



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



# **STS-128 Delta Launch Site Flow Review**

Presenter **Kenneth Nowak**

Date **04-23-09**

## **Program Freeze Point**

## **PRCB Presentation**

## **S115128E**



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Baseline the STS-128 Mission Specific Requirements and Flow Plans.

The STS-128 Integrated Launch Site Requirements were established by PRCBD S115128CR1 dated 01-29-09. This CR and the Associated Data Package were reviewed at the 04-20-09 FRWG.

Flight Management\*

Orbiter Engineering\*

Payload/Cargo Engineering\*

SSME

Shuttle Processing

Requesting Approval

Requesting Approval

MO3/USA-PI

USA-OE

USA-PI

MP21

PH-A

## Status in BackUp

KSC Integration

Flight Software

Orbiter GFE

EVA

KSC ISS and Payload Processing

MK-SIO

USA-FSW

MV5

XA

UB-R3



# **STS-128/17A**

## **Delta Launch Site Flow Review (LSFR)**

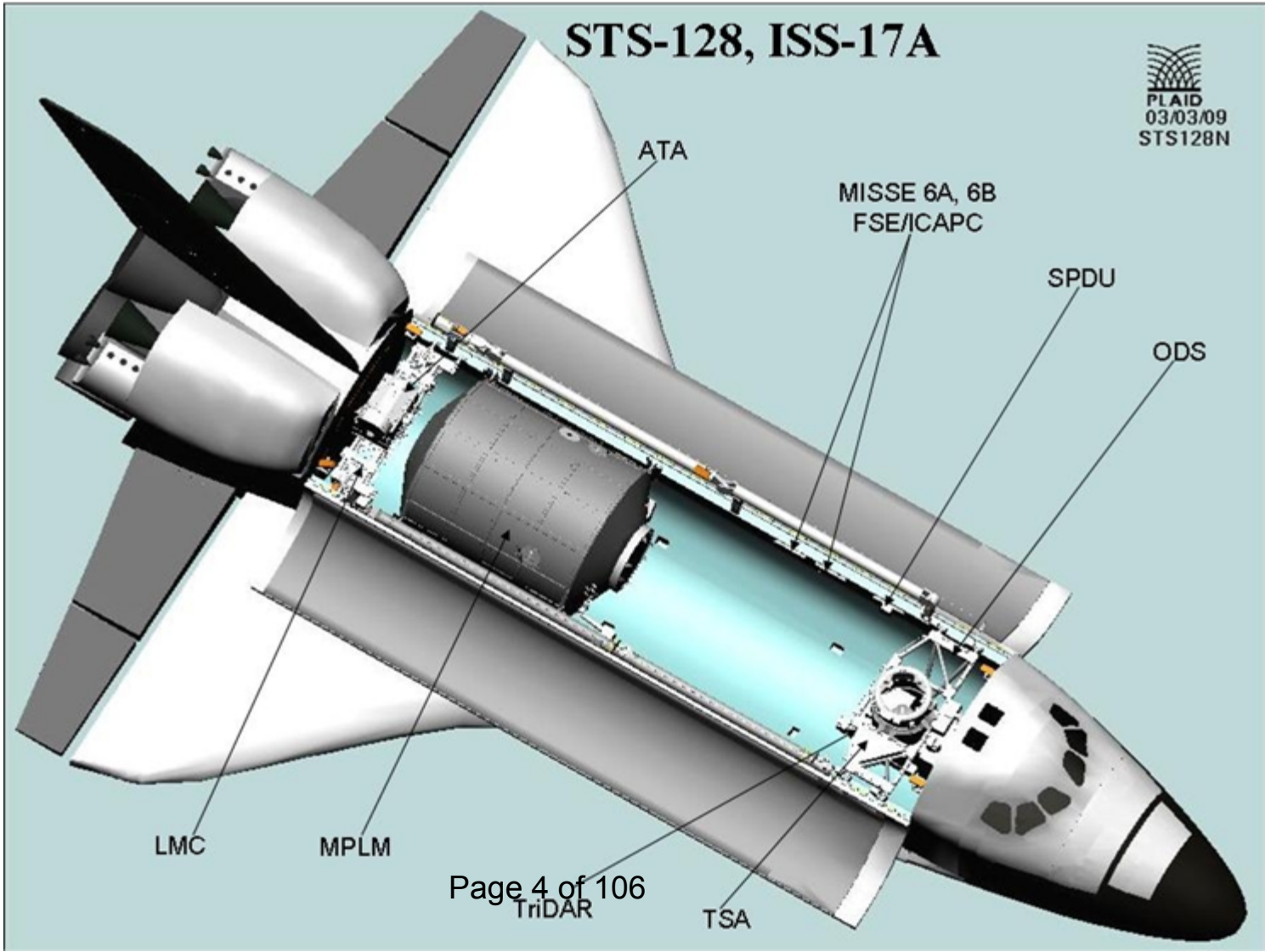
### **Flight Requirements Status**

**PRCB April 23, 2009**

**Shelby Lawson, STS-128 MIM**  
**Frank Richmond, USA Flight Mgr.**  
**Adam Richards/Boeing Mass Properties**



<b>STS-128 DELTA LAUNCH SITE FLOW REVIEW</b>		Presenter <b>MO3/Shelby Lawson</b>	
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<b>STS-128 DELTA LAUNCH SITE FLOW REVIEW</b>		Presenter <b>MO3/Shelby Lawson</b>
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**LAUNCH**

08/06/09  
 39A/ MLP 2  
 CREW SIZE: 7UP/7DN (One crew rotation)

**ORBIT**

51.6 DEG  
 122 NM  
 DIRECT INSERTION (190 NM altitude)  
 DURATION: 13 + 1 + 2 DAYS (3 EVAs)

**CONFIGURATION**

OV-103 (37)  
 LP01: RP03  
 ET-132  
 BI-139  
 RSRM-107  
 (1) 2048 (2) 2052 (3) 2047 *PROPOSED*  
 OI-34  
 SRMS, OBSS, ODS, SSPTS

**CONSUMABLES**

CRYO TANK SETS 5 (450# O2 OFFLOAD)  
 GN2 TANKS 6 (FULL)  
 FWD RCS 1912# (OFFLOAD)  
 AFT RCS 4970# (FULL)  
 OMS 22760# (FULL) – COPV offload

**PAYLOAD**

ISS-17A (MPLM, LMC), MISSE 6,  
 TriDAR AR&D Sensor DTO-701A  
 ISS-17A: MAUI, SEITE, SIMPLEX

**LANDING**

SITE KSC  
 TAL ZARAGOZA  
 ALT. TAL MORON & ISTRES  
 SCA 905

**Notes:**

- FRDR update required to manifest SSME's
- Rescue Flight for STS-127
- DTOs supporting post-SSP activities; DTO 854 (BLT), DTO 900 (RSRB Data), DTO 695 (Thrust Oscillation Seat), DTO 696 (Grab Sample Container Redesign), and DTO 701A (TriDAR)



<b>STS-128 DELTA LAUNCH SITE FLOW REVIEW</b>		Presenter <b>MO3/Shelby Lawson</b>
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**PERFORMANCE MARGIN**

• SIMULATION MARGIN (OCFAF128)		+1775
• WEIGHT CHANGES SINCE SIMULATION		
• PAYLOAD	+565	
• OPERATOR	+532	
• ORBITER	+609	
• NPC	-432	
• CREW COMPARTMENT	-408	
• MPS PROP (NOT INERT)	+260	
• RECONSTRUCTED ASCENT PERF COLLECTOR	<u>-94</u>	
TOTAL WEIGHT CHANGES	+1032	-1032
• OTHER PERFORMANCE PROJECTIONS		
• RENDEZVOUS ALT OF 188 NM		+232
• PROTECTION FOR DOL DISPERSIONS		- 700
• 08/06/09 LAUNCH DATE (PMBT&ATMOS)		+140
• USABLE IMPULSE FOR MPS BGT GEN0901S		-17
• SRB – M.P. UPDATES		- 77
• SRB – BR / 1.45 MIL HIGHER THAN 0.3705 AVG		+290
• ISP/THST FOR GEN BLOCK 2 @ 104.5%		+6
• PROJ TO 5 MIN WINDOW FROM INPLANE		- 600
• PERFORMANCE CHANGES ADJUSTMENT		<u>+72</u>
• CURRENT BASELINED APM (04/21/09)		+89
• ISP/THST FOR RELUCTANT ENGINE SET 2048/2052/2047		-52
• DECREASE TO A 95 SEC OMS ASSIST		-37
• 3 MINUTE LAUNCH WINDOW FRD CR #23		<u>+300</u>
• IPT PROJECTED APM		+300

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**STS-128 DLSFR**

**OV-103 Flight 37**

**Alan Ling**

**USA Orbiter Element**

**April 23, 2009**

# STS-128 OV-103 Flight 37 – Orbiter DLSFR Updates

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## Orbiter DLSFR Updates for OV-103 Flight 37

- 1 mandatory modification to be baselined
- 1 mission kit mod record to be baselined
- 1 modification baselined since LSFR (Info Only)

## Chit list - Updates

## Backup

- STR/TPS Priorities list – Updates
- Previously baselined modifications (info only)
- Potential / pending modifications (info only)
- Engineering, Hardware and Certification Status
- Mod Record/MECSLSI Updates (info only)



# STS-128 OV-103 Flight 37 DLSFR – Mandatory Mod to be Baselined

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- **TAD 30091 - Boundary Layer Transition Development Test Objective (BLT DTO) Second Flight and Catalytic Coating Material DTO Update & Plan**
  - Vehicle modifications allow flight data collection of the effects of controlled induced turbulent flow at high mach numbers during vehicle entry
  - First flight of BLT DTO during STS-119 was with a 0.25” high fixed protuberance tile on the port lower aft wing to initiate early boundary layer transition (pre-flight prediction was ~Mach 15 transition)
    - Initial BLT onset occurred downstream of the protuberance at ~Mach 16 (within 1-sigma of prediction). BLT at the protuberance occurred later at ~Mach 8.5.
    - Protuberance temperature from MADS data was ~2000 F compared to ~2950 F prediction
    - No visible damage / slumping of protuberance tile
  - Second flight BLT DTO and Catalytic Coating Material DTO mods will be baselined in 2 increments based on engineering readiness and schedule for completing first flight data analysis
    - Complete correlation of actual temperature data to thermal models to establish revised expected BLT DTO heating environments for STS-128 implementation
    - Complete thermal analysis with updated heating environments and arc jet testing for certification of 0.35” protuberance for STS-128
    - Identify changes to thermocouple selection and layout for STS-128
    - OPO Readiness Review planned for mid-May 2009

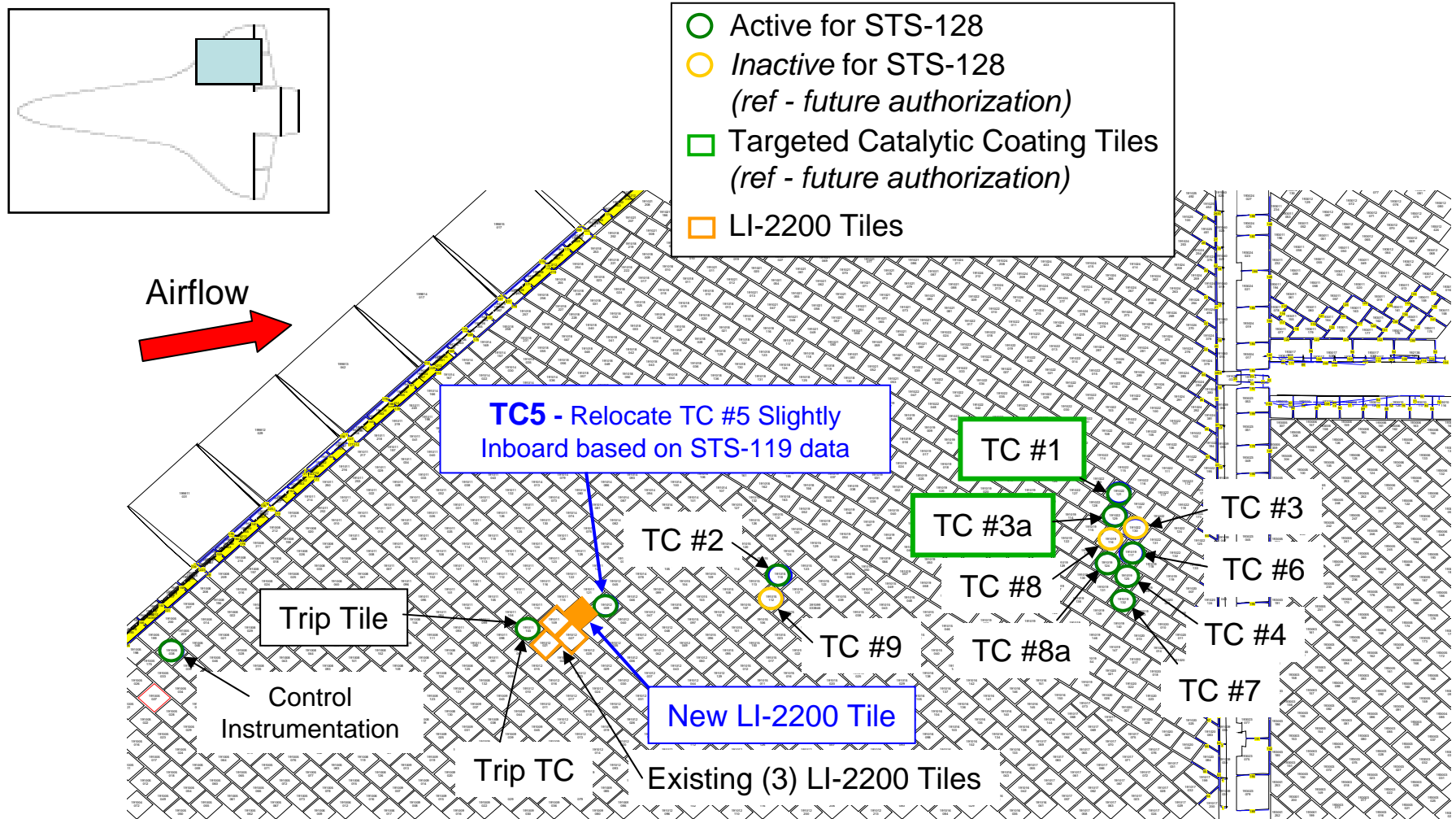
# STS-128 OV-103 Flight 37 DLSFR – Mandatory Mod to be Baselined

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- **TAD 30091 Boundary Layer Transition Development Test Objective (BLT DTO) Second Flight**
  - **First Increment: Mods to be baselined for STS-128 DLSFR:**
    - One additional tile downstream of the protuberance will be changed from LI-900 to LI-2200 to mitigate risk of potential of tile overheating / slumping (3 were changed prior to BLT DTO first flight)
      - Provides margin for abort case and for the increased 0.35” protuberance height
    - Relocation of thermocouple (TC) 5
      - STS-119 data indicates TC 5 is slightly outboard of the actual heating footprint
      - Recommendation is to move TC 5 to a more effective location and orientation approximately 2.5” inboard and re-orient angle to align with observed surface streak line
    - Engineering is released
  - **Second Increment: Mods expected to be brought forward to PRCB for baseline in the future for STS-128 after completion of forward work (Info Only):**
    - Increase protuberance height from 0.25” to 0.35”
    - Changes to thermocouple selection and layout
      - Tentatively looking at activating TC 3a and TC 8a and deactivating TC 3 and TC 8
    - Implement Catalytic Coating Material DTO on two instrumented tiles – preliminarily indication is at TC 1 & TC 3a locations

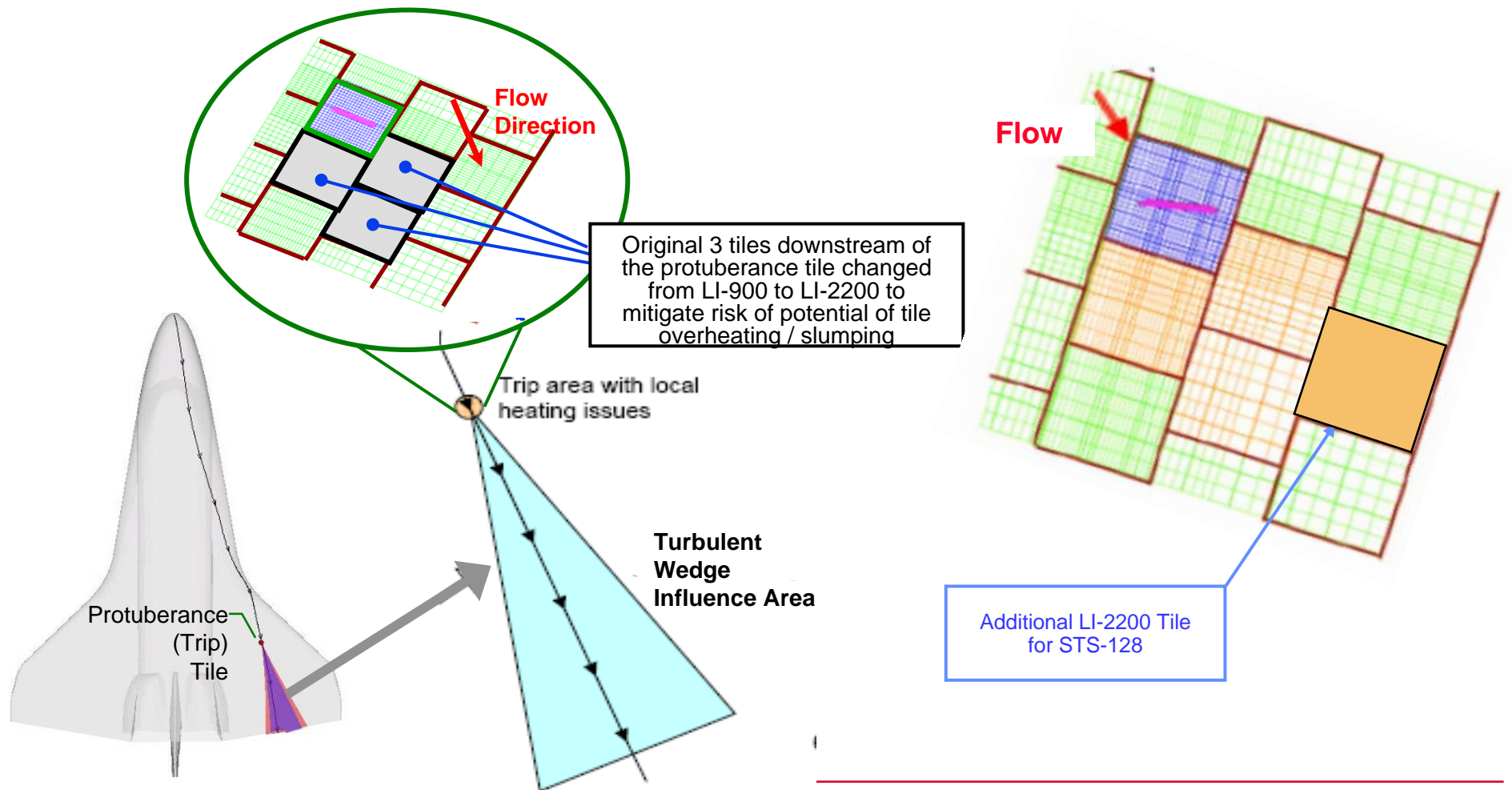
# STS-128 OV-103 Flight 37 DLSFR – Mandatory Mod to be Baselined

## Boundary Layer Transition Development Test Objective (BLT DTO) Second Flight & Catalytic Coating Material – Tile & Instrumentation Plan Overview



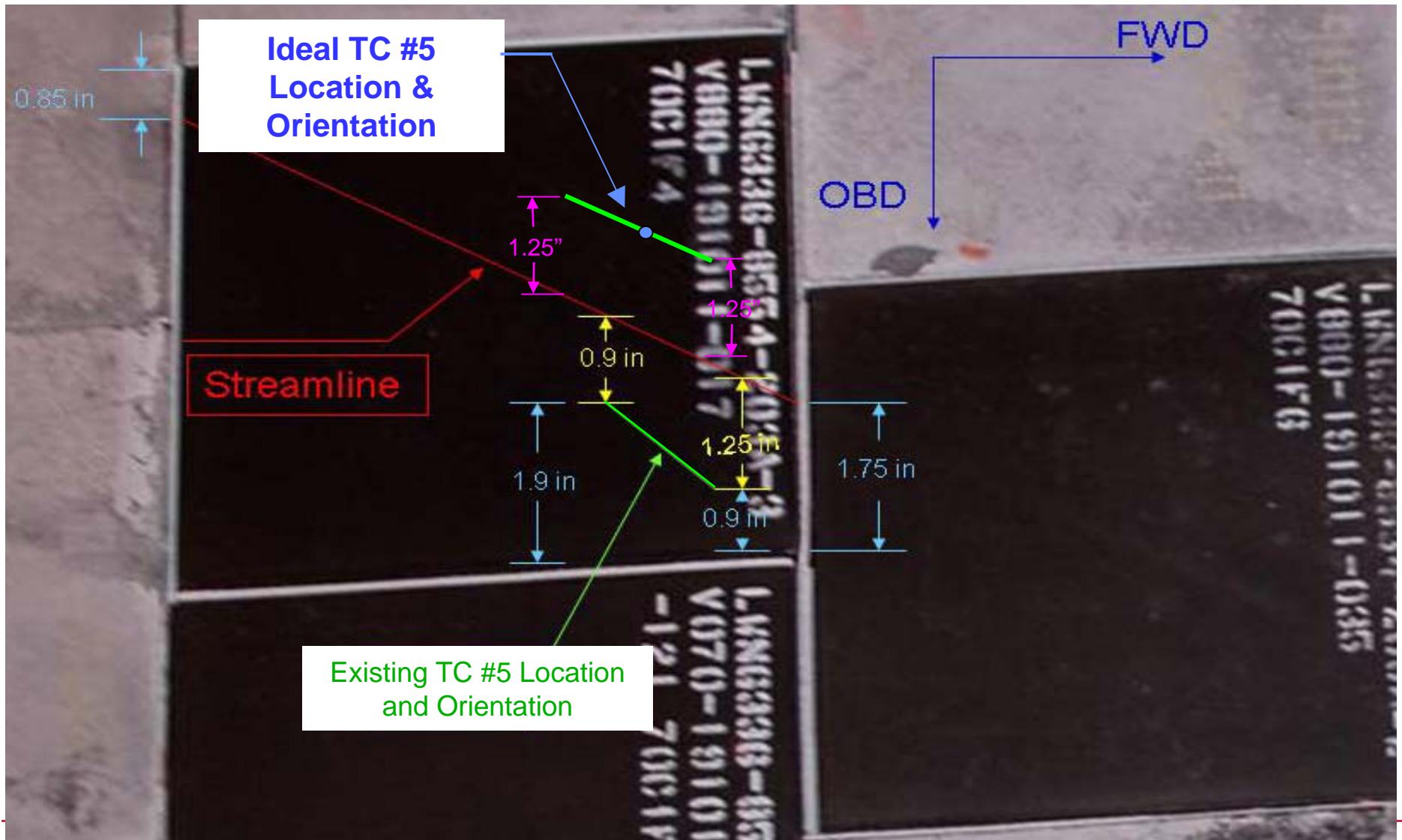
# STS-128 OV-103 Flight 37 DLSFR – Mandatory Mod to be Baselined

## Boundary Layer Transition Development Test Objective (BLT DTO) Second Flight - Protuberance Tile and Adjacent LI-2200 Tile



# STS-128 OV-103 Flight 37 DLSFR – Mandatory Mod to be Baseline

## Boundary Layer Transition Development Test Objective (BLT DTO) Second Flight TC 5 Relocation



# STS-128 OV-103 Flight 37 DLSFR – Mission Kit Mod to be Baselined

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- **TAD 30010 STS-128 Unique Starboard Lightweight (LW) Tool Stowage Assy (TSA) Cushion**
  - **FRD 17462-128 rev 008 3/18/09 demanifest the port LW TSA from STS-128 and manifest a stbd LW TSA**
    - **Only two LW TSAs exist in inventory and flight schedule does not support turnaround of the units from OV-104 and OV-105 to support STS-128 CEIT.**
  - **Since contingency tools are usually flown in the port LW TSA, a new cushion is needed to stow these tools in the stbd LW TSA**
  - **Tech order updates to the STS-128 MECSLSI are previously authorized by FRD CR 17462-128-0020**
  - **Program authorization requested for the following associated Orbiter MRCS mission kit end item EO record**
    - **Placeholder 030010,0103,3 STS-128 Unique Stbd LW TSA Cushion Change**

# STS-128 DLSFR - Mods Baselined Since LSFR (Info Only)

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- **TAD 30250 - O2 Crossover Valve Position Indication Signal Monitoring**
  - Modification to the N2/O2 panel (MO10W) wiring to provide position indication capability for the O2 crossover valve
    - Valve position feedback would allow crew additional time to troubleshoot a failed close valve and perform IFM if necessary to bypass the valve, in order to verify sufficient O2 supply capability to the ACES/QDM during any flight phase contingency (i.e fire or contaminated cabin)
    - Mod utilizes existing wire path for position signal with an added wire run to connect common ground
    - Requires repinning the Orbiter connector at the N2/O2 control panel and rewiring the MDM and signal conditioners in the avionics bay
  - Approved at 4/17/09 DPRCB

# STS-128 Chits

<b>Chit #</b>	<b>Title</b>	<b>Status</b>
J6116	Ames Gap Filler R&R	Approved
J6163	OV-103 Body Flap Power Drive Unit Gearbox Fluid Level Inspection	Approved
J6275A	Orbiter Structure IML Surface Corrosion Sampling Insp	Approved
J6341A	Evaluation of OMS Pod LI-900 Tile Installed on 0.90" SIP	Approved
J6384	BLT Tempilabel Assessment	Approved
J6392	Pre and Post Flight Optigo Scan of Protuberance Tile (Port Wing) to support the BLT Flight Experiment	Approved
J6402	Micro Inspection of Captive Gap Fillers	Approved
J6410	Aft Stub Cracked Tile Inspection	Approved
J6414A	Rudder Speed Brake thermal tab Inspection	Approved
J6434	OV-103 Putty Repair	Approved
J6443	Z-Scan of BLT Protuberance Tile	Approved
J6447	STS 126 Post Flight Inspection and Contamination Sampling of Laser Camera System & Orbiter Locations	Approved
J6453	NLGD Thermal Barrier Friction Test	Approved
J6464	Calibration of previously installed Acoustic Sensors	Approved
J6466	OMS Pod Pillow Gap Filler Installations	Approved
J6467	OMS Pod Weighing	Approved
J6480	Middeck Payload Cooling Airflow Test for OV-103 Avionics Bay 1	Approved



# STS-128 Chits cont'd

<b>Chit #</b>	<b>Title</b>	<b>Status</b>
J6482	STS-128 Payload Close Clearance Measurements	Approved
J6484	MAGRS-3S Link-008 Firmware Upgrade	Approved
J6487	Capture OV-103 output waveforms to address 1N3600 diode concerns	Approved
J6488	Additional IR Thermography Request for OV-103	Approved
J6490	Removal of OV-103 MPS GH2 FCV following STS-119	Approved
J6492	Optical Survey of TriDAR Location	Approved
J6494	OV-103 W3 Vespel Window Fastener Post Flight Torque Evaluation	Approved
J6496	Removal of IDT Star Tracker S/N 12 from Z-slot of OV-103, external sealing of unit, and reinstallation in the Z-slot	Approved
J6499	TriDAR Mechanical Fit Check	Approved
J6500	Measurement of the MPM Hook on the IBA Aft Striker Bar Sleeve during ground processing	Approved
J6503	Request for STS-128/17A Crew Evaluation for Aft Winch Alternate Tool Workaround on OV-103	Pending
J6XXX	OV-103 Large Putty Repair Tile Removal	Draft
J6XXX	PLBD C/L Actuator R&R	Potential

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**(MPLM, LMC and MISSE 6 A&B Ret.)  
DTO-TriDAR**

**DELTA LAUNCH SITE FLOW REVIEW  
(DLSFR)**

**PAYLOAD CARGO ENGINEERING STATUS**

**Abbas Elsabagh  
Cargo Mission Manager  
281-212-6186  
April 23, 2009**

# STS-128 dLSFR

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## Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Rev</u>	<u>EO</u>	<u>Released</u>
V072-200208	Early MECSLSI	B	B01	02/17/09
VA72-200208	Cargo Arrangement	Basic		10/10/08
VD72-200208	Avionics Diagram	A	A01	02/20/09
VS72-200208	Integrated Schematic	A	A01	02/20/09
VS70-540335	Retention Schematic	Basic		10/13/08

FRED Release was completed on 02/23/09

### Non-Standard Work (Chits)

- J6482.1 : MPLM measurement includes the Aft Port Scuff Plate to MPM - Approved
- Decision on the aft bulkhead winch removal or DPA measurement if required

# STS-128 dLSFR

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## Cargo Close Clearance Process

- The following Close Clearance areas have been identified as standard close clearance for MPLM flights and will require as installed measurements. Chit J6482.1 is approved.

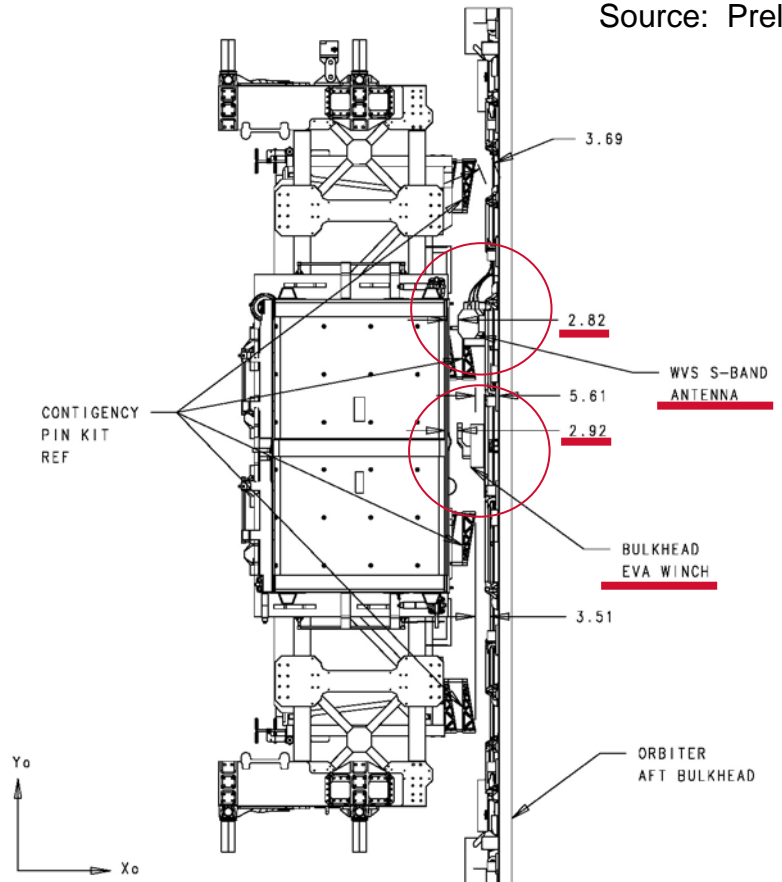
### Close Clearance Identified During the CIR

- Potential Measurement of LMC
  - Clearance issue identified between the ATA on LMC to aft bulkhead EVA winch
    - Clearances <1" are at liftoff and landing (transient data)
    - To fly the hardware, the following must be completed:
      - ISS CAD will be requested to DPA the ATA on the LMC
      - Chit will be written to get as-installed measurements if feasible
        - KSC determine feasibility ECD: DLSFR
    - Working possible removal of the aft bulkhead winch
    - Verifying no optics measurement of CPK on LMC needed
- Issues and Concerns
  - Measurements will not be applicable to returning ATA
    - Will need to request full tolerance stack-up to assess returning ATA
  - Deflections based on motion at LMC and not ATA specific point
    - May get better or worse with VLA data

# STS-128 dLSFR

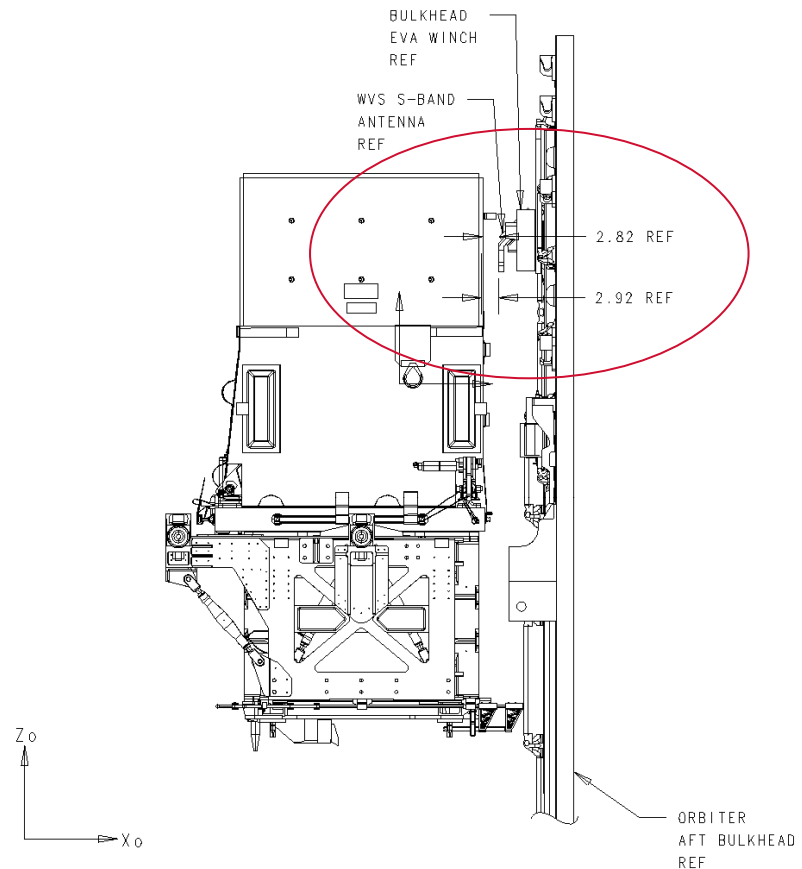
## Potential Close Clearance Points on LMC for STS-128

Source: Preliminary draft of PIRN A05665



VIEW LOOKING DOWN  
LAUNCH CONFIGURATION

SELECT AFT BULKHEAD HARDWARE OMITTED FOR CLARITY



VIEW LOOKING INBOARD  
LAUNCH CONFIGURATION

SELECT AFT BULKHEAD HARDWARE OMITTED FOR CLARITY

**Discovery STS-128**  
**Delta Launch Site Flow Review**  
**Space Shuttle Main Engine**

**SSME - KSC**  
**Paul Brzeski**  
**(321) 861-4064**

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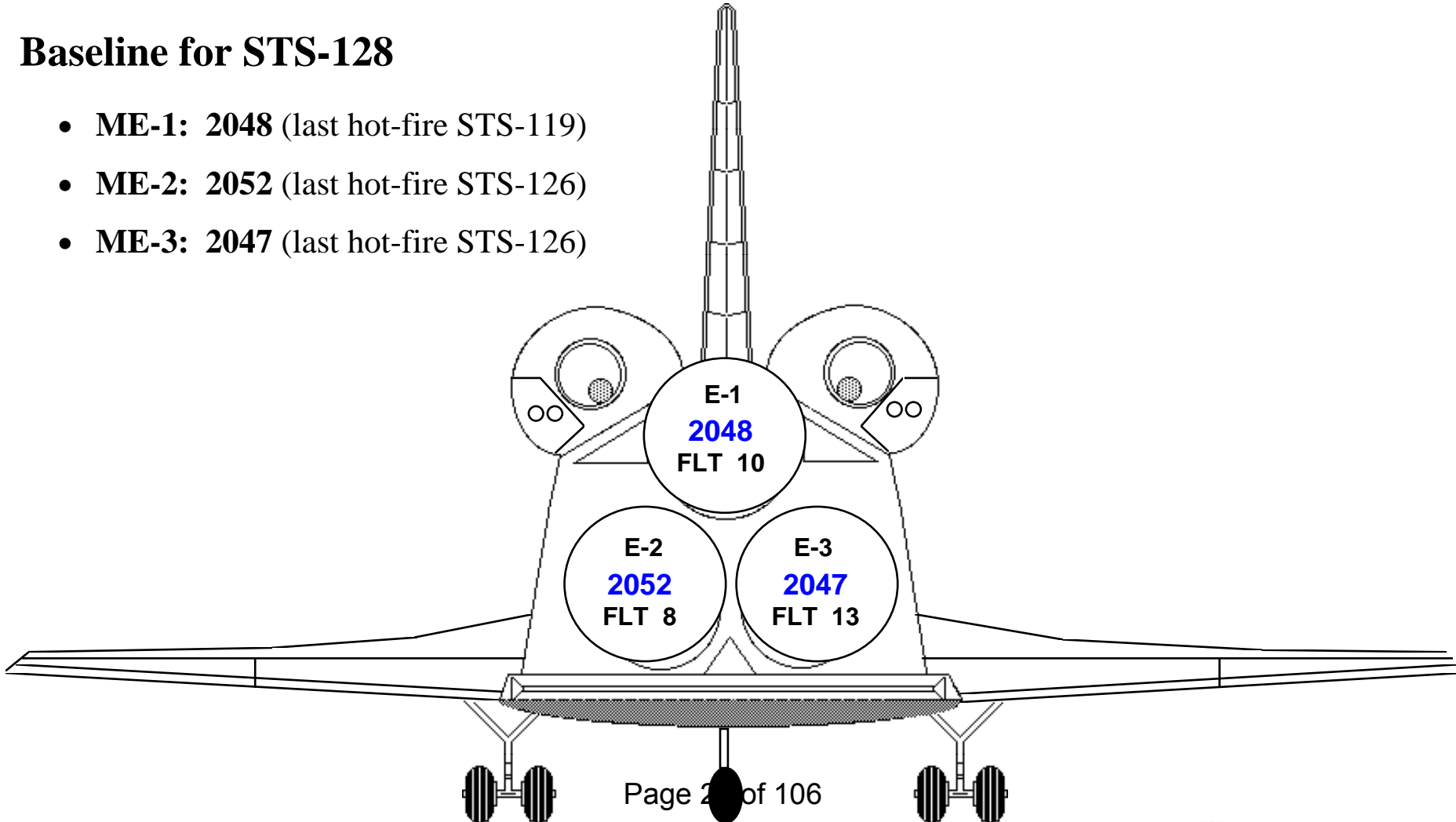


# STS-128 Delta Launch Site Flow Review

## *SSME Allocations / Locations*

### Baseline for STS-128

- **ME-1: 2048** (last hot-fire STS-119)
- **ME-2: 2052** (last hot-fire STS-126)
- **ME-3: 2047** (last hot-fire STS-126)





# STS-128 Delta Launch Site Flow Review

## *SSME Planned Modifications*

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

ECP	Title	Engine(s)	Kit Drawing	Weight Impact	SPARs / CRs	Status





# STS-128 Delta Launch Site Flow Review

## *Rocketdyne Action Requests (RAR)*

RAR	Title	Engine(s)	SPARs / CRs	Status
KLO-1633	Inspect HPFTP Inlet Housing.	2047 2052	ME-0244 B ME-0245 B	Complete.
KLO-1636	Inspect HPFTP Inlet Housing.	2048	ME-0247 B	In-work, part of postflight STS-119 processing.
KLO-1634	Remove HPOTP 8315.	2047	S063982	Complete.
KLO-1634R1	Allocate HPOTP 8325.	2047	N/A	Complete.

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# **STS-128**

## **Delta Launch Site Flow Review**

**April 23,2009**

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# Agenda

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

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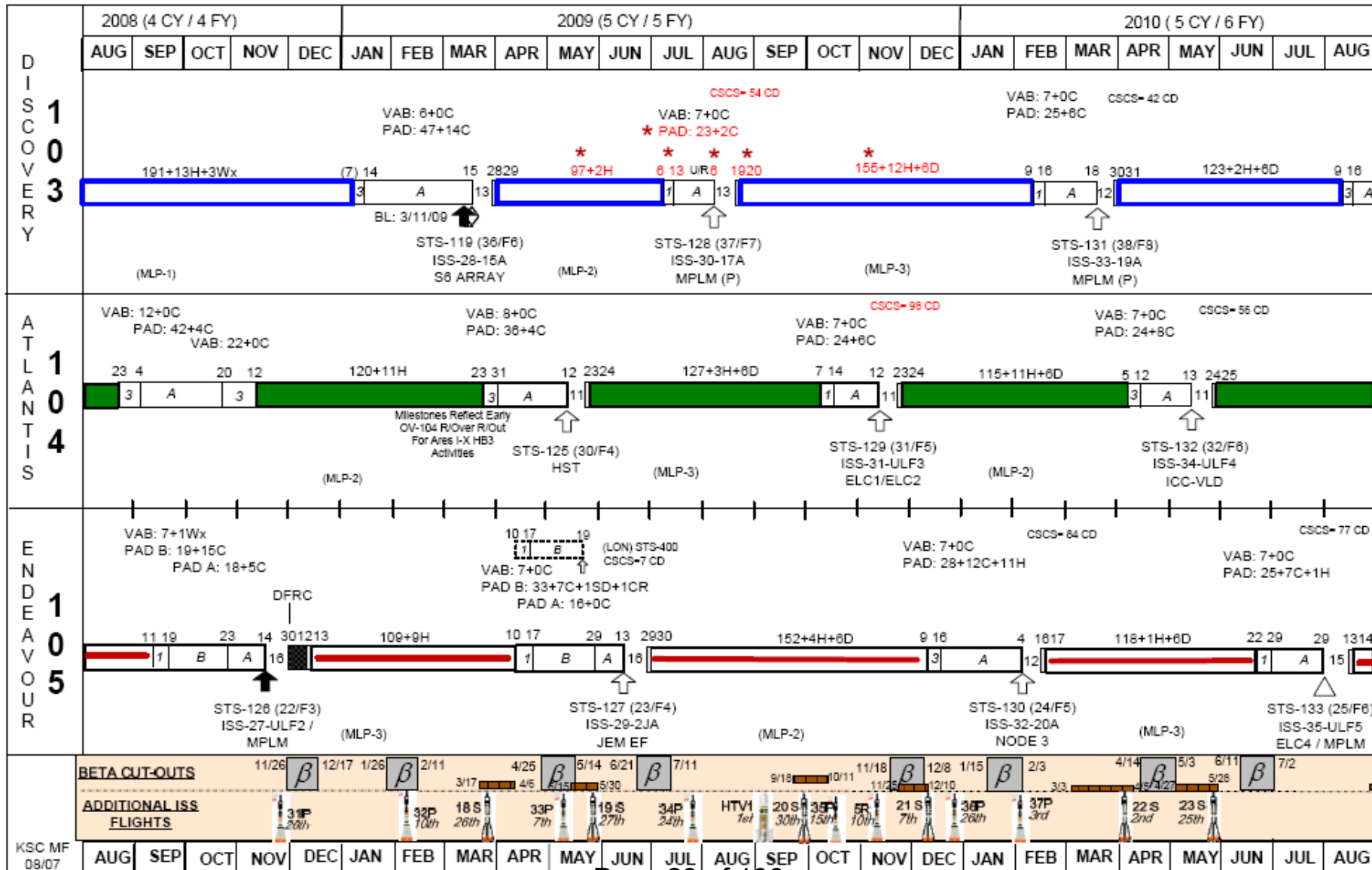
# **Multi Flow**

# **S. Stilson**

◇ KSC ASSESSMENT (SLIP or OPTION)  
\* DENOTES CHANGES TO BASELINE MANIFEST

SSP APPROVED MANIFEST  
MANIFEST REF. 09A-17

0800 EDT, 15 APR 2009



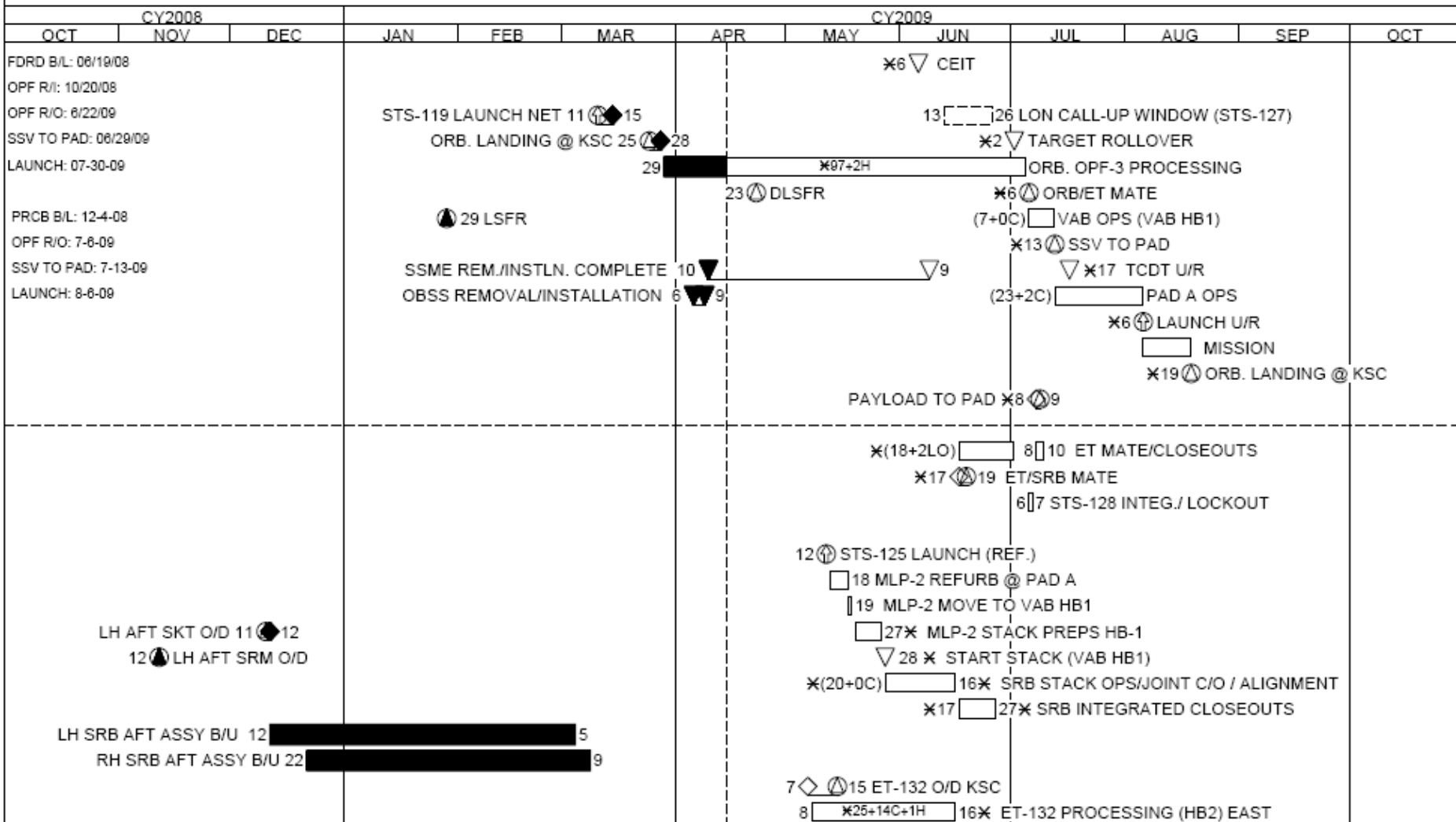
**LEGEND**  
 H - HOLIDAY    D - DRYDEN RESERVE    C - PAD CONTINGENCY    Wx - WEATHER OUTAGE    OFF-1    OFF-2    OFF-3    Vehicle out of service    S - SOYUZ    P - PROGRESS  
 CR - CREW REST DAY    DFRC OPS    1/3 VAB OPS    A/B PAD OPS    MILESTONE    LAUNCH    SOYUZ Cutout

# STS-128 KSC Milestone Interface Chart

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

OV-103/37/ ISS-30-17A / MPLM  
CREW / DURATION: 7/ 13  
ET 132 / BI139/ RSRM 107 / MLP-2 / PAD-A / VAB HB1

SSP APPROVED PRCB 12-4-08 (REF. CR# SO42013HQ)  
Status as of:  
04/15/2009



**TREATS:**

- \*1. MLP-2 COMPRESSED TURNAROUND
- \*2. OPF DURATION
- \*3. COMPRESSED SRB STACKING
- 4. ET/SRB INTEGRATED IN PARALLEL WITH FULL SRB INTEGRATED C/O's

**NOTES:**

- 1. THIRTIETH ISS/SSP FLIGHT
- \*2. ASSUMES NO LATE PAYLOAD STOWAGE @ PAD

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# **Flight Element Processing**

**Wayne Bingham**

# Flight Element Processing Overview

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



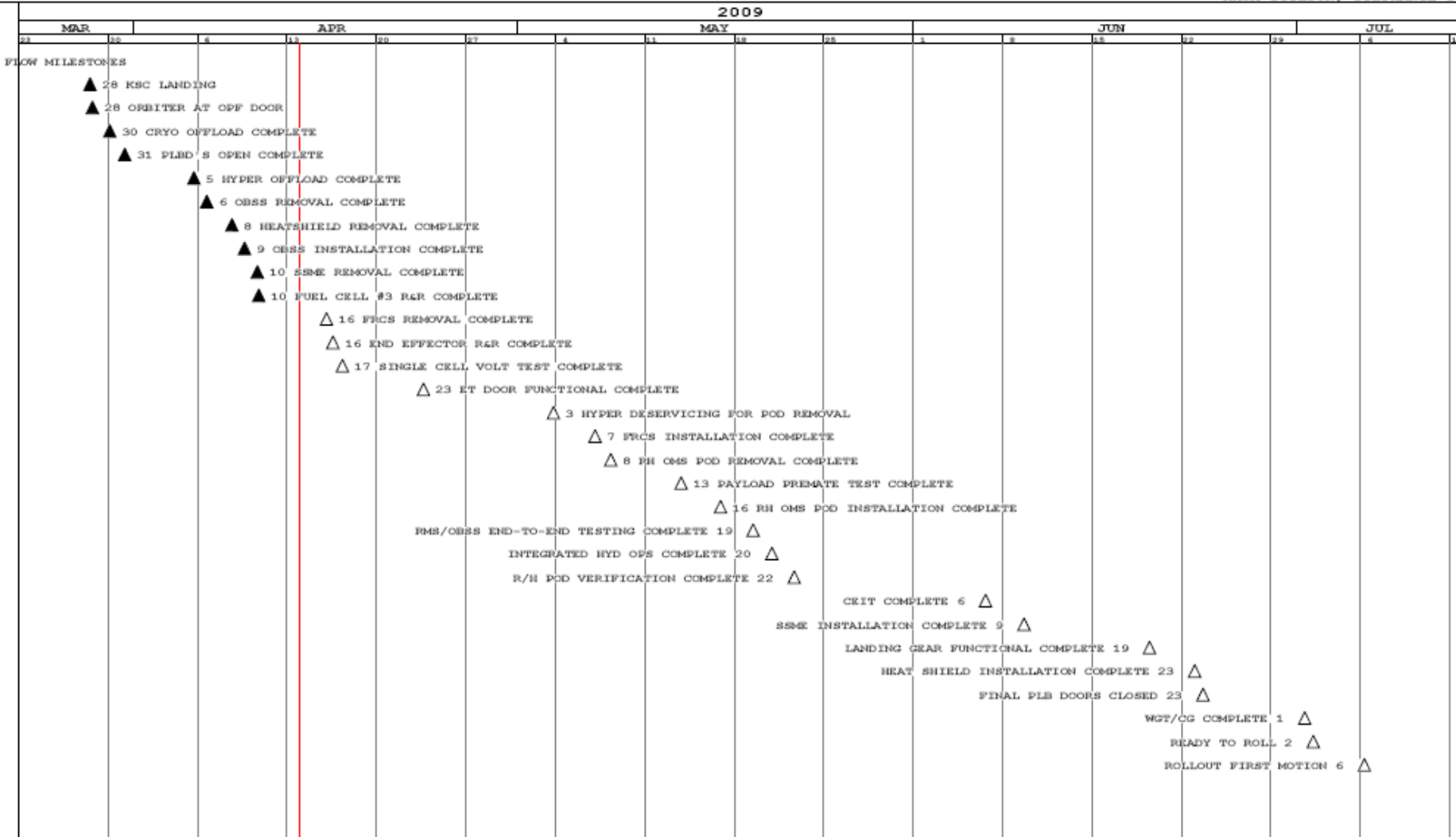
**STATUS**

USA	NASA
C	C
DC:WAS	SC:BUS-103002

Creation Date: 29-SEP-2008  
 Revision Date: 14-APR-2009  
 Revision : R

**STS-128/OV-103 OPF FLOW MILESTONES**  
 DOWN PAYLOAD: ISS-28-15A / UP PAYLOAD: ISS-30-17A MPLM (P)

OPR: USA-BINGHAM, WAYNE W  
 NASA-STILSON, STEPHANIE S



△ PLAN/BASELINE    ◇ DEVIATION FROM BASELINE    ▲ ◆ ACTIVITY CANCELED    △ △ ACTIVITY DURATION \*\*\*\* SCHEDULE CHANGE

# Significant Processing Deltas

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## Major Components Removal / Replacements

- FRCS Removal - Complete
- R/H Pod Removal
- OBSS Removal - Complete
- Fuel Cell # 3 R&R - Complete
- Windows 6 & 7
- RMS Removal /Installation
- MPCA3 R&R (Potential)
- RH ET Door PDU R&R

## MODS

- APU 3 GN2 Heater
- BLT
- O2 Crossover Valve Talkback Mod

# STS-128 Preliminary Cavity Estimate

	<u>Priority</u>	<u>Description</u>	<u>LSFR</u>	<u>DLSFR</u>
●	Mand	Deferred Tile/Fib for 1-Flight	16	18
●	Mand	In-Flight Damage	*25	25*
●	Mand	Operational Damage	*20	25*
●	Mand	BLT Mod (1-Trip, 1-Cover , 2-Adj)	2	4
●	Mand	Putty Repair/ Grindouts	*14	*14
●	Mand	2 <sup>nd</sup> Subset Putty Repair removals (J6434)	5	5
●	Mand	Additional Putty Repairs (Jxxxx)	*10	10
●	Mand	Corrosion Sampling (J6275A)	5	0
●	Prelim	Body-Flap Instr.	2	0
●		<u>MANDATORY TOTAL</u>	<u>99</u>	<u>101</u>

## RISK REDUCTION

●	<b>MLGD BRI</b>	<b>24</b>	<b>0</b>
●	<b>TOTAL (ESTIMATED )</b>	<b>*<u>123</u></b>	<b>*<u>101</u></b>

\*ESTIMATED NUMBER

STS-128 DLSFR

J. F. KENNEDY SPACE CENTER

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**Flow Duration 94 + 1H**

# Issues and Concerns

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- **Short Flow**
  - 7/3's for Critical Path
- **Resources (3<sup>rd</sup> In Flow)**
- **Hardware Deliverables:**
  - FCV
  - Spare PDI
  - GFE
- **Freon Loop #1 Moisture Issue – Sample and Re-defer**





# **STS-128 Delta Launch Site Flow Review**

**Presenter** Kenneth Nowak

**Date** 04-23-09

## **Backup Material**

### **FRWG Presentation (With Minor Changes)**



	Presenter <b>MO3/Shelby Lawson</b>	
	Date <b>04/23/09</b>	Page <b>5</b>

# Flight Operations and Integration (FO&I)

**Flight Requirements:**  
**MIP, PIPs, CIP**  
**FDRD**  
**FRD**

**Backup Charts**



<b>STS-128/17A</b>		Presenter <b>MO3/Shelby Lawson</b>
<b>Mission Requirements Status</b>		Date <b>04/23/09</b>   Page <b>6</b>

**Documentation**

**ECD/Status**

**MIP – ISS 17A – NSTS 21546, Rev B, Chg 2 (03/24/09)**

CR-0020: Post FOR update and removal of SDBI 1906 Visual Performance  
 CR-0021: POCC Definition

05/06/09  
 05/06/09

**CIP-LMC, NSTS 21494, Rev B, Chg 1-14 (02/20/09) STS-128 Addendum**

**PIP – MPLM, NSTS 21499, Rev B, Chg 1-3 (03/23/09)**

**PIP – MAUI, NSTS 21530, Basic, Chg 1-2 (5/5/08)**

**PIP – SEITE, NSTS 21542, Basic (11/19/07)**

**PIP – SIMPLEX, NSTS 21327, Rev A (6/16/08)**

**PIP – MISSE 6a and 6b, NSTS 21537, Basic, Chg 1-3 (01/24/08)**

**IP-DTO-701A TriDAR AR&D Sensor, NSTS 21547, Basic (06/05/08)**

**IP– RMS Sideview Camera (RCS), NSTS 21418, Chg 1-3 (06/28/05)**

**FDRD –**

None Pending  
 None Pending  
 None Pending  
 None Pending  
 None Pending  
 None Pending  
 None Pending  
 None Pending  
 None Pending





<b>STS-128/17A FRD Status</b>		Presenter <b>USA/Frank Richmond</b>
Date <b>04/23/09</b>	Page <b>7</b>	

- **STS-128 Latest FRD Revision**
  - Revision 008: Dated, March 18, 2009 (<https://sspweb.jsc.nasa.gov/efrd>)
- **Approved CRs to be incorporated into next FRD Revision**
  - **FRD17462-128-022 – Add Delete Aft Bulkhead Winch**
- **Open/Pending CRs**
  - **FRD17462-128-023 – Update Launch Window Duration**  
ECD:           **04/22/09**



<b>STS-128 DELTA LAUNCH SITE FLOW REVIEW</b>		Presenter <b>MO3/Shelby Lawson</b>
Date <b>04/23/09</b>	Page <b>8</b>	

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

<b><u>CASE</u></b>	<b>TOUCHDOWN</b>	<b>MACH 3.5</b>
	<b><u>WEIGHT pounds (LIMIT)</u></b>	<b><u>X C.G. inches (LIMIT)</u></b>
<b>NOMINAL</b>	<b>226452 (233000)</b>	<b>1087.0 (1075.2)</b>
<b>RTLS</b>	<b>240516 (245000)</b>	<b>1086.7 (1076.7)</b>
<b>TAL</b>	<b>239135 (244000)</b>	<b>1086.8 (1076.7)</b>
<b>AOA</b>	<b>235440 (242000)</b>	<b>1084.5 (1075.2)</b>
<b>CONT RTRN*</b>	<b>205444 (233000)</b>	<b>1083.2 (1075.2)</b>

*\*CONT RTRN Case is No MPLM, LMC empty, Full Middeck, Fwd CG*

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

**ESTIMATES BASED ON OCFAF128 AND MODIFIED FOR WEIGHT CHANGES THRU 04/21/09.**



# STS-128 Delta Launch Site Flow Review

Presenter <b>MO3 Shelby Lawson</b>	
Date 04-23-2009	Page 1

- **STS-128 Orbiter/Ferry Mass Properties Have Been Reviewed by Space Shuttle Program Integration and Are Within Specified Limits**

<u>Case</u>	<u>Ferry Weight (LB)</u>	<u>Center of Gravity (inch)</u>		
		<u>X</u>	<u>Y</u>	<u>Z</u>
<u>Nominal - Orbiter c.g.</u> (SCA c.g.) (2066 lbs Max CM Ballast + 1300 lbs CCCD items, No Fluids Off-Loaded, No Payload Bay Opening)	228563	1113.6 (1409.5)	-0.2 (N/A)	374.7 (517.2)
<u>AOA - Orbiter c.g.</u> (SCA c.g.) (2066 lbs Max CM Ballast + 500 lbs CCCD items, No Fluids Off-Loaded, No Payload Bay Opening)	234261	1113.6 (1409.5)	-0.1 (N/A)	375.4 (517.9)
<u>TAL - Orbiter c.g.</u> (SCA c.g.) (3 SSME's Removed, No Fluids Off-Loaded, No Payload Bay Opening, Max Weight 217000 LB)	213865	1078.1 (1374.0)	-0.3 (N/A)	375.5 (519.8)

**X c.g. Limits (Orbiter Coordinates)**

Nominal = 1060.0 TO 1116.0  
 AOA = 1060.0 TO 1116.0  
 TAL = 1060.0 TO 1120.3

**Z c.g. Limits (Orbiter Coordinates)**

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

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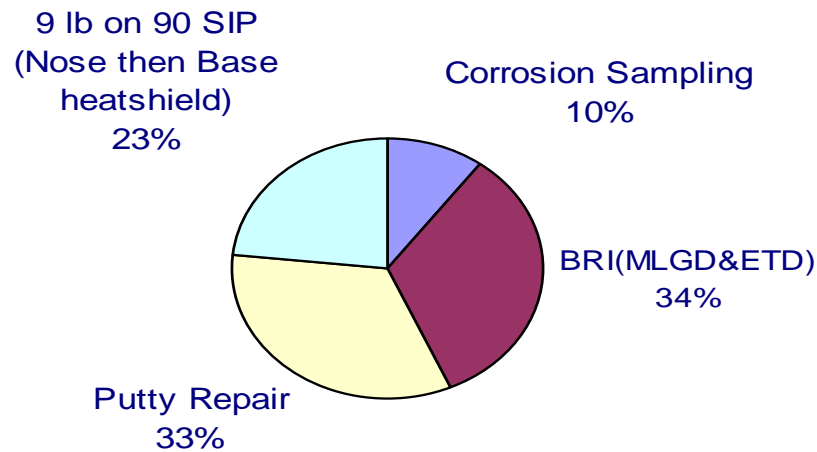
# STS-128 DLSFR BACKUP

- **STR/TPS Priority Lists - Updates**
- **Previously baselined modifications (info only)**
- **Potential / pending modifications (info only)**
- **Engineering, Hardware and Certification Status**
- **Mod Record and MECSLSI Updates (info only)**

# Allocation Breakdown for OV-103

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## TPS Priorities



- Orbiter's expectations for the work areas are shown on the pie chart for STS-128
  - Exact numbers are determined by the KSC Team based on vehicle configuration, access, and flow duration
  - Distribution provides data/risk reduction in all areas of the list
    - °Does not allocate all the resources in one area

# OV-103 STR/TPS Priorities

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## Mandatory

- Flight damage, OMRS Rqmts/Chits, LRU access, & deferred work
  - **Corrosion Sampling (10% of total tile allocation) *Chit J6275A***
  - **Putty repairs, second set – 5 tiles remain on OV-103**
  - **Putty repairs in RCC & Window DTA Zones of influence (10 tiles) (*Chit pending*)**
  - **Continue G/F R & R on a best effort basis - zones 2B subset**
  - **Deferred work may be re-deferred with acceptable inspection**

## 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

# OV-103 STR/TPS Priorities (cont)

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6. BRI-18 Tile – STR side of ET Doors Inboard side – AFT 4 Tiles (8 Tile) – **Complete**
7. Inboard Elevon “Hub” Tile Modification – (both sides) – 4 Tiles – **Complete**
8. I/B Elevon 9lb/90 SIP Upgrade to FRCI-12 – 34 Tiles (17/side) – **Complete**
9. O/B Elevon 9lb/90 SIP Upgrade to FRCI-12 – 6 Tiles (3/side) – **Complete**
10. MLGD – Outboard Middle 1/3 - (6 Door/6 STR) – **None completed**
11. ET Door – Remaining STR side of door & leading edge on door – 40 tiles (24 STR/16 door) – **39 remaining**
12. MLGD – Outboard Aft (1/3 left) 6/door/6 STR)- 24 Tile – **None completed**
13. Nose Area 9lb/90 SIP Upgrade to FRCI-12 – 14 Tiles (7/side) – (103\* 16 tiles, thruster) – **15 remaining**
14. Base Heat Shield Stinger 9lb/90 SIP Upgrade to FRCI-12 – 42 Tiles (32/stinger, 10/Box Attach point) – **34 remaining**

# OV-103 STR/TPS Priorities (cont)

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15. Gap fillers in Subset 2B (Line across MLGD edge) – **3 zones remaining**

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

1. MLGD (Inboard forward edge working to AFT door edge) – **None Completed**

2. ET Door – **23 remaining**

3. LESS - panels 8, 9, 10, 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order) – **61 tiles remaining**

3. NLGD (attrition – do leading edge first) – **111 tiles remaining**

17. Mod work LESS internal (WLE sneak flow, WLE Horsecollar Gap Fillers) – **6 locations remaining**

18. MADS Instrumentation Failures (placeholder)

19. Remaining Gap Fillers & Window BRI-18 - **122 remaining**

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



# STR/TPS Priorities Current Vehicle Status

Priority Number	Total	OV-103	OV-104	OV-105
1. BRI-18 Tile - MLGD FWD O/B Corner	28	complete	complete	complete
2. BRI-18 Tile - MLGD FWD Edge	22	complete	complete	complete
3. BRI-18 Tile - MLGD O/B Side	18	complete	complete	complete
4. BRI-18 Tile - STR side of ET Doors	20	complete	complete	complete
5. BRI-18 Tile – LESS Carrier Panels 8-10 (103 & 104)	24	complete	complete	n/a
6. BRI-18 Tile – STR side of ET Doors I/B	8	complete	1	complete
7. Inboard Elevon “Hub” Tile Mod	4	complete	2	complete
8. I/B Elevon 9lb/90 SIP	34	complete	20	complete
9. O/B Elevon 9lb/90 SIP	6	complete	complete	complete
10. MLGD – Outboard Middle 1/3	24	0	0	3
11. ET Door remaining STR side	40	1	7	0
12. MLGD - Outboard AFT 1/3	24	0	0	1
13. Nose Area 9lb/90 SIP	14 (16 <sup>OV-103</sup> )	1	0	0
14. Base Heat Shield 9lb/90 SIP	42	8	complete	complete
15. Gap fillers in Subset 2B	5 Zones	2	1	0
16. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD	MLGD 100	MLGD 0	MLGD 1	MLGD 0
	NLGD 123	NLGD 12	NLGD 19	NLGD 47
	LESS 68 (90 <sup>OV-105</sup> )	LESS 7	LESS 5	LESS 19
	ET Door 28	ET Door 5	ET Door 0	ET Door 1
17. Mod work LESS internal	44 locations	38	39	complete
19. Remaining Gap Fillers & Window BRI-18	124	2	2	19
Structural Corrosion Sampling Plan	See Special Chart			
2nd Subset Putty Repair Removals	11 / 6 / 5	6	complete	complete

# Current Vehicle Status – Corrosion Under TPS

## The Special Chart

REGION	REMAINING WORK CONTENT			
	MINIMUM SAMPLE	OV-103 (Current Flight)	OV-104 (Current Flight)	OV-105 (Current Flight)

TILE ( EACH SAMPLE SITE IS ONE TILE CAVITY )				
REGION	MINIMUM SAMPLE	OV-103 (Current Flight)	OV-104 (Current Flight)	OV-105 (Current Flight)
TILE - AFT FUSE BASE AND DOME HEAT SHIELDS	6	COMPLETE	COMPLETE	COMPLETE
TILE - AFT FUSE LOWER	7	COMPLETE	COMPLETE	COMPLETE
TILE - AFT FUSE SIDES	2	2	2	2
TILE - BODYFLAP LOWER SURFACE	3	3	3	COMPLETE
TILE - BODYFLAP SIDES AND UPPER SURFACE	3	1	3	COMPLETE
TILE - FWD FUSE LOWER	6	COMPLETE	COMPLETE	COMPLETE
TILE - FWD FUSE SIDES AND UPPER SURFACE	7	COMPLETE	COMPLETE	COMPLETE
TILE - LH IB ELEVON	3	COMPLETE	COMPLETE	COMPLETE
TILE - LH OB ELEVON	2	COMPLETE	COMPLETE	COMPLETE
TILE - LH WING	14	COMPLETE	COMPLETE	COMPLETE
TILE - MID FUSELAGE LOWER	21	COMPLETE	COMPLETE	COMPLETE
TILE - RH IB ELEVON	3	COMPLETE	COMPLETE	COMPLETE
TILE - RH OB ELEVON	2	COMPLETE	COMPLETE	COMPLETE
TILE - RH WING	14	COMPLETE	COMPLETE	COMPLETE
TILE - VERTICAL TAIL and RSB	4	COMPLETE	COMPLETE	COMPLETE

FLOW PLANNING KEY - REGION PRIORITY FOR LSRR / LSFR	
5	Priority Region - Number indicates <b>remaining</b> locations to be sampled
COMPLETE	Completed Region - No additional sampling required
3	Low Priority Region - Number Indicates remaining locations to be sampled

REGION	REMAINING WORK CONTENT			
	MINIMUM SAMPLE	OV-103 (Current Flight)	OV-104 (Current Flight)	OV-105 (Current Flight)

FRSI AND FIB ( EACH SAMPLE SITE IS ONE FIB OR ONE 12" X 12" SECTION OF FRSI) - (12" x 24" for WINGS)				
REGION	MINIMUM SAMPLE	OV-103 (Current Flight)	OV-104 (Current Flight)	OV-105 (Current Flight)
RSI - AFT FUSE SIDES BHS and DHS	3	2	2	2
RSI - FWD FUSE SIDES AND UPPER SURFACE	9	COMPLETE	COMPLETE	COMPLETE
RSI - LH IB ELEVON	3	1	2	3
RSI - LH OB ELEVON	2	2	2	2
RSI - LH WING	12	10	COMPLETE	12
RSI - MID FUSELAGE SIDES	15	COMPLETE	1	COMPLETE
RSI - RH IB ELEVON	3	3	2	3
RSI - RH OB ELEVON	2	2	2	2
RSI - RH WING	12	10	COMPLETE	12
RSI - VERTICAL TAIL and RSB	11	COMPLETE	COMPLETE	COMPLETE

HEATSINK PERIMETER INSPECTIONS ( EACH SAMPLE SITE IS ONE 2 LINEAR FOOT SECTION)				
REGION	MINIMUM SAMPLE	OV-103 (Current Flight)	OV-104 (Current Flight)	OV-105 (Current Flight)
HEATSINK PERIMETER - BODYFLAP	3	3	3	3
HEATSINK PERIMETER - LH OB ELEVON	1	1	1	COMPLETE
HEATSINK PERIMETER - LOWER FWD FUSELAGE	3	3	3	3
HEATSINK PERIMETER - RH IB ELEVON	2	2	2	1
HEATSINK PERIMETER - RH OB ELEVON	1	1	1	COMPLETE
HEATSINK PERIMETER - LH IB ELEVON	2	2	2	1

# Potential Mods (Info Only)

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**The following are mods that are in development stages in Orbiter and may be brought forward at a future freeze point review:**

- Boundary Layer Transition (BLT) DTO Flight 2
  - Increment 2 - Increased protuberance height, thermocouple changes, cat coating
- FCV Downstream Elbow Design Change
- Tyvek Cover F3D/F4D Design Change
- Flight Deck Soft Window Shade Redesign

**The following mods are partially completed but not baselined for STS-128. These will be requested to be baselined OSB if opportunity / priority arises:**

- 19735 WLE Spar “Sneak Flow” Protection (RH & LH panels 2-4)
- 19763 Lower WLE CP Horse Collar Gap Filler Redesign (RH & LH panels 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

# STS-128 Attrition Mod Pending Program Authorization

## • TAD 30245 ET Door Pressure Seal Design Change

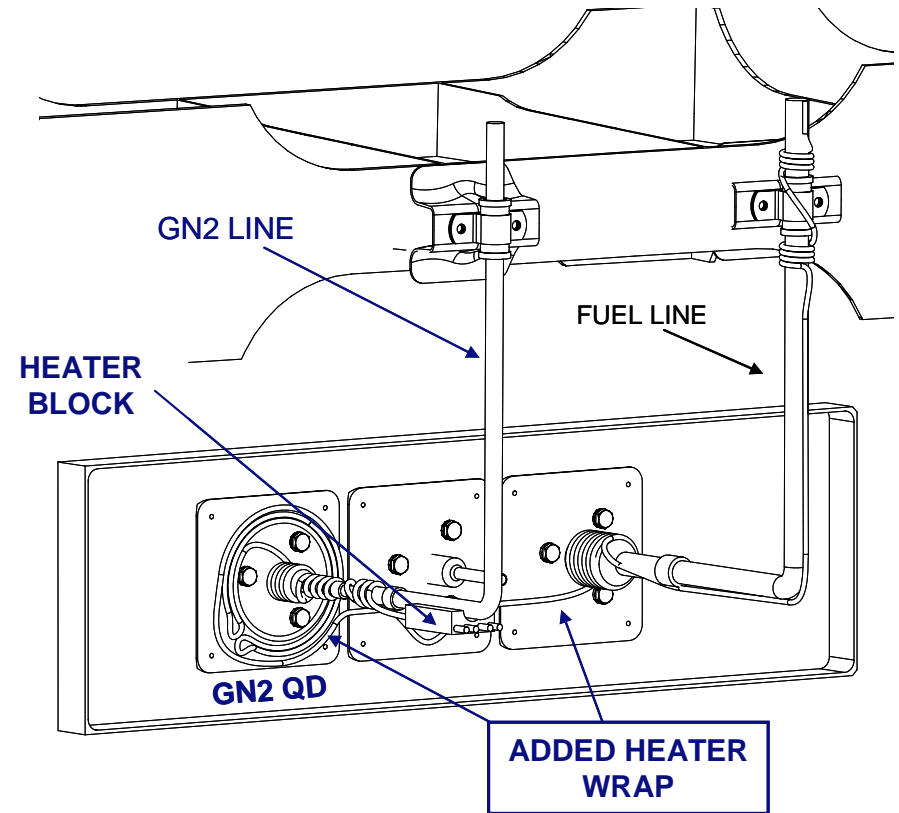
- Design change to allow 0.005" TFE coating on the ET Door pressure seals.
- The vendor (Kirkhill) is unable to manufacture ET Door Seals per current design with 0.010 coating, however can manufacture with 0.005" Teflon coating
  - There is an insufficient quantity of ET Door seals in Logistics inventory to meet end of program requirements – procurement of additional seals is required
- The new design will be Qual Tested (thermal only) to ensure the existing Certification requirement of no degradation over one mission is still met and will utilize M&P analysis supporting the change
- Implementation of this change is by attrition on all vehicles
  - OPO approved 1/12/09 OCCB
- Pending completion of certification and engineering release



# STS-128 DLSFR Previously Baselined Mod for OV-103 Flight 37

## • TAD 30189 APU GN2 QD Heater Mod

- Completion of mod which adds heaters to APU GN2 QDs to mitigate the most likely cause of GN2 system pressure decay observed on previous flights
  - Increasing the temperature of the GN2 QD expected to mitigate leak potential
  - Heaters added to systems 1 and 2 QDs for STS-119 OV-103 Flt 36
- Heater mod will be installed on system 3 QD during the Flt 37 flow pending no performance issues during STS-119
  - Existing system 3 fuel fill line will be replaced with a longer heater and the extra length will be used to heat the system 3 GN2 QD
- Engineering is released
- Hardware required is in stock in logistics inventory



**HEATER LAYOUT SYSTEM 3**

TEST LINE NOT SHOWN FOR CLARITY

# Engineering, Hardware and Certification Status – DLSFR Baselined Mods

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 at STS-128 DLSFR</b>										
<b>30091</b> Dolas	<b>Boundary Layer Transition (BLT) DTO - Flight 2</b> Mod / flight experiment consists of an integrated TPS and MADS instrumentation design with a fixed protuberance tile which will initiate early BLT. STS-119 was flown with a protuberance height of 0.25" to initiate BLT at ~Mach 15. The BLT FE protuberance will generate a boundary layer transitional cone downstream of the protuberance. A total of thirteen thermocouples are 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. Ten temperature measurements of the thirteen will be selected and recorded on the MADS instrumentation system each flight. Post-flight BLT performance evaluation will determine protuberance height changes for subsequent flights. Desire is to increase protuberance height to 0.35". BLT Readiness Review (BRR) will be held in mid-May 09 to review first flight DTO results and solidify go-forward plan for protuberance height and down stream thermocouple activation.  DLSFR mods to be authorized include an additional LI-2200 tile in the existing cluster of 3 immediately downstream of the protuberance for additional thermal margin and slight relocation of TC 5 into the BLT heating stream.	Released (N)	N/A	N/A (h)	TBD (h)	N/A (N)	N/A	N/A	N/A	Drawings are a mix of vehicle (V070) drawings, Orbiter mission kit (M070) drawings and tech orders (M072). Instrumented and Protuberance Tiles are installed by Orbiter mission kit (M070 drawings) which stay in the orbiter drawing tree and do not require manifesting on the MECSLSI  (h) All hardware previously provided by KSC USA NSLD, Logistics and KSC TPS Backshop, which fabricated all TPS tile required for this mod  (i) STS-119 flight evaluation, arc jet testing and associated thermal/stress analysis will be required to certify protrusion tile and heating effects for a protuberance tile of > 0.25" height.  (L) BRR scheduled mid- May for protuberance height change and downstream thermocouple activation locations.  (N) Additional LI-2200 tile and TC 5 relocation to be baselined at DLSFR.

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>Mission Kit Mod Record for Baseline at STS-128 DLSFR</b>										
<b>30010</b> Teal	<b>STS-128 Unique Stbd LW TSA Cushion</b> FRD 17462-128 rev 008 3/18/09 (FRD CR 0020) demanifest the port LW TSA from STS-128 and manifest a stbd LW TSA. Only two LW TSAs exist in inventory and flight schedule does not support turnaround of the units from OV-104 and OV-105 to support STS-128 CEIT. Since contingency tools are usually flown in the port LW TSA, a new cushion is needed to stow these tools in the stbd LW TSA	5/15/09	TBD	5/28/09	TBD	Go	7/6/09 P	7/23/09 P	CR 25-849-660516-001P CAR 16-25-849-660516-001P	FRD 17462-128 rev 008 3/18/09 (FRD CR 0020) authorizes change from the port to the starboard LW TSA and associated MECSLSI tech order updates.

# Engineering, Hardware and Certification Status – Baselined Mods

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>Mods Authorized for STS-128</b>										
<b>30189</b> Antonios	<b>APU QD Heater Modification</b> APU system 1 experienced pressure decay on-orbit during STS-121 (OV-103) and STS-123 (OV-105) - pressure decay was not evident on the ground prior to launch. The GN2 QD was isolated as the most likely source for the leak. Tests of the two QDs which exhibited on-orbit leakage indicated that leakage occurred as a result of the effects of contamination (including hydrazine) on the QD poppet sealing surface and the cold environment of space. Replacement of the poppet and seal assembly following STS-121 resulted in no leakage during the 3 subsequent flights of OV-103. Testing has demonstrated that cold temperatures must be present for a leak to occur, therefore, increasing the temperature of the GN2 QD expected to eliminate the leak condition.  <b>Mod parially implemented during flight 36 flow - heaters added to system 1 and 2 GN2 QDs for STS-119. System 3 will be modified during the flight 37 flow ( STS-119 systems 1 &amp; 2 performance was nominal). Existing system 3 fuel fill line will be replaced with a longer heater and the extra length will be routed / used to heat the system 3 GN2 QD.</b>	Released (a)	N/A	N/A (b)	N/A	Go (c)	10/9/08 A 1/15/09 A	12/5/08 A 1/20/09 A	CR 09-000002-002Q CAR 01-09-000002-002Q	(a) APU and Wiring engineering is 100% released. (b) Parts available on site (c) No technical issues - STS-119 systems 1 & 2 performance was nominal  <b>Baselined at STS-128 LSRR</b>
<b>Mods Authorized for STS-128</b>										
<b>30250</b> Garcera	<b>N2/O2 Panel O2 Crossover Valve Position Indicator Talkback</b> N2/O2 Control Panel provides pressure control support. The panel supports O2 and N2 Flow to the Crew Cabin and provides O2 to the Crew Launch Escape Suits (LES) and Airlock. The N2/O2 Panel O2 crossover valves (2) are required to be open to support crew breathing on the ACES. Current Orbiter configuration provides only switch scan instrumentation which verifies power applied to valve but not position indication. A N2/O2 Control Panel O2 Crossover valve failure closed could result in the loss of oxygen to Crew Launch Escape Suits (LES). The O2 crossover valve position indication is provided at N2/O2 Control Panel electrical connector. Connecting to the available N2/O2 valve position will provide a reliable method for verifying the O2 crossover valve is open.	Released	N/A	N/A	N/A	Go	N/A	N/A	N/A	Vehicle Mod Engineering: Released (OV-103) Subsystem & Integrated Schematic: 4/30/09 Hardware Delivery: N/A Certification: N/A OMRS RCN Approval: 6/12/09 LCC LCN Approval: 6/23/09 Software Load Delivery (Base 2 Shuttle Data Tape): 5/28/09 (Flight software only - no ground software impact) FMEA/CIL Update Program Approval: 5/8/09 Hazard Report Update Program Approval: 6/15/09  <b>Approved at 4/17/09 DPRCB S115128D</b>

# Engineering, Hardware and Certification Status – Baselined Mission Kit Mods

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>Mission Kit Changes Authorized For STS-128</b>										
<b>30164</b> Antonios	<b>TriDAR (DTO-701A) Installation</b> The autonomous rendezvous and docking sensor (TriDAR) will be integrated into the Orbiter system to demonstrate technology for autonomous rendezvous and docking in Low Earth Orbit. The sensor will be mounted on the airlock truss next to the Trajectory Control Sensor (TCS) 2 in the TCS 1 location which is no longer used. Hardware furnished by GFE and installed by Boeing TCS tech order which will be updated to establish a unique TriDAR installation configuration	Released (d)	N/A	N/A (GFE) (e)	TBD	Go (f)  TBD (GFE) (e)	1/15/09 A  2/3/09 A	2/25/09 A  2/25/09 A	CR 09-362000-001CK  CAR 72A-09-362000-001CK  TCS Blanket Config Update	(d) Tech order installation engineering is released – minor engineering cleanup may be required to transfer to OV-103 end item (originally issued for OV-104 installation) (e) Hardware delivery and LRU certification is GFE responsibility. Per 12/16/08 OCCB brief, delivery of TriDAR flight unit KSC ~L-4 months (target on-dock April 15, 2009) (f) Boeing certification for LRU & TCS thermal blanket installation  <b>Ref OCRD S165322</b>  <b>Baselined at STS-128 LSRR</b>
<b>17222</b> Kadri	<b>RMS End Effector Change</b> In response to an End Effector on-orbit anomaly (back up release stalled) on STS-103, two design mods are being incorporated during planned End Effector refurbishment. 1) The Spring Return Assembly was altered to improve the output torque drive efficiency and reliability. Background: The Back-up release mechanism does not deliver enough torque to overcome minor anomalies, such as debris in some gear passes. Gear ratios were modified on two gears to provide additional torque (2X) and material changes (nitride coating) were made to decrease wear due to mission vibration loads. 2) The Energy Absorber shaft material and processing were changed to reduce chipping of the nitride coating. Background: The Energy absorbers are deteriorating faster than expected, exacerbating wear of some gears. Energy absorber changed to a stronger material (AerMet 100) and coated with ion nitride. Boeing update to the Remote Manipulator Arm Tech Order Installation drawing (M072-544502) implemented to reflect this new -13 EE replacing the -11 EE configuration.	Released	N/A	(g)	N/A (g)	N/A (g)	N/A	N/A	N/A	Ref M072-544502 C01 V082-000002 end item EO not released  (g) Hardware delivery and certification is NASA GFE responsibility. Boeing certification not affected.  Ref OCRD S165341  Placeholder Record authorized at LSRR. MECSLSI update previously picked up as part of CIR process.



# Mod Record / MECSLSI Updates for STS-128 DLSFR Baselined Mods

MCR NO.	MCR TITLE	KIT-MOD RECORD / TECH ORDER IMPACT DESCRIPTION	REMARKS
<b>Mod for Baseline at STS-128 DLSFR</b>			
<b>30091</b> Dolas	<p><b>Boundary Layer Transition (BLT) DTO - Flight 2</b></p> <p>Mod / flight experiment consists of an integrated TPS and MADS instrumentation design with a fixed protuberance tile which will initiate early BLT. STS-119 was flown with a protuberance height of 0.25" to initiate BLT at ~Mach 15. Post-flight BLT performance evaluation will determine protuberance height changes for subsequent flight(s). Desire is to increase protuberance height to 0.35" for STS-128. BLT Readiness Review (BRR) will be held in early May 09 to review first flight DTO results and solidify go-forward plan for protuberance height and down stream thermocouple activation.</p> <p>DLSFR mods to be authorized include an additional LI-2200 tile in the existing cluster of 3 immediately downstream of the protuberance for additional thermal margin and slight relocation of TC 5 into the BLT heating stream.</p>	<p><b>TCTIM1930091REF.0001,2</b> - Tile Replacement &amp; TC 5 Relocation for Second BLT FE Flight</p> <p><b>TCTIV8830091REF.0103,1</b> - Vehicle Tree-Up for 2nd BLT FE Flt (New 22LB Tile &amp; TC 5 Relocation)</p> <p><b>No Tech Order / MECSLSI Impact</b></p>	<p>Drawings are a mix of vehicle (V070) drawings, Orbiter mission kit (M070) drawings and tech orders (M072). Instrumented and Protuberance Tiles are installed by Orbiter mission kit (M070 drawings) which stay in the orbiter drawing tree and do not require manifesting on the MECSLSI</p> <p>Additional LI-2200 tile and TC 5 relocation to be baselined at DLSFR.</p>
<b>Mission Kit Mod Record for Baseline at STS-128 DLSFR</b>			
<b>30010</b> Teal	<p><b>STS-128 Unique Stbd LW TSA Cushion</b></p> <p>FRD 17462-128 rev 008 3/18/09 (FRD CR 0020) demanifest the port LW TSA from STS-128 and manifest a stbd LW TSA. Only two LW TSAs exist in inventory and flight schedule does not support turnaround of the units from OV-104 and OV-105 to support STS-128 CEIT. Since contingency tools are usually flown in the port LW TSA, a new cushion is needed to stow these tools in the stbd LW TSA</p>	<p><b>Placeholder 030010,0103,3</b> - STS-128 Unique Stbd LW TSA Cushion Change</p> <p>K849-000022-001,0006,0 End Item Kit Record</p> <p>(Delete) M072-660850-005 Port LWt TSA            (Delete) M072-660853-002 Port LW TSA Stowage Cushion            (Add) M072-660850-006 LW Stbd TSA            (Add) M072-660856-001 LW Stbd TSA Stowage Cushion            Tool Stowage Assy            Model MV0849A</p>	<p>FRD 17462-128 rev 008 3/18/09 (FRD CR 0020) authorizes change from the port to the starboard LW TSA and associated MECSLSI tech order updates.</p>

## Cargo Engineering Backup

# STS-128 dLSFR

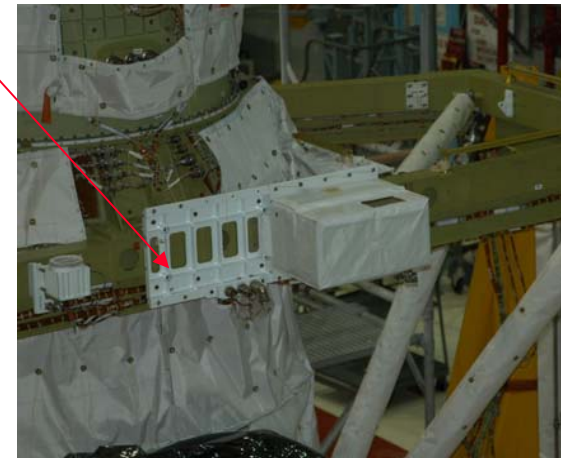
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## TriDAR DTO 701A

### Description

- NEPTEC is one of two leading candidates that combines 3D Triangulation and LIDAR in a single optical path
  - Largely based on OBSS LCS flight hardware
  - Immune to lighting conditions
- For STS-128, TriDAR DTO 701A assembly mounts to the existing Trajectory Control System (TCS) Carrier Assembly on the Orbiter Docking System (ODS) in the Stbd location, with the TCS-2 mounted in the Port location

TriDAR will be installed next to TCS



### Documentation

- NSTS 21547: TriDAR DTO 701A Integration Plan
- ICD-A-21342: Shuttle Orbiter/ODS-ISS Cargo Element ICD
  - Documents avionics interfaces
- ICD-3-0071-01: Orbiter Level III ICD
  - Documents mechanical interfaces



# STS-128 dLSFR

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## TriDAR DTO 701A - Concluded

### Engineering

- V072-200208: MECSLSI update with TriDAR related tech orders will be released on 02/23/09
  - M072-730021: TCS Tech Order for Mechanical Installation of TriDAR into Orbiter
  - M072-710728: Payload Bay Wiring Tech Order Installation to the wire tray
  - M072-794746: Orbiter Tech Order to install wiring from wire tray to TriDAR
- VA72-200208: Cargo Arrangement expected 02/23/09

### Testing

- Pre mate test will be covered by OMRS F2 V4
- Post mate will be covered by a chit and will be developed by NEPTEC and Orbiter

### Hardware Deliveries

- Cable Harnesses – 46P77983 (New), 46P77W121 (MOD), 46P77W349 (Re-Make)
  - Hardware was delivered on 3/31/09

# STS-128 dLSFR

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## Interface Control Documents

Document	Title	ECD	Status
ICD-A-21342	ODS-ISS	05/24/96	Baselined
ICD-A-21494	Lightweight MPESSE Carrier (LMC) Baselined	12/08/00A	
ICD-A-21537	MISSE 6	07/10/07	Baselined
ICD-A-21350	MPLM	02/12/96	Baselined
• A05712	Update Trunnion Scratch non-compliance	04/24/09	In Review

\* Impact to Flight Products

# STS-128 dLSFR

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## ICD Status (\* = Impact Flight Products)

<u>Document</u>	<u>Title</u>	<u>ECD</u>	<u>Status</u>
ICD-A-21429	DTV	03/10/99	Baselined
ICD-A-21449	MINICAM/Downlink	01/28/99	Baselined
ICD-A-21264	OIU	08/17/95	Baselined
ICD-A-21403	SSV	03/17/97	Baselined
ICD-A-21420	VPU	01/14/98	Baselined
ICD-A-21418	RSC	12/16/98	Baselined
ICD-A-21342	ODS-ISS	05/24/96	Baselined

# STS-128 dLSFR

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## OMRSD

- FII V2 (Post-Mate)  
Baselined Files

- P350 Multi-Purpose Logistics Module (MPLM)
- P430 SL/ORB Generic I/F Requirements (LMC)

### RCNs

- PP17785 P546 – ISS-17A Baseline

### Release

09/25/08A

### Baseline

01/23/09A

- FII V4 (Pre-Mate)

### RCNs

- PS17920R1 Mission-Unique List
- PS17919 FIII MUL
- PS17923R1 Adjacent Pin Test
- PS17909R5 ROEU Core Requirement

### Release

03/06/09A

03/06/09A

03/06/09A

03/31/09A

### Baseline

03/27/09A

03/27/09A

04/17/09

04/14/09

### Update

- FII V6 (Shuttle Experiments)

- None

- Issues / Concerns

- None

# STS-128 dLSFR

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## Annex 1

### ISS 17A MIP

Baseline

Post-CIR Update

Final Weight Update (L-1M)

Customer  
Submittal

08/14/07A

01/30/09A

06/08/09

CR  
Release

08/31/07A

03/23/09A

06/22/09

CR  
ECD

10/03/08A

04/30/09

07/06/09

### LMC CIP

Baseline

Post-CIR Update

Final Weight Update (L-1M)

06/30/08A

01/30/09A

06/08/09

08/11/08A

03/23/09A

06/22/09

09/26/08A

04/30/09A

07/06/09

### MISSE 6 PIP

Baseline

Final Weight Update (L-1M)

06/30/08A

06/08/09

08/11/08A

06/22/09

08/15/08A

07/06/09



# STS-128 dLSFR

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## Standardization

- **Mission Configuration does comply with Orbiter/Payload Integration Standardization Document NSTS 60523**

## Rescue Flight Status

- **STS-328 Reconfiguration Engineering Products will be developed by the Engineering Order To Follow (EOTF) Process**



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## Overview

- **SSP System Drawings** **No Issues\***
- **SSP Authorized Modifications/Non-Standard Work** **No Issues\***
- **SSP ICD Changes (IRNs)** **To Be Presented**
- **SSP OMRS Changes (RCNs)** **To Be Presented**



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## SSP ICD Changes

- **The Following ICD Changes, Program Designated for STS-128, are in the Review/Approval Cycle:**

<u>IRN#</u>	<u>Description</u>	<u>Status</u>
IC-3358	Updates interface to Orbiter Window Cavity Conditioning System (WCCS) for newly built dual desiccant canister thermal testing GSE	05/04/09



<b>STS-128 Delta Launch Site Flow Review</b>	<b>Presenter</b> MK-SIO / A. Swift	
	<b>Date</b> 4-23-09	<b>Page</b> 1

### **Mandatory RCNs:**

<b>OV17826</b>	<b>V46 – APU GN2 QD HEATER MODIFICATION</b>	<b>4/24/09</b>
<b>KV17849</b>	<b>V05 - WCCS THERMAL FLOW TEST VERIFICATION</b>	<b>4/24/09</b>

### **Non-Mandatory Value Added RCNs:**

<b>MS</b>	<b>S00 – CLARIFY SRB HPU GG BED HEATER</b>	<b>4/22/09</b>
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# **STS-128**

## **Delta Launch Site Flow Review**

### **Flight Software Overview**

**Tom Stansel**  
**USA FSW**

**PRCB 04/23/09**

# STS-128 DLSFR (FSW)

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- **STS-128/OV103 Flight Software (FSW) Versions**
  - First scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS content)
  - First scheduled flight of MEDS IDP VI 07.00/MDUF VI 06.00 (SASCB SCR 98113 documents content)
  - Second scheduled flight of MAGRS-3S Link 613-996-008 Software (Link-008) (SASCB SCR 98115 documents content)
- **STS-128/OV-103 Flight Software Payload Support:**
  - ISS 17A
  - Orbiter Interface Unit (OIU)
  - Sequential Still Video (SSV)
  - Orbiter Docking System (ODS)
  - Trajectory Control System (TCS)
  - Multi-Purpose Logistics Module (MPLM)
  - ISS Caution and Warning (ISSCW)
  - 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-128 DLSFR (FSW)

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- **STS-128 Source Changes/Edits for Primary Flight Software (Base)**
  - SCR 93211A Update of SSMEC Vehicle Data Table (VDT) for Enhanced Accelerometer
  - SCR 93262A Film ET Camera
  - SCR 93267A Removal of the Set and Reset to False Cmds For the RCS Tank Iso Valves
  - DR 126366 SM GPC Failure to Send GCIL Commands
- **STS-128 Patch Implementation for Primary Flight Software**
  - None
- **STS-128 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
  - None
- **STS-128 Patch Implementation for Backup Flight Software**
  - None

# STS-128 DLSFR (FSW)

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- **Products**

- **STS-128/OV-103 Base Cycle product delivery schedule (available to field)**

**FPSB**

- **Shuttle Data Tape**

**January 15, 2009A**

- **Mass Memory Unit**

**February 06, 2009A**

- **An STS-128/OV-103 Base 2 Cycle SDT will be required to support the O2 Cross Over Valve (PRCB CR S070006). No Mass Memory Unit update is required. Product delivery schedule**

**FPSB**

- **Shuttle Data Tape**

**May 28, 2009**

- **STS-128 Flight Specific Orbit I-Load patch**

**April 22, 2009**

- **Open Items**

- **None**

- **Concerns/Issues**

- **No issues or concerns with STS-128 at this time**





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

**STS-128 DLSFR**  
**OV-103 FLIGHT 37**

Kenneth Brown  
Orbiter GFE

December 18th, 2008



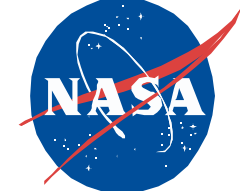
# End Effector Swap

Presenter  
MV / Kenneth Brown

Date

Page 2

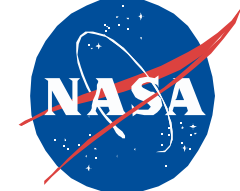
- **Modifications Was Baselined at LSRR for OV-103 Flight 37**
  - **RMS End Effector Upgrade**
  
- MDA is in the process of completing the second End Effector (EE) upgrade on S/N 303:
  - Change the raybestos brakes/clutches to a ceramic material (since raybestos is no longer available)
  - Implement two design modifications to address issues that occurred on STS-103 (back-up release stall)
  
- EE S/N 303 to be delivered to KSC in February
  - Plan to swap/return to MDA EE S/N 403 for upgrade



# **EVA Status**

## **STS-128/Flight 17A Delta Launch Site Flight Review**

**XA/Maria Tullar  
Johnson Space Center  
April 23, 2009**



- **Bulkhead PFR – SED33105308-307**
  - Bulkhead PFR installation – Tech Order: M072-661568-029
  
- **Winches**
  - Forward Winch, SED33101570-327
  - Aft Winch – Removed and manifested in the middeck in 5 MLE bag.
    - FRD17462-128-0022: Delete Aft Bulkhead Winch approved on 4/15.
    - KSC CHIT J6503: Request for STS-128/17A Crew evaluation for Aft winch Alternate Tool workaround on OV-103 submitted on 4/17.
    - In parallel, briefing to provide option to delete aft winch from the manifest once crew evaluation is completed is in work.
  
- **Stbd LWTSA**
  - Stbd LWTSA installation – Tech Order: M072-660850-006
  - Stbd LWTSA Tools installation – Tech Order: M072-TBD (new cushion design is in work) – scheduled to be released 5/15.

# STS-128 Delta Launch Site Flow Review

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J.F. KENNEDY SPACE CENTER

**17A**  
**STS-128**  
**MPLM/LMC**

**KSC ISS & Spacecraft Processing**  
**Joseph T. Delai, NASA, KSC Mission Manager**  
**Mike Kinslow, Boeing, KSC Flow Manager**

# Planned Processing Milestones



J.F. KENNEDY SPACE CENTER

## PRE-SHUTTLE INTEGRATION ACTIVITIES

### Space Station Processing Facility

- ULF-2
  - LMC/ORU Processing 11-03-08 to 06-26-09
  - MPLM Rack Integration 04-07-09 to 05-14-09
  - MPLM Internal/External Closeouts 06-01-09 to 06-19-09
  - MPLM/LMC ICD Walk down 06-01-09 to 06-02-09
  - Hatch Closure 06-22-09
  - Payload to Pad 07-07-09

# Planned Processing Milestones



J.F. KENNEDY SPACE CENTER

## SHUTTLE INTEGRATION ACTIVITIES

### Orbiter Processing Facility

- Two MISSE FSE plates installation 4/23/09

### PAD (U/R)

- Payload to Pad 07/07/09
- Payload installed into Orbiter 07/14/09
- Payload IVT 07/17/09
- Late Stow Operations/Hatch Closeouts Not required
- Payload Closeouts TBD
- Launch 08/06/09

# KSC/ISS Processing Summary



J.F. KENNEDY SPACE CENTER

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## **Watch Items:**

- Currently due to additional requirements, payload to pad is seven days 'out of bed'. MPT working hard to recover time by working extended shifts.

**The KSC STS-128/17A - ISS Mission Processing Team is ready to proceed with processing the STS-128 Mission payload complement.**





# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## Backup Material

- **SSP Systems Drawings** Attachment 1
- **SSP Authorized Modifications/Non-Standard Work** Attachment 2
- **SSP OMRS Waivers and Exceptions** Attachment 3
- **Launch Window** Not Available
- **Open Configuration Waivers** Attachment 4



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

**STS-128 DLSFR**

**OV-103 FLIGHT 37**

Kenneth Brown  
Orbiter GFE

December 18th, 2008



# End Effector Swap

Presenter  
MV / Kenneth Brown

Date

Page 2

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  - **RMS End Effector Upgrade**
  
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- EE S/N 303 to be delivered to KSC in February
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# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## SSP System Drawings

The Drawings Baseline Was Released By PRCB S115128A on 09-29-08

- V072-000001-280 (Rev. VV) Space Shuttle System (Rel. 02-12-09)
  - V072-200208-003 (Rev. B) Mission Equipment Cargo Support (Rel. 02-17-09)
  - SGD32104451-301 (Rev. A) Crew Compartment Configuration (Rel. 02-17-09)
    - 302 Descent
  - V070-000001-003 Orbiter General Assembly
    - V070-410100-017 SSME Installation
  - 10100-0061-176 Integrated SRB General Assembly (BI-139)
  - 80901000000-530 External Tank Assembly (ET-132)
  
- STS-128 LSRR + 18 days Mission Configuration Product Plan (MCP) was last published on 01-05-09 and will be republished at ORR - 14 days on TBD.



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## SSP System Drawings – Continued

### Ferry Configuration

- **V072-000001-281** (Rev. VU) Space Shuttle System Drawing (Rel. 01-15-09)
  - **V072-200208-004** (Rev. B) Mission Equipment Cargo Support (Rel. 02-17-09)
  - **SGD321004451-001** (Rev. A) Crew Compartment Configuration (Rel. 02-17-09)
  - **V072-300055-027** (Rev. BT) Ferry Flight Configuration (Rel. 12-11-08)

**SCA 905**

CDR	FREDERICK W. STURCKOW
PLT	KEVIN A. FORD
M/S #1	PATRICK G. FORRESTER
M/S #2	JOSE M. HERNANDEZ
M/S #3	CHRISTER FUGLESANG
M/S #4	JOHN D. "DANNY" OLIVAS
M/S #5	(UP) NICOLE STOTT
M/S #5	(DN) TIMOTHY KOPRA

## ASCENT MODULAR LOCKER LAYOUT

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

LEADER:	VANESSA OSBORN
DATE:	2-27-09
LAUNCH:	8-6-09
FLIGHT:	STS-128/17A (MPLM)
VEHICLE:	OV-103
CREW:	7 CREW 13 + 1 + 2 DAYS
RQMTS:	NO RCRS, SLEEPING
	BAGS, EXT A/L, ERGOMETER, RMS
	LW MAR, NON-EDO VOL B, NO VOL D

ML60B 6013 -310
PRIME C/L CAM GFE TV CNTRLR
ML60E 0646 -TBD
PGSC (6)
STS1=OCA STS2-WINDECOM STS3-KFX STS4-WORLDMAP STS5-RPOP STS6-WLES
ACCESS PT ACCESSORIES
WLE CABIN RELAYS
☒ PCS LAPTOP ☒ PWR SPLY ☒ CD-ROM
ML60M 6014 -312
B/U C/L CAM ULTRA TRASONIC LEAK DETECTOR

### MIDDECK FORWARD

5962 -303 MF14E 6269 -309 PRINTER TRAYS IODINE REMOVAL (GIRA) 6256-306	MF28E/G TBD TBD	6697 -TBD MF43E HH LIDAR W/NIGHTSCOPE 2ND HHL (TRAD)/SSV BPSMU (2)	1900 -308 MF57E CDR CLOTHING
6256-306	MICE DRAWER SYSTEM (MDS)	1908 -309 MF43G CREW SUPPORT	6240 -311 MF57G ORBITER FDF SODF
6300 -345 MF14H 6250 -353 IFM TOOLS 2163-302 2161-305 2162-307 ☒ MULTIMETER	MF14G TBD MDS SUPPORT EQUIPMENT CTB	1902 -308 MF43H M/S #1 CLOTHING	5473 -305 MF57H ORBITER FDF/ CLOTHING
6231 -TBD MF14K POST INSERTION 2 *SDBI 1634 / (3) ACTIWATCH	MF28K 6231 TBD POST INSERTION 1	6020 TBD MF43K G-SUITS (6)	TBD -TBD MF57K ISS RESERVE CTB
6299 -321 MF14M COAS/BTA WORK LTS/LT SHADES/D2X AUDIO DOSIMETER	MF28M 2763 -304 MENU FOOD	1904 -307 MF43M M/S #3 CLOTHING	1901 -305 MF57M PLT CLOTHING
8047 -304 MF14O DC VACUUM CLEANER (CTB) 6015-326	MF28O 8965 -TBD SHUTTLE CSA/CP SUPA (13)/FMK CONDENSATE HOSE/CWC DOCKING KIT/O-RINGS BRAYCOTE	2766 -305 MF43O MENU FOOD	2765 -304 MF57O MENU FOOD

### MIDDECK AFT

MA9D/F 9882 -309 T-RAD SPARE DTV VIP MUX/TOOLS DTV DSR 25	MA16D TBD -TBD ISS SAMPLES DOUBLE COLD BAG
MA9G 8719 -309 COLOR PRINTER CTB	MA16F/G TBD -TBD GLACIER (36 CFM/REAR BREATHER)
MA9J 8737 -310 RCC COLD BAG (NOAX) DOUBLE COLD BAG	MA16J TBD -TBD SODF STOTT CREW PREF HCTB
MA9L TBD STOW-N-GO CTB	MA16L 9014 -TBD MED KITS MAK
MA9N 7432 -TBD SOFT STWG BAGS PHK'S 4980-309 BRKTS/COK/RE-ENT LIGHT STICKS 8071-311 RSTRNTRS/RE-ENT FIBERSCOPE 8070-302	MA16N 0631 -TBD SOMS RESUSCITATOR AMMONIA DETECT KIT

VOL B 7436 -TBD MAM/J
HYGIENE
VOL 3B 7425 -326 MA75J
QUICK DON MASK (3) CABIN AIR CLEANER SPOT (FLASHLIGHT) G1 CAMCDR/FLASH D2X/400 MM LENS 12-24MM LENS

A16 8706 -TBD 35 MM CAMERA BAG PILOT HAND CNTRL	A17 7424 -TBD DTV CAMCORDER BAG CC SYSTEM BAG QUICK DON MASK (4) HATC H TOOL	VOLUME D (MDS2C) NOT INSTALLED	VOLUME F (MD76M) 1403 -306 WET TRASH	VOLUME G (MD80R) 1800 -TBD CONT UCDS WASTE MGMT ODOR BACT FLTR	VOLUME H (MA23R) 8068 -TBD EVA ACCESS (INBD) 8065 -TBD EVA ACCESS (OBD)	WMC (MAB2H) 0914 -331 TOWELS AND RESUPPLY ITEMS WMC DISPENSER 1ST DAY CLOTH SUPA (1) 1641-330	EXT A/L TBD -TBD 2-EMUs EXT A/L FLOOR 0289 TBD EMU BATTERY/CDC(4) CRACK REPAIR PALLET (2) BMRRM TOOL FRT 85' TETHERS
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MD CEIL (PORT 1) 0718 TBD RCC TILE REPAIR CCC(2)
MD CEIL (PORT 2) 9895 -302 RSK-6 ACES G-SUIT ENTRY GARMENTS
MD CEIL (STBD 1) TBD EVA B/U EQUIP 2 LCVG (OL & FG) 2 PR GLOVES (OL & FG) DIDB (6)
MD CEIL (STBD 2) 6665 -TBD IELK ☒ RUNNING SHOES
MD FLOOR (PORT 2) TBD ISS ITEMS ☒ ISS PHOTO/TV (CTB) ☒ EMU EQUIP (ST) IPT RESERVE (2MLE)
MD FLOOR (PORT 1) TBD TOOLS EMU EQUIP DIDB (8)
MD FLOOR (STBD 2) TBD ISS RESERVE
MD FLOOR (STBD 1) TBD ISS ITEMS (TBD) HCTB) CREW CARE PKG (2)

TOTAL LIOH (47)
LIQH BOX (7435-TBD)
29 LIOH IN LIOH BOX & 1 ATCO
2 INSTALLED
16 SSP LIOH MPLM STOWED

KSC P/D: TBD-301
JSC C/D: TBD-301
KSC P/D: TBD-301
JSC P/D: TBD-301
CEIT KIT: TBD-301
ISS KIT: TBD

WINDOW SHADE BAG- (5548-TBD)
1. WINDOW SHADES
2. IFM CABLES & HOSES 4259-344
3. FILM CHG BAG (4828-303)
4. PANEL COVERS

L10A1: AVIU (6686-335)
L10A2: DTV MUX
L10A3: DTV/VTR/VIP
L11A1: PDIP 2
L11A2;A3: OIU 1 & 2
L12A1: SSP 1
L12A2: SSP 2
L12A3: PDIP 1
R12A1: VPU
R12A2: VPU (OPP)

* NOT APPROVED
● L-24 LATE LOAD
☒ SWAP
☒ TRANSFER HARDWARE
CTB CARGO TRANSFER BAG
HCTB HALF CARGO TRANSFER BAG

CTB	HLF	SGL
LAUNCH	TBD	TBD
RETURN	TBD	TBD

NOTE: LOCKER LAYOUTS ARE FOR REFERENCE ONLY & ARE NOT RELEASED DWGS. FOR RELEASED DRAWING, PLEASE REFER TO THE CREW COMPARTMENT CONFIGURATION DRAWING FOR THIS FLIGHT (SGD32104446)

DWG NO. SGD32104451

CCMM: DELLA WYLLIN  
281-483-9790  
/USR/DWGS/LOCKER/STS-128



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 7 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
  - **No impacts for all six disciplines 3**
  - **One or more disciplines with impacts, documentation approved 1**
    - **MCRs 30189**



# STS-128 Delta Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-23-09**

## Modification Impact Report – Continued

- Possible impacts still under review 3
- MCR's 17222, 30164, 30250 are being reviewed for all impacts



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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0128

MEQ

ECP-MCR/KIT SEQUENCE

RUN

TIME 08:47 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIOR	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
017222	AUTH	017222	0103 006	RMS END EFFECTOR MOD
S115128C				
	KSC		CONTR	ADDED FOR STS-128, OV-103/37 LSRR
2009-01-06	037			
030164	AUTH	030164	0103 000	AUTONOMOUS RENDEZVOUS AND DOCKING SENSOR - TRIDAR
S115128C				
	KSC		CONTR	ADDED FOR STS-128, OV-103/37 LSRR
2009-01-06	037			

TOTAL MODS = 2

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0128

ORB

ECP-MCR/KIT SEQUENCE

RUN

TIME 08:47 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIOR	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
INSPECTION	AUTH	J6275A	0103 002	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING
LSFR,	S-J6275A	MAND		
2008-02-26	KSC	037	SPAR	CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT AND FINALIZED AT DLSFR FOR EACH FLOW.
S-J6341A	PLND	J6341A	0103 001	EVALUATION OF OMS POD LI-900 TILE INSTALLED ON 0.090" SIP
2008-04-09	MAND		SPAR	LI-900 TILE INSTLD ON .090 SIP WILL BE INSPD FOR DEFECTS PER CHIT ON NEAR TERM FLOWS UNTIL RCN IS
S-J6384	PLND	J6384	0103 000	BLT TEMPILABEL ASSESSMENT
2008-08-11	MAND		SPAR	BLT TEMPILABEL READINGS WILL BE RECORDED POST STS-119 NIB TO OPF PROCESSING.
WING)	PLND	J6392	0103 001	PRE & POST FLT OPTIGO SCAN OF PROTUBERANCE TILE (PORT
2008-07-28	S-J6392	MAND	SPAR	TO SUPPORT THE BOUNDARY LAYER TRANSITION (BLT) FLIGHT EXPERIMENT
S-J6402	PLND	J6402	0103 001	MICRO INSPECTION OF CAPTIVE GAP FILLERS
	MAND			

2008-08-08	KSC 037		SPAR	CHIT DOCUMENTS MICRO INSPECTION OF SPECIFIC CAPTIV E GAP FILLERS DUE TO OBSERVED FLT DEGRADATION.
S-J6410	PLND J6410 MAND KSC 037		0103 001	AFT STUB CRACKED TILE INSPECTION
2008-09-18			SPAR	
S-J6414A	AUTH J6414A KSC KSC 037		0103 001	RUDDER SPEED BRAKE THERMAL TAB INSPECTION
2008-12-19			SPAR	
S-J6434	PLND J6434 MAND KSC 037		0103 001	OV-103 PUTTY REPAIR
119 2008-10-28			SPAR	TPS REPLACEMENT WILL BE ON AN OPPORTUNITY BASIS FOR STS- WITH COMPLETION DURING STS-129.
S-J6443	AUTH J6443 MAND KSC 037		0103 001	Z-SCAN OF BLT PROTUBERNANCE TILE
2008-11-19			SPAR	
S-J6447	AUTH J6447 MAND KSC 037		0103 000	STS-126 POST FLT INSP AND CONTAMINATION SAMPLING
2008-12-19			SPAR	
TEST S-J6453	AUTH J6453 MAND KSC 037		0103 000	NOSE LANDING GEAR DOOR (NLGD) THERMAL BARRIER FRICTION
2009-01-20			SPAR	
S-J6464	AUTH J6464 MAND		0103 000	CALIBRATION OF PREVIOUSLY INSTALLED ACOUSTIC SENSORS

2009-03-16	KSC 037		SPAR	CALIBRATION OF ACOUSTIC SENSORS WILL BE A PARALLEL EFFORT PLANNED FOR THE STS-128 GRND PROCESS'G FLOW
S-J6466	PLND J6466 MAND		0103 000	OMS POD PILLOW GAP FILLER INSTALLATIONS
2009-02-09	KSC 037		SPAR	
S-J6467	AUTH J6467 MAND		0103 000	OMS POD WEIGHING
2009-02-12	KSC 037		SPAR	OMS POD WEIGHING WILL BE ACCOMPLISHED IN PARALLEL WITH SCHEDULED REMVL FOR ATTACH POINT INSPNS.
S-J6480	AUTH J6480 MAND		0103 000	MIDDECK PAYLOAD COOLING AIRFLOW TEST FOR OV-103 AV BAY 1
2009-03-25	KSC 037		SPAR	

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0128

ORB

ECP-MCR/KIT SEQUENCE

RUN

TIME 08:47 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIOR	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S-J6482	AUTH MAND KSC	J6482	0103 000	STS-128 PAYLOAD CLOSE CLEARANCE MEASUREMENTS
BEEN 2009-04-01		037	SPAR	P/L CLOSE CLEARANCE MSRMNTS FOR STS-128 & STS-131 HAVE PLANNED FOR THEIR FLOWS. NO M/S IMPACTS
S-J6484	AUTH MAND KSC	J6484	0103 000	MAGRS-3S-LINK-008 SOFTWARE UPGRADE
2009-04-02		037	SPAR	MAGRS SOFTWARE UPGRDS WILL BE IMPLEMENTED IN PARAL LEL W/ CURRENT PLANNED OPS. VENDORS WILL BE CERT'D.
CONC S-J6487	AUTH MAND KSC	J6487	0103 000	CAPTURE OV-103 OUTPUT WAVEFORMS TO ADDRESS 1N3600 DIODE
2009-03-30		037	SPAR	ERNS
S-J6488	AUTH MAND KSC	J6488	0103 000	ADDITIONAL IR THERMOGRAPHY REQUEST FOR OV-103
2009-03-26		037	SPAR	REQ'D IR THERMOGRAPHY WILL BE PERF'D IN PARALLEL WITH CURRENTLY PLANNED POST FLT THERMOGRAPHY OPS.
STS- S-J6490	PLND MAND KSC	J6490	0103 000	REMOVAL OF OV-103 MPS GH2 FLOW CONTROL VALVES FOLLOWING
2009-03-27		037	SPAR	119

EVALUATI	S-J6494	AUTH	J6494	0103 000	OV-103 W3 VESPEL WINDOW FASTENER POST FLIGHT TORQUE
			MAND		
		KSC		SPAR	ON
2009-04-09		037			
EXT-	S-J6496	AUTH	J6496	0103 000	RMVL OF IDT STAR TRACKER S/N 12 FROM -Z SLOT OF OV-103,
			MAND		
		KSC		SPAR	ERNAL SEALING OF THE UNIT, AND REINSTLN IN -Z SLOT
2009-04-09		037			
S052924CD		AUTH	K6493	0103 000	CANNIBALIZATION SUPPORT FOR LON
		SCHD			
		KSC		NSW	
2009-04-06		37			
011621		AUTH	TCTIV1911621REF	0103 015	REV SHIM THICKNESS TO DELETE INTERFERENCE W/SPAR FTG -
EOTF	S115128CR1		MAND		
		KSC			ADDED PER V070-199750 C05, -199743 C05, (REF: TES-3-
A0058)	2009-02-10		037		
030189		AUTH	TCTIV4630189REF	0103 001	APU QD HEATING MOD, SYSTEM 3
S115128C					
		KSC	NOT REQUIRED		ADDED BY EDS I/F & V070-465433 F04, 465002 Y06. RE PLACES
2009-01-06		037			030189,0103,1
115119		PLND	S115119F	0103 001	TEMPERATURE SENSING LABELS REMOVAL
S115119F			MAND		
		KSC			
2009-01-22		037			
TOTAL MODS =			26		

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0128

PIH

ECP-MCR/KIT SEQUENCE

RUN

TIME 08:47 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIO	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
008844	APPD	K796-774001-001	0001 000	WIRE HARNESS ASSY AREA 46 - IBSS KIT (TRIDAR)
NOT REQD	MAND			
	KSC			ADDED PER V796-000002 A06
037				
	APPD	TCTIM7108844REF	0001 000	ADDITIONAL WIRE HARNESS HARDWARE TO SUPPORT TRIDAR
NOT REQD				
	KSC			ADDED PER V782-000002 C06 & -714721 A02
037				

TOTAL MODS = 2

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0128

SRB

ECP-MCR/KIT SEQUENCE

RUN

TIME 08:47 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S063944A	PLND	CR S063944A	B139 000	TCTI FOR IMPLEMENTATION OF THE IPT AT KSC
2008-11-26	KAS			
S084539LR2	AUTH	FEC A-10358A	B139 000	EDAS SENSOR INSTALLATION SUPPLEMENT FOR BI138 & BI139
2009-01-09	KAS			
S084539LR2	AUTH	FEC A-10361A	B139 000	SUPPLEMENTAL EDAS INSTALLATION FOR BI138 AND BI139
2009-01-09	KAS			
(IEA) S090912Y	AUTH	FEC A-10362	B139 000	ADD ALTERNATE FWD AND AFT INTEGRATED ELECTRONIC ASSY
2009-01-15	KAS			
S092140M	AUTH	FEC A-10363	B139 000	CREATE AND INSTALL DEBRIS CONTAINMENT SYSTEM ASSEMBLY
2009-01-22	KAS			
TOTAL MODS =		5		



Approved STS-128 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END	
+	E	ORB	S053299DT EV10602-A (A)	OMRSD EXCEPTION REQUEST - WING LEADING EDGE SPAR STRUCTURAL SAMPL INGDEFERRAL (EV10602)	103	035 999
	RCS		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
	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)		
	S053299JU	OMRSD WAIVER REQUEST -	103	035 040
	WK10653 (A)	WATER SPRAY BOILER #1 EXCEEDED 44 PSIA MAX IMUMLIMITATION (WK10653)		
	S053299MG	OMRSD WAIVER REQUEST -	103	035 038
	WK10656 (A)	FUEL CELL POWERPLANT 3 HYDROGEN FLOWMETERL OWER LIMIT (WK10656)		
RCS	S053298VTR1	OMRSD WAIVER REQUEST -	0023	035 043
	WK10559 (A)	RIGHT RCS OXIDIZER B-LEG SECONDARY REGULAT ORLOCK UP HIGH (WK10559R1)		

FLIGHT-SPECIFIC

Approved STS-128 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
W	SRB	S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

	Waivers	Except	Deviat	Cannib	Total
o	o	o	o	o	o
o Total Extracted	o 9	o 3	o 0	o 0	o 12

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</b> <b>S061954B MV 4-2</b> <b>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	The following requirements are waived to allow OV-103, Flight 31 to fly (ferry) with the following out-of-configuration conditions:  1) V070-391139-025 (blanket under window #1 removed for ferry flight)  2) M072-421502-002 (did not perform acetone wipe prior to universal thruster plug assemblies - procedural omission)  3) V070-753110-003 (camera mount will not be installed for ferry flight)  ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31	Ferry Flight from Dryden
330	S115114VR15	09/16/05	The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:  TCS blanket V070-362917-001 located at Door #44 NOT installed.  ***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****	OV-103, Flight 31 Ferry Flight	Ferry Flight from Dryden

ACTIVE WAIVERS FOR  
OV-103

Item #	Authority	Date	Waiver Description	Effectivity	Wad
331	S115114VR15	09/16/05	<p>The following requirement is waived to allow OV-103 to ferry from DFRC to KSC with the following out-of-configuration condition:</p> <ol style="list-style-type: none"><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	