



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



## **STS-119 Integrated Launch Site Requirements Review**

Presenter **Stephen Reilly**

Date **04-03-08**

# **Program Freeze Point**

## **PRCB Presentation**

### **S115119A**



# STS-119 Integrated Launch Site Requirements Review

Presenter	Stephen Reilly	
Date	04-03-08	

Baseline the STS-119 Mission Specific Requirements and Flow Plans. This CR and the associated Data Package were reviewed at the 03-31-08 FRWG.

Flight Management

MO3/USA-PI

Orbiter Engineering\*

Requesting Approval

USA-OE

Orbiter GFE

Requesting Approval

MV5

Status in BackUp

KSC Integration

MK-SIO

Flight Software

USA-FSW

EVA

XA

Payload/Cargo Engineering

USA-PI

SSME

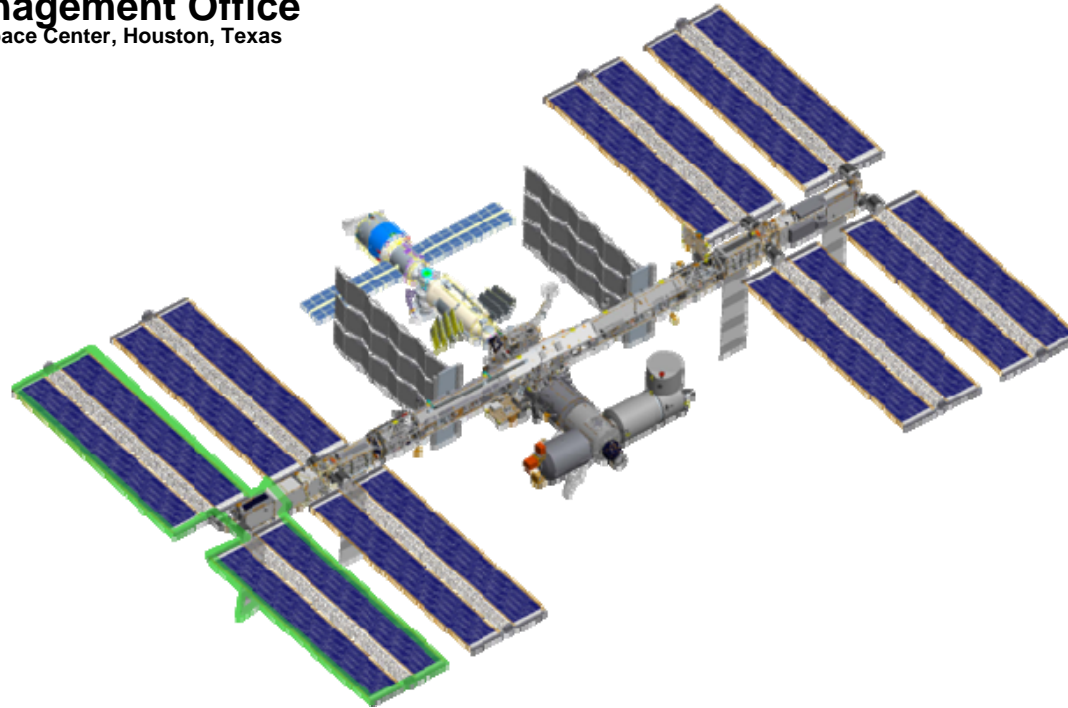
Baseline at LSFR

MP21

\*Backup Material



**SPACE SHUTTLE PROGRAM**  
**Flight Management Office**  
NASA Johnson Space Center, Houston, Texas



**STS-119 (ISS-15A)**  
**Launch Site Requirements Review (LSRR)**  
**Mission Requirements Status**

April 3, 2008

**ZD/Frank Moreno, STS-119 Mission Integration Manager**  
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**STS-119 LAUNCH SITE REQUIREMENTS REVIEW**

Presenter <b>ZD/Frank Moreno</b>
Date <b>APRIL 03, 2008</b>

**MISSION OVERVIEW**

**LAUNCH**

12/04/08  
 39A/ MLP2  
 CREW SIZE: 7

**ORBIT**

51.6 DEG  
 122 NM  
 DIRECT INSERTION  
 DURATION: 13 + 1 + 2 DAYS

**CONFIGURATION**

OV-103 (36)  
 LP01;RP03  
 ET-130  
 BI-137  
 RSRM-105  
 (1) TBD (2) TBD (3) TBD  
 OI-33  
 SRMS,ODS,OBSS,SSPTS

**CONSUMABLES**

CRYO TANK SETS	5 (OFFLOAD)
GN2 TANKS	6 (OFFLOAD)
FWD RCS	1912# (OFFLOAD)
AFT RCS	4970# (FULL)
OMS	22760# (OFFLOAD/COPV)

**PAYLOADS**

ISS 15A (S6)  
 MAUI

**LANDING**

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



## STS-119 LAUNCH SITE REQUIREMENTS REVIEW

Presenter	ZD/Frank Moreno
Date	APRIL 03, 2008

### PERFORMANCE MARGIN

• SIMULATION MARGIN (CIRBF119)		+2756
• WEIGHT CHANGES SINCE SIMULATION		
• PAYLOAD	-90	
• ORBITER	-28	
• NPC	-5	
• CREW COMPARTMENT	+10	
• ET	<u>+2</u>	
TOTAL WEIGHT CHANGES	-111	+111
• OTHER PERFORMANCE PROJECTIONS		
• PROTECTION FOR DOL DISPERSIONS		-700
• SRB – M.P. UPDATES		-184
• 12/04/08 LAUNCH DATE (PMBT & ATMOS)		-330
• SRB – BR / 0.30 MIL LOWER THAN 0.3705 AVG		-108
• PROJ TO 5 MIN WINDOW FROM INPLANE		-600
• PERFORMANCE CHANGES ADJUSTMENT		<u>-8</u>
• CURRENT BASELINED APM (03/18/08)		+937
• IPT Projected (cryo on-load)		-69
• Projected APM		+868



**STS-119 LAUNCH SITE REQUIREMENTS REVIEW**

Presenter	ZD/Frank Moreno
Date	APRIL 03, 2008

**FLIGHT MASS PROPERTIES**

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	200667 (233000)	1082.1 (1075.7)
RTLS	237930 (245000)	1080.2 (1077.2)
TAL	236553 (244000)	1080.3 (1077.2)
AOA	233170 (242000)	1078.2 (1075.7)
CONT RTRN **	234347 (233000)	1079.6 (1075.7)

\*\* Contingency Return (No Dock PLS) case exceeds 233K NEOM weight limit. (See Vol. X Bk.1 Sec. 3.3.1.1.9)  
 Assumptions: Middeck Mass up = Middeck Down Mass; NPC Remaining: Contingency Vs. NEOM: 5341 / 3225 LB  
 RCS Remaining: Contingency Vs. NEOM : 3151 / 2701 LB (Difference is 100% ARCS)

**NOTE: RTLS INCLUDES 185 SEC ARCS, 25 SEC FRCS DUMPS**  
**TAL INCLUDES 120 SEC ARCS, 65 SEC FRCS DUMPS**  
**104 LBS AFT BALLAST (BOXES ONLY)**

**ESTIMATES BASED ON TDDP CIRBF119 AND MODIFIED FOR WEIGHT CHANGES THRU 03/18/08.**



<b>STS-119 LSRR Flight Requirements Status</b>		Presenter <b>ZD/Frank Moreno</b>
		Date <b>4/03/08</b>   Page <b>5</b>

### **PRCB CR Status**

#S072119C	Re-Baseline STS-119 into the FDRD	Approved 10/04/07
#S040213HD	Update Launch Dates for STS-125 and Suns	Approved 02/14/08

### **NSTS 21510 -15A MIP CR Status**

#MIP21510-0008	Update S6 IEA Battery Charging Reqmts at the Pad	Approved 03/4/08
#MIP21510-0009	Add Section 3.1 reference to OBSS and Clarify Section 5.0 SSPTS Requirements	ECD 4/9/08
#MIP21510-0010	Add ISS Utilization Payload Requirements	ECD 4/9/08
#MIP21510-0011	Update Section 4.2.3.2 – Contamination	ECD 4/9/08
#MIP21510-0012	Update O2 Transfer Requirements	ECD 4/9/08
#MIP21510-0013	Update Table 4-2 Mission Task Priorities	In Work – Pending ISS Input

# STS-119 FRD Status

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- **STS-119 FRD Latest Revision: 003, dated February 26, 2008**
  - **Closed R's for Revision 004**
    - **NSTS 17462-119-011 – Update Photo TV Configuration Tables**
      - **Closed 3/26/08**
  - **LON**
    - **No additional FRD required**
    - **Fly STS-119 with LON crew compartment configuration**





<b>STS-119 LSRR</b> <b>Flight Requirements Status</b>	Presenter <b>ZD/Frank Moreno</b>	
	Date <b>4/03/08</b>	Page <b>7</b>

## Issues/Concerns/Open Work:

- **Pad Hold < 96 hrs**
  - Requires reduction to current 601 lb O2 Cryo Offload to accommodate 96 hr Pad Hold and addition of GLACIER and PCDF-PU powered Middeck ISS Utilization Payloads
  - 151 lb Offload reduction approved at 3/26/08 FPSR – *New offload is 450 lb*
- **Defer EVA 1 from FD4 to FD5 to offload intensive robotics ops on FD3 & FD4**
  - For planning purposes EVA 1 will be deferred to FD5; TPS Focused Inspection Place holder moves to FD6
  - Action to ISS to confirm content for 4 EVA's or may delete 4<sup>th</sup> EVA ; decision will have mission duration implications
- **Middeck Stowage Threat - BMRRM (Ascent)**
  - Displaces two 5 MLE Bags; Use ISS-5A stowage design; special bag and foam
  - Current ISS plan is to defer to ISS-17A Mission
- **Optimize Crew Compartment Mass/Volume for ISS Logistics**
  - Crew approved using Volume B for Crew Hygiene supplies

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**STS-119 LSRR**  
**OV-103 FLIGHT 36**

**Alan Ling**  
**USA Orbiter Element**

**April 3, 2008**

# STS-119, OV-103 Flight 36 – Orbiter LSRR Baseline

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## Modifications To Be Baselined at LSRR for OV-103 Flight 36

- 1 Mandatory mod to be baselined

## Previously Baselined Mod (info only)

## Potential modifications (info only)

## Additional Requirements being tracked:

- STR/TPS Priorities
- Chits

## Authorization Requested for MECSLSI and CCCD Updates for STS-119 Orbiter Mods

- Incorporate updates to CCCD and V072-200198 (OV-103 Flight 36)

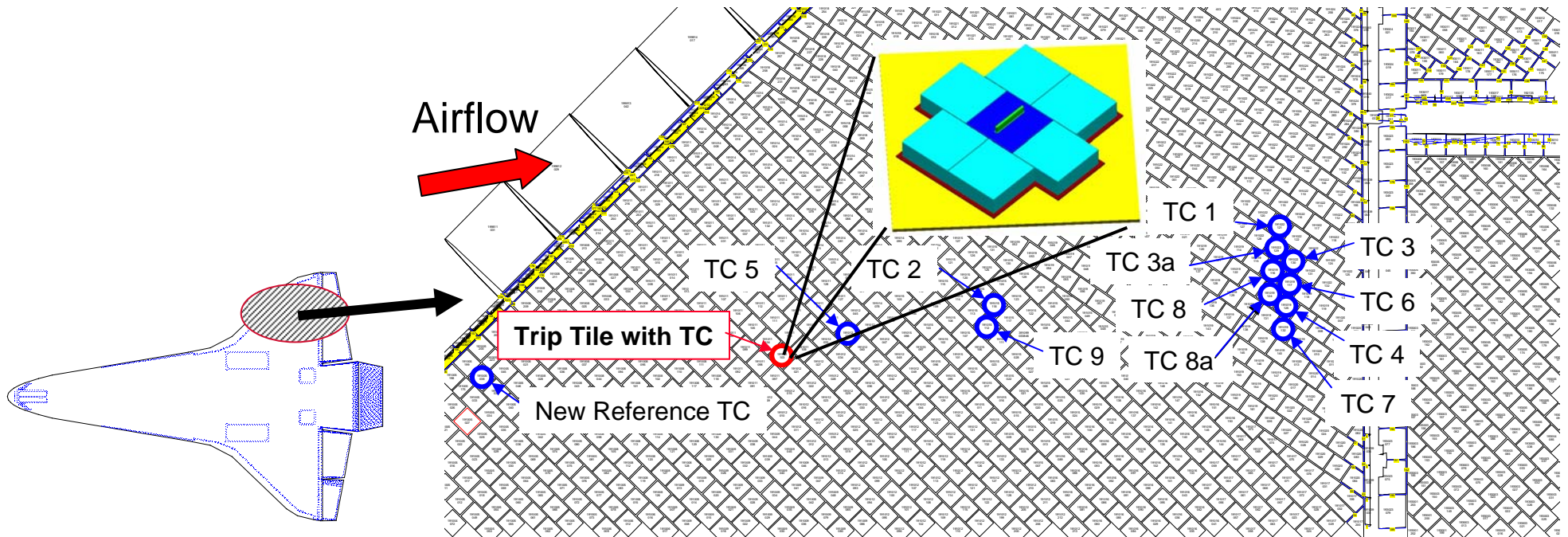
## Backup

- Engineering, Hardware and Certification Status for Proposed Mods
- Mandatory and Opportunity Modification Details

# OV-103 Flight 36 Mandatory Mods - LSRR

## • 30091 Boundary Layer Transition (BLT) Light DTO

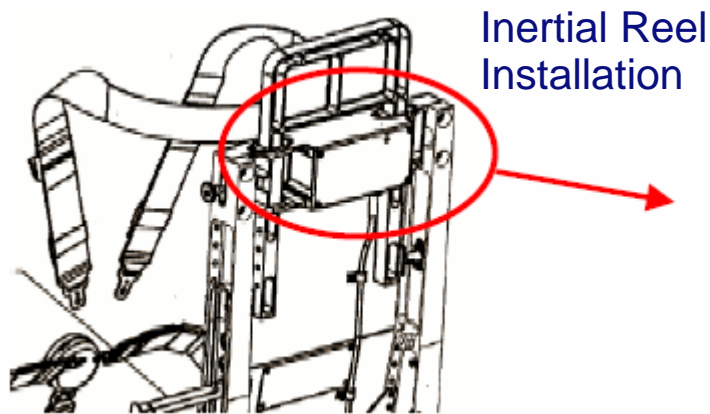
- Mod / flight experiment involves integrated TPS and MADS instrumentation design to fly with a fixed protuberance tile with a height of 0.25" to initiate BLT at ~Mach 15
- A total of thirteen thermocouples will be installed in TPS tiles: eleven will be in the affected wing area downstream of the transitional cone of influence, one in the protuberance tile, and one as a reference upstream of the protuberance.
  - Three tiles aft of the protuberance tile will be changed from LI-900 to LI-2200 as a risk mitigation to eliminate any potential of overheating / slumping of these tiles immediately downstream of the protuberance
- Ten temperature measurements of the thirteen will be selected and recorded each flight on the MADS instrumentation system via wiring to a new thermal reference junction (TRJ) in the wing and from there, wiring (most existing) to the mid-body MADS shelf



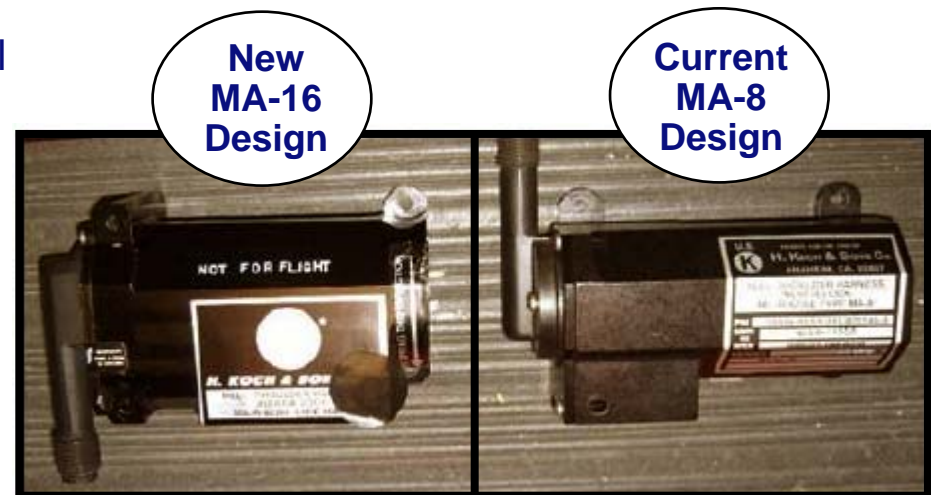
## Mission Equipment Change – Previously Baselined (Info Only)

### • 30010 Inertia Reel Mod for Lightweight Crew Seats

- Modification to replace the existing lightweight (LW) seat MA-8 Inertia Reels with improved MA-16 design
  - Current MA-8 design locks through differential acceleration of the crewmember and the seat in the forward X direction only
    - During a low onset acceleration event, the inertia reel may allow the crewmember to become dislocated from the seatback
    - The occupant may have too much slack in the seatbelts to be properly restrained when the acceleration load reaches sufficient force to lock the inertia reel
  - New MA-16 design provides differential and absolute locking in +/- X, Y and Z axes



PLT/CDR and MS Seat



Mounting hole/footprint identical on MA-16 & MA-8

# Potential Mods /Under Review (Info Only)

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**The following mods are approved but not baselined for STS-119. Will be baselined if opportunity and priority arises:**

- 19735 WLE Spar “Sneak Flow” Protection (RH panels 1-4, LH panels 2-4)
- 19763 Lower WLE CP Horse Collar Gap Filler Redesign (RH 1-4, LH 2-4)
- 23227 Connector Saver (ME414-0630) Redesign (LH OMS Pod, Ku Band)

## **LON Requirements, if necessary**

- 19798 LON Crew Rescue Recumbent Pallet System
- 19760 Recumbent Seat Kit (Seat 8) Rail Assembly

# OV-103 STR/TPS Priorities

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## Mandatory

- Flight damage, OMRS Rqmts/Chits, LRU access, & deferred work
  - **Deferred work may be redeferred with acceptable inspection**
- **Boundary Layer Transition Modification (*Scheduled OV-103 flt 36*) 22 Tile, ~ 20 Gapfillers affected**
- Noted: Continue G/F R & R on a best effort basis - zones 2A, 2B and 2B'

## Prioritized Opportunity

- 1. BRI-18 Tile - MLGD (28 Tile) - Complete**
  - 1<sup>st</sup> subset – FWD and O/B corner – 14/door
- 2. BRI-18 Tile - MLGD FWD Edge (22 Tile) - Complete**
  - 2<sup>nd</sup> subset – fwd & O/B sides – 11/door
- 3. BRI-18 Tile - MLGD O/B Side (18 Tile) - Complete**
  - 3<sup>rd</sup> subset – O/B sides – 9/door outboard side
- 4. BRI-18 Tile - STR side of ET Doors (20 Tile) - Complete**
  - 4<sup>th</sup> subset – ET Doors – 10/door
- 5. BRI-18 Tile – LESS Carrier Panels 8-10 (24 Tile) – Complete**
  - 5<sup>th</sup> Subset – LESS Hot Panels – 12/side

# 103 STR/TPS Priorities Continued

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6. BRI-18 Tile – STR side of ET Doors Inboard side – AFT 4 Tiles (8 Tile) – **1 Complete**
  7. OMS Pod Tile/Fib Mod – (6 tile/side) – **Complete**
  8. Hub Tile Modification – (both sides) – 4 Tiles – **None completed**
  9. I/B Elevon 9lb/90 SIP Upgrade to FRCI-12 – 34 Tiles (17/side) – **2 completed**
  10. O/B Elevon 9lb/90 SIP Upgrade to FRCI-12 – 6 Tiles (3/side) – **4 completed**
  11. Structural Corrosion Sampling – Heat sink Areas – **Approx 56 remaining**
  12. MLGD – Outboard Middle 1/3 - (6 Door/6 STR) – **None completed**
  13. FRCS 9lb/90 SIP Upgrade to FRCI-12 – 14 Tiles (7/side) – 2 add. on 103 near thruster  
– **14 remaining**
  14. MLGD – Outboard Aft (1/3 left) 6/door/6 str)- 24 Tile – **None completed**
  15. Base Heat Shield Stinger 9lb/90 SIP Upgrade to FRCI-12 – 42 Tiles – **None completed**
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# 103 STR/TPS Priorities Continued

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16. Gap fillers in Subset 2B (Line across MLGD edge) – **See Gap Filler Status**

17. BRI-18 Tile – Remaining MLGD (Top Priority)/LESS carrier panels/NLGD

1. MLGD (Inboard forward edge working to AFT door edge) – **98 Tiles remaining**
2. LESS - panels 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order) – **62 Tiles remaining**
3. NLGD (attrition – do leading edge first) – **112 Tiles remaining**

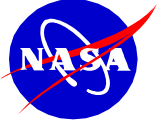
18. Mod work (WLE sneak flow, Horsecollar Gap Fillers, MLGD sneak flow)

19. Remaining Gap Fillers & Window BRI-18

1. Windows 2, 3, 4, & 5 Upper Carrier Panels (top priority) – **59 remaining**
2. Window locations 1 & 6 Upper Carrier Panels 1<sup>st</sup>/Lower C/P's 1 – 6 last – **65 remaining**

# STS-119 Chits

<b>Chit #</b>	<b>Title</b>	<b>Status</b>
J6116	Gapfiller R & R	Approved
J6275A	Corrosion Structure Inspection	Approved
J6296	Thermography On WLE Joggle Areas	Approved
J6327	Tactile Test On WLE Joggle Areas	Approved
J6209	Body Flap PDU R & R	Approved
J6331	Post Flight Payload Close Clearance Measurements	Approved
J6334A	ASA 3 & 4, ATVC 3 & 4 R & R for Tin Whiskers	In Approval Cycle
J6341A	OMS POD Vernier Stinger Door Inspection	In Approval Cycle
J6345	Main Landing Gear Tempi Label Installation	In Approval Cycle
JXXXX	Link-008 Software Update	Potential, under review
JXXXX	Payload Bay Door Centerline Actuator R & R	Potential, under review
JXXXX	IMU Slip Ring R & R	Potential, under review
JXXXX	Window 1-6 Scanning Using IWIT	Potential, under review
JXXXX	NLG & MLG Tire Resistance Checks	Potential, under review



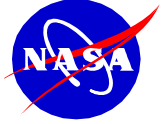
	Presenter <b>MV / Kenneth Brown</b>	
	Date	Page 1

# **STS-119 LSRR**

## **OV-103 FLIGHT 36**

Kenneth Brown  
Orbiter GFE

April 3, 2008



**STS-119, OV-103 Flight 36 LSRR**

Presenter  
**MV / Kenneth Brown**

Date

Page 2

- **Modifications To Be Baselined at LSRR for OV-103 Flight 36**
  - **RMS End Effector Upgrade**
  
- **Potential modifications (info only)**
  - **Thrust Oscillation Seat DTO**
  
- **Partnering of Standard GFE hardware is continuing**



## End Effector Swap

Presenter  
MV / Kenneth Brown

Date Page 3

- MDA is in the process of completing the first End Effector (EE) upgrade on S/N 302:
  - Change the raybestos brakes/clutches to a ceramic material (since raybestos is no longer available)
  - Implement two design modifications to address issues that occurred on STS-103 (back-up release stall)
- EE S/N 302 to be delivered to KSC this summer
  - Plan to swap/return to MDA EE S/N 403 for upgrade
- TO M072-544502 will need to be updated to reflect the new EE configuration



## Thrust Oscillation Seat DTO

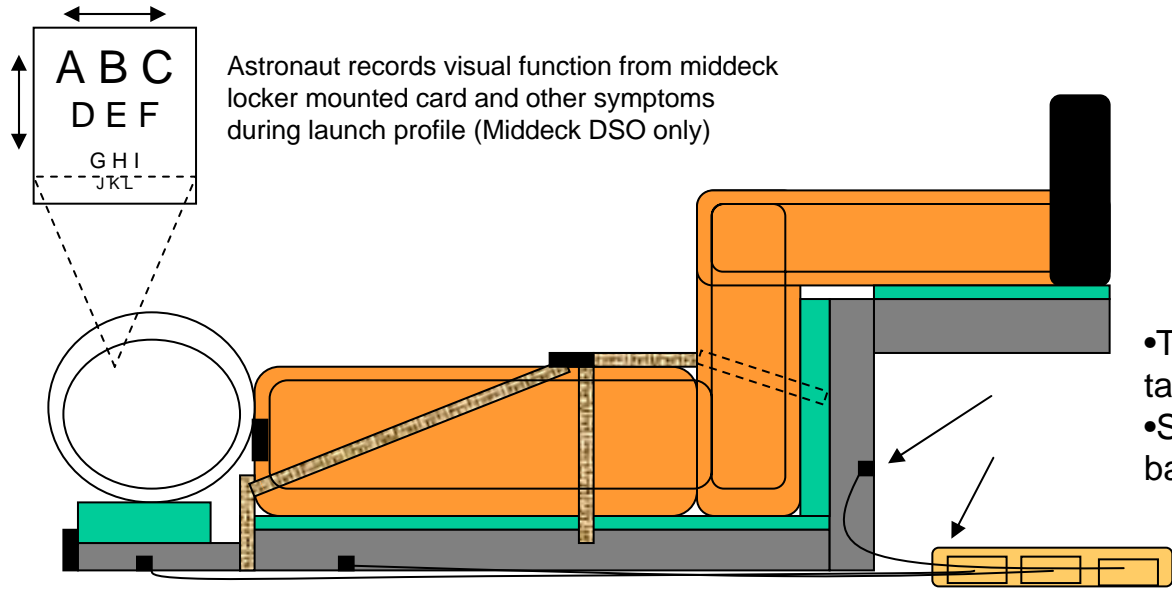
Presenter  
MV / Kenneth Brown

Date Page 4

- Constellation Program (CxP) has requested OPO to implement a DTO to gather launch vibration data
  - DTO will be done in conjunction with a DSO to record astronaut visual performance to aid in CxP unimpeded crew performance specification development
  - Proposed DTO will instrument three Orbiter Seats (Seats 3, 5, 6 or 7)
  - Each seat will be instrumented with three triaxial accelerometers
  - Each accelerometer will be attached to a sensor box, stowed in a softgoods bag
  - Data will be taken during launch, sensors will be removed and stowed post-insertion
  - DTO is targeted for STS-119, STS-127, STS-128



<h1>Thrust Oscillation Seat DTO</h1>		Presenter <b>MV / Kenneth Brown</b>	
		Date	Page 5



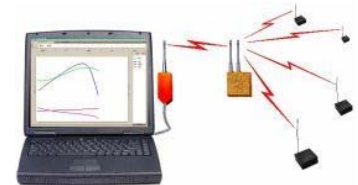
Accelerometer



- Triax accel blocks (3), on tape w/courtesy tab
- Sensor Units (3) in cloth bag with pockets

**Laptop/Software**

- Used to program units pre-flight, and download data post-flight
- Not Required for Flight Ops



Sensor Unit



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



# STS-119 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-03-08**

## Backup Material

## FRWG Presentation (With Minor Changes)



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# STS-119 LSRR BACKUP

- **Engineering, Hardware and Certification Status**
- **Mod Record and MECSLSI Updates**
- **Current Gap Filler Status**
- **Current Bri-18 Status**
- **Hub Tile Mod Details**

# Engineering, Hardware and Certification Status

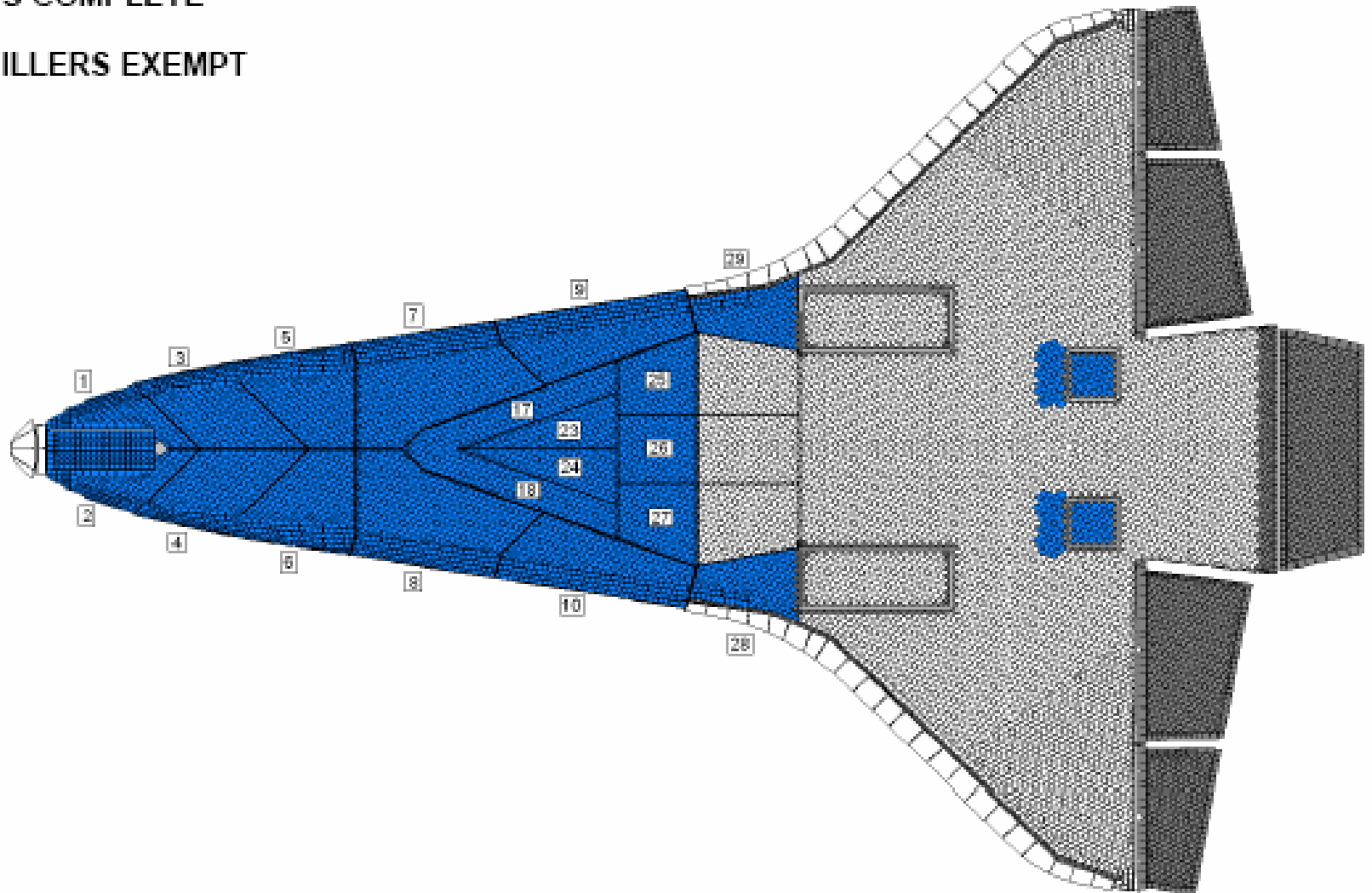
MCR NO.	MCR TITLE	Est. Engr Release (MM/DD/YY)	G.O. Engr Need (MM/DD/YY)	Est. Hdwe Delivery (MM/DD/YY)	G.O. Hdwe Need (MM/DD/YY)	MOD/CERT GO / NO-GO	CERT SUBMITTAL DATE	CERT APPROVAL DATE (ESTIMATE)	CERTIFICATION CR / CAR (BOEING)	REMARKS
<b>Mod for Baseline</b>										
<b>30091</b> Dolas	<b>Boundary Layer Transition (BLT) Flight Experiment (FE)</b> Mod / flight experiment consists of an integrated TPS and MADS instrumentation design with a fixed protuberance tile of .025" which will initiate BLT at approximately Mach 15. Current plan calls for the first FE to be flown on OV-103 Flt 36 with a determination made post-flight if BLT FE will be flown a second flight on OV-103 at the same protuberance height. The BLT FE protuberance will be generating a boundary layer transitional cone downstream of the protuberance. A total of thirteen thermocouples will be installed in TPS tiles: eleven will be in the affected wing area downstream of the transitional cone of influence, one in the protuberance tile, and one as a reference upstream of the protuberance. Three tiles aft of the protuberance tile will be changed from LI-900 to LI-2200 as a risk mitigation to eliminate any potential of overheating / slumping of these tiles immediately downstream of the protuberance. Ten temperature measurements of the thirteen will be selected and recorded on the MADS instrumentation system each flight via wiring to a new therm	4/30/08 (b)	TBD	5/25/08 (c)	TBD	NO-GO (b,d)	4/11/08 P 4/11/08 P 4/11/08 P  (b)	5/23/08 P 5/23/08 P 5/23/08 P  (b)	CR 07-190001-001Y CAR 32-07-190001-001Y (Wing TPS Certification)  CR 05-100004-002K CAR 149-05-100004-002K Wing Structure Certification	<p>Drawings will be a mix of vehicle (V070) drawings, Orbiter mission kit (M070) drawings and tech order (M072) drawings.</p> <p>(b) OCCB review of arc jet testing (planned for the week of March 24), analysis and implementation readiness planned for early April 2008. Engineering release schedule is success-oriented with the assumption that there will be no additional changes required coming out of arc-jet testing and OCCB review.</p> <p>(c) All hardware is provided by KSC USA NSLD / Logistics / TPS Backshop. Wiring, TRJs and TCs will be provided by KSC - tile will be fabricated at the KSC TPS backshop.</p> <p>(d) Arc jet testing and thermal/stress analysis required to certify protrusion tile and heating effects.</p> <p>Note - other equipment will be handled as follows: (1) TRJ &amp; hookup - Orbiter mod (V070 drawings) (2) Structures to mount TRJ and holes for the instrumentation - Orbiter mod (V070 drawings) (3) Instrumented and Protuberance Tiles - Orbiter mission kit (M070 drawings) which stay in the orbiter drawing tree and do not require manifesting on the MECSLSI</p>
<b>Previously Baselined Mod (Info Only)</b>										
<b>30010</b> Groo	<b>Inertia Reel Mod for Lightweight Crew Seats</b> Mod replace the existing LW seat MA-8 Inertia Reels with improved MA-16 Inertia Reels as a result of findings from a NASA Crew Survivability Study conducted to identify key crew survivability improvement areas. One area identified by this study was the Light Weight Seat Restraint System. The currently used MA-8 Inertia Reel only locks from differential acceleration in the forward X direction. The MA-16 Inertia Reel provides differential locking and absolute locking in +/- X, Y, and Z axes.	Released	N/A	7/3/08 (a)	TBD	Go	4/18/08 P	5/23/08 P	CAR 25-39129185-301F CDR & Pilot Seats  CAR 25-39126815-301G Mission Specialist Seats	<p>Drawings affected: SED39126815 LW Mission Specialist Seat, SED39129185 LW Pilot/Commander Seat, M072-660225 &amp; M072-660226 tech order installations, mission kit end items K225-000002 &amp; K226-000002 and ML0101-0113 Acceptance Test Procedure.</p> <p>(a) Estimated delivery date of MA-16 inertia reels to Boeing Crew Equipment Houston. Boeing Crew Equipment will mod pilot / commander seats on the vehicle and mission specialist seats will be modified off-line in the FCE lab per KSC GO identified window of opportunity in the flow.</p> <p><b>Previously program authorized by monthly CCD Mission Equipment Modification directive S063027Y 3/5/08.</b></p>

# Mod Record / MECSLSI Updates for STS-119 LSRR

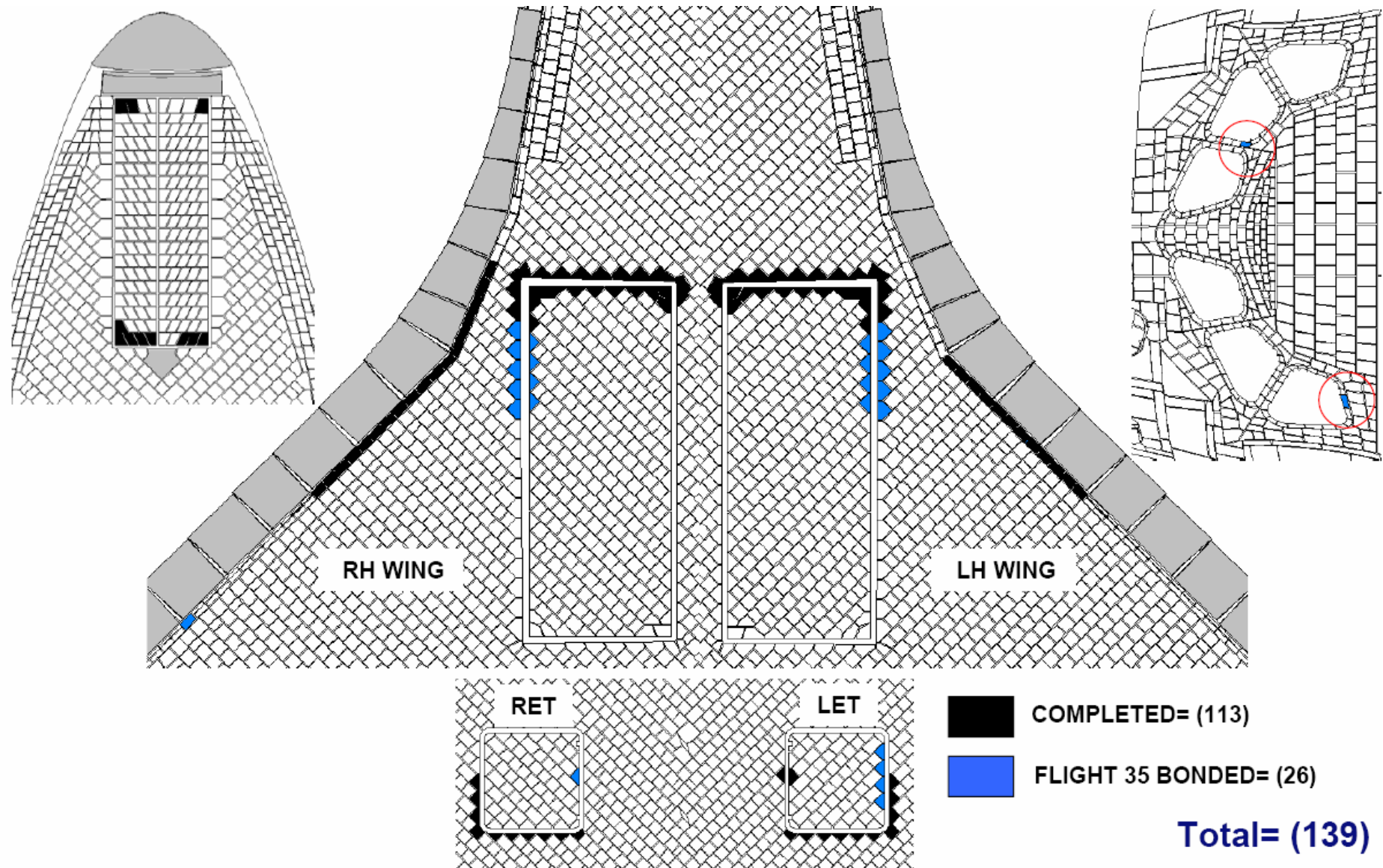
MCR NO.	MCR TITLE	KIT-MOD RECORD / TECH ORDER IMPACT DESCRIPTION	REMARKS
<b>Mod for Baseline</b>			
30091 Dolas	<b>Boundary Layer Transition (BLT) Flight Experiment (FE)</b> Mod / flight experiment consists of an integrated TPS and MADS instrumentation design with a fixed protuberance tile of .025" which will initiate BLT at approximately Mach 15. Current plan calls for the first FE to be flown on OV-103 Flt 36 with a determination made post-flight if BLT FE will be flown a second flight on OV-103 at the same protuberance height. The BLT FE protuberance will be generating a boundary layer transitional cone downstream of the protuberance. A total of thirteen thermocouples will be installed in TPS tiles: eleven will be in the affected wing area downstream of the transitional cone of influence, one in the protuberance tile, and one as a reference upstream of the protuberance. Three tiles aft of the protuberance tile will be changed from LI-900 to LI-2200 as a risk mitigation to eliminate any potential of overheating / slumping of these tiles immediately downstream of the protuberance. Ten temperature measurements of the thirteen will be selected and recorded on the MADS instrumentation system each flight via wiring to a new therm	<p><b>TCTIV1930091REF.0103.0</b> - TPS Instrumentation for BLT</p> <p><b>TCTIM1930091REF.0001.0</b> - TPS Protuberance Tile for Boundary Layer Transition</p> <p><b>VK70-100054-001.0103.0</b> - Wing Structures Kit for BLT</p> <p><b>VK70-756013-001.0103.0</b> - Wing Vehicle Wiring Kit for BLT</p> <p><b>K426-776103-001.0001.0</b> - MADS Mission Kit Instrumentation for BLT</p> <p><b>030091.0103.0</b> - Placeholder for BLT FE Mod</p> <p><b>Tech Order and MECSLSI Impact</b></p> <p>MECSLSI manifested tech orders will be utilized only for instrumentation wiring:            (IS) M072-784634-015 (WAS) M072-784634-014 Shelf 8 Harness Instl Model MV0426A            (IS) M072-786361-004 (WAS) M072-786361-003 LH Wing Wire Hsrness Instl MV0426A</p>	<p>Drawings will be a mix of vehicle (V070) drawings, Orbiter mission kit (M070) drawings and tech order (M072) drawings.</p> <p>(b) OCCB review of arc jet testing (planned for the week of March 24), analysis and implementation readiness planned for early April 2008. Engineering release schedule is success-oriented with the assumption that there will be no additional changes required coming out of arc-jet testing and OCCB review.</p> <p>(c) All hardware is provided by KSC USA NSLD / Logistics / TPS Backshop. Wiring, TRJs and TCs will be provided by KSC - tile will be fabricated at the KSC TPS backshop.</p> <p>(d) Arc jet testing and thermal/stress analysis required to certify protrusion tile and heating effects.</p> <p>Note - other equipment will be handled as follows:            (1) TRJ &amp; hookup - Orbiter mod (V070 drawings)            (2) Structures to mount TRJ and holes for the instrumentation - Orbiter mod (V070 drawings)            (3) Instrumented and Protuberance Tiles - Orbiter mission kit (M070 drawings) which stay in the orbiter drawing tree and do not require manifesting on the MECSLSI</p>
<b>Previously Baselined Mod (Info Only)</b>			
30010 Groo	<b>Inertia Reel Mod for Lightweight Crew Seats</b> Mod replace the existing LW seat MA-8 Inertia Reels with improved MA-16 Inertia Reels as a result of findings from a NASA Crew Survivability Study conducted to identify key crew survivability improvement areas. One area identified by this study was the Light Weight Seat Restraint System. The currently used MA-8 Inertia Reel only locks from differential acceleration in the forward X direction. The MA-16 Inertia Reel provides differential locking and absolute locking in +/- X, Y, and Z axes.	<p><b>K225-000103-001.0001.0</b> - CDR Seat Inertia Reel Mod</p> <p><b>K225-000103-001.0002.0</b> - PLT Seat Inertia Reel Mod</p> <p><b>K226-000103-001.0002.0</b></p> <p><b>K226-000103-001.0003.0</b></p> <p><b>K226-000103-001.0005.0</b></p> <p><b>K226-000103-001.0006.0</b></p> <p><b>K226-000103-001.0008.0</b></p> <p><b>K226-000103-001.0010.0</b></p> <p><b>K226-000103-001.0012.0 thru 0017.0</b></p> <p>- Mission Specialist Crew Seats Inertia Reel Mod</p> <p><b>Tech Order and CCCD Impact</b></p> <p>(IS) M072-660225-012 (WAS) M072-660225-011 CDR &amp; PLT Seats MV0225A</p> <p>(IS) M072-660226-042 thru -046 (WAS) M072-660226-036 thru -040 Mission Specialists Seats (crew of 7) MV0226A</p>	<p>Drawings affected: SED39126815 LW Mission Specialist Seat, SED39129185 LW Pilot/Commander Seat, M072-660225 &amp; M072-660226 tech order installations, mission kit end items K225-000002 &amp; K226-000002 and ML0101-0113 Acceptance Test Procedure.</p> <p>(a) Estimated delivery date of MA-16 inertia reels to Boeing Crew Equipment Houston. Boeing Crew Equipment will mod pilot / commander seats on the vehicle and mission specialist seats will be modified off-line in the FCE lab per KSC GO identified window of opportunity in the flow.</p> <p><b>Previously program authorized by monthly CCCD Mission Equipment Modification directive S063027Y 3/5/08.</b></p>

# OV-103 Current Gapfiller Location

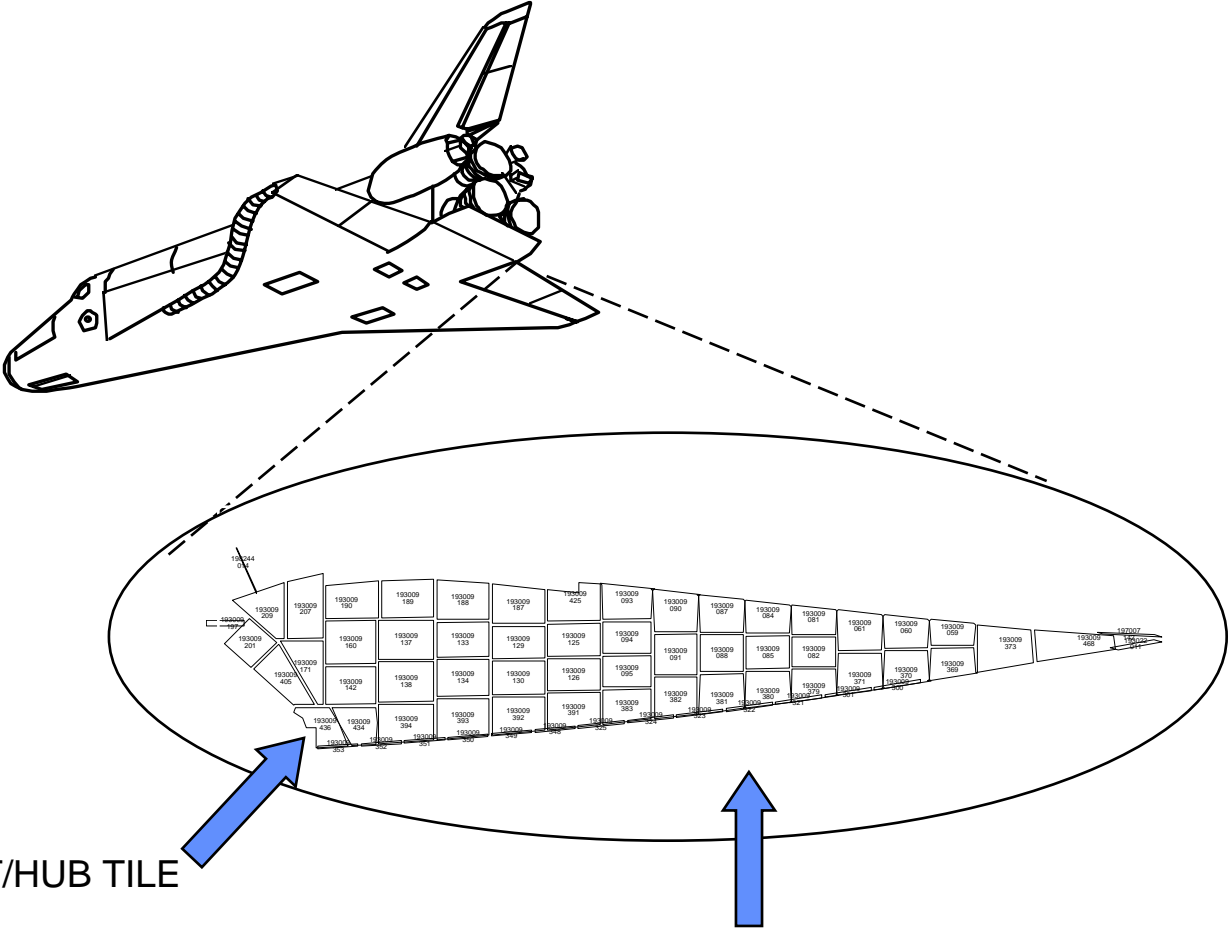
-  BONDS COMPLETE
-  GAP FILLERS EXEMPT



# OV-103 Current Bri-18 Status



# Hub Tile Mod

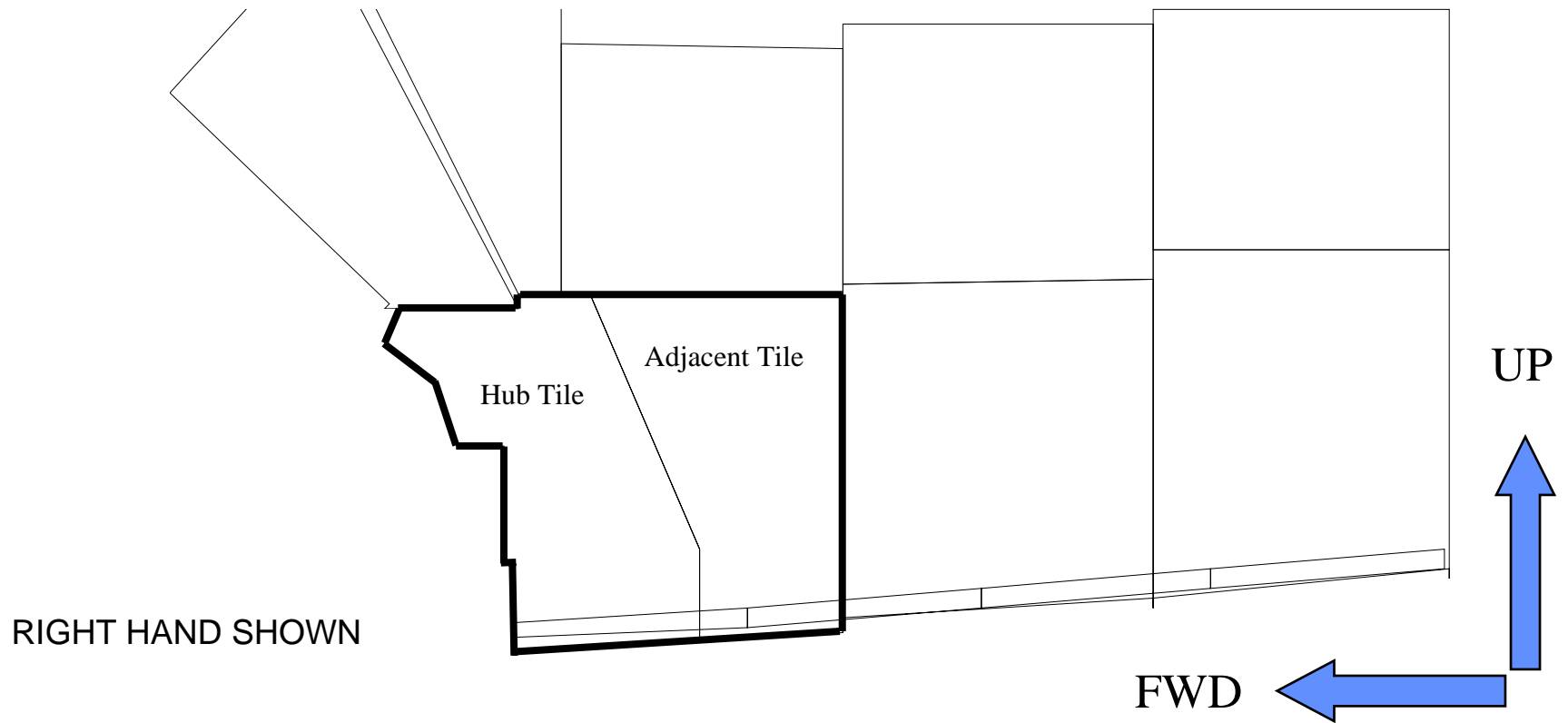


HINGE POINT/HUB TILE

APPROXIMATELY 50 TILE ARE LOCATED ON ELEVON SIDEWALL

# Hub Tile Mod - continued

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<b>STS-119 Launch Site Requirements Review</b>	<b>Presenter</b> MK-SIO / A. Swift	
	<b>Date</b> 4-3-08	<b>Page</b> 1

**Mandatory RCNs:**

**NONE**

**Non-Mandatory Value Added RCNs:**

<b>OS17583R1</b>	<b>F2V3 - MPS Helium Pressure Regulator LL</b>	<b>4/2/08</b>
<b>KV17641</b>	<b>V76 – AMEC Transient Voltage Verification</b>	<b>Prelim</b>



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# **STS-119 Launch Site Requirement Review Flight Software Overview**

**Judi Powell**

**Flight Software**

**FRWG 03/31/2008**

**PRCB 04/03/2008**

# STS-119 LSRR (FSW)

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- **STS-119/OV-103 Base System is the Second Scheduled Flight of Operational Increment (OI) 33 Flight Software (FSW)**
- **STS-119/OV-103 Flight Software Payload Support:**
  - ISS-15A
  - Orbiter Interface Unit (OIU)
  - Sequential Still Video (SSV)
  - Orbiter Docking System (ODS)
  - Trajectory Control System (TCS)
  - 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-119 LSRR (FSW)

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- **STS-119 Source Changes/Edits for Primary Flight Software (Base)**
  - SCR 93211A - Update of SSMEC Downlist for Enhanced Accelerometer Operations
  - SCR 93215A - Protect Ascent Bearing Spec From MM 104 Retrograde Guidance Solution
  - SCR 93252A - Raise Fwd RCS Tank Temperature Limit
  - DR 124995 - Runway Label Not Displayed Above Runway
  - DR 124997 - Wrong DEU for Spec 54 Auto Ascent to Entry Bearing Switch
  - DR 126166 I-Load Constraint Checker for STS 126 Failed with an Abend
  - DR 126187 Entry Bearing Display not Displayed on CRTs with Unsupported MF after MM602 Transition
- **STS-119 Patch Implementation for Primary Flight Software**
  - None

# STS-119 LSRR (FSW)

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- **STS-119 Patch/Edit Implementation for Backup Flight Software (included on the delivered mass memory)**
  - SCR 93223 - Change N2/02 BFS FDA K-Loads to I-Loads
  - DR 121410 - BFS Setting of Unused Bits in Feature Control Words
- **Products**
  - **STS-119/OV-103 Base software production schedule (available to field)**
    - Shuttle Data Tape May 13, 2008
    - Mass Memory Unit Contents May 29, 2008
  - **STS-119/OV-103 ADTL software production schedule (available to field)**
    - Shuttle Data Tape August 28, 2008
    - Mass Memory Unit Contents September 12, 2008
- **Open Items**
  - None
- **Issues or Concerns**
  - There are no known issues or concerns with Flight Software in supporting STS-119



*Extravehicular  
Activity  
Office*



# **EVA Status STS-119/15A Launch Site Readiness Review**

**David Foltz  
EVA Office  
Johnson Space Center  
April 3, 2008**

- **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 Port TSA**
  - Port LWTSA installation – Tech Order: M072-660850-005
  - Port LWTSA Tools installation – Tech Order: M072-660853-002
- **No Starboard TSA**
- **Winches**
  - Winch P/N SED33101570-327 on Forward Bulkhead
  - Winch P/N SED33101570-325 on Aft Bulkhead

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**STS-119  
ISS-15A / ITS-S6**

**Launch Site Requirements Review  
Payload Cargo Engineering Status**

**Yvette Carmona**

**281-212-6492**

**03/31/08**

# STS-119 LSRR

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## Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Rev</u>	<u>EO</u>	<u>Released</u>
V072-200198	MECSLSI	Basic	-	01/23/08
VA72-200198	Cargo Arrangement	Basic	-	01/25/08
VD72-200198	Avionics Diagram	Basic	-	01/25/08
VS72-200198	Integrated Schematic	Basic	-	01/25/08
VS70-540394	Retention Schematic	Basic	-	01/25/08

## Engineering Open Work

- FRED 04/28/08

## Standardization

- Mission configuration complies with Orbiter/Payload Integration Standardization Document NSTS 60523

## Rescue Flight Status

- Cargo bay payload would remain installed for STS-119 rescue mission



# STS-119 LSRR

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## OMRSD

### Baselined Files

- None

### Open Work

<u>RCN #</u>	<u>Title</u>	<u>RCN Release</u>	<u>ECD</u>
<u>F2V2 (Post Mate)</u>			
• PP16162	P510 - ISS-15A S6 Baseline	03/05/08A	04/07/08
<u>F2V4 (Premate)</u>			
• DPS12590	STS-119 Mission-Unique List	05/10/08	05/24/08
• DPS12605	FIII MUL	05/10/08	05/24/08
• PSXXXX	Adjacent Pin Test	05/10/08	05/24/08
<u>F2V6 (Shuttle Experiments)</u>			
• None			

### Issues/Concerns

- None

# STS-119 LSRR

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## Annex 1

- Baselined Files

- NSTS 21510 ISS-15A

- Open Work

- ISS-15A A01 – NSTS 21510

- Safety-Critical Switch List Update

- Interim Submittal

- Data required: Weight update

- Final Weight Update (L-1M)

### Submittal

03/28/08

07/14/08

10/21/08

### CR Release

04/011/08

07/21/08

10/28/08

### ECD

04/25/08

08/04/08

11/04/08

- Issues/Concerns

- None

## TGHR Status

- Open Work

- Customer Submittal (L-4M)

- Release For Review (L-3M)

- Baseline (L-60 Days)

08/04/08

09/04/08

10/03/08

- Issues/Concerns

- None

# STS-119 LSRR

## Interface Control Documents

ICD-A-21418	RSC		Baselined
ICD-A-21420	VPU		Baselined
ICD-A-21429	DTV		Baselined
ICD-A-21403	SSV		Baselined
ICD-A-21449	Mini-Cam		Baselined
ICD-A-21264	Orbiter Interface Unit		Baselined
ICD-A-21510-S6	ITS-S6		Baselined
A05581*	Bonding Requirements	04/04/08	In Review
A05582	Update Venting Paragraph	05/19/08	In Review
Forward Work:	Update CE attach point location compatibility; Struct/Dynamics report numbers; Incorporate ISS IDD IRNs; Update Mech figures per CAD model*; Add Section 20		
ICD-A-21342	ODS-ISS		Baselined
A05573	Incorporate CORE IRNs	05/08/08	In Review
ICD-A-21510-OOR	On-Orbit Interfaces		Baselined
A05551*	Implement SSPTS	04/11/08	In Review
Forward Work:	Update Thermal Data; Incorporate ISS IDD IRNs; Potential CE deployment violations; Add loads and robotics data (Sect 4, 11, 14)		

\* Impact to Flight Products

# STS-119 LSRR

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## Cargo Close Clearance Process

- No clearances less than 1 inch identified by compatibility assessment
- No measurements required at this time

## Cargo Integration Hardware

### Delivery Status

- All required CIH has been delivered

### Issues/Concerns

- None



## **STS-119 Integrated Launch Site Requirements Review**

Presenter **Kenneth Nowak**

Date **04-03-08**

### **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-119 Integrated Launch Site Requirements Review**

Presenter **Kenneth Nowak**

Date **04-03-08**

### **SSP System Drawings**

**The Drawings Baseline Was Released By PRCB S0115119 on 02-12-08**

- **V072-000001-261** (Rev. VH) Space Shuttle System (Rel. 03-05-08)
  - **V072-200198-001** (Rev. NC) Mission Equipment Cargo Support (Rel. 01-23-08)
  - **SGD32104442-301** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
    - 302** Descent
  - **V070-000001-003** Orbiter General Assembly
    - **V070-410100-017** SSME Installation
  - **10100-0061-170** Integrated SRB General Assembly (BI-137)
  - **80901000000-529** External Tank Assembly (ET-130)
  
- **STS-119 CIR + 70 days Mission Configuration Product Plan (MCP) will be published on 04-21-08 and will be republished at LSRR +18 days on 04-21-08**



## **STS-119 Integrated Launch Site Requirements Review**

Presenter **Kenneth Nowak**

Date **04-03-08**

### **SSP System Drawings - Cont'd**

#### **Ferry Configuration**

- **V072-000001-262** (Rev. VH) Space Shuttle System Drawing (Rel. 03-05-08)
  - **V072-200198-002** (Rev. NC) Mission Equipment Cargo Support (Rel. 01-23-08)
  - **SGD32104442-001** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
  - **V072-300055-015** (Rev. BN) Ferry Flight Configuration (Rel. 02-20-08)

**SCA 911**



## **STS-119 Integrated Launch Site Requirements Review**

Presenter **Kenneth Nowak**

Date **04-03-08**

### **Modification Impact Report**

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



MCR/ECP	STAT SITE	ITEM/KIT NUMBER TCTI NUMBER	SEQ EISN NO.	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
-----	AUTH KSC	J6209	0103 000 SPAR	REMOVAL AND REPLACEMENT OF OV-103 BODY FLAP (BF) POWER DRIVE UNIT (PDU)	S-J6209 2007-09-21	MAND 036
	AUTH KSC	J6275A	0103 000 SPAR	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT LSFR AND FINALIZED AT DLSFR FOR EACH FLOW.	S-J6275A 2008-02-26	MAND 036
	AUTH KSC	J6296	0103 001 SPAR	OV-103 IR THERMOGRAPHY REQUEST	S-J6296 2007-11-07	MAND 036
	AUTH KSC	J6327	0103 001 SPAR	WLE RCC JOGGLE INSPECTION	S-J6327 2008-02-14	MAND 036
	AUTH KSC	J6331	0103 001 SPAR	STS-124 ELBOW CAMERA TO JEM PM MEASUREMENT CLEARANCE MEASUREMENTS WILL BE PERFORMED PRE-FLT AND POST- FLT DURING DECONFIGURATION.	S-J6331 2008-03-03	MAND 036

TOTAL MODS =

5

Approved STS-119 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)		ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
+	E	OMS	S053296YK EK10327 (A)	OMRSD EXCEPTION REQUEST - RIGHT RC SOXIDIZER B-LEG PAD REGULATOR L OCKUPPRESSURE (EK10327)	0023	032 040
			S053297WA EK10452 (A)	OMRSD EXCEPTION REQUEST - RRCS FUEL GHE TANK P1 TRANSDUCER ACCURA CY (EK10452)	0023	032 039
		ORB	S053299DT EV10602-A (A)	OMRSD EXCEPTION REQUEST - WING LEADING EDGE SPAR STRUCTURAL SAMPL INGDEFERRAL (EV10602)	103	035 999
	W	ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET	099 999
		OMS	S053296UM WK10299 (A)	OMRSD WAIVER REQUEST - RP03 TK302 DYNATUBE LEAK RATE (WK10299)	0023	032 040
		ORB	S053297NZ WK10415 (A)	OMRSD WAIVER REQUEST - MADS FDM CALIBRATION MANUAL MODE (WK10415)	103	031 038
			S053298VM WK10557R1 (A)	OMRSD WAIVER REQUEST - FUEL CELL POWERPLANT 3 OXYGEN FLOWMETER LO WERLIMIT (WK10557R1)	103	033 042
			S053299BB WK10603 (A)	OMRSD WAIVER REQUEST - FORWARD OXYGEN REGULATOR	103	034 039

LOCK UP PRESSURE( WK10603)

RCS	S053298VT WK10559 (A)	OMRSD WAIVER REQUEST - RIGHT REACTION CONTROL SYSTEM OXIDIZER B-L EGSECONDARY REGULATOR LOCK UP HIGH (WK10559)	0023	035 043
	S053298VTR1 WK10559 (A)	OMRSD WAIVER REQUEST - RIGHT RCS OXIDIZER B-LEG SECONDARY REGULAT ORLOCK UP HIGH (WK10559R1)	0023	035 043
SRB	S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

1

Date: 03/25/08 12:52

PCASS

Page: 2

FLIGHT-SPECIFIC

Approved STS-119 OMRS Waivers and Exceptions

	Waivers	Except	Deviat	Cannib	Total
Total Extracted	8	3	0	0	11

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ACTIVE WAIVERS FOR  
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
47	S052310A	02/14/91	Fly with FRSI instead of tile	OV-103, Flight 12 & Subs (flight by flight evaluation)	<b>OK TO RETIRE S061954B MV 4-2 RTF-130 Briefing</b>
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	<b>STAYS OPEN</b>
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	<b>STAYS OPEN</b>
327	S115114VR5	03/17/05	Partial installation of M072-784633-014 (harness installation - interface panel - MADS #3). The M072-784663-014 Technical Order was established to incorporate the crossover bracket modification at locations X0863 and X0750. The dash number configuration for the Technical Order was not baselined until January 25, 2005 (PRCBD S115114VR2). This area was closed out before this time and would cause significant impact to verify configuration of this Technical Order dash number -014.	OV-103, Flight 31 OV-103, Flight 32 <b>WAIVER for STS-121</b>	INS-3-28-279 (installed Tech Order)
***** 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 Longerons Bridge installation was complete. With the installation of the bridge, the removal of the IVHM harness is no longer possible without the removal of the bridge.	OV-103, Flight 31 OV-103, Flight 32 <b>WAIVER for STS-121</b>	OEL-3-31-304 PTL OEL-3-31-4432 PTL
***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****					

ACTIVE WAIVERS FOR  
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
329	S115114AM	08/15/05	<p>The following requirements are waived to allow OV-103, Flight 31 to fly (ferry) with the following out-of-configuration conditions:</p> <ol style="list-style-type: none"><li>1) V070-391139-025 (blanket under window #1 removed for ferry flight)</li><li>2) M072-421502-002 (did not perform acetone wipe prior to universal thruster plug assemblies - procedural omission)</li><li>3) V070-753110-003 (camera mount will not be installed for ferry flight)</li></ol> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 31	Ferry Flight from Dryden
330	S115114VR15	09/16/05	<p>The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:</p> <p>TCS blanket V070-362917-001 located at Door #44 NOT installed.</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 31 Ferry Flight	Ferry Flight from Dryden

ACTIVE WAIVERS FOR  
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
331	S115114VR15	09/16/05	<p>The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:</p> <ol style="list-style-type: none"><li>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.</li><li>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.</li><li>3) Three switch guards are not installed on Panel L4 for TACAN circuit breakers. The procedure does not include the switch guard installation.</li></ol> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 31 Ferry Flight	Ferry Flight from Dryden
332	S115121TR8	05/04/06	<p>The following requirement is waived to allow OV-103 to fly with the following out-of-configuration condition:</p> <p>M072-794500-004 IVHM harness installation Bay 13 called out by MECSLSI V072-200201 NOT removed from OV-103.</p> <p>During STS-114 processing this Tech Order configuration called for the removal of an un-used IVHM harness along with the routing hardware. At the time the Tech Order was made a requirement for Flight 31, the Bay 13 longeron had already been installed for flight. The harness was demated and stowed in place per MR and was deferred to a future flight at which time Bay 13 longeron will be removed since the Bay 13 longeron was not removed this flight, a configuration waiver is needed for STS-121.</p>	OV-103, Flight 32	

ACTIVE WAIVERS FOR  
OV-103

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

ACTIVE WAIVERS FOR  
OV-103

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



ACTIVE WAIVERS FOR  
OV-103

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

ACTIVE WAIVERS FOR  
OV-103

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

**VEHICLE LIMITED LIFE STATUS REPORT**

PRELIMINARY SUBMITTED 02/12/2008

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

## Constraints

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

## Elements

O=ORBITER  
M=MISSION EQUIP.

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12	MEQLG	C00AB0.010.006 NOSE WHEEL ASSEMBLY MC621-0050-0004 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
13	ODS	C00AB0.075.004 STR. HOOK ACTUATORS 33Y6121038-07-01 (2)	SEPAR TC07-085	REMOVE/INSTALL	4	O
14	PLM	C00AB0.160.020A VIDEOSPECTION CAMERA ASSY SED39125120-305	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

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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	O

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