STF-133 Launch Site Flow Review

<table>
<thead>
<tr>
<th>Presenter</th>
<th>Kenneth Nowak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>03-04-10</td>
</tr>
</tbody>
</table>

Program Freeze Point

PRCB Presentation

S115133B
Baseline the STS-133 Mission Specific Requirements and Flow Plans. The STS-133 Integrated Launch Site Requirements were established by PRCBD S115133A dated 01-28-10. This CR and the Associated Data Package were reviewed at the 03-01-10 FRWG.

Flight Operation & Integration*          MO3/USA-PI
Orbiter Engineering*                    USA-OE
KSC ISS and Payload Processing           UB-R3
Launch Vehicle Processing               PH-A

Status in BackUp

KSC Integration*                        MK-SIO
Flight Software                         USA-FSW
Orbiter GFE*                            MV5
EVA                                     XA
Payload/Cargo Engineering               USA-PI

SSME                                    Status at DLSFR
                                         MP21
                                         *Backup material included
STS-133 LSFR

PRCB
Flight Requirements Status

March 4, 2010

Michael Darnell, Lead MIM
Middeck Powered Payloads

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

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

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
Empty Cargo Bay Configuration

STS-133, ISS-ULF5
OPF ROLL-OUT CONFIGURATION

SRMS
SPDU W/APC
OBSS
ROEU
TSA
LAUNCH
09/16/10
39A/ MLP2
CREW SIZE: 6UP/6DN

ORBIT
51.6 DEG
122 NM
DIRECT INSERTION
DURATION: 8 + 1 + 2 DAYS
EVAs 0+1+2 (No Scheduled)

CONFIGURATION
OV-103(39)
LP01;RP03
ET-138
BI-145
RSRM-113
(1) 2059 (2) 2061 (3) 2057
OI-34
SRMS, OBSS, ODS, SSPTS
Proposed

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

CARGO BAY PAYLOAD
ISS-ULF5
(ELC4, PMM)

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

MIDDECK PAYLOADS
ISS-ULF5
MAUI
SEITE
SIMPLEX
RAMBO-2
PERFORMANCE MARGIN

SIMULATION MARGIN (SPLAF133) +1578

WEIGHT CHANGES SINCE SIMULATION
- PAYLOAD -125
- OPERATOR +51
- ORBITER -8
- CREW COMPARTMENT +350

TOTAL WEIGHT CHANGES +268 -268

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 +19

CURRENT BASELINED APM (02/23/10) +669
PERFORMANCE MARGIN

- CURRENT BASELINED APM (02/23/10) +669

- IPT PROJECTIONS
  - LOWER ISS RENDEZVOUS ALTITUDE TO 190 NAUTICAL MILES +1160
  - ADD 1,000 LBS TO PMM +1000 - 930
  - REDUCE ELC BY 125 LBS - 125 +116
  - ADD 150 LBS FOR ORBITER WEIGHING +150 - 140
  - SRB BURNRATE ADJUSTMENT - 200
  - IPT PROJECTION SUBTOTAL + 6

- TOTAL IPT PROJECTED APM + 675

VOLUME III: ASCENT PERFORMANCE MANAGER'S RESERVE GUIDELINE AT LSFR/LSRR IS 400 LBS
**FLIGHT MASS PROPERTIES**

<table>
<thead>
<tr>
<th>CASE</th>
<th>TOUCHDOWN</th>
<th>MACH 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WEIGHT pounds (LIMIT)</td>
<td>X C.G. inches (LIMIT)</td>
</tr>
<tr>
<td>NOMINAL</td>
<td>202487 (233000)</td>
<td>1080.1 (1075.7)</td>
</tr>
<tr>
<td>RTLS</td>
<td>240090 (245000)</td>
<td>1080.8 (1077.2)</td>
</tr>
<tr>
<td>TAL</td>
<td>237911 (244000)</td>
<td>1080.6 (1077.2)</td>
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<tr>
<td>AOA</td>
<td>232651 (242000)</td>
<td>1076.4 (1075.7)</td>
</tr>
<tr>
<td>CONT RTRN**</td>
<td>233829 (233000)</td>
<td>1078.0 (1075.7)</td>
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</tbody>
</table>

**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 02/23/10.
### Flight Requirements Status

<table>
<thead>
<tr>
<th>PRCB CR’s</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>– None</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ULF5 MIP (NSTS 21554):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>– Current version available on PILS: Rev. A PCN-1, February 5, 2010</td>
<td></td>
</tr>
<tr>
<td>– Recently approved MIP CRs:</td>
<td></td>
</tr>
<tr>
<td>• 21554, MIP CR#0004 Update Utilization Payloads and Appendix E</td>
<td></td>
</tr>
<tr>
<td>– Pending CRs:</td>
<td></td>
</tr>
<tr>
<td>• 21554, MIP CR#0005 Update ULF5 MIP Priorities</td>
<td></td>
</tr>
</tbody>
</table>

### Open Assessment:

- KSC flow impacts for the removal of the TriDAR DTO and the addition of the DragonEye DTO during the OV-103 Flow for STS-133
STS-133 LSFR

OV 103 / FLT 39
PRCB

Belinda Soublet
USA Orbiter Element
March 04, 2010
STSS-133 OV 103/FLT 39 – Orbiter LSFR Baseline

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

• None

Potential Modification for STS-133 OV 103 / FLT 39

• To be presented

Additional Requirements being tracked:

• Chits

• Backup

• Information previously presented at STS-133 LSRR
  • STR/TPS Priorities
  • Potential modifications previously presented (info only)
  • Opportunity modifications previously presented (info only)
  • STS-133 Weight Saver Mission Kit Changes (Info Only)
STS-133 Potential Modification (Info Only)

• TAD 30283 MEI Acoustic Sensor Filter Mod
  – Completion of MADS low pass in-line filter installation for MEI acoustic sensors (microphones) in the LH OMS pod stinger
    • Contingent upon whether or not both filters are installed prior to STS-131
  – Mod consists of re-routing existing coax cable from the acoustic sensor to the new in-line filter mounted with a saddle clamp, and routing a new cable from the filter to the micro-WIS box
  – If not completed prior to STS-131, the remainder of the mod and tech order work will be brought forward at the STS-133 DLSFR
    • Deferred portion of mod record and final tech order configuration would be authorized
MEI Acoustic Sensor Filter Mod

Mockup of new in-line filter / clamp locations

Existing coax is routed to filter instead of micro-WIS

New coax is routed from filter to micro-WIS
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
  – 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 Inertial Measurement Unit (IMU) S/N 213 (MC409-0126) with S/N 204 on OV-103 in IMU slot 1 Prior to STS-133
  – K6516A Ground Lightning Monitoring System (GLMS) Installation
  – K6566 SSME Nozzle Purge Hot Wall Corrosion Prevention

• Pending
  – J6589 Crew Module Contamination Sampling
  – JXXXX STS-133 ELC MGSE Measurements
  – JXXXX Payload Close Clearance Measurements
  – J6599 Pre-Flight Citric Acid Flush

• Potentials
  – EVA Winch Attach Point Inspection
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
March 4, 2010
ELC4 Configuration

Top Side

Keel Side

No Orbiter 87” or 90” violations

HRSR

Empty Payload Site

Future FHRC Site
(via HTV2)

CTC-4 (via HTV2)

Empty ORU Site

Empty Payload Site

HRSR ORU
ELC4 Berthing Location on ISS
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)

Includes Straps, Bags, CMC Foam, and Cargo
PMM Rack Configuration on Orbit (proposed)

Includes Straps, Bags, CMC Foam, and Cargo

Bungee Jails used in Bays 1 and 3

Late Stow

RSR or Empty Bay
ULF5 Hardware Processing Status Summary

ExPRESS Logistics Carrier 4 (ELC4)
- ELC arrived at KSC via C-5 on 15 August 2009
- Assembly operations are underway and ahead of schedule
  - PFAP (five each) build up operations are complete
  - PCASS/ACASS test complete
  - PFAP cable termination and kinematic mount match drilling ops are complete
  - Cable routing/securing underway
- Flight ExPRESS Carrier Avionics (ExPCA) arrived at KSC on 2/19/10
- HRSR ORU in dwell
- HRSR Flight Support Equipment on schedule to arrive at KSC on 4/1/10

Permanent Multi-purpose Module (PMM)
- Donatello (MPLM FM3) MLI removed and sent to TASI for modification
- Leonardo (MPLM FM1) in final preparations for upcoming STS-131/19A mission
- Change Request (CR11801) to baseline modifications necessary to transform MPLM FM1 into the PMM is scheduled for approval at the SSPCB on 3/2/10
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 19 May 2010
- Install HRSR ORU onto ELC4 3 June 2010
- 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 late August 2010 (U/R)
- ELC4 Canister Installation late August 2010 (U/R)
## ULF5 Processing Milestones

<table>
<thead>
<tr>
<th>PMM (All Dates Under Review)</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>19A Landing</td>
<td>18 April 2010</td>
</tr>
<tr>
<td>FM-1 MPLM Return to SSPF</td>
<td>27 April 2010</td>
</tr>
<tr>
<td>PMM External Modifications Start</td>
<td>27 April 2010</td>
</tr>
<tr>
<td>FM-1 MPLM 19A deintegration Complete</td>
<td>17 May 2010</td>
</tr>
<tr>
<td>PMM Standalone Internal Modification “Window”</td>
<td>18 May – 20 May 2010</td>
</tr>
<tr>
<td>PMM Testing Complete</td>
<td>14 June 2010</td>
</tr>
<tr>
<td>PMM Rack Integration Complete</td>
<td>12 July 2010</td>
</tr>
<tr>
<td>CEIT</td>
<td>TBD</td>
</tr>
<tr>
<td>PMM Closeouts Complete</td>
<td>late August 2010</td>
</tr>
<tr>
<td>PMM ICD Walkdown</td>
<td>TBD</td>
</tr>
<tr>
<td>PMM Weight and C.G. Determination</td>
<td>late August 2010 *</td>
</tr>
<tr>
<td>PMM Installation into Canister</td>
<td>late August 2010 *</td>
</tr>
</tbody>
</table>

* PMM will not be ready for delivery to the Pad any earlier than the last week of August 2010. Current SSP baseline “payload to Pad” date is 11 August 2010.
Issues / Concerns

- There are multiple threats to the MPLM to PMM conversion/processing campaign:
  - Recent delay of the STS-131/19A launch (will STS-133/ULF5 launch slip correspondingly?)
  - Potential for further 19A launch delays
  - Potential for an other than KSC 19A landing
  - Significant number of “first time” modification operations to be performed by ASI/TASI
  - Potential for late cargo requirements
  - Workforce changes/turnover
KSC Launch Vehicle Processing

STS-133

FRWG

March 1, 2010
Agenda

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

S. Stilson
STS-133 KSC Milestone Interface Chart

STS-133 Launch (Ref.) 14

LH Aft Skt O/D KSC 31

3 25 LH Aft SRM O/D

LH SRB Aft Assy B/4 21

RH SRB Aft Assy B/4 29

NOTES: 1. Thirty-sixth ISS/SSP Flight
2. PMM Payload Delivery to Pad

THREATS:
1. OPF Flow Duration
2. PMM Payload Delivery to Pad

Prepared by: Manifest Planning
FILE: JPC133

Run Time/Date: 9:47:05 AM, 02/22/2010

Denotes changes since last publication
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
Significant Processing Deltas

- Major Component Removal / Replacement
  - 5TH PRSD Tank Set Removal

- Will complete remaining “red” OMDP Requirements

- MODS
  - BLT Tile Update
  - Catalytic Coating
# TPS Work Content (STS-133)

## Projected TPS Removals

<table>
<thead>
<tr>
<th>Priority</th>
<th>Description</th>
<th>LSFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mand</td>
<td>Deferred Tile/ Fib For 1 Flight (Minimum)</td>
<td>2</td>
</tr>
<tr>
<td>Mand</td>
<td>In-Flight Tile/Fib Damage</td>
<td>*40</td>
</tr>
<tr>
<td>Mand</td>
<td>Operational Damage (Estimate)</td>
<td>*10</td>
</tr>
<tr>
<td>Mand</td>
<td>BLT Mod (1-Trip Tile/1-Cover Tile)</td>
<td>4</td>
</tr>
<tr>
<td>Mand</td>
<td>Putty Repairs from Grind-outs</td>
<td>*20</td>
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<tr>
<td>Mand</td>
<td>Additional Putty Removals (Chits)</td>
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</tr>
<tr>
<td>Mand</td>
<td>Corrosion Sampling (Chit J6275A)</td>
<td>5</td>
</tr>
<tr>
<td>Mand</td>
<td>Catalytic Coating</td>
<td>2</td>
</tr>
</tbody>
</table>

**Mandatory Total** *93

**Risk Reduction:**

11 ET DOOR STRUCTURE SIDE *24

**Projected TPS Removals TOTAL (Estimate)** *117

* Estimated Number

---

STS-131 FRWG
J. F. KENNEDY SPACE CENTER

Final TPS Work Content will be presented at the DLSFR
Issues and Concerns

- Flow Control Valves - Hardware Deliverables
- AFT Ballast Boxes Removal Decision
### STS-133 / OV-103

**Integrated Operations Assessment Summary**

**Payloads:** ISS-36-ULF5 ELC4 - PMM (VERT)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>ORB/ET MATE</td>
</tr>
<tr>
<td>9</td>
<td>PL TO PAD</td>
</tr>
<tr>
<td>15-31</td>
<td>SSV TO PAD</td>
</tr>
<tr>
<td>1</td>
<td>TCOT</td>
</tr>
<tr>
<td>7</td>
<td>LABOR DAY</td>
</tr>
<tr>
<td>11</td>
<td>STS-133 LAUNCH</td>
</tr>
</tbody>
</table>

**Workdays Required**
- 7 VAB (9 C)
- 22 PAD (9 C/1 H)

**United Space Alliance**

Contact: M. Cheatham (1-2387)

Printed: 16FEB10 10:13

Page 40 of 92
Backup Material

FRWG Presentation (With Minor Changes)
STS-133
Flight Requirements Document (FRD)
LSFR Status

James Flores
FRWG 03/01/10
PRCB 03/04/10
• STS-133 Latest FRD Revision

Approved CR
  • None

Open CRs
  • FRD17462-133-0012: Update ISS Rendezvous Altitude
    ECD: 2/18/10
STS 133 LSFR
BACKUP

• Information previously presented at STS-133 LSRR
  • STR/TPS Priorities
  • Potential modifications (info only)
  • 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
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 FRCI-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
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)
### STR/TPS Priorities Current Vehicle Status

#### STATUS AS OF 1-08-2010

<table>
<thead>
<tr>
<th>Priority Number</th>
<th>Total</th>
<th>OV-103</th>
<th>OV-104</th>
<th>OV-105</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BRI-18 Tile - MLGD FWD O/B Corner</td>
<td>28</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>2. BRI-18 Tile - MLGD FWD Edge</td>
<td>22</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>3. BRI-18 Tile - MLGD O/B Side</td>
<td>18</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>4. BRI-18 Tile - STR side of ET Doors</td>
<td>20</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>5. BRI-18 Tile – LESS Carrier Panels 8-10 (103 &amp; 104)</td>
<td>24</td>
<td>complete</td>
<td>complete</td>
<td>n/a</td>
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<tr>
<td>6. BRI-18 Tile – STR side of ET Doors I/B</td>
<td>8</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>7. Inboard Elevon “Hub” Tile Mod</td>
<td>4</td>
<td>complete</td>
<td>2</td>
<td>complete</td>
</tr>
<tr>
<td>8. I/B Elevon 9lb/90 SIP</td>
<td>34</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
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<tr>
<td>9. O/B Elevon 9lb/90 SIP</td>
<td>6</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>10. MLGD – Outboard Middle 1/3</td>
<td>24</td>
<td>complete</td>
<td>complete</td>
<td>complete</td>
</tr>
<tr>
<td>11. ET Door remaining STR side</td>
<td>40</td>
<td>1</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>12. MLGD - Outboard AFT 1/3</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>9</td>
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<tr>
<td>13. Nose Area 9lb/90 SIP</td>
<td>14 (16&lt;sup&gt;OV103&lt;/sup&gt;)</td>
<td>3</td>
<td>complete</td>
<td>7</td>
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<tr>
<td>14. Base Heat Shield 9lb/90 SIP</td>
<td>42</td>
<td>22</td>
<td>complete</td>
<td>complete</td>
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<tr>
<td>15. Body Flap Stub &quot;Piano Key&quot; tiles</td>
<td>40</td>
<td>18</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>16. Gap fillers in Subset 2B</td>
<td>5 Zones</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>17. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD</td>
<td>MLGD 100</td>
<td>MLGD 0</td>
<td>MLGD 1</td>
<td>MLGD 0</td>
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<tr>
<td></td>
<td>NLGD 123</td>
<td>NLGD 19</td>
<td>NLGD 22</td>
<td>NLGD 52</td>
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<td></td>
<td>LESS 68 (92&lt;sup&gt;OV105&lt;/sup&gt;)</td>
<td>LESS 8</td>
<td>LESS 10</td>
<td>LESS 22</td>
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<tr>
<td></td>
<td>ET Door 28</td>
<td>ET Door 5</td>
<td>ET Door 4</td>
<td>ET Door 1</td>
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<td>18. Mod work LESS internal</td>
<td>44 locations</td>
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<td>20. Remaining Gap Fillers &amp; Window BRI-18</td>
<td>124</td>
<td>3</td>
<td>2</td>
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</table>
STS-133 Potential Mods previously presented

• 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 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**
  - Currently removed for STS-131 to provide payload clearance
  - Removal tech order configuration incorporated in 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 incorporated in MECSLSI

Potential change under evaluation:

- **Aft Ballast Boxes Removal** *(LSFR update: Boxes will not be removed)*
  - 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
Launch Site Flow Review
Flight Software Overview

Tom Stansel
USA FSW

PRCB 03/04/2010
STS-133 LSFR (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 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 LSFR (FSW)

• Products
  – STS-133/OV103 Base delivery schedule (available to field)
    FPSB
    • Shuttle Data Tape February 22, 2010 Actual
    • 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
PRCB

David Foltz
EVA Office
Johnson Space Center
March 4, 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
  – Winch P/N SED33101570-325 on Aft Bulkhead
STS-133
ISS – ULF5  PMM, ELC4

Launch Site Flow Review

Payload Cargo Engineering Status

ABBAS ELSABAGH
281.212.6186
03-04-2010
STS-133 LSFR

Engineering Flight Product Status

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- FRED released on 02-19-10

Engineering Open Work

- VA Drawing release  
  - Waiting on PMM model
  
  ECD: 04/09/2010
  ECD: 03/02/2010

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 LSFR

## ICD Status (* = Impact Flight Products)

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<td>PMM CAD model*</td>
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## Issues/Concerns

- PMM configuration changes, late CAD model delivery - ICD impacts unknown
**STS-133 LSFR**

**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

- A Chit will be 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
Backup
OMRSD

• FII V2 Payload (Post-Mate)
  Baseline Files
  • P350  MPLM Core Requirement (Permanent Multi-Purpose Module (PMM))

RCNs
  • PP18135R1  P554 – ISS-ULF5 (Baseline)  03/05/10
  • PP18177R2  P350 – Core MPLM (PMM) Update  03/05/10

• FII V4 (Pre-Mate)

RCNs
  • PS18163  Mission-Unique List  03/19/10  04/02/10
  • PS18164  FIII MUL  03/19/10  04/02/10
  • PS TBD  Adjacent Pin Test  03/19/10  04/02/10

• FII V6 (Shuttle Experiments)
  • XDT701A  TriDAR

RCN
  • None

Issues / Concerns
  • None
Annex 1: ISS-ULF5-NSTS 21554-A01: Baselineated on 11/12/09

**L-4 M Update**
- Customer submittal
  - Data needed: Weight and Mass Properties Update & Drawing Releases
- CR approval
  - 05/14/10

**L-1 M Update**
- Customer Submittal
  - Data needed: Weight and Mass Properties
- CR Approval
  - 08/16/10
- Final weight log
  - 08/23/10

**Issues/Concerns**
- None
## STS-133 LSFR

### Time-Critical Ground Handling Requirements

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<td>Release for review (L-3M)</td>
<td>06/16/10</td>
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<tr>
<td>Baseline (L-60 Days)</td>
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- **Issues / Concerns**
  - None
Payload Integration Hardware Open Work

- Cargo Integration Hardware Allocation Assessment
  - CIR Assessment
  - Bridge & Latch Allocation
    - FRED Assessment
    - On-going assessment of Engineering releases

- New Build Hardware
  - Crows Foot – V826-340001-005 (New) 04/18/10
  - Extended Fitting – V826-340003-003 (New) 04/18/10

- Issues / Concerns
  - None
STSW-133 Launch Site Flow Review

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
### 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 Launch Site Flow Review

<table>
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<tr>
<th>Mandatory RCNs:</th>
<th>NONE</th>
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</thead>
</table>

| Non-Mandatory Value Added RCNs: | NONE |
STS-133 LSFR
Flight Crew Equipment/GFE

STS-133 LSFR
FCE/GFE Status

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

BACKUP
• All GFE hardware need dates and delivery dates were partnered at CIR

• Tech orders and hardware list noted in following 2 charts
<table>
<thead>
<tr>
<th>Hardware</th>
<th>Tech Order</th>
<th>KSC Eng Need</th>
<th>Eng(TO) Release</th>
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Tech Order numbers are identified for reference only. Report generated 3/17/10.
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<tr>
<th>Hardware</th>
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<th>KSC Eng Need</th>
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SSP System Drawings

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

- V072-000001-290 (Rev. WH) Space Shuttle System (Rel. 02-11-10)
- V072-200213-001 (Rev. A) Mission Equipment Cargo Support (Rel. 02-18-10)
- SGD32104456-301 (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
- 80901000000-530 External Tank Assembly (ET-138)
- 10100-0061-182 Integrated SRB General Assembly (BI-145)
- V070-000001-003 Orbiter General Assembly
- V070-410100-017 SSME Installation

- STS-133 LSRR + 18 days Mission Configuration Product Plan (MCP) was last published on 02-15-10 and will be republished at ORR - 14 days on TBD.
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. 01-18-10)
- SGD321004456-001 (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
- 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.

STSW-133 OCF
LAUNCH WINDOW

EOM+1/KSC
1-1-1-2 KSC
1-1-1-1 EDW

EOM+3/KSC
1-1-1-1 KSC
2-2-2-1 EDW

SUNSET/KSC

ISS PLANAR OPENING

60° BETA VIOLATION

LAUNCH DATE
7/29/10

SUNRISE/KSC

TAL/ZZA

LAUNCH WINDOW

ISS PLANAR OPENING

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

• Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.

• A total of 2 MCRs have been approved and/or pending mods

• Current MCR impact status:
  • No impacts for all six disciplines 2
  • One or more disciplines with impacts, documentation approved and/or pending approval 0
STS-133 Launch Site Flow Review

Modification Impact Report – (Continued)

- Possible impacts still under review

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AMES GAP FILLER REMOVAL AND REPLACEMENT
GAP FILLER REPLACEMENTS WILL BE PERF’D OVER REMAINING MANIFESTED FLTS BASED ON PROG LSFR PRIORITIES.

CAPTURE OV-103 OUTPUT WAVEFORMS TO ADDRESS 1N3600 DIODE CONSERVATION

OPTIGO AND Z-SCAN OF BLT PROTUBERANCE TILE
BLT TPS SCAN HAS BEEN INTEGR’D INTO & IS ACCOMMODATED BY CURRENT STS-131/STS-133 OPF PROCESS’G PLANS

R&R OF IMU S/N 213 WITH S/N 204 ON OV-103 IN IMU SLOT1 PRIOR TO STS-133

GROUND LIGHTNING MONITORING SYSTEM (GLMS) INSTALLATION

SSME NOZZLE PURGE HOT WALL CORROSION PREVENTION

TOTAL MODS = 12
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<tr>
<td></td>
<td>APPD K826-340001-001 0001 000</td>
<td>ADDITIONAL HARDWARE TO SUPPORT STS-133</td>
</tr>
<tr>
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<td>KSC</td>
<td>ADDED PER V826-340001 B04</td>
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**TOTAL MODS =** 1
<table>
<thead>
<tr>
<th>WVR ELEMENT WAIVER# (STAT)</th>
<th>ABSTRACT</th>
<th>EISN</th>
<th>BEG END</th>
<th>PAYLOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>E  RCS S053296YK EK10327 (A)</td>
<td>OMRSD EXCEPTION REQUEST - RIGHT RCS OXIDIZER B-LEG PAD REGULATOR LOCKUP PRESSURE (EK10327)</td>
<td>0023</td>
<td>032 040</td>
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</tr>
<tr>
<td>W  ET S053293FZ WK03850R1 (A) (STS-093)</td>
<td>L02/LH2 TANK PRESSURE MONITOR FOR MOVE</td>
<td>ET</td>
<td>099 999</td>
<td></td>
</tr>
<tr>
<td>OMS S053296UM WK10299 (A)</td>
<td>OMRSD WAIVER REQUEST - RP03 TK302 DYNATUBE LEAK RATE (WK10299)</td>
<td>0023</td>
<td>032 040</td>
<td></td>
</tr>
<tr>
<td>ORB S053298VM WK10557R1 (A)</td>
<td>OMRSD WAIVER REQUEST - FUEL CELL POWERPLANT 3 OXYGEN FLOWMETER LOW LIMIT (WK10557R1)</td>
<td>103</td>
<td>033 042</td>
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<tr>
<td>S053299BB WK10603 (A)</td>
<td>OMRSD WAIVER REQUEST - FORWARD OXYGEN REGULATOR LOCK UP PRESSURE (WK10603)</td>
<td>103</td>
<td>034 039</td>
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<tr>
<td>S053299JU WK10653 (A)</td>
<td>OMRSD WAIVER REQUEST - WATER SPRAY BOILER #1 EXCEEDED 44 PSIA MAX IMU LIMITATION (WK10653)</td>
<td>103</td>
<td>035 040</td>
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<tr>
<td>RCS S053298VTR1 WK10559 (A)</td>
<td>OMRSD WAIVER REQUEST - RIGHT RCS OXIDIZER B-LEG SECONDARY REGULAT ORLOCK UP HIGH (WK10559R1)</td>
<td>0023</td>
<td>035 043</td>
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</tr>
<tr>
<td>SRB S053293WA WK03886 (A)</td>
<td>LH FWD AND RH MID SRB JOINT TEMP SENSORS</td>
<td>BI</td>
<td>099 999</td>
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<tr>
<td>47</td>
<td>S052310A</td>
<td>02/14/91</td>
<td>Fly with FRSI instead of tile</td>
<td>OV-103, Flight 12 &amp; Subs (flight by flight evaluation)</td>
</tr>
<tr>
<td>53</td>
<td>S052428A</td>
<td>03/27/91</td>
<td>Allows specified flights to fly with interim TPS repair after each mission to minimize damage to surrounding tile during ferry flight</td>
<td>STS-37, STS-39, STS-40, STS-42 thru STS-999</td>
</tr>
<tr>
<td>101</td>
<td>S076972</td>
<td>11/19/91</td>
<td>Permit the modified GPCs (AP101-S) Battery Back-up Unit to fly with annotated fastener improvements without rolling the LRU Part Number</td>
<td>STS-42, STS-44, STS-47 and STS-49 thru STS-999</td>
</tr>
<tr>
<td>327</td>
<td>S115114VR5</td>
<td>03/17/05</td>
<td>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 (PRCB S115114VR2). This area was closed out before this time and would cause significant impact to verify configuration of this Technical Order dash number -014.</td>
<td>OV-103, Flight 31 OV-103, Flight 32</td>
</tr>
</tbody>
</table>

***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****

| 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 Longeron 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. | OV-103, Flight 31 OV-103, Flight 32 | OEL-3-31-304 PTL OEL-3-31-4432 PTL |

***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****

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USA CM/CVAS
861-2505
02/22/2010
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<tbody>
<tr>
<td>329</td>
<td>S115114AM</td>
<td>08/15/05</td>
<td>The following requirements are waived to allow OV-103, Flight 31 to fly (ferry) with the following out-of-configuration conditions:</td>
<td>OV-103, Flight 31</td>
<td>Ferry Flight from Dryden</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>1) V070-391139-025 (blanket under window #1 removed for ferry flight)</td>
<td></td>
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<td></td>
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<td></td>
<td>2) M072-421502-002 (did not perform acetone wipe prior to universal thruster plug assemblies - procedural omission)</td>
<td></td>
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<td></td>
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<td>3) V070-753110-003 (camera mount will not be installed for ferry flight)</td>
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<td></td>
<td>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</td>
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</tr>
<tr>
<td>330</td>
<td>S115114VR15</td>
<td>09/16/05</td>
<td>The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:</td>
<td>OV-103, Flight 31 Ferry Flight</td>
<td>Ferry Flight from Dryden</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>TCS blanket V070-362917-001 located at Door #44 NOT installed.</td>
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<td>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</td>
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</table>
| 331    | 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:  
  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.  

  ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****  |
| 332    | S115121TR8      | 05/04/06   | The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:  
M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200201 NOT removed from OV-103.  

  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.  | OV-103, Flight 31 Ferry Flight | Ferry Flight from Dryden |
<table>
<thead>
<tr>
<th>Item #</th>
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<th>Date</th>
<th>Waiver Description</th>
<th>Effectivity</th>
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</thead>
<tbody>
<tr>
<td>333</td>
<td>S115121TR8</td>
<td>05/04/06</td>
<td>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</td>
<td>OV-103, Flight 32</td>
<td></td>
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<tr>
<td></td>
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<td>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 (PRCB S115114VR2). This area was closed out before this time and would cause significant impact to verify configuration of this Tech Order dash number -014.</td>
<td></td>
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</tr>
<tr>
<td>335</td>
<td>S115116NR2</td>
<td>08/18/06</td>
<td>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</td>
<td>OV-103, Flight 33</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200195 not removed from OV-103.</td>
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<td>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.</td>
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<td>Item #</td>
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<tr>
<td>336</td>
<td>S115116NR2</td>
<td>08/18/06</td>
<td>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition: M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200201. 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). 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.</td>
<td>OV-103, Flight 33</td>
<td></td>
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</tbody>
</table>

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<table>
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<tbody>
<tr>
<td>337</td>
<td>S115116NR4</td>
<td>10/27/06</td>
<td>Tech Order M072-544501-087 - install, M072-544501-027 - remove, -087</td>
<td>OV-103, Flight 33</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>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.</td>
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<td>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.</td>
<td></td>
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<tr>
<td>338</td>
<td>S115116NR4</td>
<td>10/27/06</td>
<td>Tech Order M072-794021-026 install, M072-794021-019 remove, -026</td>
<td>OV-103, Flight 33</td>
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<td>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.</td>
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<td>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.</td>
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<tr>
<td>342</td>
<td>S115120DR3</td>
<td>09/12/07</td>
<td>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition: 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 configuration. At this time there is NO plan to ever open up this area again.</td>
<td>OV-103, Flight 34 thru OV-103, Flight 999</td>
<td></td>
</tr>
<tr>
<td>344</td>
<td>S071024MP</td>
<td>12/20/07</td>
<td>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).</td>
<td>OV-103, Flight 35 OV-104, Flight 30 OV-105, Flight 21</td>
<td></td>
</tr>
</tbody>
</table>

P/N MC450-0016-0029  

***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****

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USA CM/CVAS  
861-2505  
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</thead>
<tbody>
<tr>
<td>352</td>
<td>S115128CR6</td>
<td>10/05/09</td>
<td>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:</td>
<td>OV-103, Flight 37</td>
<td>Ferry Flight</td>
</tr>
</tbody>
</table>

  Three MPS GH2 FCV solenoid and poppet sleeve assemblies (P/N 80420-1301) for each engine.

  Engine 1 GH2 FCV LV56
  Engine 2 GH2 FCV LV57
  Engine 3 GH2 FCV LV58

  Note: The following MPS cap and plug set GSE plugs will be installed in place of the FCVs: 3 G070-602824-001.

  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.