan-2010.
KLO-1646	Allocate LPFTP.	2058	N/A	LPFTP 2232: Removed 14-Jan-2010. LPFTP 4208R1: Installed 21-Jan-2010.



STS-133 Delta Launch Site Flow Review



KSC International Space Station and Spacecraft Processing

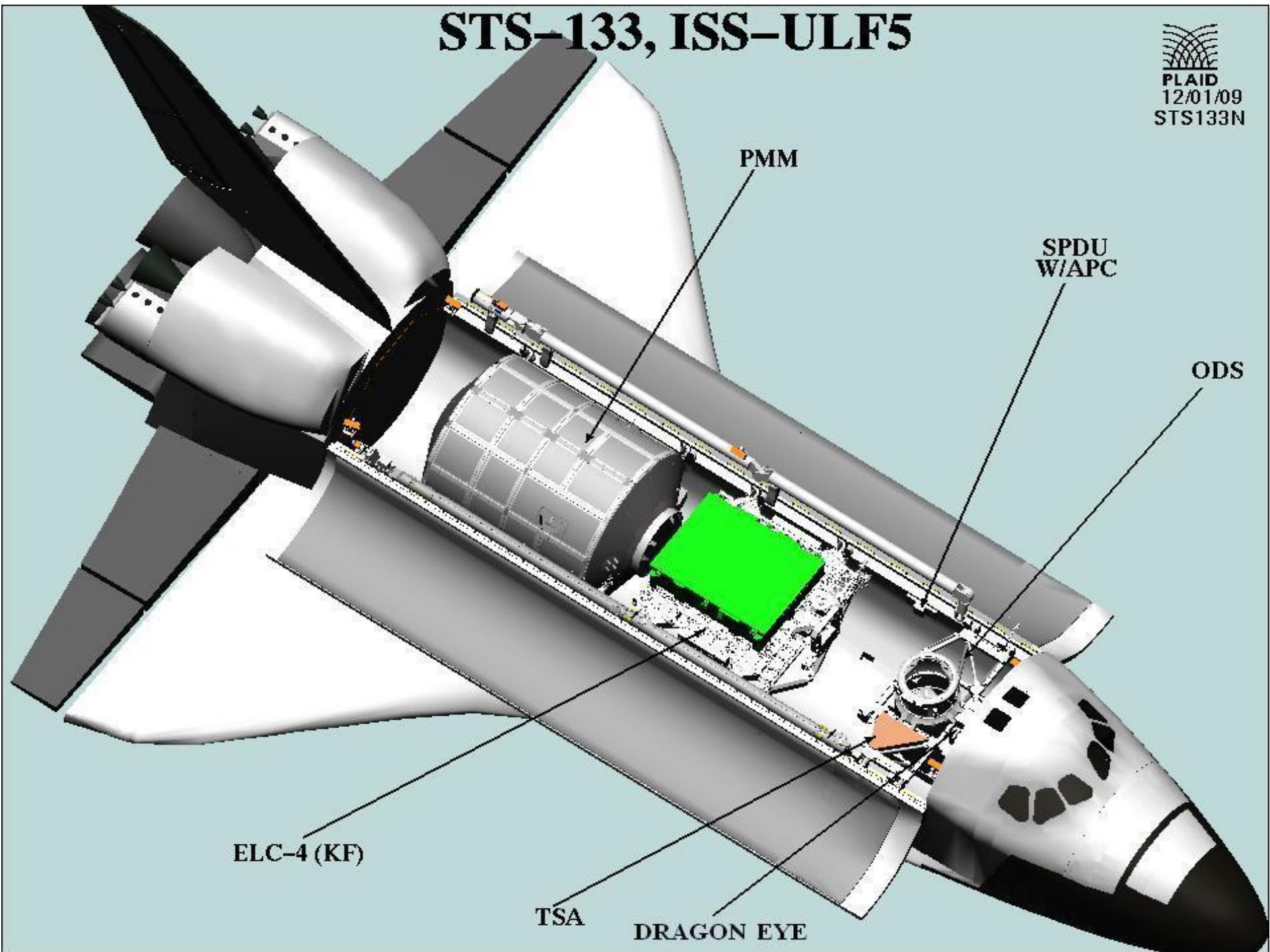
ISS-ULF5

**ExPRESS Logistics Carrier 4 (ELC4) with Heat Rejection System
Radiator (HRSR) Orbital Replacement Unit (ORU)
Permanent Multi-purpose Module (PMM)**

**Scott Higginbotham / UB-R
ULF5 NASA-KSC Mission Manager
May 20, 2010**

STS-133, ISS-ULF5

PLAID
12/01/09
STS133N



ELC-4 (KF)

PMM

SPDU
W/APC

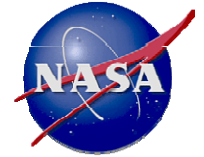
ODS

TSA

DRAGON EYE



ULF5 Hardware Processing Status Summary



EXPRESS Logistics Carrier 4 (ELC4)

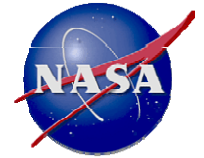
- Assembly operations are continuing on schedule
 - Keel side PFAP (five each) build up/installation operations are complete
 - Top side HRSR FSE installation/alignment operations are complete
 - Cable harness testing operations are underway
- Flight EXPRESS Carrier Avionics (ExPCA) standalone testing is underway
- HRSR ORU in dwell – flight installation scheduled for late June

Permanent Multi-purpose Module (PMM)

- Leonardo (MPLM FM1) STS-131/19A destow/deintegration operations are complete
- TAS-I modification work is underway
 - All external MLI/MDPS has been removed
 - Feed through leak checks underway
 - Harness removals/modification underway
- CBM seals have been replaced - leak check is underway
- First cargo bench review planned for 5/19



ULF5 Processing Milestones

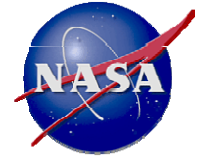


ELC4

- ELC4 On Dock KSC 15 August 2009
- ExPCA #4 On Dock KSC 19 February 2010
- HRSR FSE On Dock KSC 1 April 2010
- Install ExPCA #4 onto ELC4 21 May 2010
- Install HRSR ORU onto ELC4 25 June 2010 (U/R)
- ELC4 Testing 29 June - 12 July 2010 (U/R)
- ELC4 Deck To Keel Mate mid July 2010 (U/R)
- ELC4 Closeouts Complete late July 2010 (U/R)
- ELC4 CEIT TBD
- ELC4 ICD Walkdown TBD
- ELC4 Weight and C.G. Measurements TBD
- ELC4 Canister Installation TBD



ULF5 Processing Milestones

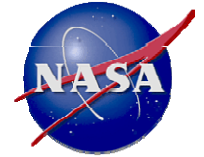


PMM

- FM-1 MPLM 19A Deintegration Start 28 April 2010
- PMM External Modifications Start 28 April 2010
- FM-1 MPLM 19A Deintegration Complete 14 May 2010
- PMM Internal Modification "Window" 11 May – 4 June 2010
- PMM Testing Complete 18 June 2010 (U/R)
- PMM Rack Integration Complete 15 July 2010 (U/R)
- PMM External Modifications Complete 27 July 2010 (U/R)
- CEIT TBD
- PMM Closeouts Complete TBD
- PMM ICD Walkdown TBD
- PMM Weight and C.G. Determination TBD
- PMM Installation into Canister TBD



Issues / Concerns



- **There are multiple threats to the MPLM to PMM conversion/processing campaign:**
 - 19A FOD damage to MPLM/PMM pressure vessel
 - Conversion mod scope growth
 - Anticipated late cargo “integrated assembly” deliveries
 - Workforce changes/turnover
- **Potential addition of sidewall PFIP for LWAPA return**

KSC Launch and Landing Project

STS-133

DLSFR

May 20, 2010

Agenda

- Orbiter Multi Flow S.Stilson / NASA
- Milestone Interface Chart S. Stilson / NASA
- Flight Element Processing W.Bingham / USA



Multi Flow

S.Stilson

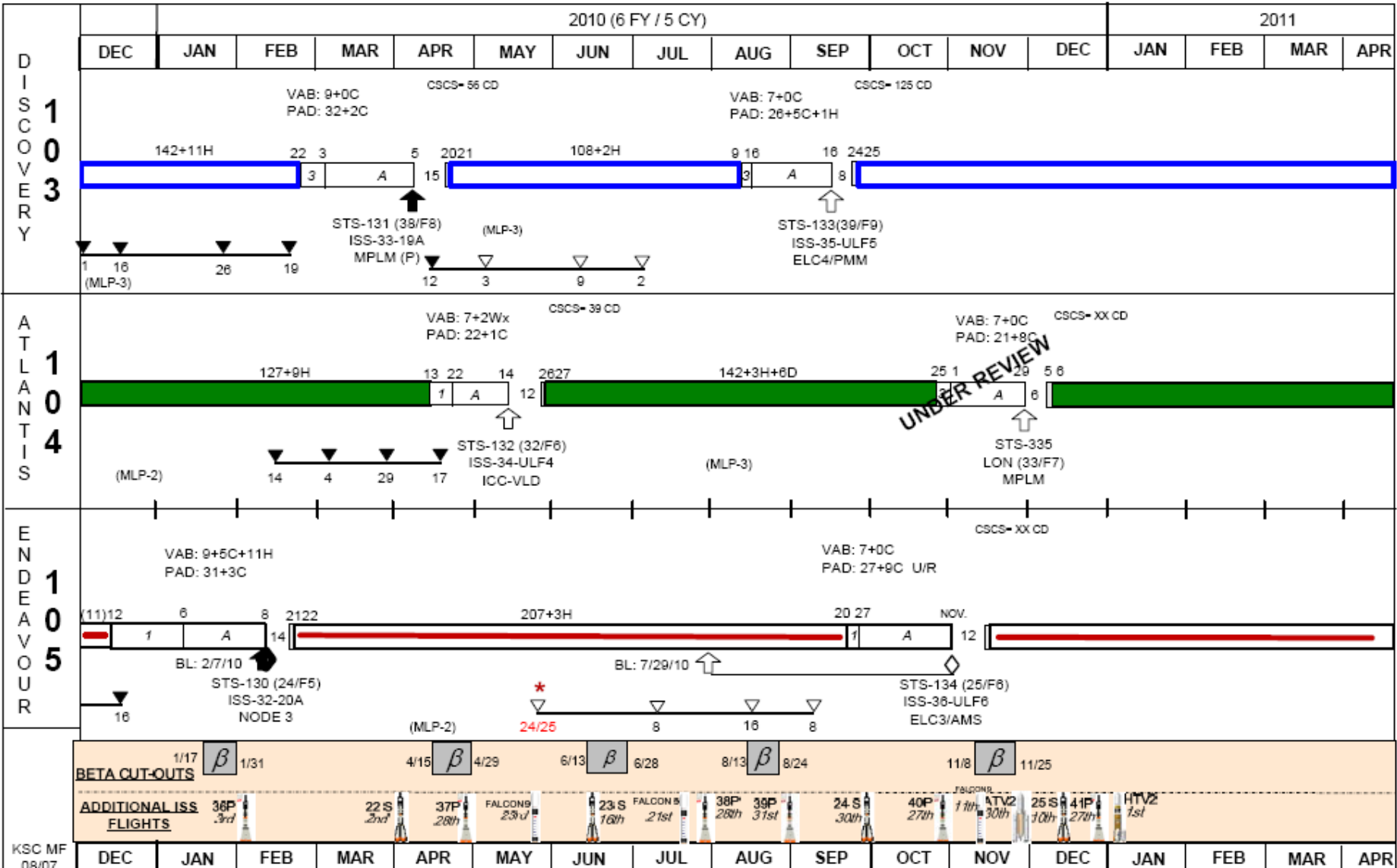
BASELINE MANIFEST (FDRD) / PREL. PROGRAM PLAN
 KSC ASSESSMENT (SLIP or OPTION)
 * DENOTES CHANGES TO BASELINE MANIFEST

KSC ASSESSMENT / ORB MULTI-FLOW

PENDING APPROVAL CR#S042013HZ
 MANIFEST REF. 10A-36

OPR: USA - R. GILLETTE, MFM
 NASA - C. FORD, PH-0

1300 EST, 7 MAY 2010



LEGEND

H = HOLIDAY D = DRYDEN RESERVE C = PAD CONTINGENCY Wx = WEATHER OUTAGE OPF-1 OPF-2 OPF-3 Vehicle out of service S = SOYUZ P = PROGRESS
 CR = CREW REST DAY DFRS OPS 1/3 VAB OPS A/B PAD OPS MILESTONE LAUNCH MATE CLOSEOUTS COMPLETE
 SOYUZ Cutout

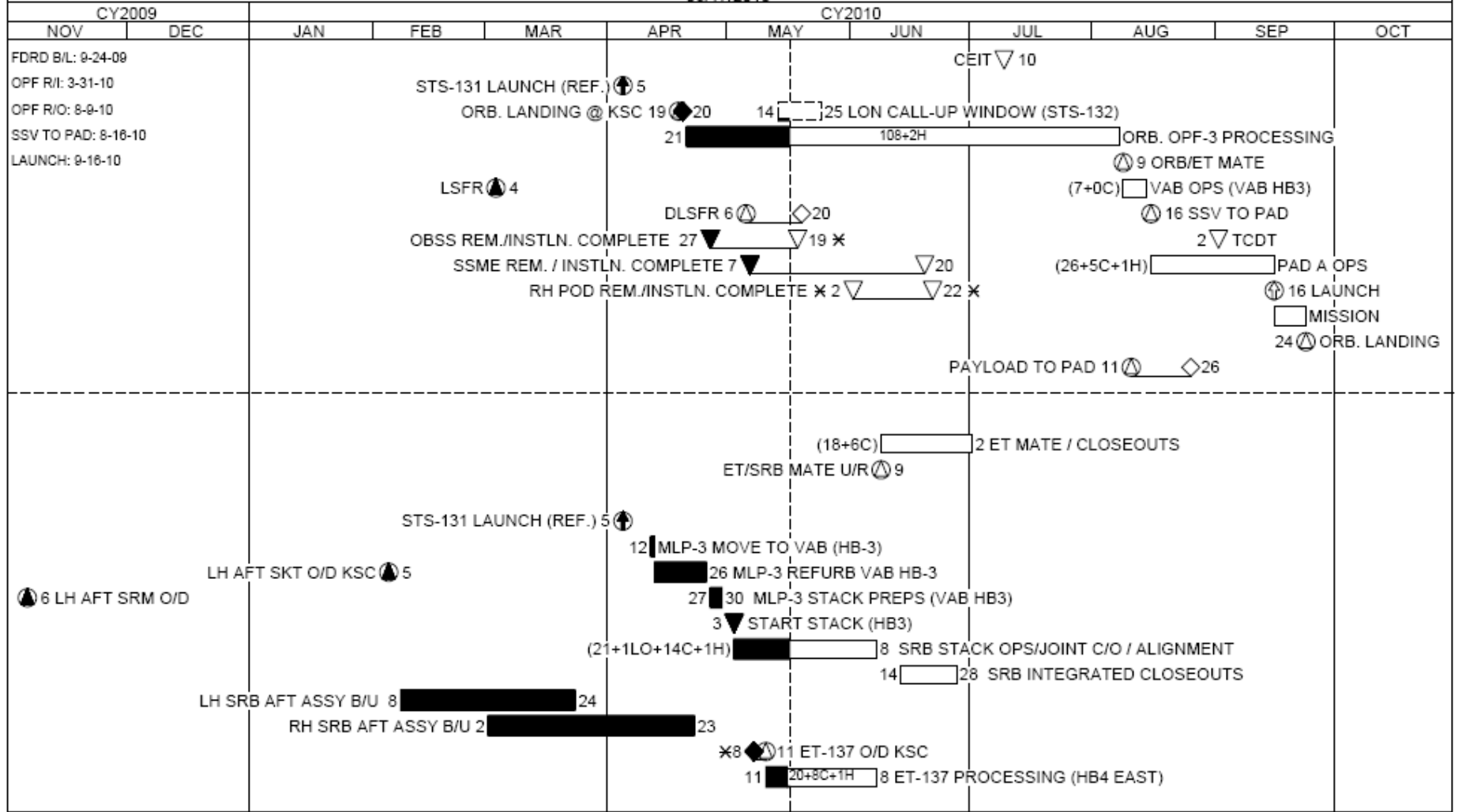
Contact: S. Wierszalowski, USA Near-Term Manifest Planning (321)861-8701

STS-133 KSC Milestone Interface Chart

OPR: USA - R. GILLETTE, INTEG. OPS.
NASA - S. STILSON, PH-A

OV-103 / 39 / ISS-35-ULF5 / ELC4 - PMM
CREW / DURATION: 6 Up 6 Dwn / 8
ET-137 / BI-144 / RSRM 112 / MLP-3 / PAD-A / VAB HB3

SSP APPROVED PRCB 9/24/09 (REF. S042013HW)
Status as of:
05/17/2010



THREATS:
1. OPF FLOW DURATION
2. PMM PAYLOAD DELIVERY TO PAD

NOTES:
1. THIRTY-FIFTH ISS/SSP FLIGHT
2. STS-133-134 MLP / VAB HB / STACK SWAP

Flight Element Processing

W. Bingham

Flight Element Processing Overview

- **Milestone Summary** **To Be Presented**
- **Significant Processing Deltas** **To Be Presented**
- **TPS Status** **To Be Presented**
- **Issues and Concerns** **To Be Presented**

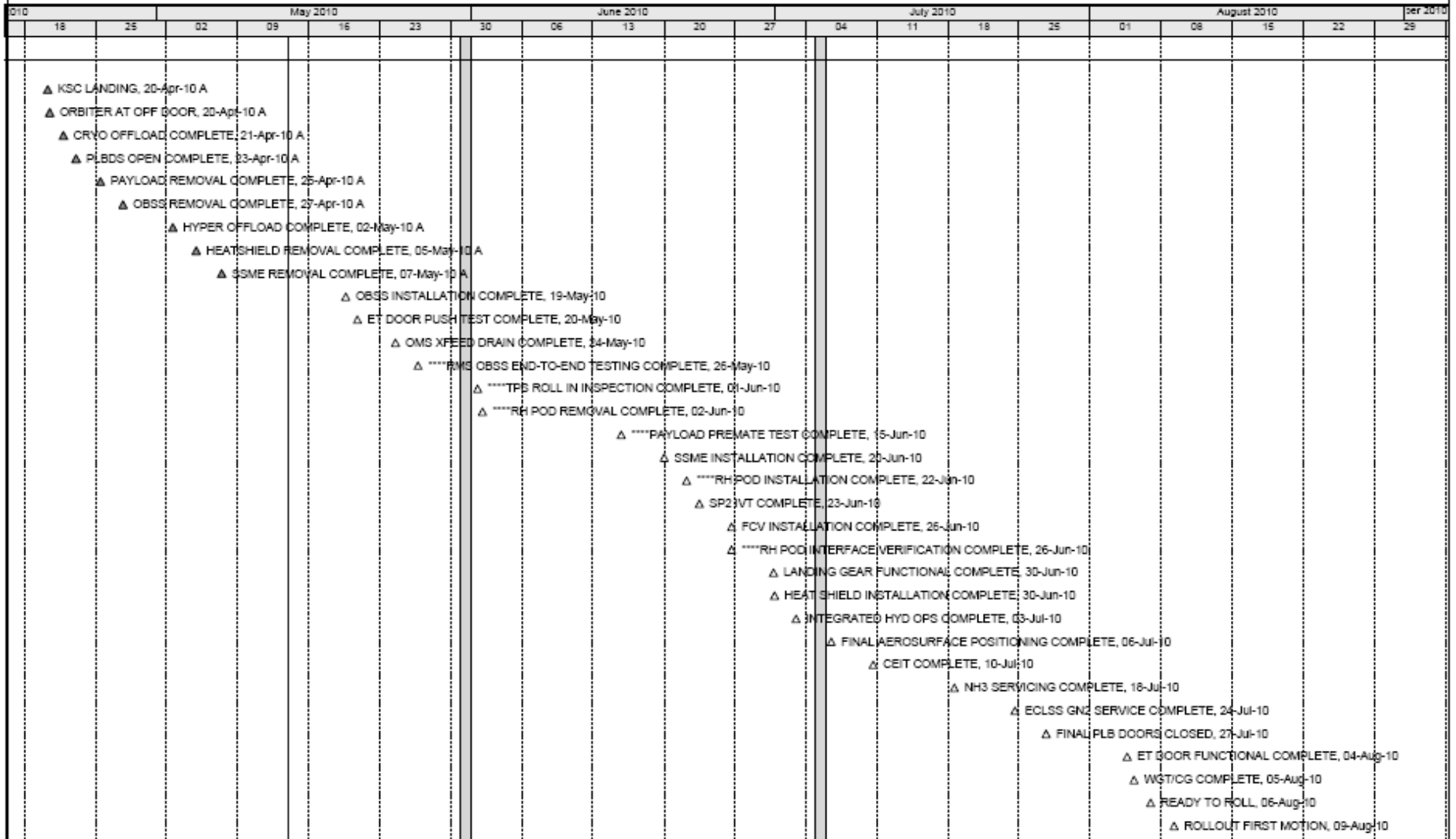
STS-133/OV-103 OPF FLOW MILESTONE

REVISION: J
 REVISION DATE: 14-May-10

STATUS	
USA	NASA
C	C
C=Concur	NC=Not-Concur

DOWN PAYLOAD: ISS-33-19A
 UP PAYLOAD: ISS-36-ULF5
 OFFICIAL MILESTONE REPORT

****States Milestone Change
 OPR: USA-BINGHAM, WAYNE W.
 NASA-STILSON, STEPHANIE S.



Legend: ▲ Milestone ▲ Milestone Complete

Significant Processing Deltas

- **Major Component Removal and Replacements**
 - **5TH PRSD Tank Set Removal**
- **Will Complete Remaining “Red” OMDP Requirements**
- **Mods**
 - **BLT Tile Update**
 - **Catalytic Coating**
 - **Ceramic Plug Thicker Cord Mod (Potential)**
 - **Port And Starboard Wing Leading Edge Reference Marks**

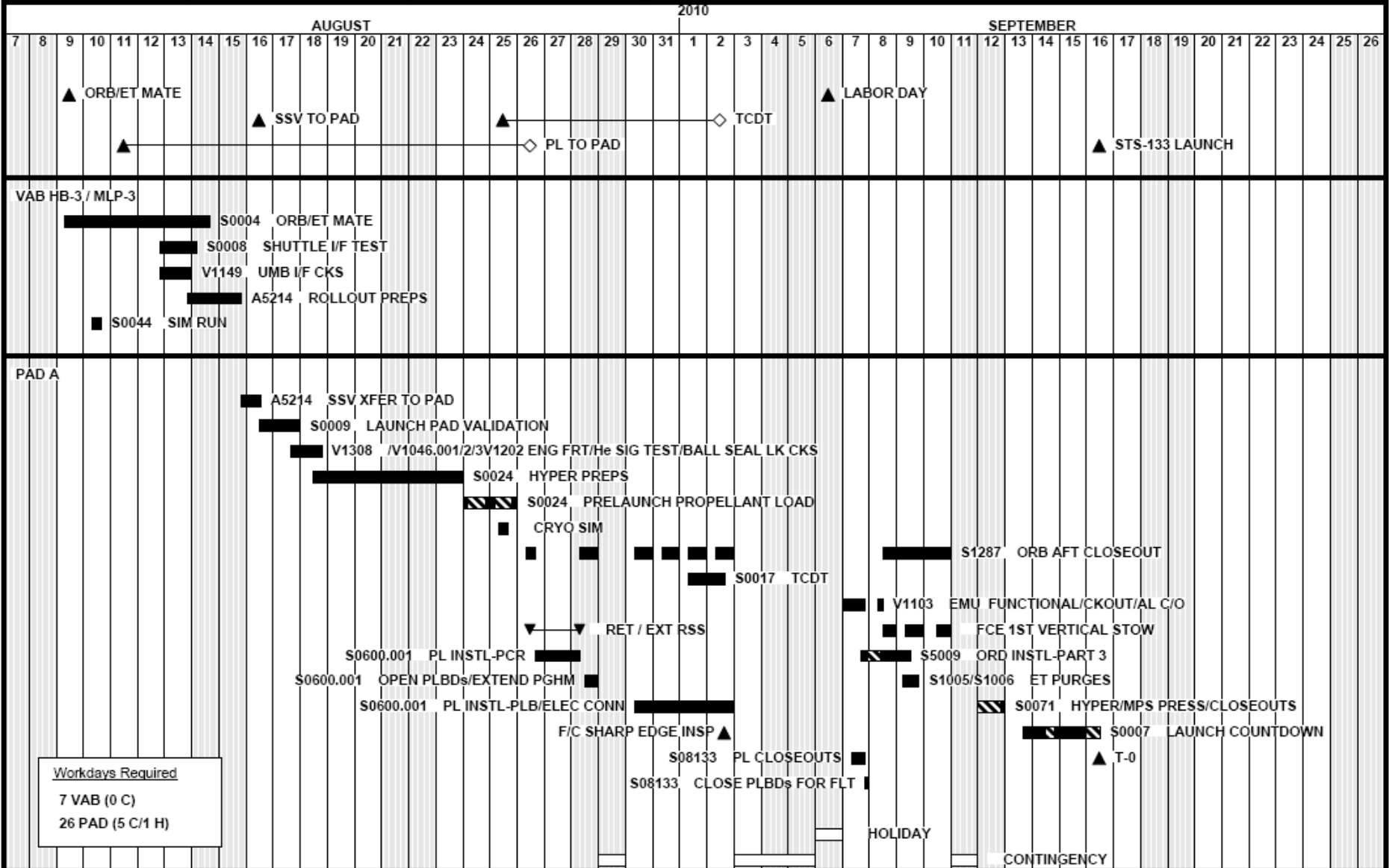
TPS Work Content (STS-133)

Projected TPS Removals			
<u>Priority</u>	<u>Description</u>	<u>LSFR</u>	<u>DLSFR</u>
Mand	Deferred Tile/Fib For 1 Flight (Minimum)	2	6
Mand	In-Flight Tile/Fib Damage	*40	*40
Mand	Operational Damage (Estimate)	*10	*10
Mand	BLT Mod (1-Trip Tile/1-Cover Tile)	4	4
Mand	Putty Repairs form Grind-outs	*20	*20
Mand	Additional Putty Removals (Chits)	10	10
Mand	Corrosion Sampling (Chit J6275A)	5	5
Mand	Catalytic Coating	2	2
Mand	Rudder Speed Brake (Chit 6625)	0	*2
Mand	RTV Sampling (OMS & Elevon)	0	3
P-11	ET Door BRI (STR Side)	24	24
	Total	*117	*126
	Projected TPS Removals TOTAL (Estimate)	*126	

Issues and Concerns

- **Payload Bay Configuration (Sidewall Carriers)**

STATUS		OPR: USA - J. Taylor, INTEG FM (1-7420) NASA - S. Stilson, PH-A (1-9103)		STS-133 / OV-103	
USA	NASA	CONCUR			
C	C			Creation Date: 11 SEP 09 Revision Date: 14 JAN 10 Revision: A	
C=Concur NC=Non-Concur				Payloads: ISS-36-ULF5 ELC4 - PMM (VERT)	





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



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

Backup Material

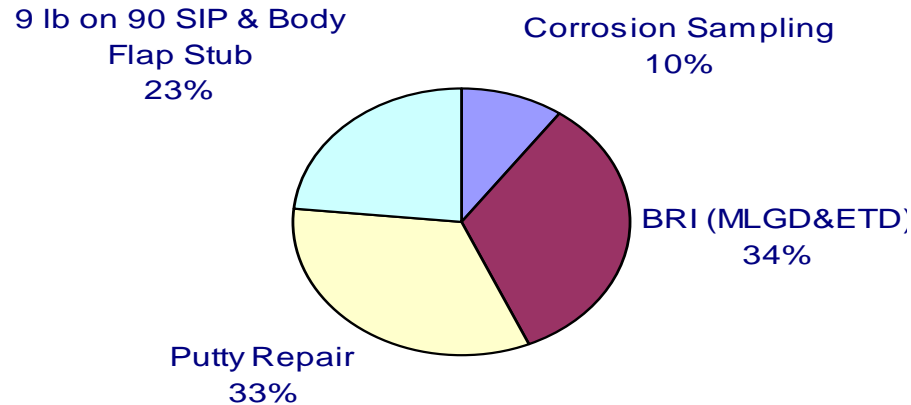
FRWG Presentation (With Minor Changes)

STS 133 DLSFR BACKUP

- **Information previously presented at STS-133 LSRR/LSFR**
 - **STR/TPS Priorities Detailed List**
 - **Opportunity modifications (Info Only)**
 - **STS-133 Weight Saver Mission Kit Changes (Info Only)**

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

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) – **6 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) – **103 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)

STS-133 Opportunity Mods previously presented

- **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 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**
 - Removed for STS-131 to provide payload clearance
 - Decision made to not remove aft winch for weight savings
 - Will be re-addressed as part of LMC payload addition CR
- **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 incorporated in MECSLSI

STS-133 DLSFR

Backup

STS-133 DLSFR

ICD Status (* = Impact Flight Products)

<u>Document</u>	<u>Title</u>	<u>ECD</u>	<u>Status</u>
ICD-A-21403-ELC4A	ELC4		Baselined
- A05858	Updates to sections 3 and 20	06/02/10	In Tech Review
- A05872	Add thermal surfaces and table	05/27/10	In Tech Review
ICD-A-21449-MPLMA	MPLM (PMM)		Baselined
- A05793	Add non-compliances	05/28/10	In Review
- A05868	Removal of power reference	05/31/10	In review
Forward Work:	Structural/Stress reports; Thermal properties/reports		

Issues/Concerns

- None

STS-133 DLSFR

OMRSD

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

 - Baselined Files

 - P350 MPLM Core Requirement (Permanent Multi-Purpose Module (PMM))
 - P554 ISS-ULF5 (Baseline)

 - RCNs

 - None

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

 - PS18163R1 Mission-Unique List
 - PS18164 FIII MUL
 - PS18173R3 Adjacent Pin Test

 - RCNs

 - None

- **FII V6 (Shuttle Experiments)**

 - XDT701A TriDAR – Will be replaced XDT701B Dragon Eye

 - RCN

 - None

Issues / Concerns: None

STS-133 DLSFR

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

L-4 M Update

ECD

- Customer submittal 04/23/10A
 - Data needed: Weight and Mass Properties Update & Drawing Releases
- CR approval 05/16/10

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 DLSFR

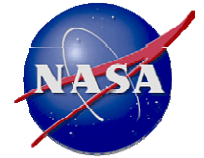
Time-Critical Ground Handling Requirements

- | 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 DLSFR

Payload Integration Hardware

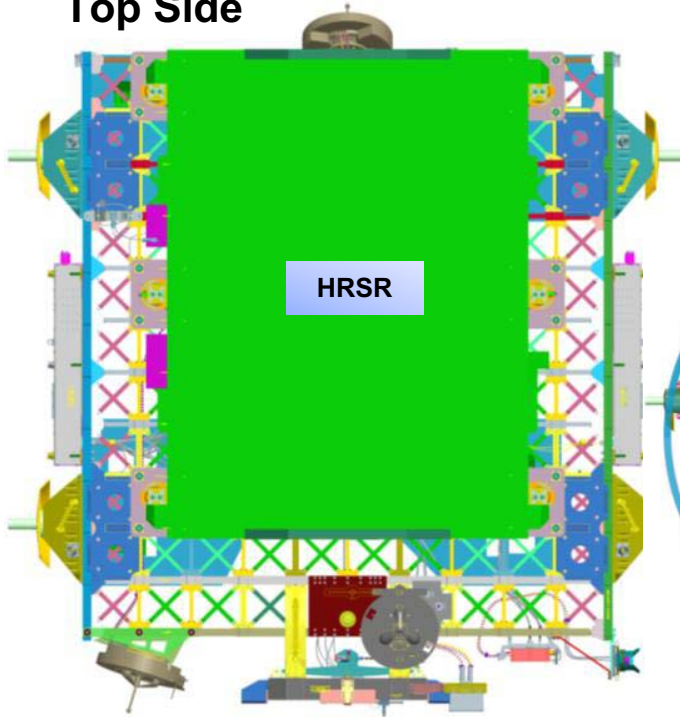
- **Cargo Integration Hardware Allocation Assessment**
 - **Hardware assessment completed - No open work**
 - **All hardware were delivered:**
 - **New Build Hardware**
 - **Crows Foot – V826-340001-005**
 - **Extended Fitting – V826-340003-003**
- **Issues / Concerns**
 - **None**



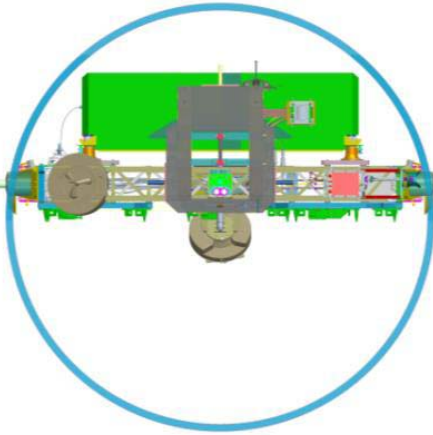
BACK UP

ELC4 Configuration

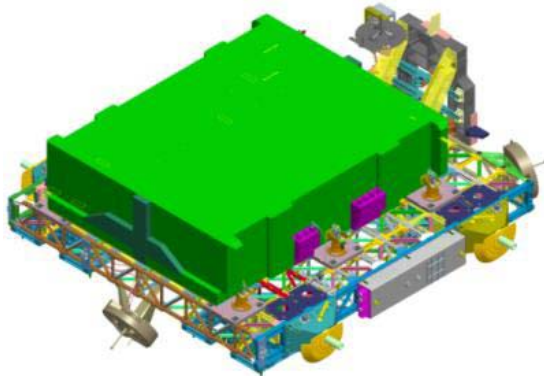
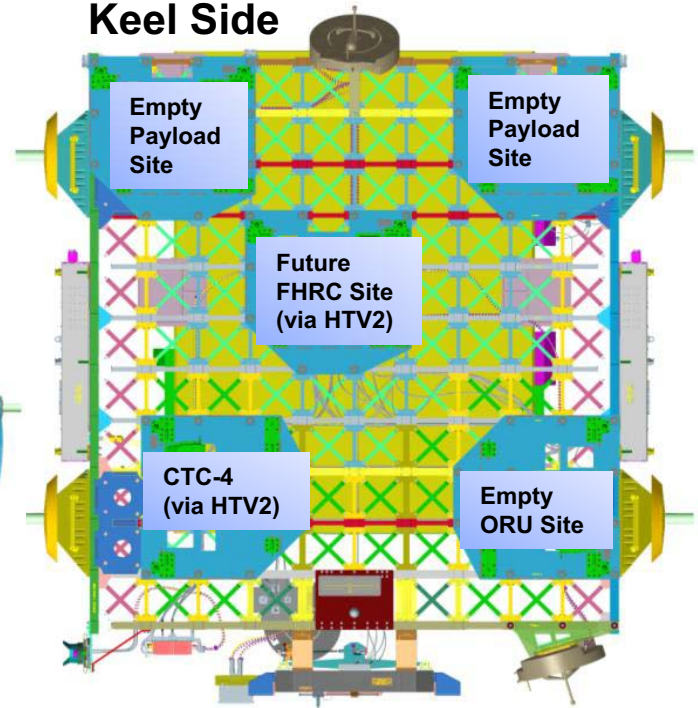
Top Side



No Orbiter 87" or 90" violations



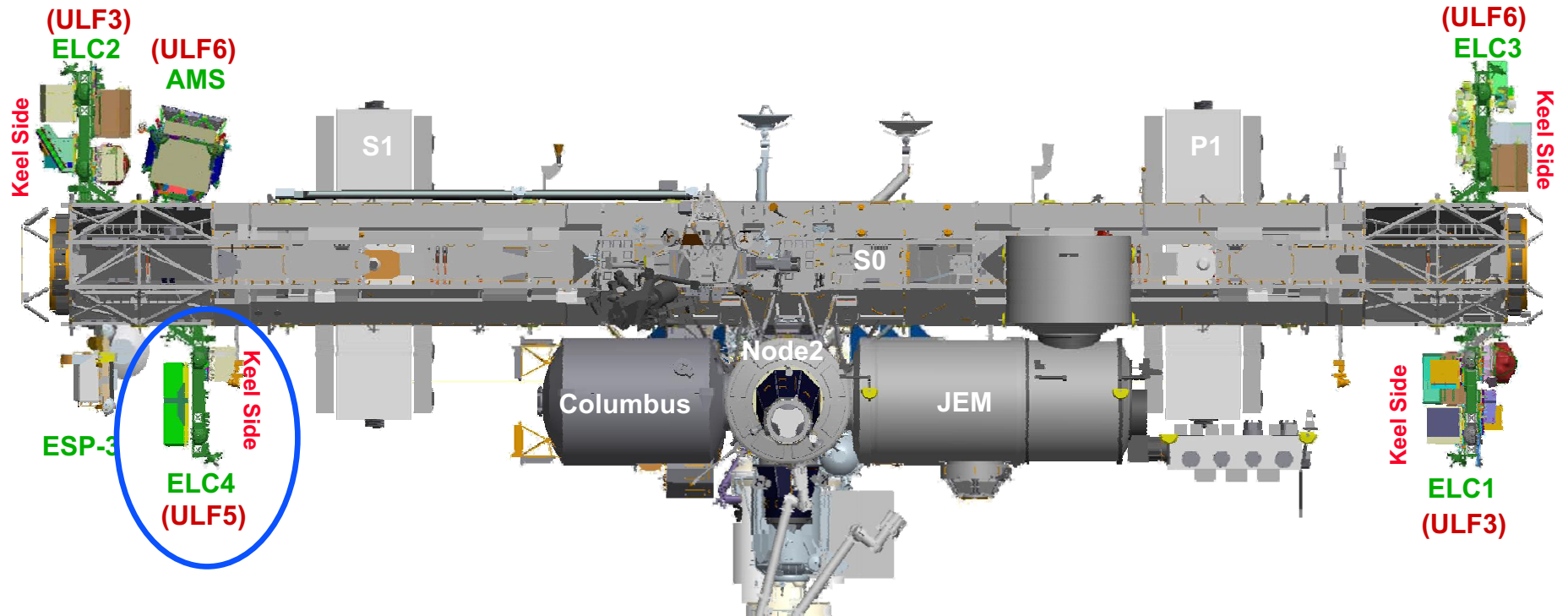
Keel Side



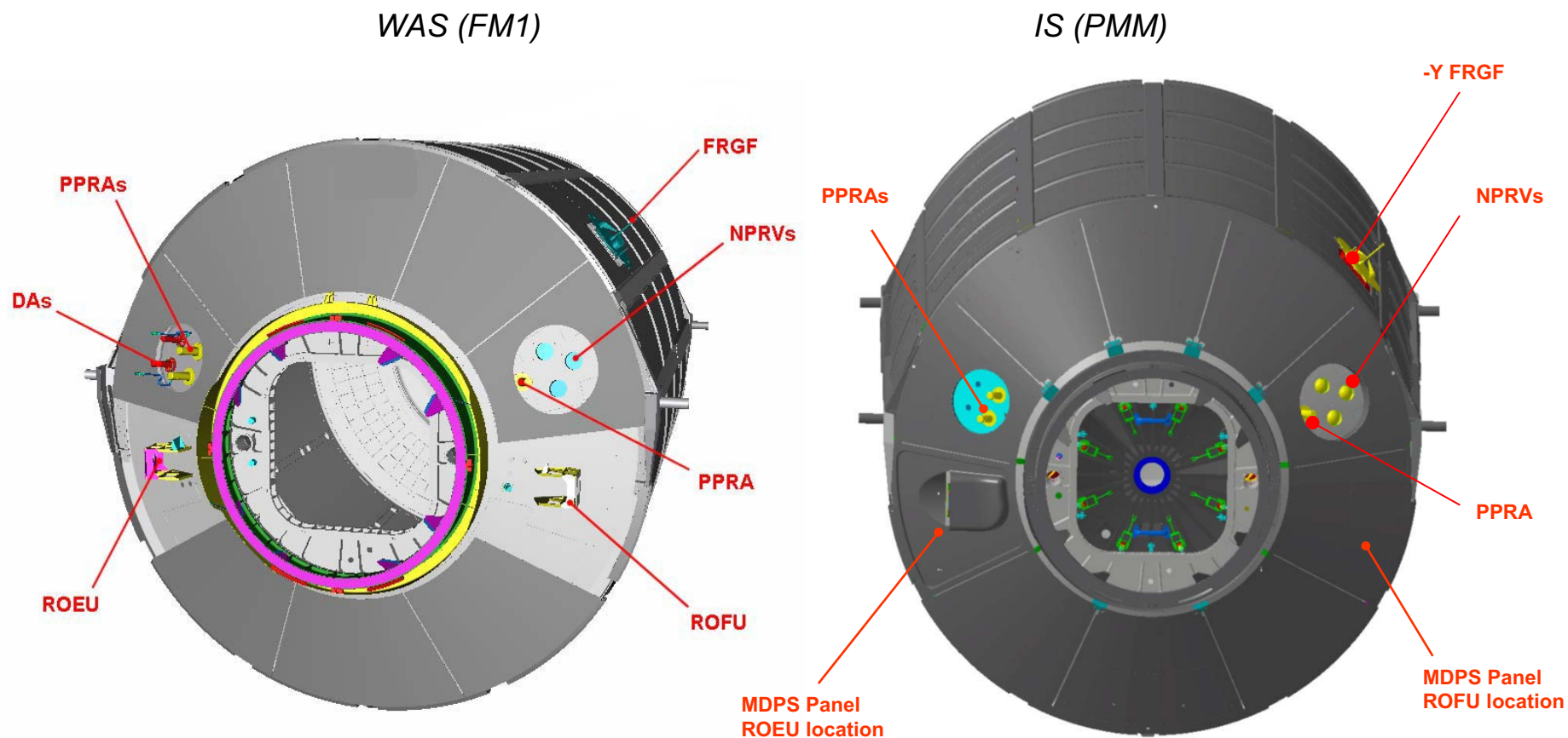
HRSR ORU



ELC4 Berthing Location on ISS

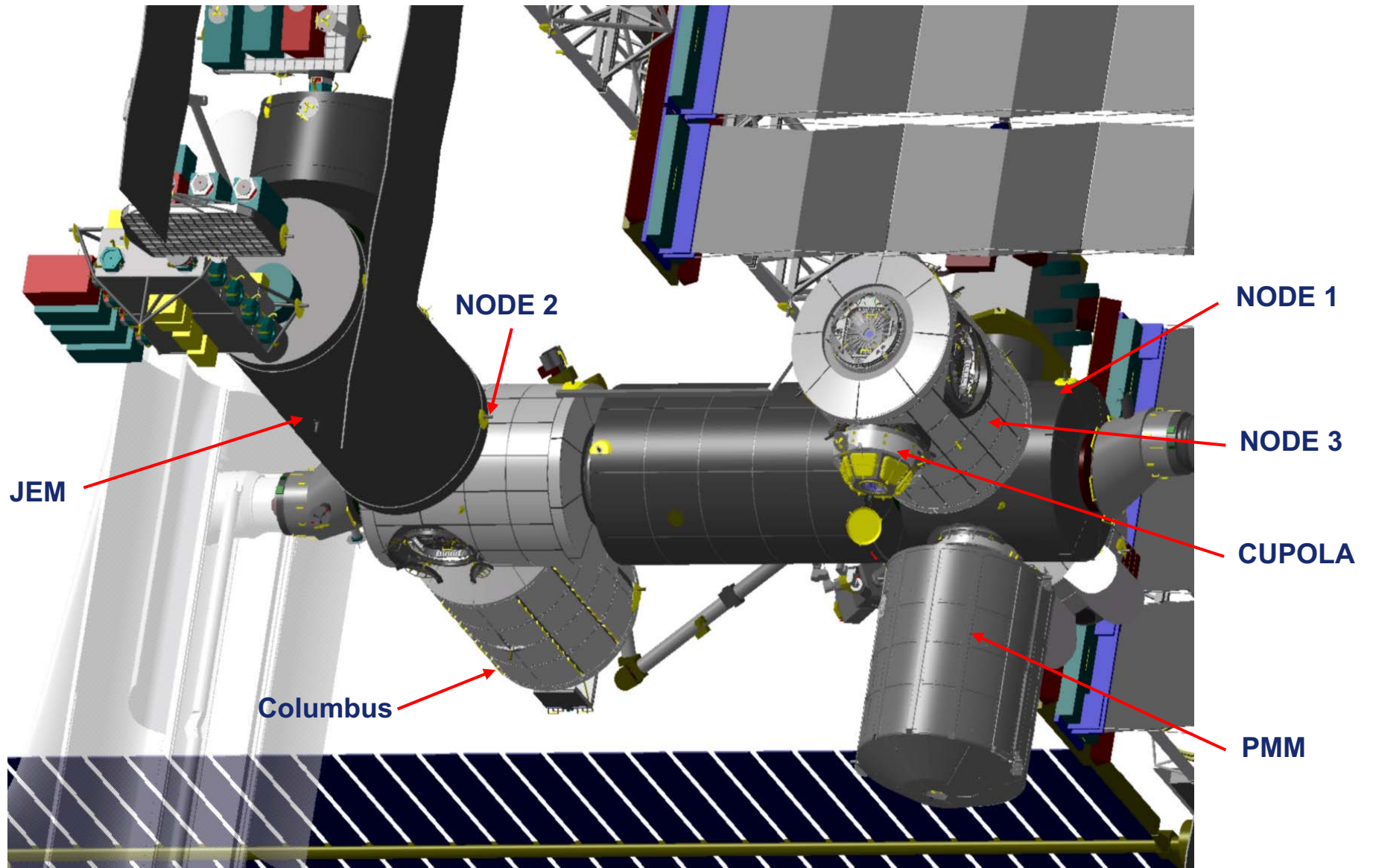


PMM External Configuration (proposed)

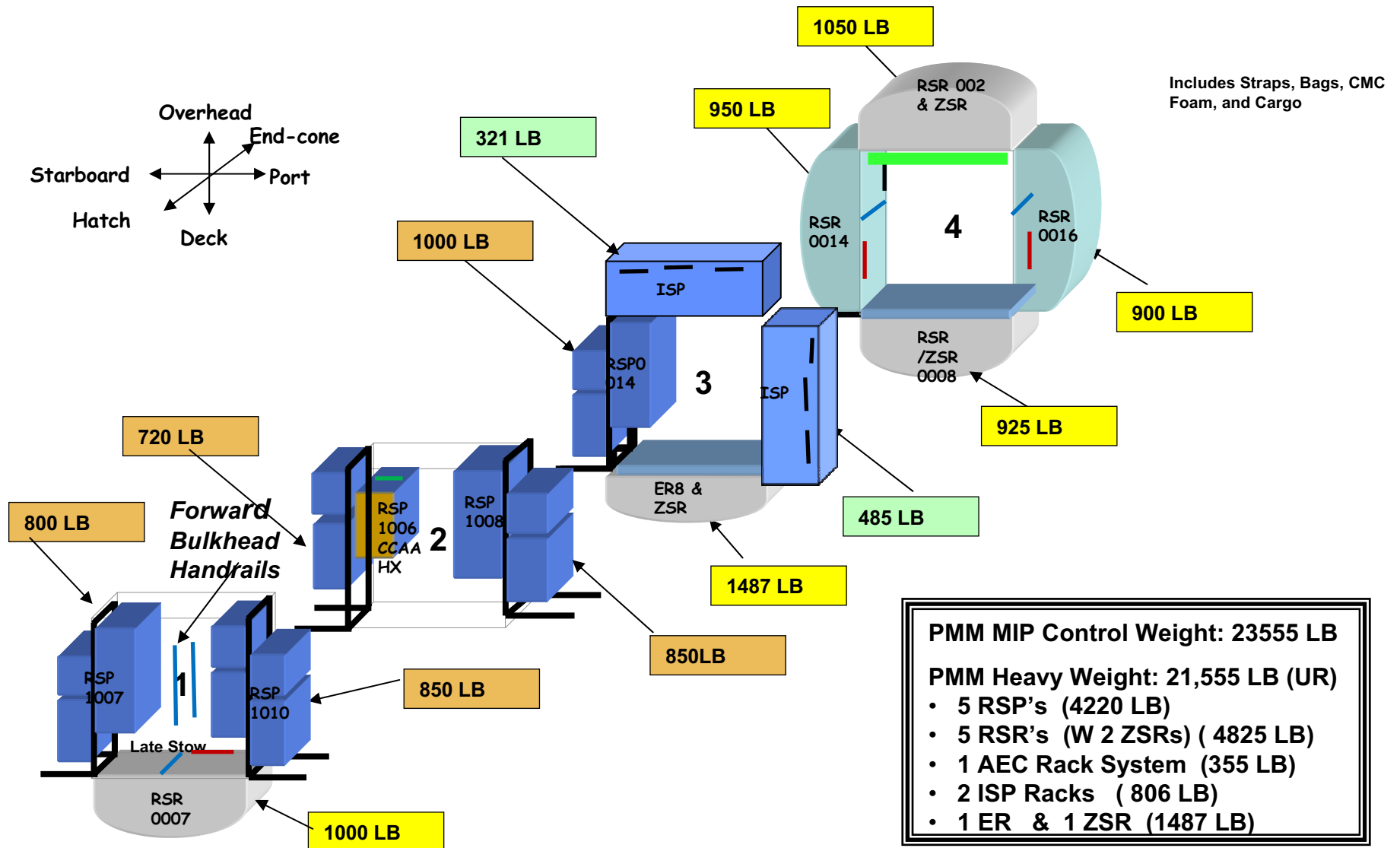


Modifications to Include: Removal of +Y FRGF, removal of ROFU components, replacement of CBM seal, installation of new forward end cone MMOD shields, feed through seal replacement, visiting vehicle retro-reflector installation, modification of MLI underneath MMOD shields to add Nextel/Kevlar "mattresses", and much more!

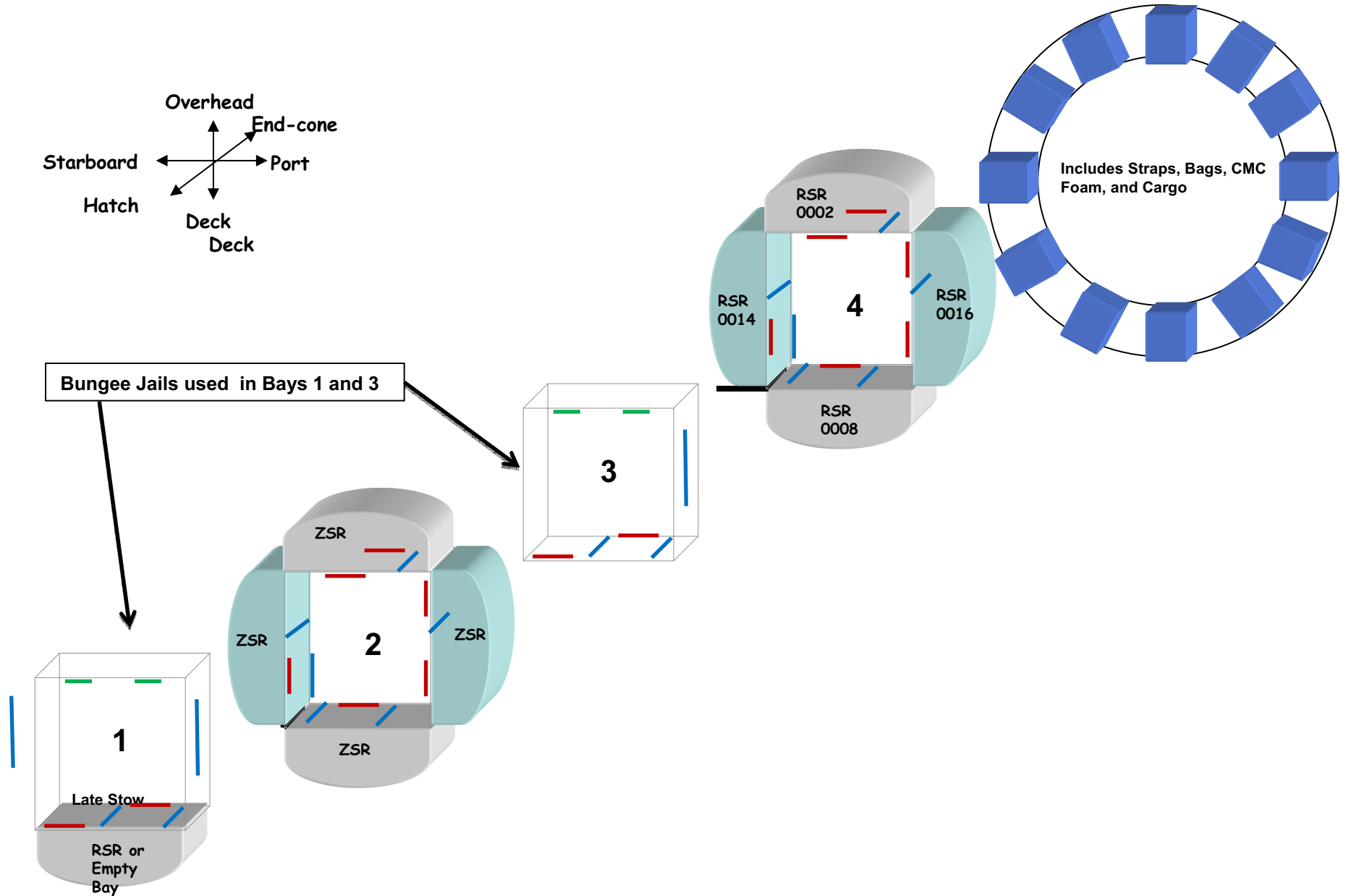
PMM Berthing Location on ISS



PMM Rack Configuration for Launch (proposed)



PMM Rack Configuration on Orbit (proposed)



STS-133

Delta Launch Site Flow Review

Flight Software Overview

Tom Stansel
USA FSW

PRCB 05/20/2010

STS-133 DLSFR (FSW)

- **STS-133/OV-103 Flight Software (FSW) Versions**
 - Sixth scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS OI-34 content)
 - Fourth scheduled flight of MEDS IDP VI 07.01/Sixth scheduled flight of MDUF VI 06.00 (SASCB SCR 98113A documents content)
 - Seventh 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 DLSFR (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**



*Extravehicular
Activity
Office*



EVA Status STS-133/ULF5 Delta Launch Site Flow Review

**David Foltz
EVA Office
Johnson Space Center
May 20, 2010**



STS-133 Delta LSFR EVA Hardware



- **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
 - Winch P/N SED33101570-325 on Aft Bulkhead



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

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**



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

Overview

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

* Backup material included



STS-133 Delta Launch Site Flow Review	Presenter MK-SIO / A. Swift	
	Date 5-20-10	Page 1

Mandatory RCNs:

NONE

Non-Mandatory Value Added RCNs:

NONE



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **5-20-2010** Page **1**

- **STS-133 Orbiter/Ferry Mass Properties Have Been Reviewed by Space Shuttle Program Integration and Are Within Specified Limits**

<u>Case</u>	<u>Ferry Weight (lb)</u>	<u>Center of Gravity (inch)</u>		
		<u>X</u>	<u>Y</u>	<u>Z</u>
<u>Nominal</u> - Orbiter c.g. (SCA c.g.) (No CM Ballast, No Fluids Off-Loaded, No Payload Bay Opening)	202538	1117.9 (1413.6)	-0.3 (N/A)	371.7 (514.0)
<u>AOA</u> - Orbiter c.g. (SCA c.g.) (No CM Ballast, No Fluids Off-Loaded, No Payload Bay Opening)	232474	1108.6 (1404.5)	0.0 (N/A)	375.4 (518.2)
<u>TAL</u> - Orbiter c.g. (SCA c.g.) (3 SSME's Removed, No Fluids Off-Loaded, No Payload Bay Opening, Max Weight 217000 lb)	213101	1067.5 (1363.5)	-0.1 (N/A)	376.2 (521.1)

X c.g. Limits (Orbiter Coordinates)

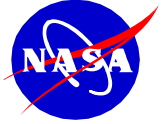
Nominal = 1060.0 TO 1128.4
 AOA = 1060.0 TO 1116.0
 TAL = 1060.0 TO 1120.9

Z c.g. Limits (Orbiter Coordinates)

Nominal = 360.0 TO 380.0
 AOA = 360.0 TO 380.0
 TAL = 360.0 TO 380.0



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



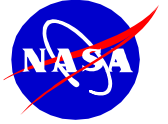
STS-133 DLSFR Flight Crew Equipment/GFE	Presenter MV6/Tom Goebel	
	Date May 20, 2010	Page 1

STS-133 DLSFR

FCE/GFE Status

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

BACKUP



STS-133 DLSFR Flight Crew Equipment/GFE	Presenter MV6/Tom Goebel	
	Date May 20, 2010	Page 2

- **Delivery dates for Camera C and OBSS SP1 are still being coordinated.**
- **Tech orders and hardware list noted in following 2 charts.**



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



STS-133 DLSFR
Flight Crew Equipment/GFE

Presenter MV6/Tom Goebel	
Date May 20, 2010	Page 3

Tech Order numbers are identified for reference only. Report generated 5/11/10.

Hardware	Program Authorization	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
A (port forward)	FRD	M072-750025-072	5/5/2010	1/7/2005	2/19/2010	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-131. note: Changed Ptu isolators.	Randall Moore
B (port aft)	FRD	M072-750025-073	5/5/2010	1/7/2005	2/19/2010	C	6/5/2010	6/5/2010	OPF Instl for testing PAD Installation. Assembly from STS-131.	Randall Moore
C (starboard aft)	FRD	M072-750025-074	5/5/2010	1/7/2005	2/19/2010	C	6/5/2010	Date In Work.	CCTV to be swapped out. OPF Instl for testing. Pad Installation. Assembly from STS-131. Note: Camera C will be a spare. Note: PTU Isolators wont be available until the beginning of July.	Randall Moore
D (starboard forward)	FRD	M072-750025-075	5/5/2010	1/7/2005	2/19/2010	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-131. Note: Changed PTU Isolators.	Randall Moore
SRMS elbow camera	FRD	M072-544504-013	5/5/2010	3/3/2008	2/19/2010	C	6/5/2010	6/5/2010	OPF Instl for testing. Pad Instl for flight. Assembly from STS-131.	Randall Moore
SRMS wrist camera	FRD	M072-544504-006	5/5/2010	3/3/2008	2/19/2010	C	6/5/2010	6/5/2010	OPF Installation Desirable. Assembly from STS-131.	Randall Moore
Centerline Airlock Camera (stowed)	FRD	M072-660828-002, plus C CCD stow		3/17/1999	2/19/2010	C			OPF Installation mandatory for alignment. Assembly from STS-131.	Randall Moore
Lefthand Umbilical Camera (aft)	FRD	M072-705001-016	7/2/2010	10/28/2004	2/19/2010	C	8/2/2010	8/2/2010	VAB installation mandatory.	Randall Moore
Righthand Umbilical Camera	FRD	M072-705001-028 M072-705001-027	7/10/2010	10/28/2004 10/28/2004	2/19/2010	C	8/2/2010	8/2/2010	VAB installation mandatory.	Randall Moore
Digital Television (DTV)	FRD	M072-710570-007		11/15/2007		C				Larry Schmidt
MCIU/RMS Situational Awareness Display (RSAD)	FRD	M072-710543-001		3/7/2000	2/19/2010	C				Larry Schmidt
Tools for Rendezvous and Docking (TRAD)	FRD	M072-730021-019*		7/20/2007	2/19/2010	C			Installed.	Larry Schmidt



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



STS-133 DLSFR
Flight Crew Equipment/GFE

Presenter MV6/Tom Goebel	
Date May 20, 2010	Page 4

Tech Order numbers are identified for reference only. Report generated 5/11/10.

Hardware	Program Authorization	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
Video Processing Unit (VPU)	FRD	M072-710338-007		3/2/2008		C				Larry Schmidt
Wireless Video System (WVS)	FRD	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	2/19/2010	O	4/24/2010			Randall Moore
Space to Space Orbiter Radio (SSOR)	FRD	M072-344828-002 M072-740828-002 Harness		9/24/2004	2/19/2010	C				Larry Schmidt
RMS Sideview Camera (RSC)	FRD	M072-710281-002 M072-000416-006 camera	7/9/2010	11/24/2004	2/19/2010	C	8/9/2010	8/9/2010	Pad instl only. Assembly from STS-131 after return to JSC for repressurization. Note: JSC requests a later delivery date because they want to pressurize as late as possible.	Randall Moore
OBSS Sensor Package 1	FRD	M072-710282-008	5/5/2010	4/18/2008	2/19/2010	C	6/5/2010	Date In Work.	OPF Instl for testing. Pad Instl for flight. Unit from STS-132.	Russell Yates
OBSS Sensor Package 2	FRD	M072-710282-006		4/18/2008	2/19/2010	C			Unit from STS-131.	Larry Schmidt



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115133 on 01-26-10

- V072-000001-290 (Rev. **WL**) Space Shuttle System (Rel. **05-12-10**)
 - V072-200213-001 (Rev. A) Mission Equipment Cargo Support (Rel. 02-18-10)
 - SGD32104456-301 (Rev. NC) Crew Compartment Configuration (Rel. 02-24-10)
 - 302 Descent
 - V070-000001-003 Orbiter General Assembly
 - V070-410100-017 SSME Installation
 - 10100-00061-**181** Integrated SRB General Assembly (**BI-144**)
 - 80901000000-530 External Tank Assembly (**ET-137**)

- STS-133 LSRR + 18 days Mission Configuration Product Plan (MCP) was last published on 02-15-2010 and will be republished at ORR-14 days on TBD.



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

SSP System Drawings – (Continued)

Ferry Configuration

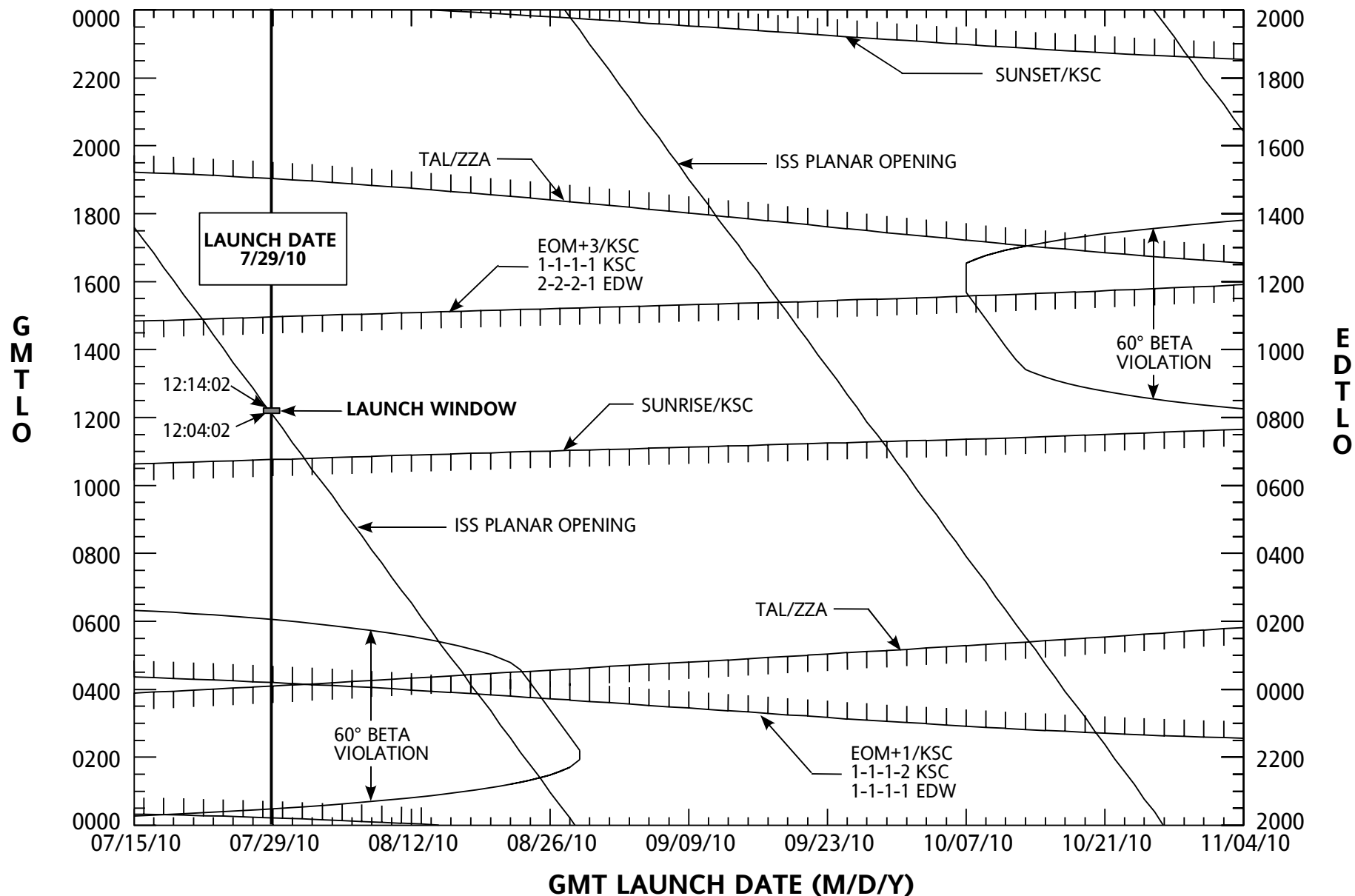
- **V072-000001-291 (Rev. WH) Space Shuttle System Drawing (Rel. 02-11-10)**
 - **V072-200213-002 (Rev. A) Mission Equipment Cargo Support (Rel. 02-18-10)**
 - **SGD321004456-001 (Rev. NC) Crew Compartment Configuration (Rel. 02-24-10)**
 - **V072-300055-015 (Rev. BU) Ferry Flight Configuration (Rel. 05-11-09)**

SCA 911

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.

LW MAR
8929-324

CDR STEVE LINDSEY
PLT ERIC BOE
M/S #1 TIMOTHY KOPRA
M/S #2 MICHAEL BARRAT
M/S #3 NICOLE STOTT
M/S #4 ALVIN DREW

MODULAR LOCKER LAYOUT ASCENT

PANTRY FOOD	1622 -308	MF57A	1622 -308	PANTRY FOOD	1622 -302
		CLOTHING			

LEADER: DANIEL CULPS
DATE: 02-19-10
LAUNCH: 09-16-10
FLIGHT: STS-133/ULF5
VEHICLE: OV-103
CREW: 6 MAN 8 + 1 + 2 DAYS
RQMTS: SRMS, ERGOMETER,
SORG, NO RCRS,
SLEEPING BAGS

MD CEIL (PORT 1) TBD
ISS RESERVE
MD CEIL (PORT 2) 0654
-301

ML60B 6013
-310
PRIME C/L CAM
GFE TV CONTROL

ML60E TBD
-XXX

PGSC ACCESS

ML60M 6014
-312
B/U C/L CAM
LEAK DETECTOR

VOL B (MA73J) 7436
-TBD
INSTALLED

VOL 3B (MA73J) 7425
-320
QUICK DON
MASKS(2)/CABIN AIR
CLEANER/AUD.DOS.
BTA/LCD MONITOR/
DCS 760 CAM/SPOT-
LIGHT/400MM LENS/
PD100 CAM/FLASH
28-70MM LENS

MIDDECK FORWARD

MF14E 2760 -306 FRESH FOOD FRESH FOOD	MF28E 0644 -301 GLACIER
MF14G 2761 -308 FRESH FOOD MENU FOOD	MF28H xxxxx -334 IFM BREAKOUT BOX ALTIMETER
MF14H 2763 -304 MENU FOOD MENU FOOD	MF28K 0655 -301 0656 -301 IFM TOOLS
MF14K 2764 -306 MENU FOOD MENU FOOD	MF28M TBD SOMS AMMONIA KIT
MF14M 2765 -304 MENU FOOD MENU FOOD	MF28O 9014 -314 MED KITS MAK(1)
MF14O 2766 -305 MENU FOOD	

MF43C 1900 -309 M/S #4 CLOTHING	MF43E xxx -TBD SSP RESERVE	MF43G 1902 -309 CDR CLOTHING	MF43H 1901 -306 POST INSERTION	MF43K xxxxx -TBD AEM MOUSE IMMUNOLOGY2	MF43M 0641 -301 AEM MUFFLERS (2)	MF43O xxxxx -TBD HYGIENE
MF57C 8072 -302 M/S #2 CLOTHING	MF57E xxx -TBD CHeCS	MF57G 8073 -302 PLT CLOTHING	MF57H xxxxx -TBD ORBITER FDF	MF57K xxxxx -TBD FDF	MF57M xxxxx -TBD SODF	MF57O 6687 -326 HH LIDAR W/ NIGHTSCOPE 2ND HHL (TRAD)/SSV BPSMU
MF71C 3005 -305 M/S #3 CLOTHING	MF71E TBD -xxx CGBA NLP CELLS	MF71G 1903 -306 M/S #1 CLOTHING	MF71H 0645 -301 CREW CARE PKG ENTRY GMTS	MF71K xxxxx -TBD AEM MOUSE IMMUNOLOGY2	MF71M 8965 -311 CONDENSATE COLL SUPA(14) INGRESS HDWR O-RING/BRAYCOTE STS CSA-CP	MF71O 6299 -318 COAS/FLUOR LT SHIELDS/DCS 760 AUDIO DOSIMETER BTA

MIDDECK AFT

MA9D/F TRAD SPARE DTV MUX SPARE DTV DSR SPARE DTV VIP	MA16D xxx -327 ISS RESERVE
MA9G 6066 -334 COLOR PRINTER	MA16F xxxxx -TBD SSP RESERVE
MA9J 5962 -303 6269 -307 PRINTER TRAYS IODINE REMOVAL 6256-303	MA16G 8723 -302 PHOTO/TV STOW-N-GO
MA9L DC VACUUM (CTB 6015-326)	MA16H 0634 -305 PCS LAPTOP PCS ACCESSORIES PGSC ACCESSORIES CD STOWAGE CASE
MA9N 7432-317 -317 SOFT STWG BAGS PHK'S (6) 4980-309 CCK LIGHT STICKS/COMM PHK 8071-312 RSTRNTS/FLUID LOAD 8070-302 FIBERSCOPE	MA16J 1908 -309 CREW SUPPORT
	MA16N 8737 -310 RCC BAG ASSY

MD CEIL (STBD 1) 0718
-305
RCC REPAIR
TILE REPAIR
MD CEIL (STBD 2) 6665
-343

MD FLOOR (PORT 2) 0637
-TBD

MD FLOOR (PORT 1) TBD
ANTIMICROB APP/GLOVES
H2 SENSORS (2)
SAMPLE PURGE KIT
SILVER BIOCIDES KIT (2)
MINERAL SYRINGE KIT
CWC

MD FLOOR (STBD 2) TBD
1 MLE (IPT RESERVE)
ISS HDW

MD FLOOR (STBD 1) 0657
-TBD

ISS HDW
EVA/EMU HDW

A17 7424
-304
CORE CC SYS BAG
DTV CAMERA BAG
QUICK DON MASK (4)
HATCH TOOL

VOLUME D (MD52C)
NOT INSTALLED

VOLUME F (MD76M) 1403
-306
WET TRASH

VOLUME G (MDBOR) 1800
-346
CONT UCDS
WASTE MGMT

VOLUME H (MD23R) 8068
-310
EVA ACCESS (INBD)
EVA ACCESS (OBD) 8065
-308

WMC 4575
-315 (MA82H) 0914
-332
TOWELS AND
RESUPPLY ITEMS
WMC DISPENSER
1st DAY CLOTH
SUPA
1641-330

EXT AIRLOCK 5557
-319 (STBD) 2-EMUs (PORT) 5555
-320
EXT A/L FLOOR TBD
SAFER
EVA/EMU

55 LIOH- 29 + 1 ATCO IN LIOH BOX, 2 INSTLD
(7435-320)
7 STOWED PORT FLOOR 1

WINDOW SHADE BAG - WINDOW SHADES
(5548-352)
WINDOW SHADES
IFM CABLES & HOSES (4259-343)
MONITOR SHIELDS

L10A1: AVIU (6686-331)
L10A2: DTV MUX
L10A3: DTV VTR/MP
L11: PDIP 2 OIU 1/2
L12A1: SSP 1
L12A2: SSP 2
L12A3: PDIP 1
R12A1: VPU
R12A2: OBSS/OPP

* NOT APPROVED
● LATE LOAD
☒ SWAP
☒ TRANSFER TO ISS
CTB-CARGO TRANSFER BAG
HCTB-HALF CARGO TRANSFER BAG

C/D JSC TBD
P/D JSC TBD
C/D KSC TBD
P/D KSC TBD
CEIT KIT TBD
MDK LBL TBD
DWG NO. SGD32104442
/USR/DWGS/LOCKER/STS119
CCMM: T. HUNT 483-3063

NOTE: LOCKER LAYOUTS ARE FOR REFERENCE ONLY AND ARE NOT RELEASED FOR RELEASED DRAWINGS, REFER TO CCCD DRAWING # SGD32104442



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 4 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
 - **No impacts for all six disciplines** **3**
 - **One or more disciplines with impacts, documentation approved and/or pending approval** **1**
 - **MCRs 30234**



STS-133 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-20-10**

Modification Impact Report – (Continued)

- Possible impacts still under review

0

1MRC5 REPT. 4650-1
PAGE NO. 1

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

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

12:08 DATE 05/11/2010

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
ORB-0090B	PLND	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	PLND	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-J6577	AUTH MAND KSC 039	J6577	0103 000	AMES GAP FILLER REMOVAL AND REPLACEMENT
2010-01-29			SPAR	GAP FILLER REPLACEMENTS WILL BE PERF'D OVER REMAIN ING MANIFESTED FLTS BASED ON PROG LSFR PRIORITIES.
S-J6578	PLND MAND KSC 039	J6578	0103 000	CAPTURE OV-103 OUTPUT WAVEFORMS TO ADDRESS 1N3600 DIODE CON-
2009-12-14			SPAR	CERNS
S-J6585	PLND MAND KSC 039	J6585	0103 001	OPTIGO AND Z-SCAN OF BLT PROTUBERANCE TILE
2010-01-14			SPAR	BLT TPS SCAN HAS BEEN INTEGR'D INTO & IS ACCOMMODA TED BY CURRENT STS-131/STS-133 OPF PROCESS'G PLANS
S-J6587	PLND MAND KSC 039	J6587	0103 000	R&R OF IMU S/N 213 WITH S/N 204 ON OV-103 IN IMU SLOT1 PRIOR
2010-02-11			SPAR	TO STS-133
S-J6599	PLND MAND KSC 039	J6599	0103 000	PRE-FLIGHT CITRIC ACID FLUSH
2010-03-05			SPAR	REQUESTED CITRIC ACID FLUSH WILL BE INTEGRATED INTO PLANNED POST FLT WASTE TANK SERVICING PROCESS
S-J6600	AUTH MAND KSC 039	J6600	0103 000	ORBITER MEASUREMENTS FOR STS-133
2010-03-29			SPAR	LATCH AND TRUNNION MEASUREMENTS ARE INTEGRATED INT O PLANNED STS-133 MIDBODY OPERATIONS.
S-J6601	PLND MAND KSC 039	J6601	0103 000	STS-133 PAYLOAD CLOSE CLEARANCE MEASUREMENT
2010-03-22			SPAR	THE EXPRESS LOGISTICS CARRIER SCUFF PLATE CLEARANC E MEASUREMENTS WILL BE INTEG'D INTO P/L HANDLG OPS

S-J6613	AUTH	J6613	0103 000	DTV MUX BYPASS SWITCH VERIFICATION
2010-04-13	MAND		SPAR	DIGITAL TV MULTIPLEXER BYPASS SWITCH VERIFICATION IS
	KSC			INTEGRATED WITH PLANNED OPF COM TESTING.
	039			
S-J6620	PLND	J6620	0103 000	EVALUATION OF CLEARANCE BETWEEN CERAMIC PLUG & CARRIER PANEL
2010-04-13	MAND		SPAR	FASTENER
	KSC			
	039			

1MRC5 REPT. 4650-1
PAGE NO. 2

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

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

12:08 DATE 05/11/2010

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S052924DV	AUTH	J6622	0103 001	THERMAL WINDOWS TORQUE EVALUATION FOR OV-103
2010-05-06	MAND		NSW	
	KSC			
	039			
S052924DT	AUTH	J6625	0103 000	RSB TE TILE INSPECTION FOR STS-133
2010-05-04	MAND		NSW	
	KSC			
	039			
S-J6626	AUTH	J6626	0103 000	WASTE WATER SAMPLE AND URINE SOLIDS FILTER REQUEST
2010-05-06	MAND		SPAR	SAMPLING&FILTER REPLACEMENTS WILL BE PERF'D W/POST FLT
	KSC			POTABLE & WASTE WATER SERVICING/DE-SERVICING.
	039			
S052924CZ	AUTH	K6561A	0103 001	GROUND LIGHTNING MONITORING SYSTEM (GLMS) INSTALLATION
2009-10-13	SCHD		NSW	
	KSC			
	039			
S052924DA	AUTH	K6566	0103 001	SSME NOZZLE PURGE HOT WALL CORROSION PREVENTION
2009-10-13	SCHD		NSW	
	KSC			
	039			
S-K6610	PLND	K6610	0103 000	DUAL DOCKING CONTAMINATION SAMPLING
2010-04-13	MAND		SPAR	SAMPLE WIPES OF SELECTED AREAS OF RADIATORS & MID-BODY WIRE
	KSC			TRAY COVERS WILL BE TAKEN POST-FLT.NIB.
	039			

1MRC5 REPT. 4650-1
PAGE NO. 3

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

PIH

ECP-MCR/KIT SEQUENCE

RUN TIME

12:08 DATE 05/11/2010

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
008852	PLND	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	ORB	S053300BQ EV10771 (A)	OMRSD EXCEPTION REQUEST - TRAJECTORY CONTROL SENSOR FLIGHT KITEX CEPTION (EV10771)	103 039 039
			S053300DF EV10763 (A)	OMRSD EXCEPTION REQUEST - WASTE WATER TANK FLUSH (EV10763)	103 104 039 039 033 033
	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	103 035 040

IMUMLIMITATION (WK10653)

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) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

-
-

1

Date: 05/11/10 12:14

PCASS

Page: 2

FLIGHT-SPECIFIC

Approved STS-133 OMRS Waivers and Exceptions

	Waivers	Except	Deviat	Cannib	Total
Total Extracted	7	3	0	0	10

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	<p>The following requirements are waived to allow OV-103, Flight 31 to fly (ferry) with the following out-of-configuration conditions:</p> <p>1) V070-391139-025 (blanket under window #1 removed for ferry flight)</p> <p>2) M072-421502-002 (did not perform acetone wipe prior to universal thruster plug assemblies - procedural omission)</p> <p>3) V070-753110-003 (camera mount will not be installed for ferry flight)</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 31	Ferry Flight from Dryden
330	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> <p>TCS blanket V070-362917-001 located at Door #44 NOT installed.</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	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	