



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



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

Program Freeze Point

PRCB Presentation

S115125B



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Baseline the STS-125 Mission Specific Requirements and Flow Plans. This CR and the associated Data Package were reviewed at the 10-22-07 FRWG.

Flight Management*

MO3/USA-PI

Orbiter Engineering*

Requesting Approval

USA-OE

Status in Back-Up

KSC Integration

MK-SIO

Flight Software

USA-FSW

GFE FCE/EVA

MV5/XA

Payload/Cargo Engineering

USA-PI

KSC ISS and Payload Processing

UB-R3

***Backup Material**



STS-125/HST SM4

Launch Site Requirements Review (LSRR)

Flight Requirements Status

PRCB Oct, 25, 2007

Phyllis Grounds, HST & ICBC3D PIM
Frank Richmond, USA Flight Mgr.



STS-125 Launch Site Requirements Review	Presenter Phyllis Grounds/MO3	
	Date 10/22/07	Page 2

LAUNCH

08/07/08

39A/ MLP2

CREW SIZE: 7

CONFIGURATION

OV-104 (30)

LP04;RP01

ET-127

BI-135

RSRM-103

(1) TBD (2) TBD (3) TBD

OI-32

SRMS,OBSS

PRCBD S042013GU:

ORBIT

28.45 DEG

297 NM

DIRECT INSERTION

DURATION: 11 + 0 + 2 DAYS

CONSUMABLES

CRYO TANK SETS

5 (FULL)

GN2 TANKS

5 (FULL)

FWD RCS

2446# (FULL)

AFT RCS

4970# (FULL)

OMS

25063# (MAX LOAD)

PAYLOAD

HST SM4

ICBC 3D

LANDING

SITE

KSC

TAL

MORON

ALT. TAL

NONE

SCA

905



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PERFORMANCE MARGIN

•	SIMULATION MARGIN (SPLCF125)		+1823
•	WEIGHT CHANGES SINCE SIMULATION		
•	ORBITER	<u>-12</u>	
•	TOTAL WEIGHT CHANGES	-12	+12
•	OTHER PERFORMANCE PROJECTIONS		
•	PROTECTION FOR DOL DISPERSIONS		-700
•	SRB – M/P UPDATES		-77
•	ISP/THST FOR GENERIC BLK II @ 104.5%		-68
•	PERFORMANCE CHANGES ADJUSTMENT		<u>-1</u>
•	CURRENT BASELINED APM (10/16/07)		+989
•	IPT PROJECTIONS		
•	INCREASE ODS WEIGHT	+203	
•	IINCREASE BALLAST WEIGHT	<u>+210</u>	
•	TOTAL - IPT PROJECTIONS	+413	-384
•	PROJECTED APM		+605

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



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FLIGHT MASS PROPERTIES
WEIGHTS AND CG'S ARE WITHIN ACCEPTABLE LIMITS

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	224979 (233000)	1078.2 (1075.7)
RTLS	236438 (248000)	1078.3 (1077.2)
TAL	234023 (248000)	1079.0 (1077.2)
AOA	229437 (248000)	1076.4 (1075.7)
CONT RTRN (NO GRAPPLE)	225985 (233000)	1078.0 (1075.7)

NOTE: RTLS INCLUDES 25 SEC FRCS DUMP
TAL INCLUDES 90 SEC FRCS DUMP
1752 LBS AFT BALLAST (IPT BALLAST = 1962 LBS)

ESTIMATES BASED ON TDDP SPLCF125 AND MODIFIED FOR WEIGHT CHANGES THRU 10/16/07.

STS-125 LSRR OV-104 FLIGHT 30 CONFIGURATION UPDATES

**Joe Rodriguez
USA Orbiter Element**

October 25, 2007



10-25-07

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STS-125 OV-104 Flight 30 – LSRR Updates

Program Authorization Is Requested For The Following:

- Baseline two (2) modifications

Information Only:

- Five (5) potential modifications under review
- OPF processing requirements
 - Chits, TPS Priorities

Back-up:

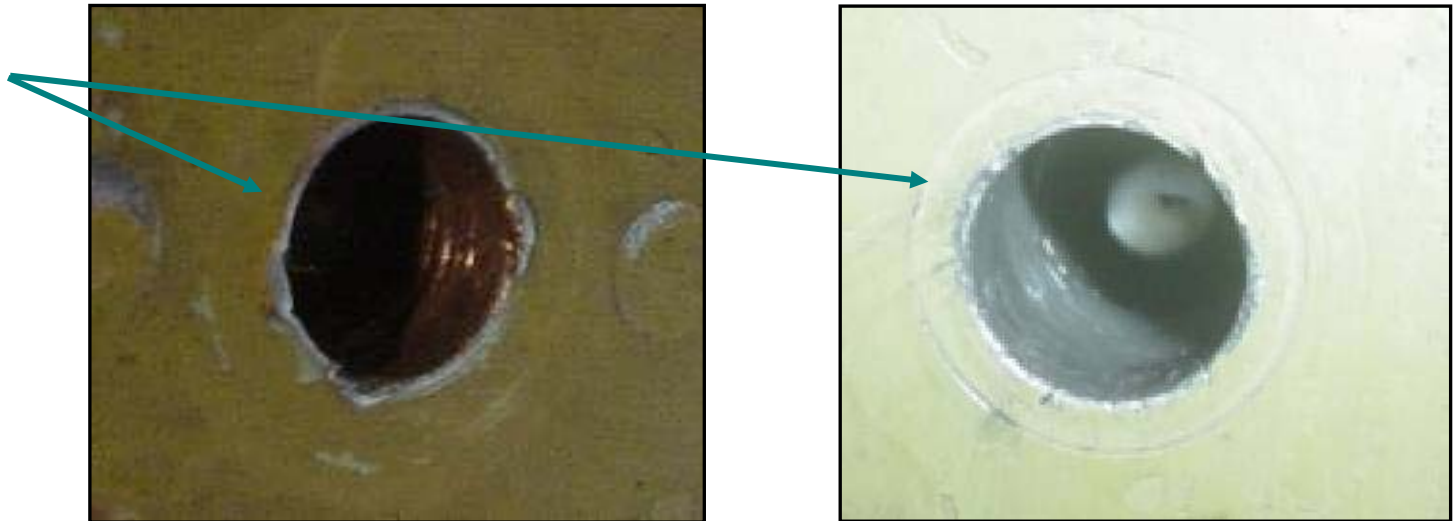
- Modification Records and MECSLSI Updates Summary
- Engineering, Hardware and Certification Status
- BRI-18 Implementation Plan

STS-125 OV-104 Flight 30 – Modifications To Be Baselined

TAD 30006 – Guide Pin Installation for 50-1 / 50-2 Aft Access Doors

- Installs two guide pins to provide alignment capability for the flight 50-1 / 50-2 aft access doors and associated GSE door frame assemblies
 - Alignment capability will reduce damage to orbiter structure during the GSE door frame and 50-1 / 50-2 aft fuselage access door installation and removal, and facilitate improved turnaround time
 - Guide pins will be installed in place of the two removed retainers on the door opening
 - Fasteners will be removed from the corresponding locations in the door and the GSE frame to allow guide pins to slide in place upon door or GSE frame installation
 - Steel bushings will be added to the holes in the flight door to prohibit damage to the aluminum door from the steel guide pins

GSE door frame and 50-1 & 50-2 aft fuselage access door current installation and removal process can cause coining and surface damage to attachment holes and adjacent areas



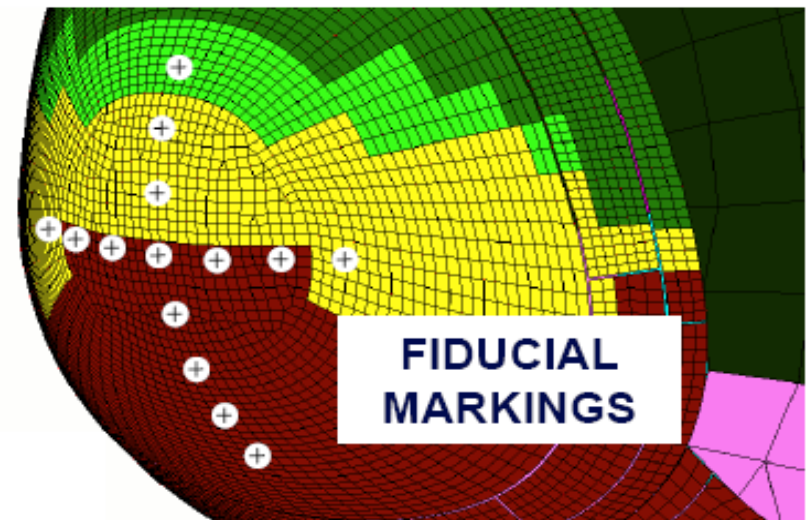
STS-125 OV-104 Flight 30 – Modifications To Be Baselined

MCR 23452 – Fiducial Markings on Nose Cap RCC

- Implements fiducial markings to facilitate on-orbit imagery X-Y-Z coordinate location to allow for more efficient damage assessment during the mission
 - Will enable more accurate and expeditious coordinate location identification for inspection and damage assessment activities
 - Permanent reference marks will be added using Black Sharpie marker at 14 original Shuttle Entry Air Data System (SEADS) locations on nose cap
 - Reduces uncertainty from ~5” without marks to ~0.5-1.0”



SEADS
Locations



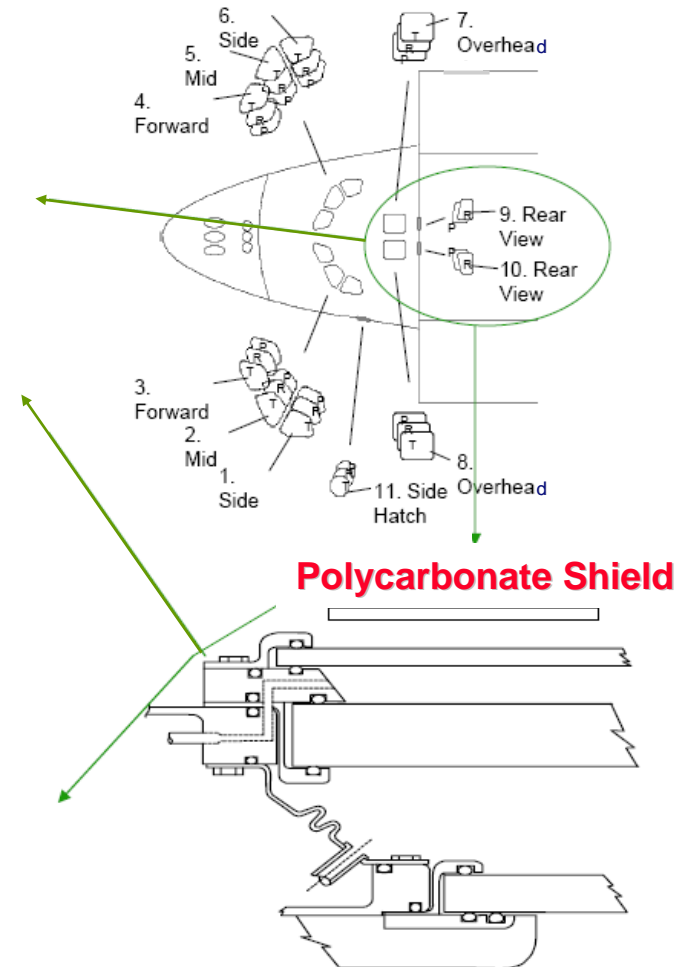
STS-125 OV-104 Flight 30 – Potential Modifications

TAD 30064 – Implementation of Protective Window Shields / On-Orbit Installation

- Implements polycarbonate window protective shields on Orbiter pressure panes (W7, W8, W9 and W10) to reduce possibility of window breakage and accommodate launch and on-orbit removal / installation
 - A thin polycarbonate sheet installed at current shade attachment locations has demonstrated the ability to prevent damage by a factor of six (minimum)
 - The bonded polycarbonate window shields concept was developed in 2006 (ref. MCR 23440) but it was determined that the Lexan would have a detrimental effect on high aperture photography
 - A new concept was developed to allow removal and installation of the polycarbonate shields on-orbit
 - A single layer of cloth is attached over the shield with Velcro to act as a shade; rear windows include tethering capabilities
 - Rear window shields will be installed for launch to protect the windows; Overhead window shields will be installed on-orbit after photographs are taken
 - Utilizes existing overhead windows #7 and #8 clamps and rear windows #9 and #10 Velcro attachment locations without invalidating the crew module window basis of certification
 - Crew office evaluation (CEIT) is scheduled for 11/30/07

STS-125 OV-104 Flight 30 – Potential Modifications

TAD 30064 – Implementation of Protective Window Shields / On-Orbit Installation (Cont.)



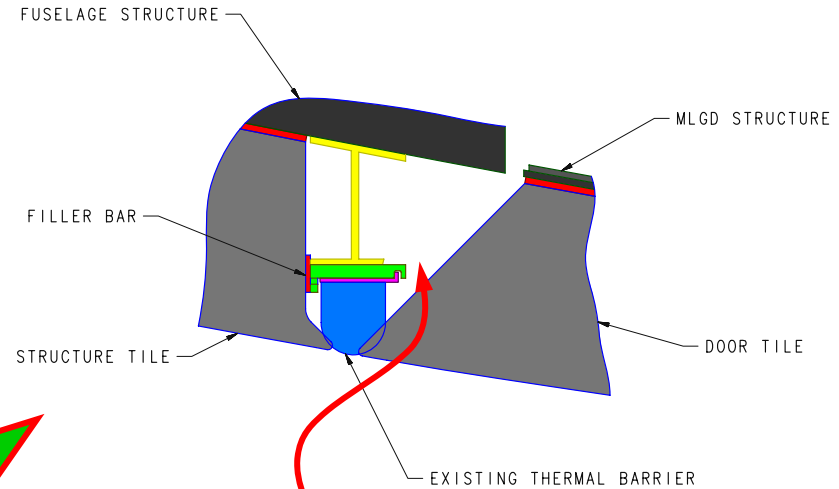
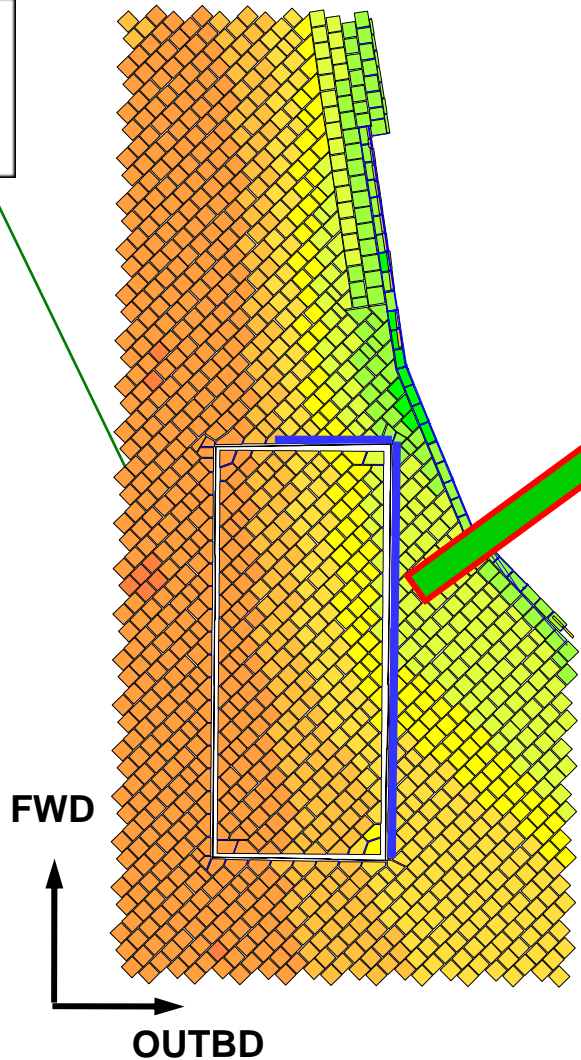
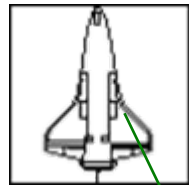
STS-125 OV-104 Flight 30 – Potential Modifications

TAD 30025 – Main Landing Gear Door Thermal Barrier Cavity Protection

- Installs a thermal inhibitor in order to prevent potential failure of the MLGD environmental seal
 - The current MLGD thermal barrier system has no redundancy and is vulnerable to impact damage which could allow the heat of re-entry into the cavity between the OML and the environmental seal
 - Thermal inhibitor, constructed of a rigidized batting material enclosed in a sleeving, will expand to seal the cavity during exposure to excessive heating and protect the environmental seal area from reaching an over-temperature condition
 - Arc jet testing demonstrated the ability of the thermal inhibitor to reduce the temperature at the environmental seal for the condition of a breach past the MLGD thermal barrier
 - All material and system testing performed to-date proved that additional insulation capability is provided by the thermal inhibitor
 - Thermal inhibitor preliminary development schedule supports implementation on OV-104 for STS-125
 - Engineering is scheduled to be released by 11/30/07
 - Material qualification is scheduled for completion on 2/18/08
 - Production hardware / certification is expected to be complete on 4/17/08

STS-125 OV-104 Flight 30 – Potential Modifications

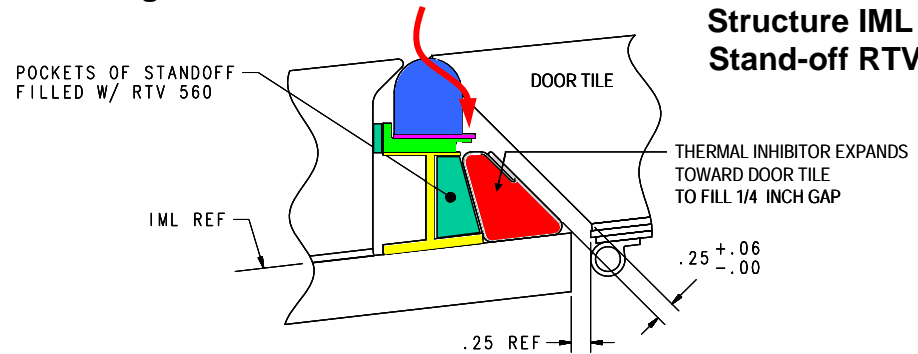
TAD 30025 – Main Landing Gear Door Thermal Barrier Cavity Protection (Cont.)



Potential Sneak Flow Path from Outboard Breach to Inboard Door Seal

Thermal Inhibitor Reduces/Eliminates Flow Path from Tile Damage to Door Pressure Seal

Inhibitor is Bonded to Structure IML and Stand-off RTV Fill



STS-125 OV-104 Flight 30 – Potential Modifications

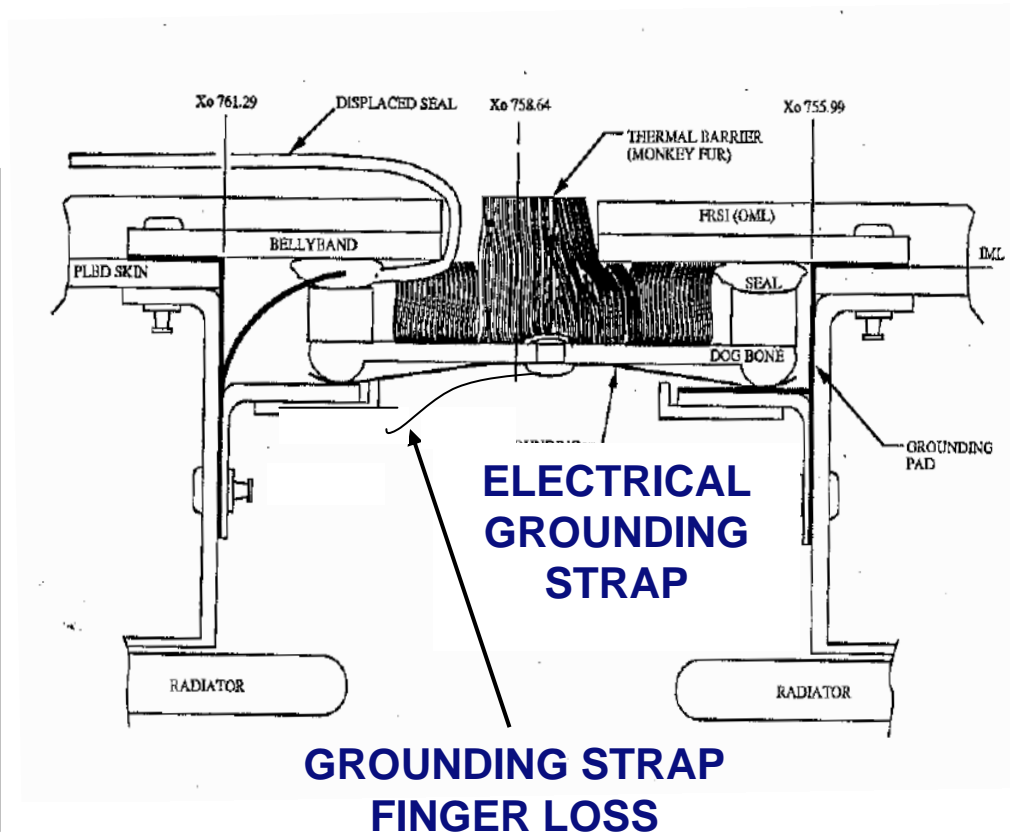
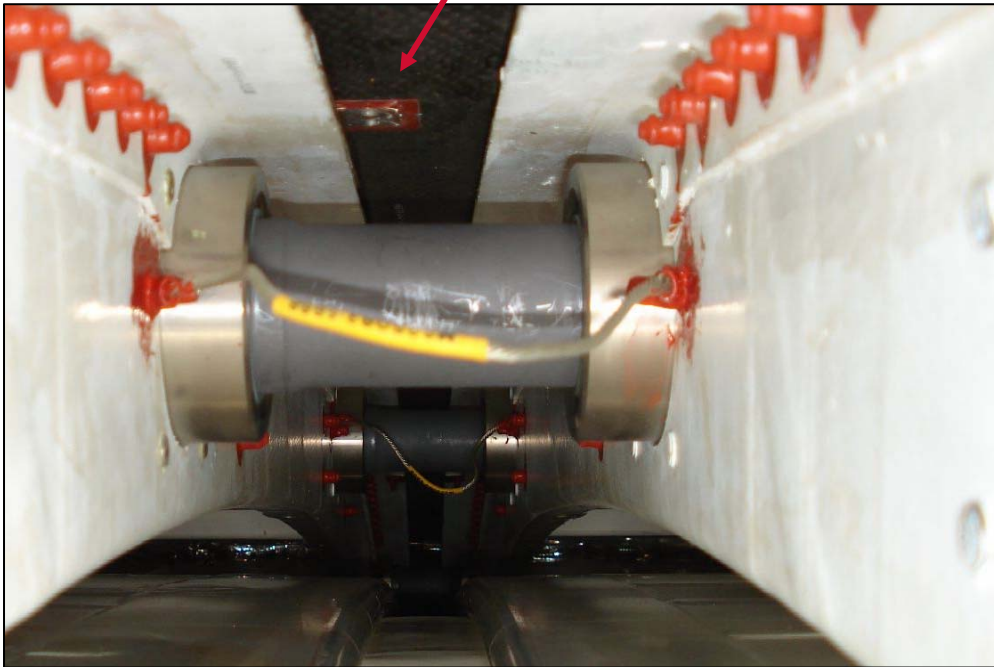
TAD 30006 – PLBD Grounding for Lightning Bond Protection

- Installs lanyards in 12 locations in the two forward PLBD expansion joints to provide adequate current flow continuity across the joint in order to meet PLBD grounding requirement
 - Current PLBD configuration does not meet NSTS 07636 Revision G “Lightning Protection, Test and Analysis Requirements”
 - Orbiter Vehicle shall ensure a resistance of no more than 2.5 milliohms between exterior surfaces
 - Payload bay door design includes provisions to dissipate lightning strike current and provide EMU shielding
 - PLBD has five panels per side, interconnected by shear tubes with expansion joints
 - The electrical grounding strap fingers provide lightning strike protection for the orbiter structure and enclosed payload
 - Electrical grounding clips become dislodged and damaged / broken
 - Loss of electrical ground strap fingers historically have been associated with the two forward payload bay door expansion joints
 - The standard repair procedure using a jumper at the shear pin flange attach point does not provide adequate conductivity across the joint
 - Study is nearing completion to define the repair locations and determine lanyard installation procedure fix to ensure lightning strike requirements are met

STS-125 OV-104 Flight 30 – Potential Modifications

TAD 30006 – PLBD Grounding for Lightning Bond Protection (Cont.)

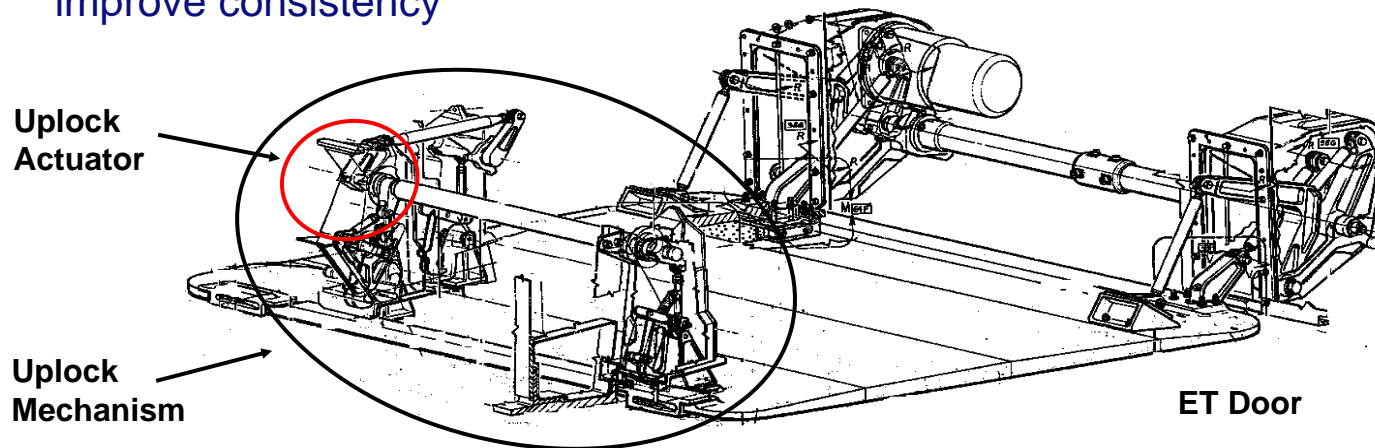
**DAMAGED ELECTRICAL BOND CLIPS TRIMMED
AND LANYARD INSTALLED**



STS-125 OV-104 Flight 30 – Potential Modifications

TAD 30069 – ET Door Uplock Latch Actuator Modification

- Redesign existing MC287-0041 ET door uplock latch actuators (LH and RH) to reduce the maximum stall torque range
 - Maximum stall torque of 4,000 to 6,000 in-lbs from the uplock ET door latch actuator could cause uplock mechanism yielding if debris causes a jam in the ET umbilical area during actuator operation
 - The modified actuator test showed consistent stall torque results within 900 to 1,151 in-lbs under all test conditions, significantly reducing the risk of yielding the uplock mechanism
 - The new design included reducing the spring force on the torque limiter friction disks by reducing the Belleville spring thickness, adding a spacer to fill the gap, and the ball pockets ground for smoother surface and slightly increased depth to improve consistency

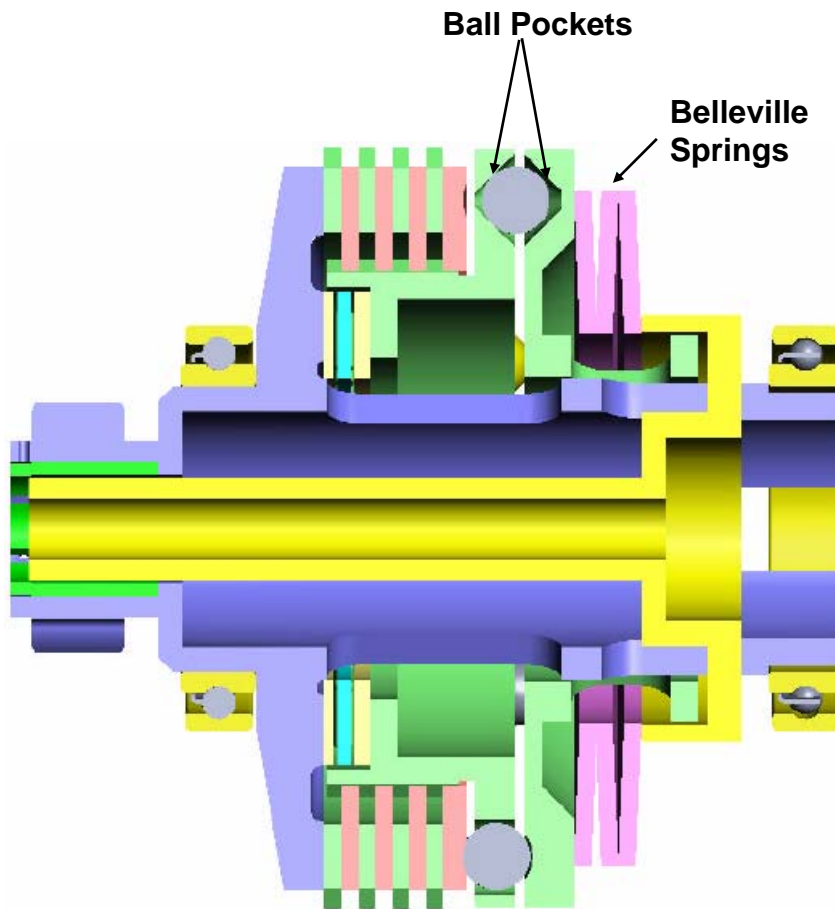


STS-125 OV-104 Flight 30 – Potential Modifications

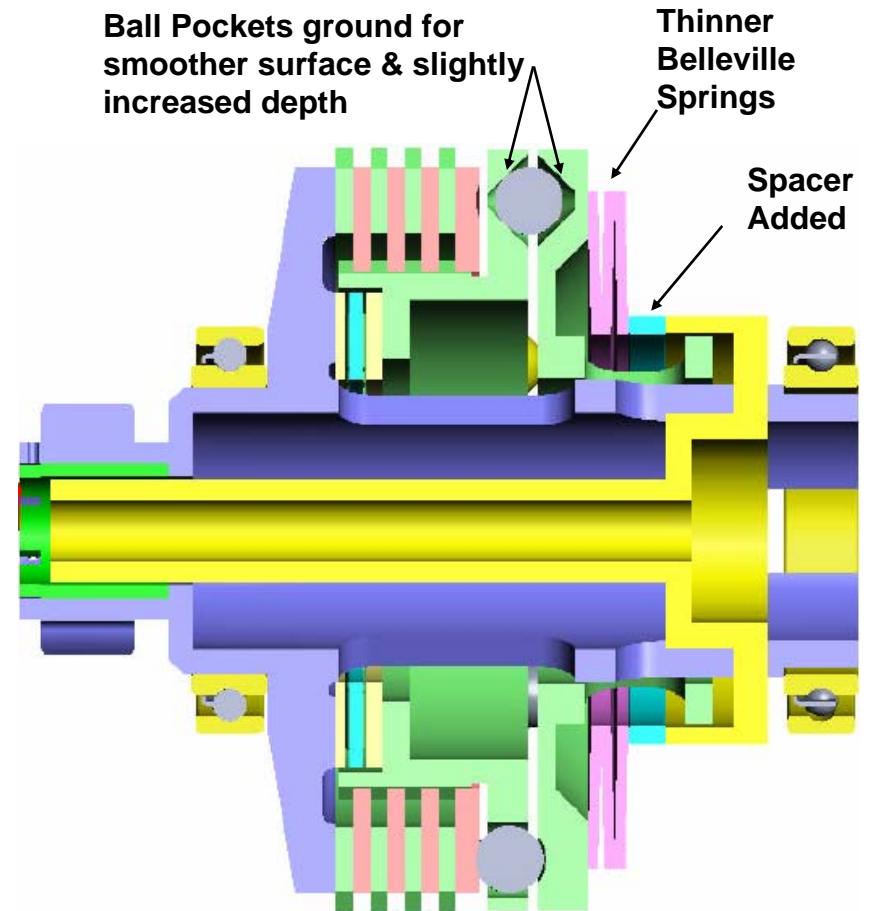
TAD 30069 – ET Door Uplock Latch Actuator Modification (Cont.)

- Torque Limiter Design Changes

Current Design



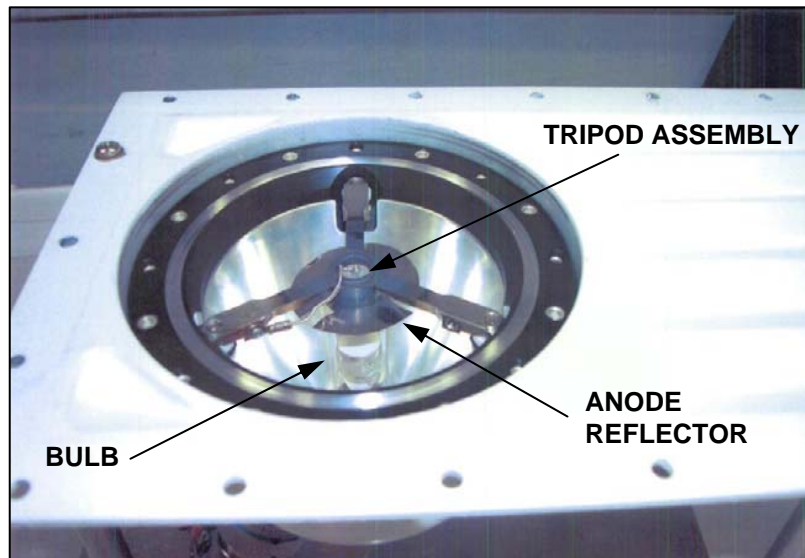
Modified Design



STS-125 OV-104 Flight 30 – Potential Modifications

UCN 30121 – Payload Bay Floodlight Anode Reflector Mod

- Adds an anode reflector to the PLB Floodlight to reduce stress and high temperature effect on the floodlight bulb to prevent it from cracking
 - Increased temperatures at the anode end of the bulb in conjunction with the inherent stress induced during manufacturing of the bulb contribute to bulb failure
 - Bulb cracks have never developed below the reflector line
 - Study is in work to manufacture a prototype upper spring support with reduced dimensions and 4 mil thick Kovar anode reflector prototype
 - Qual testing and certification are expected to be complete by 12/15/2007



Cracked Bulb

Chits

CHIT	TITLE
J6207A	REMOVAL / REPLACEMENT OF OV-104 SYSTEMS 1, 2 & 3 WATER SPRAY BOILER AGING COMPONENTS
J6265	RJDA #2 AND RJDF #1 R&R FOR OV-104, FLT 30
J6275	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
J6288	MEASUREMENTS FOR CLOSE CLEARANCE POINTS BETWEEN COLUMBUS AND ORBITER
J6204	GAP FILLER PUL TESTING
J5919B	0-GAUGE PROTECTION FOR OV-103 FLIGHT 32-35 AND OV-104 FLIGHT 27-30
J6116A	AMES GAP FILLER REMOVAL AND REPLACEMENT
JXXXX	Replacement and Inspection of Windows 1-6
JXXXX	ATVC AND ASA R/R FOR TIN WHISKERS

TPS Priorities

Mandatory (Flight damage, OMRS Requirement/Chits, LRU access & deferred work)

- Deferred work may be re-deferred with acceptable inspection
- Gap Filler R&R
 - To be worked on a best effort basis as resources allow
 - Mandatory GF areas (Priority 1, 2A, 2B back to RCC #1) have been completed

Prioritized Opportunity

- 1. BRI-18 Tile – MLGD (28 tile)**
 - 1st subset – fwd & o/b corner – 14 / door
- 2. BRI-18 Tile – MLGD FWD Edge (22 tile)**
 - 2nd subset – fwd & o/b sides – 11/door
- 3. BRI-18 Tile – MLGD O/B Side (18 tile)**
 - 3rd subset – O/B side – 9/door outboard side
- 4. BRI-18 Tile – STR side of ET Doors (20 tile)**
 - 4th subset – ET doors – 10/door
- 5. BRI-18 Tile – LESS Carrier Panels 8-10 (24 tile)**
 - 5th subset – LESS hot panels – 12/side

TPS Priorities

6. **BRI-18 Tile – STR side of ET doors, inboard side aft-most tiles**
7. **OMS Pod Tile/FIB Attrition Mod – Approximately 6 tile per side - **ADDED****
8. **MLGD – Middle 1/3 - 12 side (6 door /6 structure), Outboard (1/3 left) - Inboard Aft (in that order) – **Moved Up in Priority****
9. **Corrosion Sampling – Heat sink areas (Elevon / Body Flap) - **ADDED****
10. **BRI-18 Tile – Remaining MLGD (Top Priority) / LESS carrier panels/window tiles / NLGD**
 1. **NLGD** (attrition - do leading edge first)
 3. **LESS** - panels 7, 6, 5, 11, 12, 13, 4, 3, 2, 1 (in that order)
 - No “forced” attrition – Insert / crack issue is being worked
 - Damaged tile will be assessed on a case by case basis by stress analysis
 4. **Windows 2, 3, 4, & 5 Upper Carrier Panels**
 - No “forced” attrition – Insert/crack issue still being worked
 - Damaged tile will be assessed on a case by case basis by stress analysis
 5. **Window locations 1 & 6 Upper Carrier Panels 1st/Lower C/P’s 1 – 6 last**
 - No “forced” attrition – Insert/crack issue still being worked
 - Damaged tile will be assessed on a case by case basis by stress analysis
11. **Mod work (Hub Tile, WLE sneak flow, Horsecollar Gap Fillers, MLGD sneak flow)**
12. **Gap Fillers**



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

Backup Material

FRWG Presentation (With Minor Changes)



STS-125/HST SM4 Flight Requirements Status

Presenter **Frank Richmond**

Date **10/22/07**

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- **FRD Latest Revision: Revision 002, Dated, September 7, 2007**

- **Closed CRs:**
 - **FRD17462-125-007 – Update FRD Launch Site Support Requirements for ODS**
 - **FRD17462-125-008 – Add Aft Fuselage Ballast**
 - **FRD17462-125-009 – Editorial Updates to STS-125 FRD**
 - **FRD17462-125-010 – Update SRB and RSRM**
 - **FRD17462-125-011 - Remove WVS Antennas (2) from Xo = 75**
 - **FRD17462-125-012 – FRD Table 2 Updates**

- **Open CRs:**
 - **FRD17462-125-013 – Update ODS to Mid-weight Configuration**



STS-125/HST SM4 Requirements Status	Presenter Phyllis Grounds
	Date 10/22/07 Page 6

1. HST PIP (NSTS 14009)

- **Current version available on PILS: Revision L thru Change 5, dated 9/17/07**
- **Following CR's were closed 10/15/07 and are in editing:**
 - 14009-271 SM4 Manifest and Priorities
 - 14009-272 Rev. to Structures Section 6.1 & Thermal Sections 4.2.3.24 & 6.2
 - 14009-273 Purge Temp and Misc KSC Updates (incl. MULE testing in the OPF)
- **Pending CR's:**
 - Update Section 13, Customer Funded Services Summary to include ESTL testing, OPF and Pad ETE test and T-0 purge support
 - Post CIR Clean-up of requirements
 - Contamination requirements
 - Add to Table 7-1, SSP Provided Hdw – Four RF ground straps,
 - Delete from Table 7-1, SSP Provided Hdw – Two PDIP inverter plugs
 - Update Contingency Landing Cases, Table 6-1
 - Payload MSID Clarification from MULE to MULE/RNS, section 8.5
 - ICBC 3D energy allocation change to 16 kwh
 - Incorporate voice loops between GSFC and JSC for sim support

2. ICBC 3D PIP (NSTS 21417)

- No Open CR's
- Pending CR's – POCC/CSR Facility requirements update (section 8.5)



STS-125/HST SM4 Flight Requirements Status	Presenter Phyllis Grounds
	Date 10/22/07 Page 7

➤ **Flight Definition and Requirements Document (FDRD)**

- **S042013GU – Swap from ET -129 to -127, OSB approval pending.**

Back-up

- **Modification Record and MECSLSI Updates Summary**
- **Engineering, Hardware and Certification Status**
- **BRI-18 Implementation Plan**

Modification Records and MECSLSI Update Summary

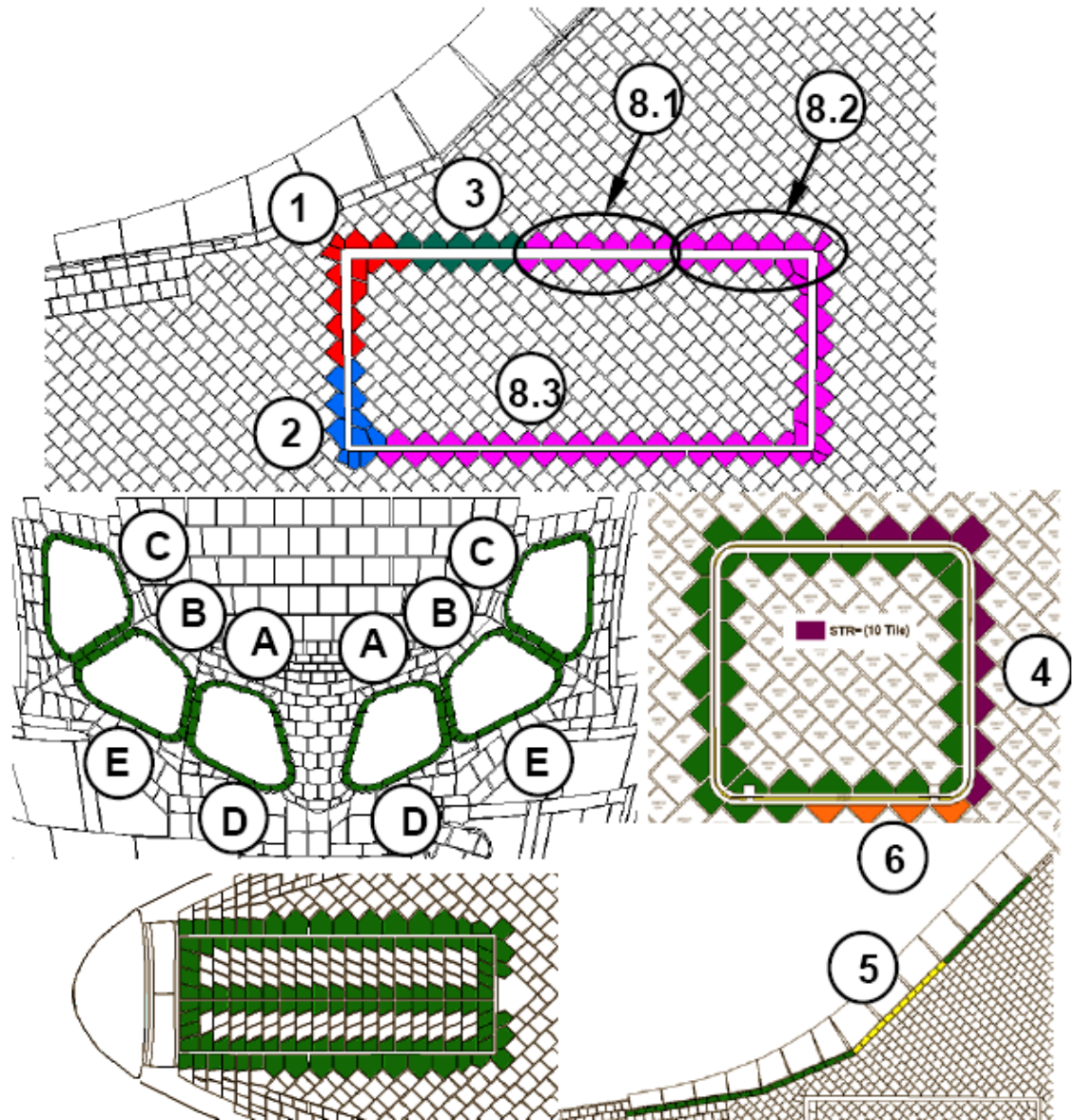
TAD / MCR	MCR TITLE	KIT / MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
<u>Modifications To Be Baselined</u>				
30006	<u>Guide Pins Installation for 50-1/50-2 aft access doors</u> Improves alignment between GSE frame and Access Door during installation and removal processes.	VK70-856104-001,0104,0 - Adds 2 guide pins to align GSE frame and 50-1 & 50-2 Access Door before engagement of fasteners	No Tech Order Impact	No MECSLSI Impact
23452	<u>Fiducial Markings on RCC Nose Cap</u> Implementation of fiducial markings on RCC Nose Cap SEADS locations.	TCTIV0023452REF,0104,0 - Implements marking using Black Sharpie brand permanent marker	No Tech Order Impact	No MECSLSI Impact
<u>Potential Modifications</u>				
30064	<u>Implementation of Protective Window Shields / On-Orbit Installation</u> Provides capabilities to remove and re-install the polycarbonate shields on-orbit in order to maintain the photography capability and mitigate window breakage risk.	K611-661001-001,0004,0 - Modifies the polycarbonate shield design utilizing existing overhead windows clamps and rear windows Velcro attachment locations	No Tech Order Impact	No MECSLSI Impact
30025	<u>Main Landing Gear Door Thermal Barrier Cavity Protection</u> Installs the thermal inhibitor to improve the MLGD thermal barrier system.	TBD - Adds the thermal inhibitor to provide larger temperature differential between the surface and environmental seal to prevent MLGD thermal system potential failure	No Tech Order Impact	No MECSLSI Impact
30006	<u>PLBD Grounding for Lightning Bond Protection</u> Defines the repair locations and installs lanyards to provide alternate grounding.	TBD - Modifies the current configuration to improve PLBD grounding	No Tech Order Impact	No MECSLSI Impact
30069	<u>ET Door Uplock Latch Actuator Modification</u> Modifies the torque limiter design to reduce the maximum stall torque range.	TBD - Modifies the torque limiter ball pockets, belleville springs and adds spacer	No Tech Order Impact	No MECSLSI Impact
30121	<u>Payload Bay Floodlight Anode Reflector Mod</u> Modifies the floodlight bulb design to add the Anode Reflector from Kovar due to a better heat transfer coefficient and emissivity than Inconel, Kovar is available in 4 mil thick sheets	TBD - Modifies the PLB floodlight design to add the anode reflector to ameliorate the life of the floodlight bulb which will reduce the Ground Ops effort to remove and replace of failed floodlights	Payload Bay Floodlights Installation M072-704000-TBD MV0549A	MECSLSI Impact

Engineering, Hardware and Certification Status

TAD / MCR	MCR TITLE	Est. Engr Release (MM/DD/YY)	G.O. Engr Need (MM/DD/YY)	Est. Hdwe Delivery (MM/DD/YY)	G.O. Hdwe Need (MM/DD/YY)	MOD/CERT GO / NO-GO	CERT SUBMITTAL DATE	CERT APPROVAL DATE	CERTIFICATION CR / CAR (BOEING)	REMARKS
Modifications To Be Baselined										
30006	Guide Pins Installation for 50-1/50-2 Aft Access Doors Improves alignment between GSE frame and Access Door during installation and removal processes.	Released	N/A	N/A*	N/A*	Go	Submitted	10/26/07	CR 03-350013-001K CAR 170-03-350013-001K	* Available on site
23452	Fiducial Markings on RCC Nose Cap Implementation of fiducial markings on RCC Nose Cap SEADS locations.	10/26/07	N/A*	N/A	N/A	Go	N/A	N/A	N/A	* Based on estimated engineering release date of 10/26/07
Potential Modifications										
30064	Implementation of Protective Window Shields / On-Orbit Installation Provides capabilities to remove and re-install the polycarbonate shields on-orbit in order to maintain the photography capability and mitigate window breakage risk.	10/29/07	N/A*	12/14/07	5/1/08**	Go	11/5/07	1/4/08	CR 25-661611-001K CAR 06-25-661611-001K	* Based on estimated engineering release date of 10/29/07 ** Prior to CEIT
30025	Main Landing Gear Door Thermal Barrier Cavity Protection* Installs the thermal inhibitor to improve the MLGD thermal barrier system.	11/30/07	12/4/07	4/17/08	12/18/07	Go	3/14/08	TBD	CR 07-199001-001N CAR 15-07-199011-001N	* First flight
30006	PLBD Grounding for Lightning Bond Protection* Defines the repair locations and installs lanyards to provide alternate grounding.	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	* Requires OPO approval
30069	ET Door Uplock Latch Actuator Modification Modifies the torque limiter design to reduce the maximum stall torque range.	11/30/08	N/A*	3/25/08	TBD	Go	2/29/08	4/29/08	CR 45-287-0041-0001 CAR 04-45-287-0041-0001** CR 45-565000-001M CAR 11-45-565000-001M*** CR 03-851033-001D CAR 06-03-851033-001D****	* Based on estimated engineering release date of 11/30/07 ** Door latch drive *** ET closeout door **** ET baggie
30121	Payload Bay Floodlight Anode Reflector Mod* Modifies the floodlight bulb design to add the Anode Reflector from Kovar due to a better heat transfer coefficient and emissivity than Inconel, Kovar is available in 4 mil thick sheets	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	* Requires OPO approval

BRI Top Risk Reduction Areas (Priority 1-5)

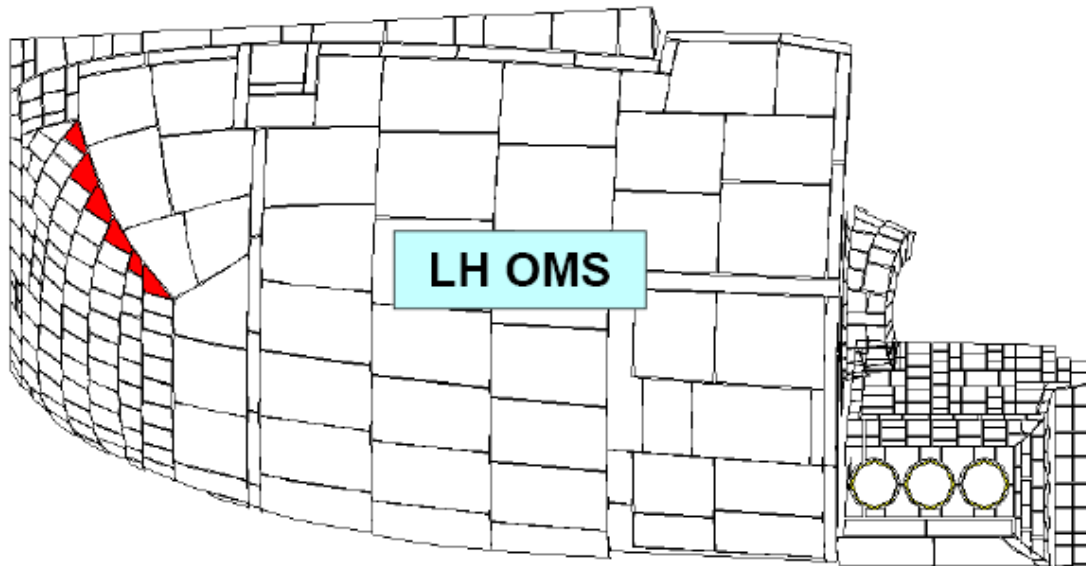
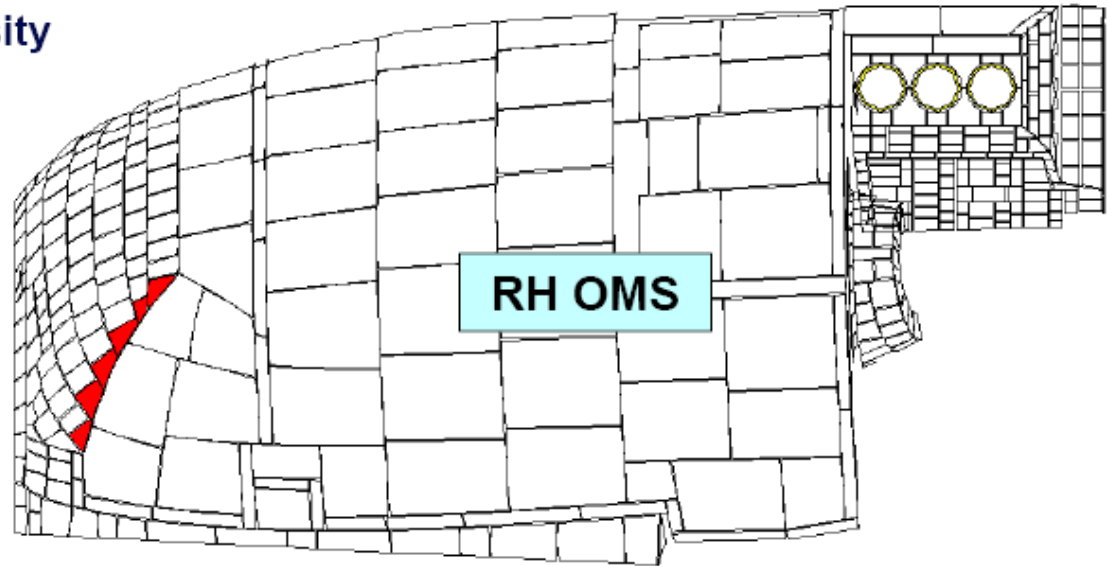
- 1. ■ **MLGD- FWD/OB Corner**
- 2. ■ **MLGD-(2A) Subset**
- 3. ■ **MLGD-(2B) Subset**
- 4. ■ **ET Doors- STR Side**
- 5. ■ **LESS "Hot Panels" (8-10)**
- 6. ■ **ET Inboard/OB STR side**
- 8.1 ■ **MLGD Middle 1/3 (12-tile)**
- 8.2 ■ **MLGD-Aft 1/3 (13 Tile)**
- 8.3 ■ **MLGD-Inboard-Aft (48 Tile)**
- 10. ■ **NLGD (Front to back)**
LESS 7,6,5,11,12,13,4,3,2,1
Windows (2,3,4,5) A-E
ET Doors remainder



OMS Pod Tile R&R (Priority 7)

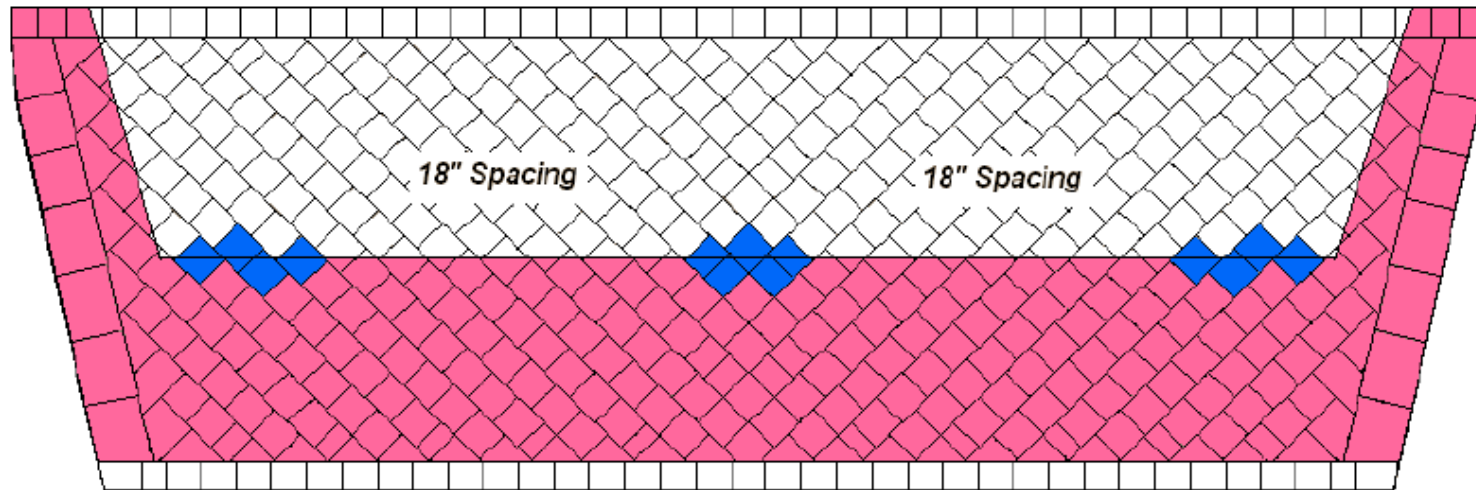
- Upgrade Tile from 9lb to 12lb density



 (6) Tile per pod



Heatsink / Lower Body Flap (Priority 9)

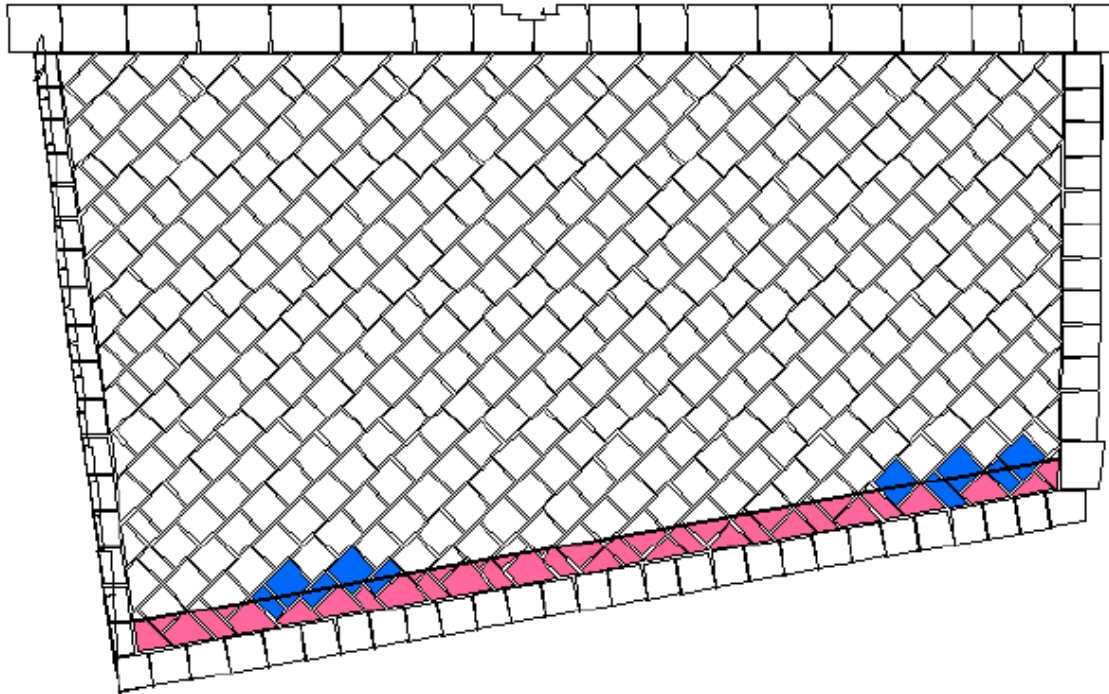
LOWER BODY FLAP HEATSINK





-  *Approx Tile Removal locations*
-  *Approx Heatsink location*

Approx (13) Tile Removals

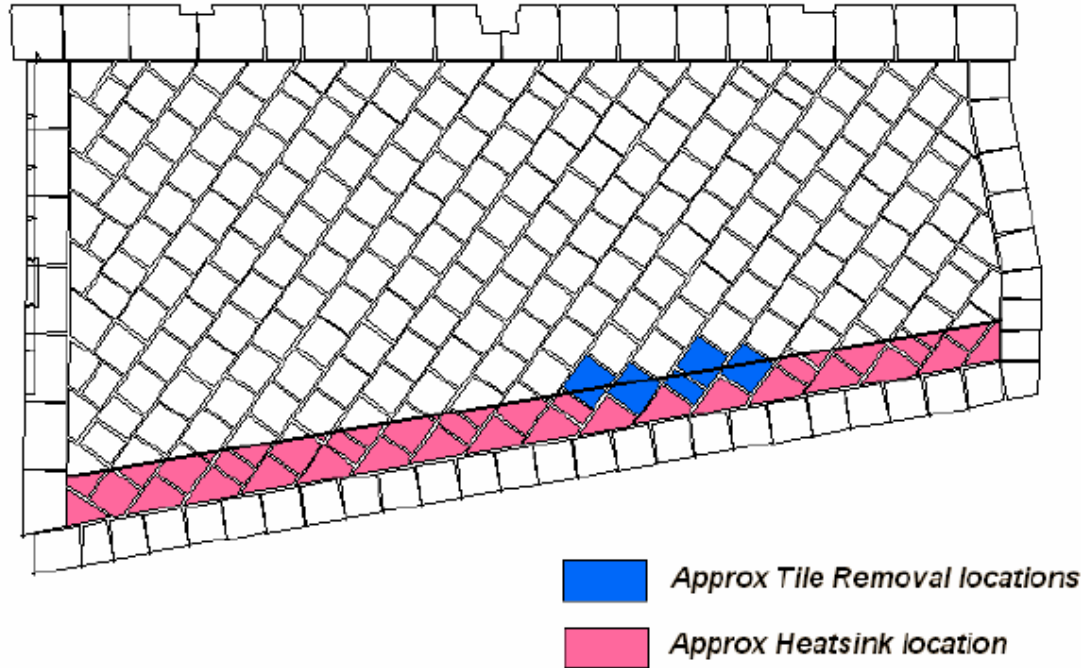
Heatsink / Inboard Elevons (Priority 9)



-  *Approx Tile Removal locations*
-  *Approx Heatsink location*

Approx (10) Tile Removals

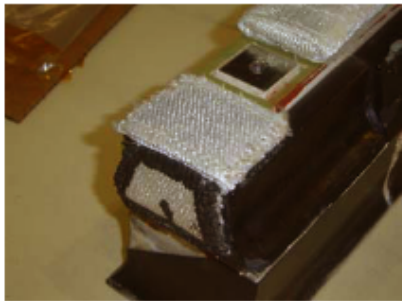
Heatsink / Outboard Elevons (Priority 9)



Approx (5) Tile Removals

MCR 19735 WLE Sneak Flow Mod (Priority 11)

MCR 19735	103	103	104	104	105	105	105	105	105	105
	LWNG	RWNG	LWNG	RWNG	LWNG T/B	L/H C/P SIP	L/H SPAR SIP	RWNG T/B	R/H C/P SIP	R/H SPAR SIP
1	LWNG-3-34-195		LWNG-4-29-151/52/53		RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
2					RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
3					RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
4					RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
5	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
6	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
7	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
8	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
9	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
10	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
11	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
12	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
13	LWNG-3-31-167	RWNG-3-31-158	LWNG-4-27-131	RWNG-4-27-136	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
14	LWNG-3-32-181	RWNG-3-32-172			RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
15	LWNG-3-32-181	RWNG-3-32-172	LWNG-4-28-138		RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
16	LWNG-3-32-181	RWNG-3-32-172	LWNG-4-28-138		RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
17	LWNG-3-32-181	RWNG-3-32-172	LWNG-4-28-138		RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
18	LWNG-3-32-181	RWNG-3-32-172			RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
19	LWNG-3-32-181	RWNG-3-32-172			RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
20	LWNG-3-32-181	RWNG-3-32-172			RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
21	LWNG-3-32-181	RWNG-3-32-172	LWNG-4-29-151/52/53	RWNG-4-28-134	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153
22	LWNG-3-32-181	RWNG-3-32-172		RWNG-4-28-134	RSI-5-20-155	RSI-5-20-152	RSI-5-20-151	RSI-5-20-156	RSI-5-20-154	RSI-5-20-153



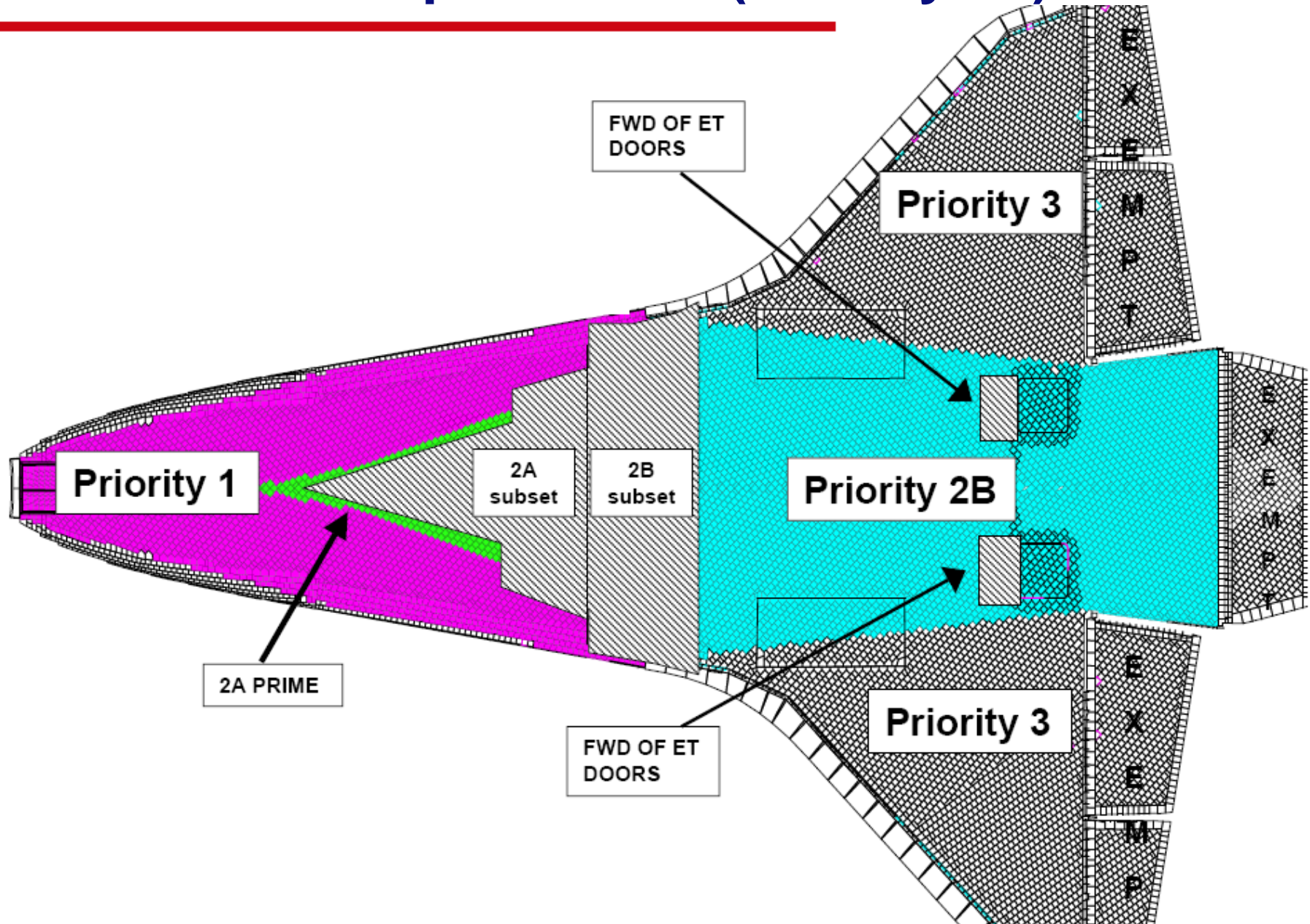
SHADED AREAS (NEED TO COMPLETE)



MCR 19546 Hub Tile Mod (Priority 11)

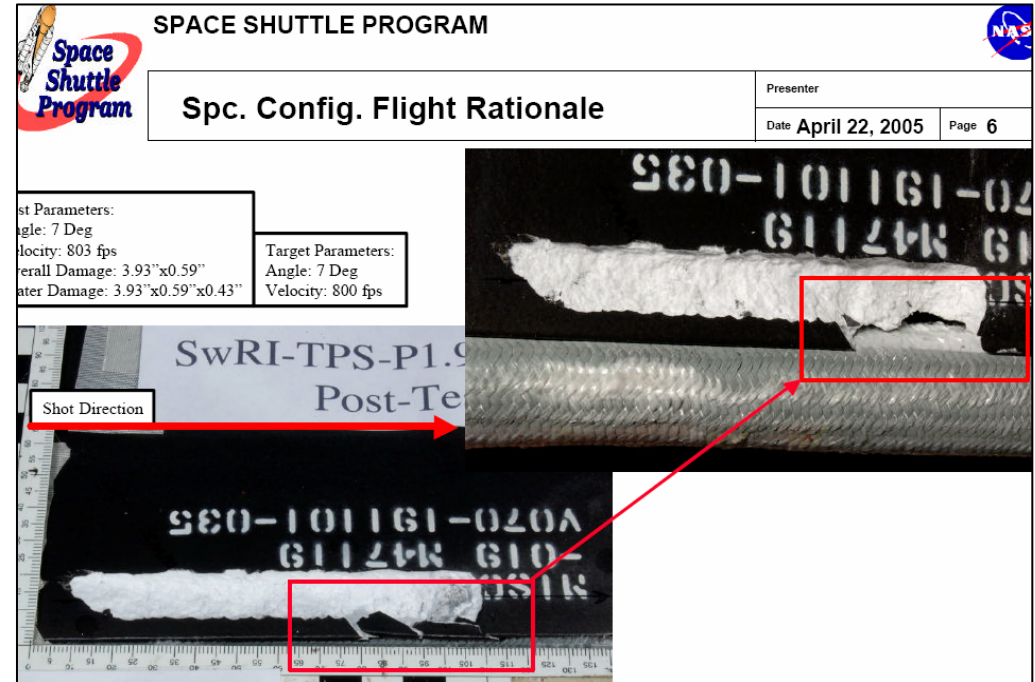
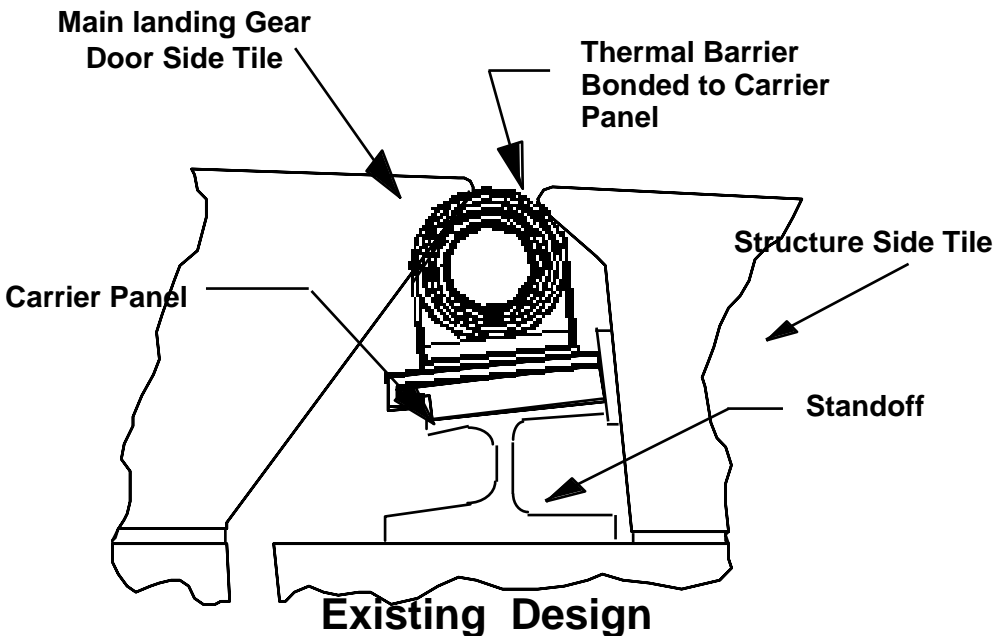
- **OV-104**
 - *RH Side Implemented RWNG-4-J2-3732*
 - *LH Hub not implemented*

GF Replacement (Priority 12)



Priority 1-3 Rationale (MLGD Area)

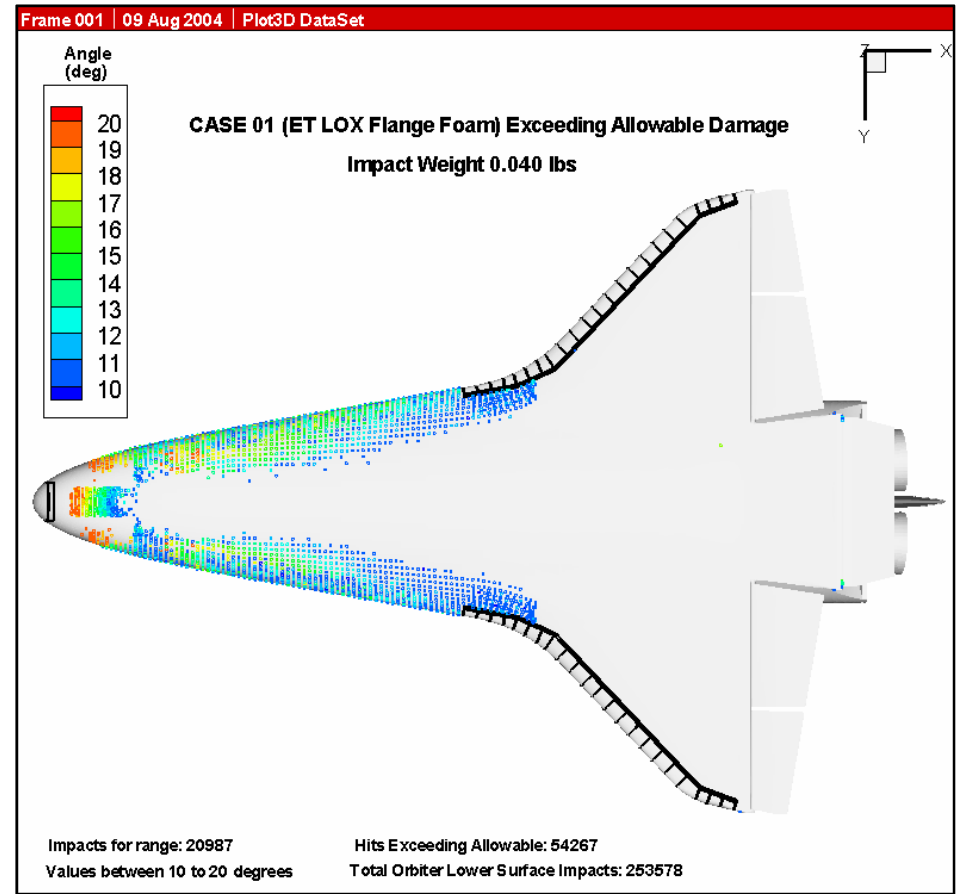
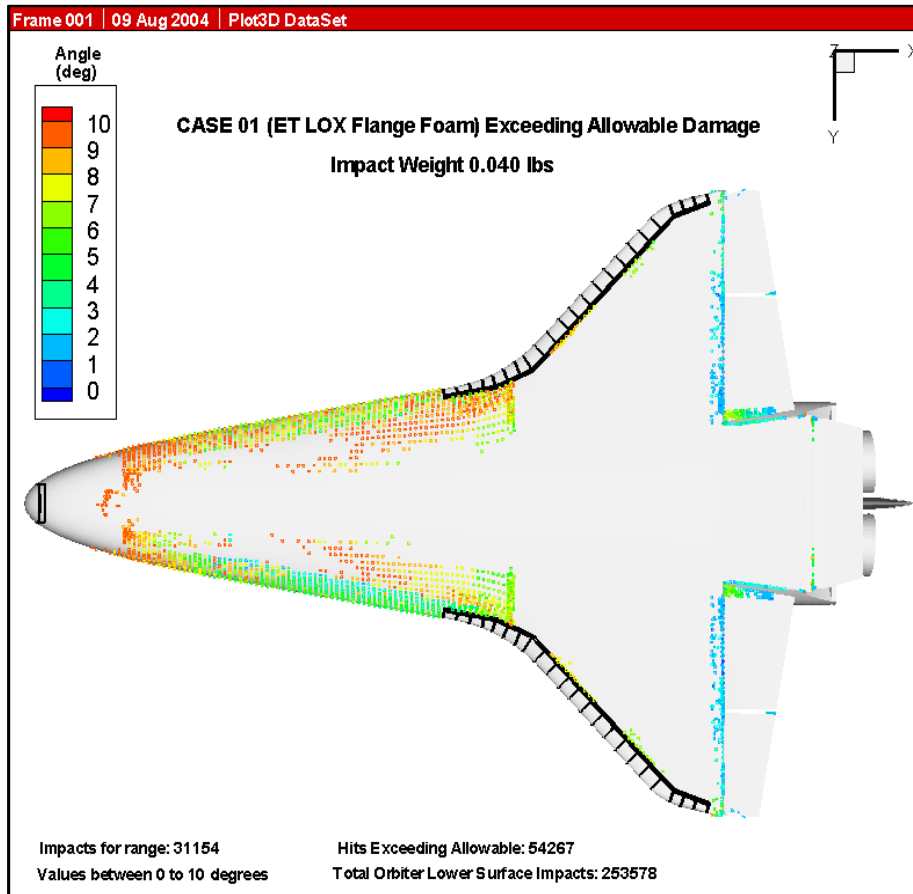
MLG Thermal Barrier Configuration



- MLGD Single Thermal Barrier design is less tolerant of perimeter tile damage
 - NLGD T/B design has full depth redundancy
- Fwd Outboard cavity is the largest

Priority 1-3 Rationale (MLGD Area)

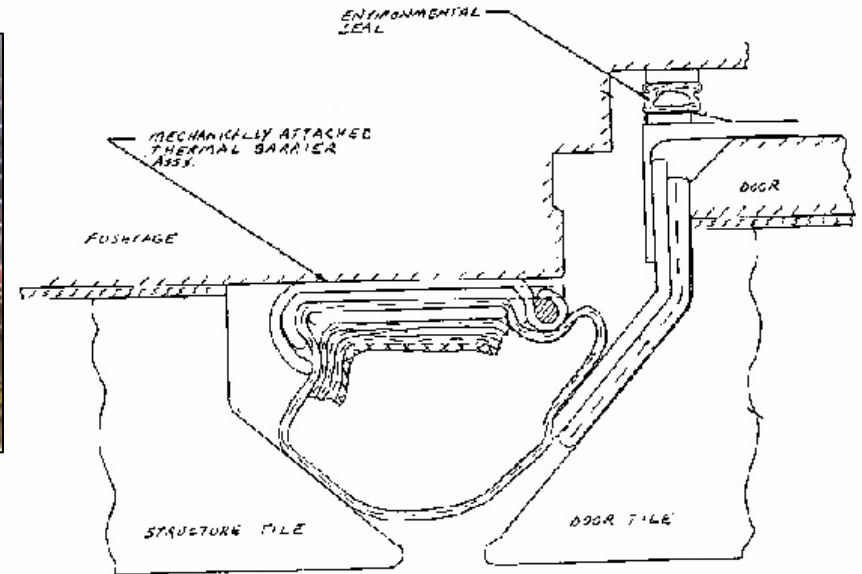
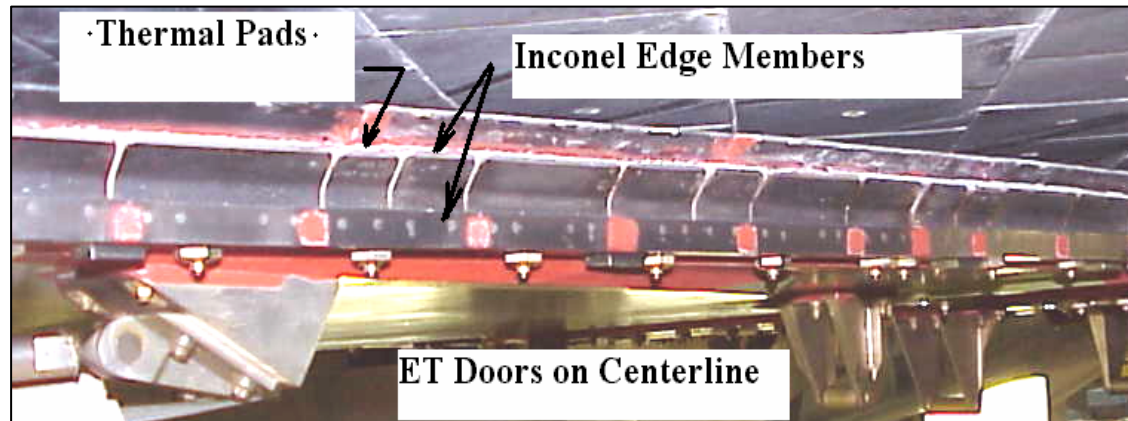
DTA Impact Pattern vs. angle of incidence



Fwd O/B corner & FWD side of MLGD are exposed to higher angle DTA conditions

Priority 4 Rationale (Aft ET Door Area)

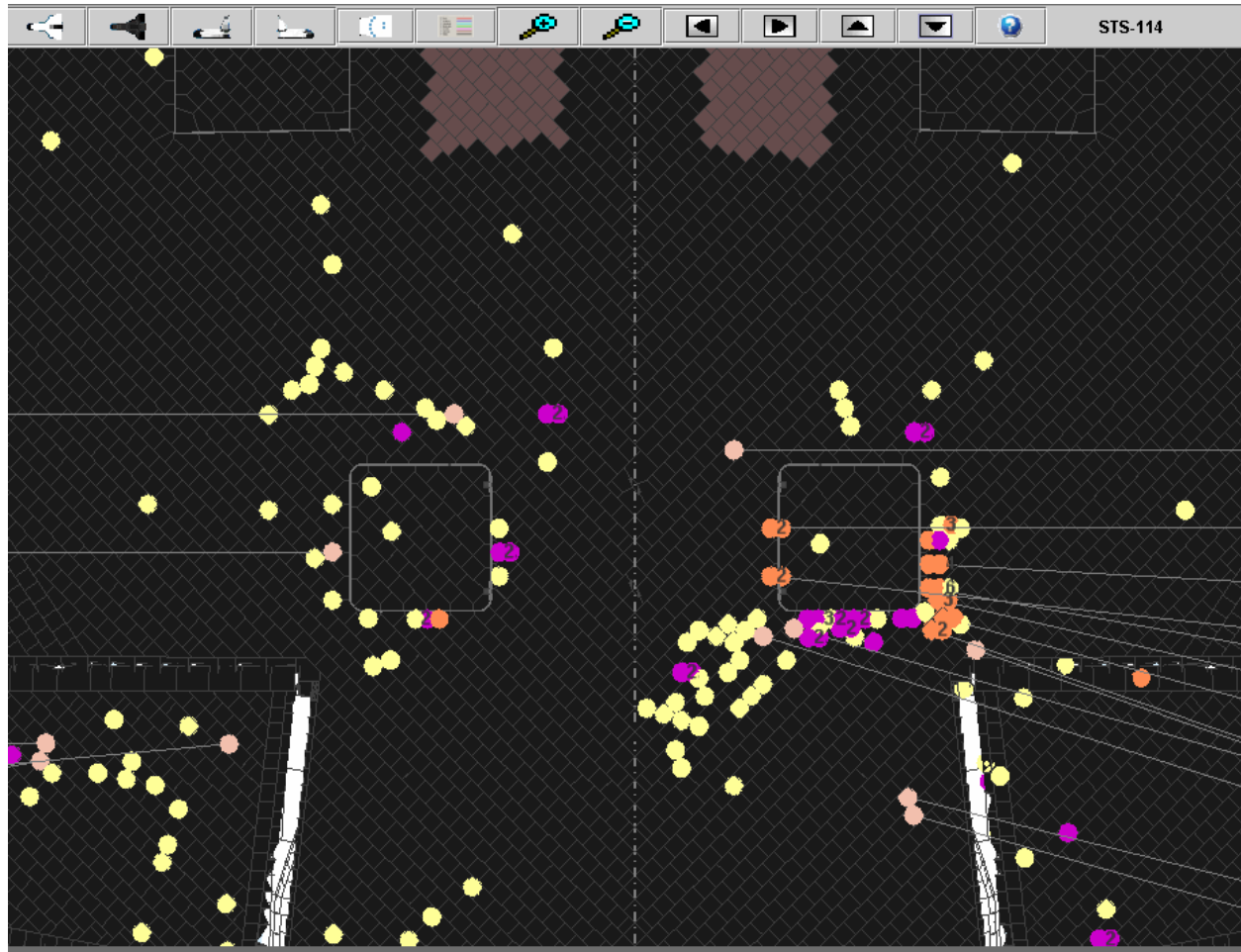
ET Door Thermal Barrier Configuration



- ET Doors are at centerline during ascent
 - Edge members / inconel fingers protect door tiles
- Umbilicals tend to protect AFT edge tiles from potential foam impacts
- Damage experienced on ET Door AFT STR tile OML each flight
 - Baggie / Ice induced ascent damage

Priority 4 Rationale (ET Door Area)

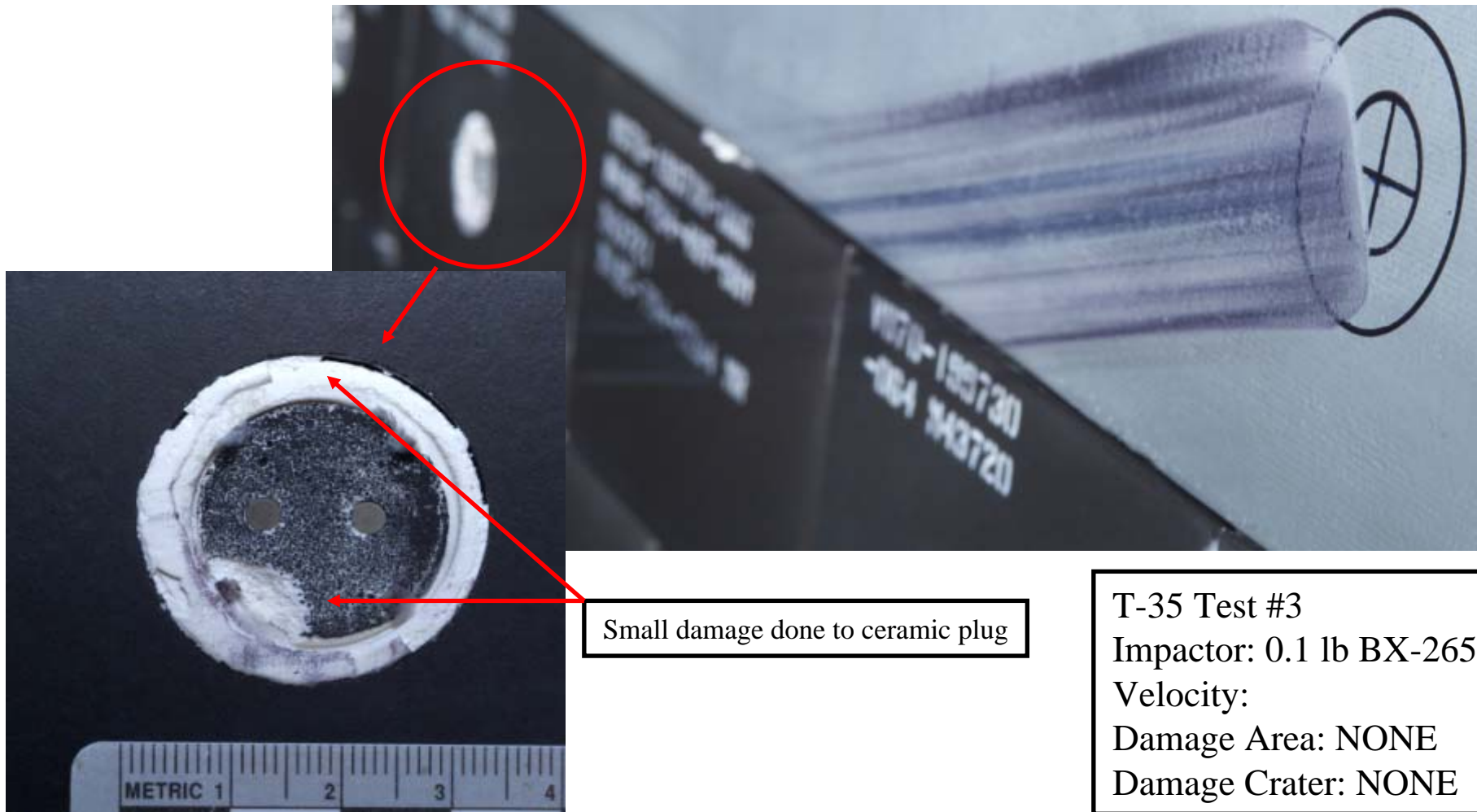
ETD Damages – Last 4 missions



ET Door Aft Edge Damage is Consistent

Priority 5 Rationale (Lower LESS C/P Area)

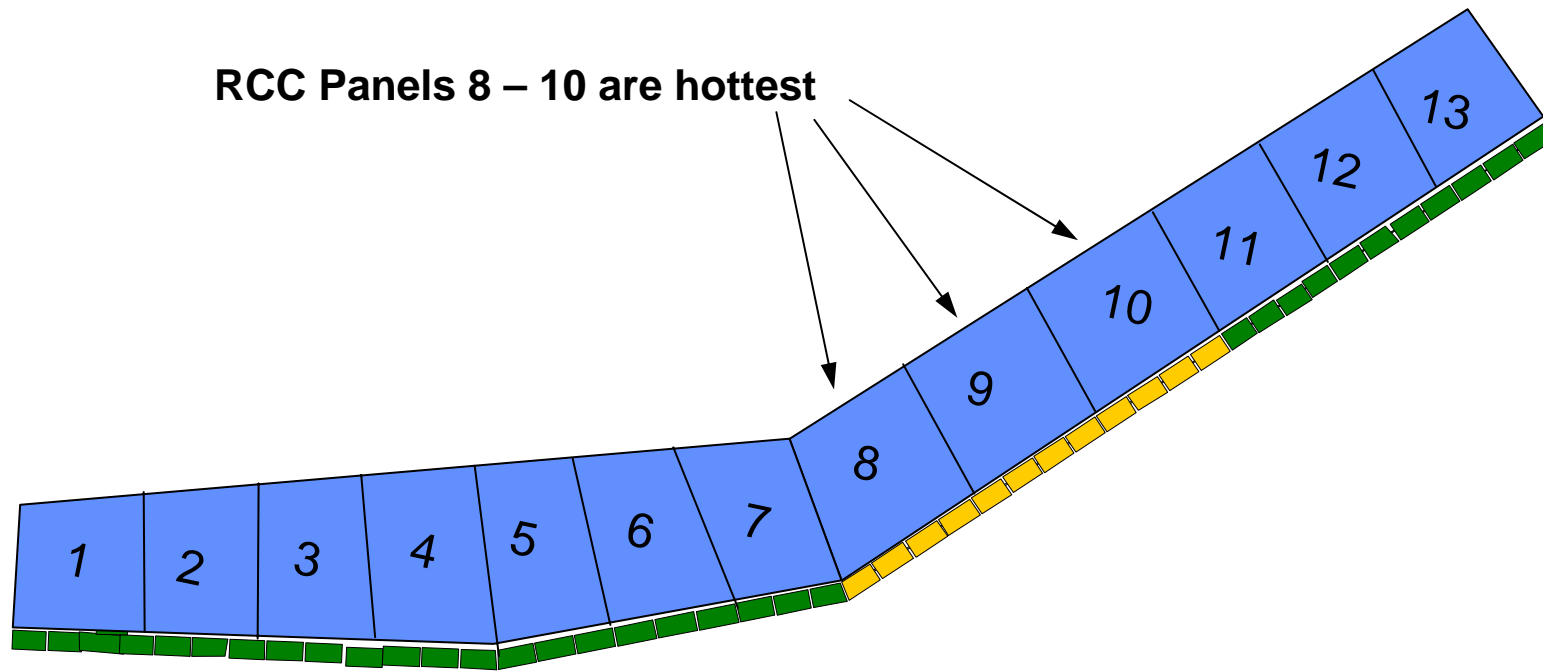
LESS tile harder to damage during test - foam compresses against RCC minimizing impact to carrier panel lip



Small damage done to ceramic plug

T-35 Test #3
Impactor: 0.1 lb BX-265
Velocity:
Damage Area: NONE
Damage Crater: NONE

Priority 5 Rationale (Lower LESS C/P Area)



Lower LESS Panels 8 – 10 See the Most Entry Heating



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

Overview

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

STS-125 Launch Site Requirements Review Flight Software Overview

Judi Powell

FRWG 10/22/07

PRCB 10/25/07

STS-125 LSRR (FSWE)

- STS-125/OV-104 is the Fifth Scheduled Flight of Operational Increment (OI) 32 Flight Software (FSW)
- STS-125/OV-104 Flight Software Payload Support:
 - Hubble SM4
 - Super Lightweight Interchangeable Carrier (SLIC)
 - Orbiter Replacement Unit Carrier (ORUC)
 - Flight Support System (FSS)
 - Multi-Use Logistic Equipment Carrier (MULE)
 - Relative Navigation Sensor (RNS)
 - 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-125 LSRR (FSWE)

- **STS-125 Source Changes/Edits for Primary Flight Software (Base)**
 - SCR 92962 Effectivity Change for SCR 92880 (STS-114 SSME Downlist Requirements)
 - SCR 93160B Year End Roll Over (YERO) Reset
 - SCR 93181A Altitude Initialization
- **STS-125 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - SCR 93158 BFS GMET/MET Update For TAL Aborts
 - DR 121399 Incorrect Bit Set for BFS HUD Velocity Scaling Indicator
 - SCR 93187 BFS HUD K-Load Change
 - SCR 93188A - BFS K-Load Update of FDA Limits for N2/O2 Flowrates

STS-125 LSRR (FSWE)

- **Products**

- **STS-125/OV-104 Base Cycle Product delivery schedule (available to field)**

FPSB

- **Shuttle Data Tape**

January 22, 2008

- **Mass Memory**

January 30, 2008

- **STS-125/OV-104 ADTL Cycle Product delivery schedule (available to field)**

FPSB

Work to

- **Shuttle Data Tape**

May 1, 2008

April 18, 2008

- **Mass Memory**

May 9, 2008

May 5, 2008

STS-125 LSRR (FSWE)

- **Open Items**
 - None
- **Concerns/Issues**
 - Schedules are compressed and extremely sensitive to 1) late/wrong requirement/inputs and 2) any delivery date changes.
 - The STS-125 schedules are interwoven with other flights whose launches are manifested before and after this flight. Perturbations to those schedules could effect the compressed schedule for STS-125/HST.
 - However, at this time there are no known issues with Flight Software in supporting STS-125



STS-125 LSRR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date October 25, 2007	Page 1

STS-125 LSRR

FCE/GFE Status

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



STS-125 LSRR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date October 25, 2007	Page 2

- **Majority of need dates and delivery dates have been partnered through CIR, IPT and weekly GFE telecons; team working to partner remaining dates**

- **Tech orders and hardware list noted in backup charts**

- **Changes since STS-122:**
 - **New Pan Tilt Units (-510) to be delivered for cameras A, B, C, D, elbow and OBSS. New fasteners eliminate -508 PTUs waiver condition.**
 - **Tool Stowage Assembly cushion mod to accommodate HST tooling.**
 - **TCS to be removed as part of ODS docking mechanism removal.**
 - **Two WVS antennas at Xo=759 location removed due to payload cargo interference.**
 - **Adding centerline cameras 1-4 and HST Flight Support System**



STS-125 LSRR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date October 25, 2007	Page 3

BACKUP



STS-125 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date October 25, 2007	Page 4

Tech Order numbers are identified for reference only. Report generated October 12, 2007.

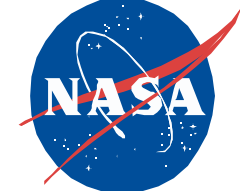
Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	HWD Need	HDW Planned	Remarks	JSC Contact
A (port forward)	M072-750025-076	2/22/08	1/17/07		O	3/24/08	3/24/08	This Flight will fly the -510 Pan & Tilt Unit. Same Camera as STS-123.	Randy Moore
B (port aft)	M072-750025-077	2/22/08	1/17/07		O	3/24/08	3/24/08	This Flight will fly the -510 Pan & Tilt Unit. Same Camera as STS-123.	Randy Moore
C (starboard aft)	M072-750025-078	2/22/08	1/17/07		O	3/24/08	3/24/08	This Flight will fly the -510 Pan & Tilt Unit. Same Camera as STS-123.	Randy Moore
D (starboard forward)	M072-750025-079	2/22/08	1/17/07		O	3/24/08	3/24/08	This Flight will fly the -510 Pan & Tilt Unit. Same Camera as STS-123.	Randy Moore
Payload Ops camera(s)	M072-340109-002		11/15/01		O	4/1/08	4/1/08	ITVC camera from STS-123.	Randy Moore
SRMS elbow camera	M072-544504-007	2/22/08	1/17/07		O	3/24/08	3/24/08	This Flight will fly the -510 Pan & Tilt Unit. Same Camera as STS-123.	Randy Moore
SRMS wrist camera	M072-544504-008	2/22/08	1/17/07		O	3/24/08	3/24/08	Same Camera as STS-123.	Randy Moore
Lefthand Umbilical Camera (forward)	M072-705001-017	5/11/08			O	6/10/08	6/10/08	Flash Module, if available to replace this camera.	Randy Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	5/11/08	10/28/04		C	6/10/08	6/10/08		Randy Moore
Righthand Umbilical Camera	M072-705001-028 M072-705001-027	5/11/08			O	6/10/08	6/10/08		Randy Moore
Digital Television (DTV)	M072-710570-007				C			Installed Hardware.	Larry Schmidt
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001		3/7/00		C			Installed Hardware.	Larry Schmidt
Tools for Rendezvous and Docking (TRAD)	M072-730021-019		7/20/07		C			HHL's only. TCS is not required.	Larry Schmidt
Video Processing Unit (VPU)	M072-710338-006		7/5/01		C			Installed Hardware.	Larry Schmidt



STS-125 LSRR		Presenter MV5/Kenneth Brown
Flight Crew Equipment/GFE		Date October 25, 2007
		Page 5

Tech Order numbers are identified for reference only. Report generated October 12, 2007.

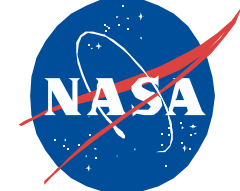
Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	HWD Need	HDW Planned	Remarks	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-014 S-BAND M072-744004-012 S-BAND M072-744004-015 S-BAND M072-744004-018 S-BAND M072-744004-016 S-BAND				C			Installed Hardware.	Randy Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 antenna				C			Installed hardware.	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-004 camera	6/13/08	11/24/04		C	7/14/08	7/14/08		Randy Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing	M072-756111-007				O			Installed Hardware	Gary Cox
Wing Leading Edge (WLE) Instrumentation - Right Wing	M072-756111-008				O			Installed hardware	Gary Cox
OBSS Sensor Package 2 (OPF)	M072-710282-006				C				Larry Schmidt
OMS POD Micro-SGU	M072-755111-001		3/19/02		C			Installed hardware	Gary Cox
WING LEADING EDGE BATTERIES	M072-756111-007 M072-756111-008	4/4/08			C	5/9/08	5/9/08	USA FCE/EVA processing facility is contracted to provide these batteries. USA POC is Richard Stephenson.	Gary Cox
OMS POD MICRO-SGU Batteries	M072-755111-001		3/19/02		C			KSC has all SGU batteries.	Gary Cox
OBSS SENSOR PACKAGE 1 ** (OPF)	M072-710282-008	12/21/07			O	2/15/08	2/15/08	This Flight will fly the -510 Pan & Tilt Unit. Same hardware from STS-117	Randy Moore
Flight Support System (FSS) Centerline Camera					O	6/1/08	6/1/08		Randy Moore



EVA Status

STS-125/HST SM-4 Launch Site Readiness Review

**XA/Linda Thomas, 281-483-2183
Johnson Space Center
October 22, 2007**



Winches

- Forward Winch, SED33101570-327
- Aft Winch, SED33101570-325

Port TSA (Lightweight)

- Port LWTSA installation – Tech Order: M072-660850-005
- Port LWTSA Tools installation – Tech Order: M072-660853-002

Starboard TSA (Lightweight)

- Starboard LWTSA installation – Tech Order: M072-660850-006
- Starboard LWTSA Tools installation – Tech Order: **TBD**
- TSA freeze point 3/13/08



- **ERCM Tether Reel Box**

- ERCM tether reel box, V617-650780-014
- ERCM tether reel box installation – Tech Order: M072-661618-003

- **ERCM Tether**

- ERCM tether, SED33105087-315
- ERCM installation – Tech Order: M072-661618-016

- **Slidewire**

- short, port, SED33103377-311
- Slidewire installation – Tech Order: M072-554700-016



- **Bulkhead PFR**
 - PFR, SED33105308-307
 - Bulkhead PFR installation – Tech Order: M072-661568-029
- **Bay 10 stbd PFR Assembly**
 - JSC will deliver an integrated APC/PFR assembly
- **Bay 10 port MFR Assembly**
 - JSC will deliver an integrated APC/MFR assembly

**STS-125
HUBBLE SPACE TELESCOPE (HST)
LAUNCH SITE REQUIREMENTS REVIEW
PAYLOAD CARGO ENGINEERING STATUS**

**MICHAEL BARIDO
281.212.6072
OCTOBER 25, 2007**

STS-125 LSRR

ENGINEERING FLIGHT PRODUCT STATUS

<u>DRAWING NO</u>	<u>TITLE</u>	<u>REV</u>	<u>EO</u>	<u>RELEASED</u>
V072-200204	MECSLSI	NC	-	24-SEP-2007
VA72-200204	CARGO ARRANGEMENT	NC	-	21-SEP-2007
VD72-200204	AVIONICS DIAGRAM	NC	-	21-SEP-2007
VS72-200204	INTEGRATED SCHEMATIC	NC	-	21-SEP-2007
VS70-540414	RETENTION SCHEMATIC	NC	-	21-SEP-2007

RESCUE FLIGHT STATUS

- NO LON FOR THIS FLIGHT DUE TO NON-ISS FLIGHT

ENGINEERING OPEN WORK

- FRED 12-17-2007

ISS STANDARDIZATION

- MISSION IS EXEMPT FROM STANDARDIZATION DOCUMENT NSTS 60523

STS-125 LSRR

OMRS STATUS

BASELINED FILES

- P321 Assembly Power Converter Unit (APCU)

OPEN WORK

ECD

- BASELINE OMRS
 - FII, V2 POST MATE
 - PP17514 HST SM4 F2V2 11/19/07
 - FII, V4 PRE-MATE
 - PSTBD MISSION UNIQUE LIST 02/07/08
 - PSTBD FIII MUL 02/07/08
 - PSTBD ADJACENT PIN 02/07/08

ISSUES/CONCERNS

- NONE

STS-125 LSRR

ANNEX 1

BASELINED FILES

- NONE

OPEN WORK

			<u>ECD</u>
• BASELINE	08/14/07A	08/31/07A	10/17/07A
INTERIM SUBMITTAL	03/17/08	03/24/08	04/07/08
FINAL WEIGHT UPDATE (L-1M)	06/09/08	06/16/08	07/07/08

ISSUES/CONCERNS

- NONE

TGHR STATUS

CUSTOMER SUBMITTAL(L-4M)

04/07/08

RELEASE FOR REVIEW (L-3M)

05/07/08

BASELINE (L-60 Days)

06/07/08

ISSUES/CONCERNS

- NONE

STS-125 LSRR

Interface Control Documents

ICD-A-14009	HST Servicing Mission		Baselined
A05511*	Power Exceedance, Pin Table updates	11/15/07	In Review
A05517	Update Purge Temp and Flow Rate	12/05/07	In Review

HST-SM forward work: Add structures and thermal model reports; FSS Figure Updates; Incorporate CORE IRNs; Add RF bonding

*** Impact to Flight Products**

STS-125 LSRR

CARGO CLOSE CLEARANCE PROCESS

- ALL CLOSE CLEARANCE AREAS HAVE NOT YET BEEN IDENTIFIED AND CONFIRMED
 - INTERFERENCES BETWEEN FSS AND EGRESSSES/FLUID LONGERONS
 - SLIC KEEL TRUNNION PULLING INTO BEARING
 - FSS LONGERON TRUNNION PULLING INTO BEARING
 - DYNAMIC CLEARANCE BASED ON HST DCLA

- DETERMINATION FOR NEED OF CHIT TO BE MADE AFTER CIR

STS-125 LSRR

CARGO INTEGRATION HARDWARE STATUS

OPEN WORK

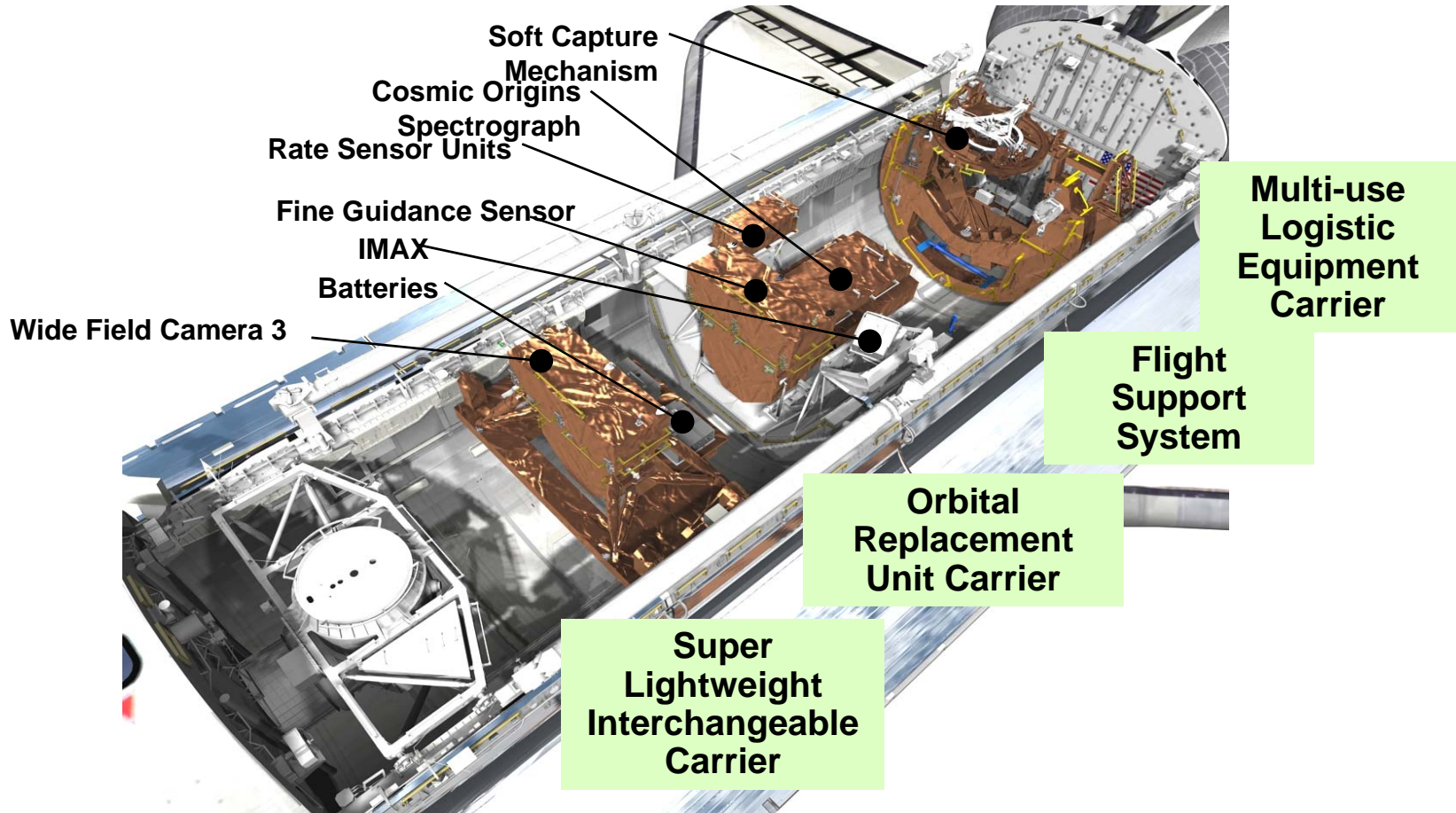
- **Hardware Deliveries**
 - V718-384025-001 Drogue (Remake) ECD: 10/25/07
 - V719-773749-002 AFD Harness (Mod) ECD: 3/11/08
 - V719-713764-002 AFD Harness (Remake) ECD: 3/11/08
 - V725-714067-001 SIP Insert (New) ECD: 3/11/08
 - V845-774979-001 PLB Harness (New) ECD: 3/11/08
- **Certification Approvals**
 - AFD Harnesses, PLB Harnesses, Duct ECD: 10/29/07
 - AFD Harnesses, PLB Harnesses, SIP Insert ECD: 3/25/08
 - STS-125 Recertification ECD: 5/7/08

ISSUES/CONCERNS

- NONE

ISS AND SPACECRAFT PROCESSING STS-125 LAUNCH SITE FLOW REVIEW

● HST SM4 Mission Payload Complement



ISS and Spacecraft Processing
Deborah Hahn/ UB-R3
October 22, 2007



ISS AND SPACECRAFT PROCESSING – SHUTTLE INTEGRATED OPERATIONS

OPF

- Configure OPF C&T lab GSE 04 May 2008(U/R)
- MULE Transfer To Orbiter 05 May 2008(U/R)
- MULE/RNS IVT and E-T-E Test 07-12 May 2008(U/R)
- Transfer MULE to Canister 13 May 2008(U/R)

PAD

- Payload Transfer To Pad 21 July 2008 (U/R)
- Payload IVT 30 July 2008 (U/R)
- IMAX IVT 31 July 2008 (U/R)
- Payload E-T-E 01 Aug 2008(U/R)
- PLB Closeouts 03 Aug 2008(U/R)
- Launch (N.E.T.) 07 Aug 2008 (U/R)



ISS AND SPACECRAFT PROCESSING SUMMARY

- **NO ISSUES OR CONCERNS**
- **The KSC STS-125 ISS and Spacecraft Processing Team is ready to process the HST SM4 Mission**





STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

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-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S0115125A on 10-12-07

- V072-000001-274 (Rev. TBD) Space Shuttle System (Rel. TBD)
 - V072-200204-001 (Rev. NC) Mission Equipment Cargo Support (Rel. 9-24-07)
 - SGD32104448-401 (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - 402 Descent
 - V070-000001-004 Orbiter General Assembly
 - V070-410100-018 SSME Installation
 - 10100-0061-169 Integrated SRB General Assembly (BI-135)
 - 80901000000-510 External Tank Assembly (ET-129)

- STS-125 Mission Configuration Product Plan (MCP) will be published at LSRR + 18 days on 11-12-2007.



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

SSP System Drawings - Cont'd

Ferry Configuration

- **V072-000001-275** (Rev. TBD) Space Shuttle System Drawing (Rel. TBD)
 - **V072-200204-002** (Rev. NC) Mission Equipment Cargo Support (Rel. 9-24-2007)
 - **SGD32104448-001** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - **V072-300055-023** (Rev. BM01) Ferry Flight Configuration (Rel. 7-24-07)

SCA 905

MODULAR LOCKER LAYOUT

(FOR REFERENCE ONLY. NOT A RELEASED DRAWING.
REFER TO CCCD DRAWING # SGD3210TBD)

LEADER: STACI BROWN
DATE: 09/19/07
LAUNCH: 08/07/08

FLIGHT: STS-125 HST SM-4
VEHICLE: OV-104
CREW: 7 CREW 11 + 2 DAY

RQMTS: NO RCRS,
SLEEPING BAGS, ERGOMETER
GALLEY, RMS

MIDDECK AFT

MA9D 8737 -305 RCC COLD BAG (NOAX)	MA16D/F 7250 -301 (9) LIOH #32 - #40
MA9F 2763 -304 MENU FOOD	MA9G 7543 -302 TOOL BOARDS/ ORU TRANSFER BAG/ INSPECTION MIRROR HEX ALLEN WRENCHES CTB
MA9J 7253 -303 EHIP CHARGER EMU BATT. CHARGER REBA CHARGERS(2)W/ EXTENSION CABLES	MA16G 7259 -304 TETHERS WIRE TIE CADDY STD McCADDIES CTB
6642 TBD PILOT	MA16J 5946 -317 PGT'S (2) PGT (NIMH) (5)
MA9N 6410-TBD SOFT STWG BAGS PHKS 4980-310 RESTR (BRKTS) 8071-TBD CCK/FIBERSCOPE/ CHEM LITS 8070-302	MA16L 9014 -TBD MED KITS
MA16N 6068 -319 MINI WORK STATIONS CONNECTOR CLEANER TOOL KIT MANUAL DOOR STAY	MA16M 9114 -TBD SOMS RESC 0235-302

MD CEIL (PORT)

3RD EMU

MD CEIL (STBD)

4TH EMU

MD FLOOR (PORT 2)

 NEW HST TOOLS (2.04)
 HST REPAIR HDWR (1.2)
 BSA B/U (1)
 SPARE DTV VIP (0.10)
 MUX/TOOLS (0.50)
 DTV DSR 25 (0.20)

MD FLOOR (PORT 1)

 CIPAA DISCARD CONT.
 RCC HAND TOOLS
 CRACK REPAIR
 ANGLE STAMP
 SCRAPER, 3 IN
 RCC PLUG

MD FLOOR (STBD 2)

 GEL BRUSH KIT (2)
 EWAS (2)
 TILE OVERLAY (TPL CTB)

MD FLOOR (STBD 1)

 CHEATER BAR
 REBA BATTS (4)
 EMU BATTS (2)
 DIB (16)
 MFR HANDHOLD
 LEG ASSY KIT (3)
 SA2 BISTEM STRAP
 SAFER HAND CTRL

CDR Scott Altman
PLT Gregory C. Johnson
M/S #1 John Grunsfeld
M/S #2 Megan McArthur
M/S #3 Andrew Feustel
M/S #4 Michael Good
M/S #5 Michael Massimino

MIDDECK FORWARD

MF14E 5947 -304 MENU FOOD	MF28E 2765 -304 MENU FOOD
MF14G 1900 -308 CDR	MF28G 1901 -305 PLT
MF14H 6231 -TBD POST INSERTION	MF28H 6045 -TBD PRT'S DOSIMETER ALTIMETER
MF14K 5452 -327 IFM BREAKOUT BOX TURNBUCKLES AIRBOTTLES WWD FLT/RMS KIT	MF28K 6269 -308 COLOR PRINT TRAYS IODINE REMOVAL 6256-305
MF14M TBD FDF CUFF CKLIST (2) 3160-302	MF28M 6243 -311 EMU GLOVES (4 PAIR) SUPA (11) CTB
MF14O 2762 -307 MENU FOOD	MF28O 8765 -303 COLOR PRINTER CTB

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

MF43C/E 7251 -TBD (10) CCC	MF57C 7247 -303 HST TOOL BAG PGT (NIMH) (2) COMPOUND CUTTER	MF71C TBD PGSC/ACCESS
MF43G 1902 -308 M/S #1	MF57E 2760 -306 FRESH FOOD	MF71E 2764 -306 MENU FOOD
MF43H 6250 -352 IFM TOOLS 2163-302 2161-305 2162-307	MF57G 1903 -305 M/S #2	MF71G 1904 -307 M/S #3
MF43K 7551 -302 VIK CADDY/ PCU CONN. BAGS/ SA2 CONN. STRAP/ RETRACTABLE TETHERS EMU BATTERY	MF57H 5473 -305 FDF EMU CUFF CKLST BAND (3)	MF71H 7518 -305 PGT/PDU FUSE PLUG/RATCHET/ LUBE APP/HIGH TORQUE CONN TOOL
MF43M 6299 -318 COAS/FLUOR LT. LIGHT SHIELDS DCS 760/AUDIO DOSIMETER/BTA	MF57K 2766 -305 MENU FOOD	MF71K 1908 -309 CREW SUPPORT
MF43O 8723 -302 STOW-N-GO (PHOTO/TV)	MF57M 3005 -304 M/S #4	MF71M 3006 -304 M/S #5
MF43P 8723 -302 STOW-N-GO (PHOTO/TV)	MF57O 8047 -304 DC VACUUM CTB	MF71O 6697 -TBD HH LIDAR W/NIGHT SCOPE (CONFIG D) SSV

ML60B 7513
TBD

 ERCA LOWER ARM
KITS (3)

ML60E 8940
-TBD

 PGSC'S (7)
A31PS (3/EXP UNIT)
(4 W/O EXP UNIT)

STS1 OCA
STS2 WINDECOM
STS3 KF/MAIL
STS4 RPOP
STS5 RPOP2
STS6 WLES
STS7 RSAD

TRAD (HERE OR
IN DOUBLE LKR)

 BSA PRIME+
PGSC
ACCESSORIES

ML60M 7514
-TBD

 ERCA LOWER ARM
KITS (3)
ULTRASONIC LEAK
DETECTION

VOL B 5484
(MA4D) -316

 HYGIENE (4 MLE)
0.5 ENTRY
GARMENTS

VOL 3B 7425
(MA73J) -314

 QUICK DON MASKS(3)
CABIN AIR CLEANER/
SPOTLIGHT(FLASHLIGHT)
PD100 CAMCDR/FLASH
DCS 760/400MM/
28-70MM LENS

A16 8706
-TBD
STILL CAMERA BAG
STILL CAMERA BAG #2
CAMCORDER BAG #2
FRED LEG BAR

A17 7424
-304
CAMCORDER BAG
DTV CAMERA BAG
HATCH TOOL
QUICK DON MASKS (4)

VOLUME D (MD32C) 7593
-TBD
LIOH (20)
#59-#78

VOLUME F (MD76M) 1403
-306
WET TRASH

VOLUME G (MD80R) 1800
-346
CONT UCDs
WASTE MGMT

VOLUME H (MD23R) 8068
-TBD
EVA ACCESS (INBD)

EVA ACCESS (OBD) 8065
-314
LENS CLEANING KIT

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

EXT AIRLOCK
STBD 7404
-TBD
PORT 7403
-TBD
2-EMUs
EXT A/L FLOOR
LIOH (18)
#41-#58
MIDDECK CONTINGENCY
KIT & BLANKET
CCCS (2)
SIZING KITS (3)
CWC

TOTAL LIOH (78) & G-SUITS (7)
29 LIOH IN LIOH BOX & 1 ATCO
2 INSTALLED
20 VOLUME D
9 MA16D/F
18 EXT A/L BAG

WINDOW SHADE BAG: 5548-348
1. WINDOW SHADES
2. IFM CABLES & HOSES (4259-337)
3. FILM CHG BAG (4828-303)
4. PANEL COVERS

L10A1: V10/AVIU/TAPES 6686-TBD
L10A2: DTV MUX
L11A1: SSP3
L11A2: PDIP 2

L12A1: SSP1
L12A2: SSP2
L12A3: PDIP 1
R12A1: VPU
R12A2: OBSS/OPP/SPASP

* NOT APPROVED
o L-24 LATE LOAD
x TRANSFER TO ISS
CTB CARGO TRANSFER BAG
HCTB HALF CARGO TRANS. BAG
x SWAP

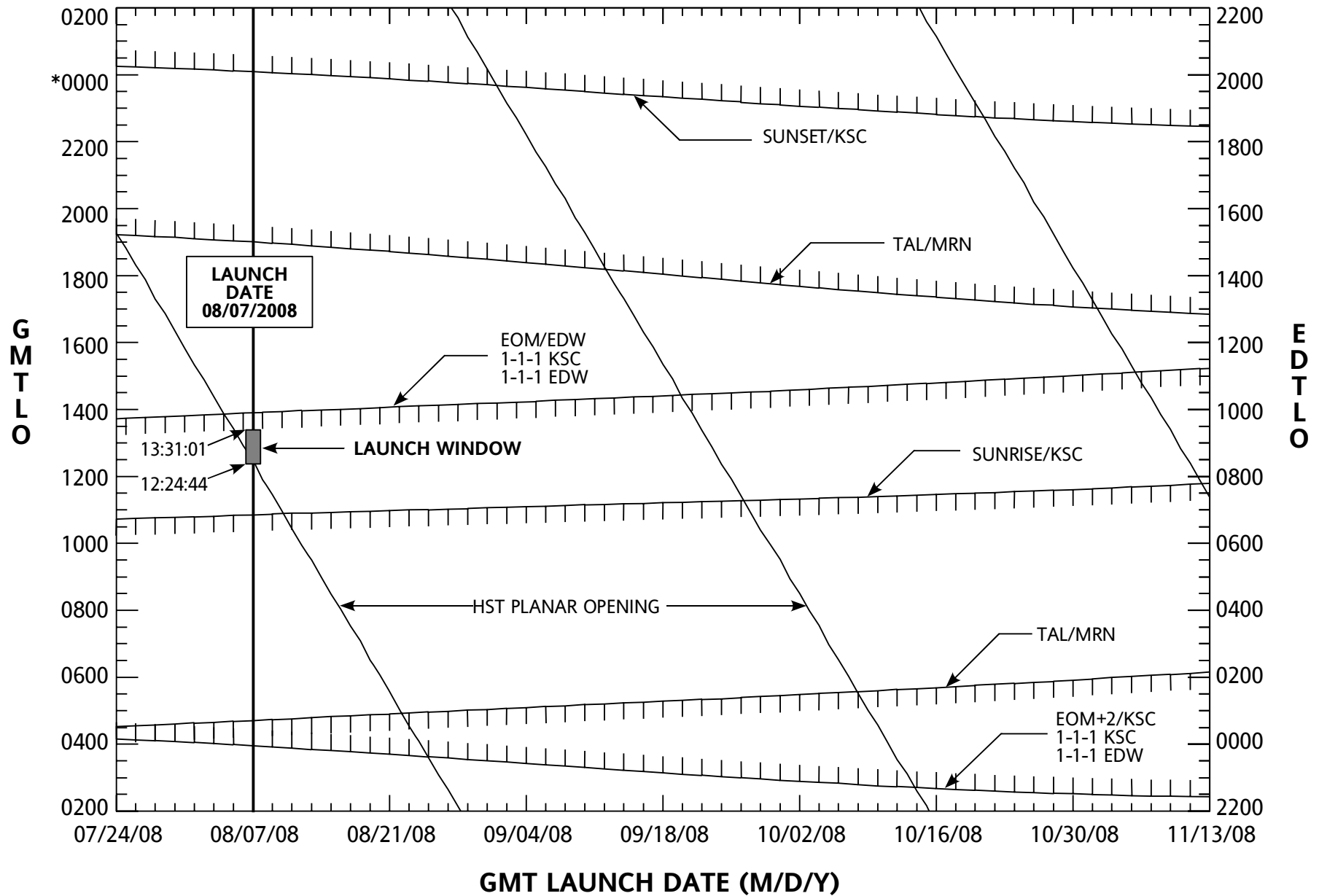
DWG NO. SGD32104448
/USR/DWGS/LOCKER/STS125
CCMM: DELLA WYLIN
(281) 483-9790

NOTE: LOCKER LAYOUTS ARE FOR REFERENCE ONLY AND ARE NOT RELEASED DRAWINGS.
FOR RELEASED DRAWINGS, REFER TO CCCD DRAWING # SGD32104440

Mission Duration = 11+0+2
 Inclination = 28.45°
 OMS2 ha/hp = 297 x 142 nmi.
 Target ha/hp = 305 x 303 nmi.

STS-125 OCF LAUNCH WINDOW

C. Oliver/USH-483L
 R. Roze/USH-483L
 September 12, 2007



Note: EOM lighting lines, based on an OMS2 phase angle of 132 deg, are representative only.
 * Indicates the dateline. Launch times above this point are on subsequent days from the date indicated on the corresponding date axis.



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 4 MCR/TADs have been approved and/or pending mods**
- **Current MCR/TAD impact status:**
 - **No impacts for all six disciplines** **2**
 - **One or more disciplines with impacts, documentation approved and/or pending approval** **1**
 - **MCR 30006 (GSE impact)**



STS-125 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **10-25-07**

Modification Impact Report (Continued)

- **Current MCR/TAD impact status (continued):**
 - **Possible impacts still under review** **1**
 - **MCR 30064 is being reviewed for OMRSD impacts**

MCR/ECP	STAT SITE	ITEM/KIT NUMBER TCTI NUMBER	SEQ EISN NO.	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
	AUTH KSC	J6207A	0104 001	REMOVAL/REPLACEMENT OF OV-104 SYSTEMS 1,2 & 3 WATER SPRAY BOILER AGING COMPONENTS	S-6207A 2007-07-27	MAND 030
	AUTH KSC	J6265	0104 000	RJDA #2 AND RJDF #1 R&R FOR OV-104, FLT 30	S-J6265 2007-09-13	MAND 030

TOTAL MODS = 2

MCR/ECP	STAT	ITEM/KIT NUMBER	SEQ	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
-----	SITE	TCTI NUMBER	EISN NO.	-----	-----	-----
008830	APPD KSC	K712-774039-001	0005 001	ADDITIONAL HST-SM4 HARDWARE ADDED PER V712-774856 A02 (MOVE WHEN MANIFESTED)	NOT REQD	030
	APPD KSC	K718-384001-001	0002 000	HST-SM4 INTEGRATION HARDWARE ADDED BY EDS I/F & K718-384001-001 KIT (MOVE TO ST S-125 WHEN MANIFESTED OR WHEN HST-SM4 FLIES)	NOT REQD	030
	APPD KSC	K718-384001-001	0001 000	HST-SM4 INTEGRATION HARDWARE ADDED BY EDS I/F & K718-384001-001 KIT (MOVE TO ST S-125 WHEN MANIFESTED OR WHEN HST-SM4 FLIES)	NOT REQD	030
	APPD KSC	TCTIM0008830REF	0004 000	ADDITIONAL HARDWARE REQUIREMENTS TO SUPPORT HST-SM4 ADDED PER V719-000002 R06 & V719-773472 A01, (MOVE TO STS- 125 WHEN MANIFESTED)	NOT REQD	030
	APPD KSC	TCTIM7708830REF	0001 000	ADDITIONAL HST-SM4 HARDWARE ADDED PER V845-774788 A04 (MOVE TO STS-125 WHEN MA NIFESTED OR WHEN HST-SM4 FLIES)	NOT REQD	030

TOTAL MODS =

5

Approved STS-125 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
+	E	ORB	S053297AU EV10331R1 (A)	OMRSD EXCEPTION REQUEST - V30 INTERVAL EXTENSION TO 6 YEARS (EV10 331R1)	104 027 030
			S053297BP EK10355 (A)	OMRSD EXCEPTION REQUEST - V31 MID FUSELAGE ZONAL INTERNAL SURVEIL LANCEINSPECTIONS (EK10355)	104 027 030
			S053298ZC EK10572R1 (A)	OMRSD EXCEPTION REQUEST - MISSION LIFE ASSESSMENT OF WING LEADING EDGEINSULATORS (EK10572R1)	104 029 033
			S053298ZD EK10574R1 (A)	OMRSD EXCEPTION REQUEST - WING LEADING EDGE INSULATORS (EK10574R1)	104 029 036
			S053298ZE EK10575R1 (A)	OMRSD EXCEPTION REQUEST - MISSION LIFE ASSESSMENT OF WING LEADING EDGEINSULATORS (EK10575R1)	104 029 031
	W	ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET 099 999
		OMS	S053296GY WK10188R1 (A)	OMRSD WAIVER REQUEST - LRCS OXIDIZER GHE ISOLATION VALVE LEAK(WK 10188R1)	0014 025 032
			S053296YG WK10318R1 (A)	OMRSD WAIVER REQUEST - RIGHT RCS OXIDIZER GHE	0021 034 042

SYSTEM INTERNAL LEA
KAGE(WK10318R1)

	S053298NV WK10522 (A)	OMRSD WAIVER REQUEST - RIGHT OMS SECONDARY REGULATOR CREEP RATE(W K10522)	0021	035 043
ORB	S053296YT WK10332R2 (A)	OMRSD WAIVER REQUEST - PV6 PREVALVESCREEN PARTICLES (WK10332R2)	104	027 031
	S053298HY WK10502 (A)	OMRSD WAIVER REQUEST - BODY FLAP DRIVE RATE TEST (WK10502)	104	027 031

0
1

Date: 10/16/07 12:35

PCASS
FLIGHT-SPECIFIC

Page: 2

Approved STS-125 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
+	W	RCS	S053298JF WK10503 (A)	OMRSD WAIVER REQUEST - RRCS OX TANKOUTLET TRANSDUCER ACCURACY (WK 10503)	0021 034 042
	SRB	S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

```

+-----+
|           | Waivers | Except | Deviat | Cannib | Total |
+-----+-----+-----+-----+-----+
| Total Extracted | 8 | 5 | 0 | 0 | 13 |
+-----+

```

ACTIVE WAIVERS FOR
OV-104

Item #	Authority	Date	Waiver Description	Effectivity	Wad
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
325	S061956	07/15/03	Blanket on the Control Moment Gyro (CMG) Orbital Replacement Unit (ORU) on the Lightweight MPESS Carrier (LMC) will NOT be re-installed on-orbit per configuration defined in ICD-A-21494. It will be secured around the FSE and attached to the aft bulkhead.	OV-104, Flight 27	
334	S115115JR1	07/19/06	The following requirement is waived to allow OV-104 to fly with the following out-of-configuration condition: Tech Order M072-544501-067 (RMS, MPM over-center stop and MPM pedestal insulation cover fasteners) will be implemented in total, less the requirement to perform bench rigging per updated specification requirements for for OV-104, Flight 27 and subsequent OV-104 flights until such time that all MPMs can be removed and bench rigging can be performed.	OV-104, Flight 27 thru OV-104, Flight 999	STAYS OPEN
339	S063652	07/09/07	The following requirement is waived to allow OV-104 to ferry from DFRC to KSC with the following out-of-configuration condition: Retain RH ET Camera installation for ferry flight MECSLSI V072-200197, reference flag note (3), removes (MV0456A) M072-705001-024 RH ET Sep Camera (Digital Camera with 35 mm lens) for ferry flight. The RH ET Camera needs to remain in flight configuration to support resolution of IFA STS-117-V07 Digital Umbilical Camera Image Corruption. Troubleshooting will be performed on the installed hardware after returning OV-104 to KSC.	OV-104, Flight 28	

Prepared by: Jeff McRoberts
USA CM/CVAS
861-2505

ACTIVE WAIVERS FOR
OV-104

Item #	Authority	Date	Waiver Description	Effectivity	Wad
340	S063652	07/09/07	<p>The following requirement is waived to allow OV-104, Flight 28 to ferry with the following out-of-configuration conditions:</p> <p>Remove LH OMS Pod LP04 (FIB) blankets prior to ferry flight thermal blanket V070-396376-241 on LOMS Pod lifted at forward leading corner and edges reported on orbit, IFA STS-117-V-02. Two blankets (V070-396376-241 and adjacent V070-396376-051) are removed. RTV ramp applied in cavity up to adjacent blankets per TLP04-28-2520 MRB approval.</p>	OV-104, Flight 28	

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 10/15/2007

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

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 10/15/2007

12	MEQLG	C00AB0.010.006 NOSE WHEEL ASSEMBLY MC621-0050-0004 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
13	PLM	C00AB0.160.019 TRAJECTORY CNTRL SENSOR FLT KIT SJD39123429-305	TPS-TBD SEPAR TC07-098	REMOVE/REFURB/INSTALL	2	M
14	PLM	C00AB0.160.020A VIDEOSPECTION CAMERA ASSY SED39125120-XXX	TPS-TBD	REMOVE/REFURB/INSTALL	4	M
15	TPS	C00AB0.170.001 RCC ARROWHEAD PLATE MC621-0007-7009	V5139.001 V5139.002	REMOVE/INSTALL	2	O
16	TPS	C00AB0.170.002 RCC ARROWHEAD PLATE MC621-0007-7010	V5139.001 V5139.002	REMOVE/INSTALL	2	O
17	PYRO	C00AD0.030.009 SPHERICAL BEARING ASSY V070-562036-002	V5032.004 V5127	REMOVE/INSTALL	2	O
18	PYRO	C00AD0.030.012 PYRO CENTERING MECHANISM SKD26100098-501	V5032.004 V5127	REMOVE/INSTALL	2	O
19	PLM	JSC24937.30 PORTABLE FOOT RESTRAINT ASSY SED33105308-307	TPS-TBD	REMOVE/REFURBISH/INSTALL	2	M
20	PLM	JSC24937.53 ERCM SAFETY TETHER (2) SED33105087-315	TPS-TBD	REMOVE/REFURBISH/INSTALL	2	M
21	FCS	JSC24937.56 EMER EGRESS SLIDE SYS MC623-0015-0023	TPS-TBD	REMOVE/INSTALL	4	M
22	ECLSS	V61AIL.010-C LIOH CANNISTER MC621-0008-0409	TPS-TBD	INSTALL AT PAD	4	O

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 10/15/2007

23	ECLSS	V61AIL.015-C HYDRAZINE (CO RMVL CART.) MC621-0008-0060	TPS-TBD	INSTALL AT PAD	4	O
24	ECLSS	V61AIL.016-C ATCO CARTRIDGE MC250-0024-0001	TPS-TBD	INSTALL AT PAD	4	O
25	ECLSS	V61AJ0.141 PPO2 SENSOR MC250-0002-3165	V1053.010	RECALIBRATE SENSORS AT PAD	4	O
26	FCS	V66AIL.060 POLE CREW ESCAPE SYS ASSY SED27101375-322	TPS-TBD	REMOVE/INSTALL	4	M
27	COM	V74AD0.130 MSBLS RF #1, 2 & 3 MC409-0017-0007	OMI-TBD SEPAR-TBD	PERFORM 15 MINUTE TEST	4	M

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.