



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



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Program Freeze Point

PRCB Presentation

S115128



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Baseline the STS-128 Mission Specific Requirements and Flow Plans. This CR and the associated Data Package were reviewed at the 08-11-08 FRWG.

Flight Management

MO3/USA-PI

Orbiter Engineering*

Requesting Approval

USA-OE

Orbiter GFE

MV5

Status in BackUp

KSC Integration*

MK-SIO

Flight Software

USA-FSW

EVA

XA

Payload/Cargo Engineering

USA-PI

Baseline at LSFR

SSME

MP21

***Backup Material**



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



STS-128/17A

Launch Site Requirements Review (LSRR)

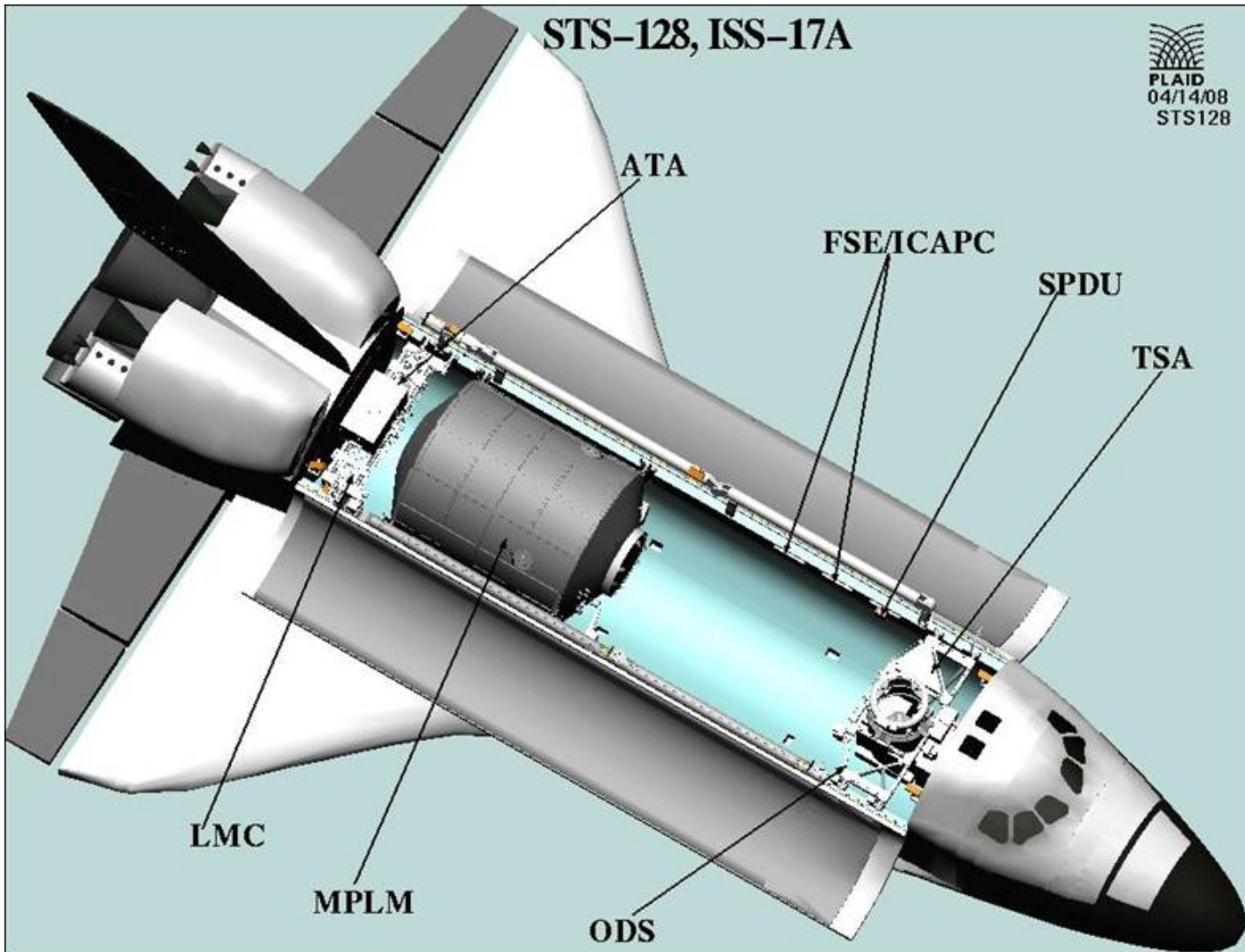
Flight Requirements Status

PRCB August 14, 2008

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



STS-128 LAUNCH SITE REQUIREMENTS REVIEW		Presenter Shelby Lawson/MO3
		Date 08/14/08 Page 2





STS-128 LAUNCH SITE REQUIREMENTS REVIEW	Presenter Shelby Lawson/MO3	
	Date 08/14/08	Page 3

LAUNCH

07/30/09
 39A/ MLP 2 (*proposed*)
 CREW SIZE: 7UP/7DN (One crew rotation)

ORBIT

51.6 DEG
 122 NM
 DIRECT INSERTION (190 NM altitude)
 DURATION: 11 + 1 + 2 DAYS (2 EVAs)

CONFIGURATION

OV-104 (31)
 LP04;RP01
 ET-132
 BI-139
 RSRM-107
 (1) TBD (2) TBD (3) TBD
 OI-34
 SRMS,OBSS, ODS

CONSUMABLES

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

PAYLOAD

<u>ISS-17A</u>	<u>ISS-17A</u>
MPLM	MAUI
LMC	SEITE
MISSE 6	
TriDAR AR&D Sensor DTO-701A	

LANDING

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

- Rescue Flight for STS-127
- **FDRD UPDATE REQUIRED TO IDENTIFY MLP#2**



STS-128 LAUNCH SITE REQUIREMENTS REVIEW	Presenter Shelby Lawson/MO3	
	Date 08/14/08	Page 4

PERFORMANCE MARGIN

- SIMULATION MARGIN (SPLCSAPM) +1257

- WEIGHT CHANGES SINCE SIMULATION
 - PAYLOAD +2095
 - OPERATOR -1185
 - ORBITER -178
 - SSME -141
 - NPC -34
 - CREW COMPARTMENT +726
 - OMS -1340
 - RCS -4
 - MPS PROP (NOT INERT) -93
 - ET -163
 - TOTAL WEIGHT CHANGES -317 +317

- OTHER PERFORMANCE PROJECTIONS
 - PROTECTION FOR DOL DISPERSIONS -700
 - 07/30/09 LAUNCH DATE (PMBT & ATMOS) +420
 - PARTIAL PROJECT FOR MPS BGT GEN 0701S +7
 - OMS ASSIST ADJ (BASED ON 3169 USAGE) +198
 - SRB – M.P. UPDATES -116
 - SRB – BR / 1.55 MIL HIGHER THAN 0.3705 AVG +310
 - ISP/THST FOR GEN BLOCK 2 @ 104.5% -225
 - PROJ TO 5 MIN WINDOW FROM INPLANE -600
 - PERFORMANCE CHANGES ADJUSTMENT -22

- CURRENT BASELINED APM (08/05/08) +846



STS-128 LAUNCH SITE REQUIREMENTS REVIEW	Presenter Shelby Lawson/MO3	
	Date 08/14/08	Page 5

PERFORMANCE MARGIN (CONT.)

- **CURRENT BASELINED APM (08/05/08) +846**

- **IPT PROJECTED**
 - **ISS RENDEZVOUS ALT TO 190 NMILE (07/22/08 SSPCB) +600**
 - **3 MINUTE LAUNCH WINDOW (FRD CR-003) +300**
 - **INCREASE LMC CONTROL WT TO 4,035 LBS (66 LBM) - 61**
 - **INCREASE MPLM CONTROL WT TO 27,795 LBS (1000 LBM) - 930**

- **PROJECTED APM +755**

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



STS-128 LAUNCH SITE REQUIREMENTS REVIEW	Presenter Shelby Lawson/MO3	
	Date 08/14/08	Page 6

FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN</u>	<u>MACH 3.5</u>
	<u>WEIGHT pounds (LIMIT)</u>	<u>X C.G. inches (LIMIT)</u>
NOMINAL	225625 (233000)	TBD (1075.7)
RTLS	240909 (245000)	TBD (1077.2)
TAL	238837 (244000)	TBD (1077.2)
AOA	232623 (242000)	TBD (1075.7)
CONT RTRN	201849 (233000)	TBD (1075.7)

- CONT RTRN CASE IS NO MPLM, LMC empty, Full middeck, Fwd CG case

**NOTE: RTLS INCLUDES 25 SEC FRCS DUMP
TAL INCLUDES 65 SEC FRCS DUMP
102 LBS AFT BALLAST (BOXES ONLY)**

ESTIMATES BASED ON SPICE AND MODIFIED FOR WEIGHT CHANGES THRU 08/05/08.

STS-128 LSRR OV-104 FLIGHT 31 CONFIGURATION UPDATES

**Alvin Jenkins
USA Orbiter Element**

August 14, 2008



8-14-08

9 of 84



STS-128 OV-104 Flight 31 – LSRR Updates

Program Authorization Is Requested For The Following:

- Baseline one (1) Orbiter modification
- Baseline two (2) mission equipment modifications
- Baseline one (1) modification as Non-Flight Specific (NFS)
- Authorize Orbiter Mission Equipment changes

Information Only:

- Three (3) potential modifications under review
- LiOH Cartridge Protective Cover Implementation
- Wing Leading Edge Spar Structural Corrosion Inspection
- Additional OPF processing requirements
 - Chits, TPS Priorities

Back-up:

- Modification Records and MECSLSI Updates Summary
- Engineering, Hardware and Certification Status

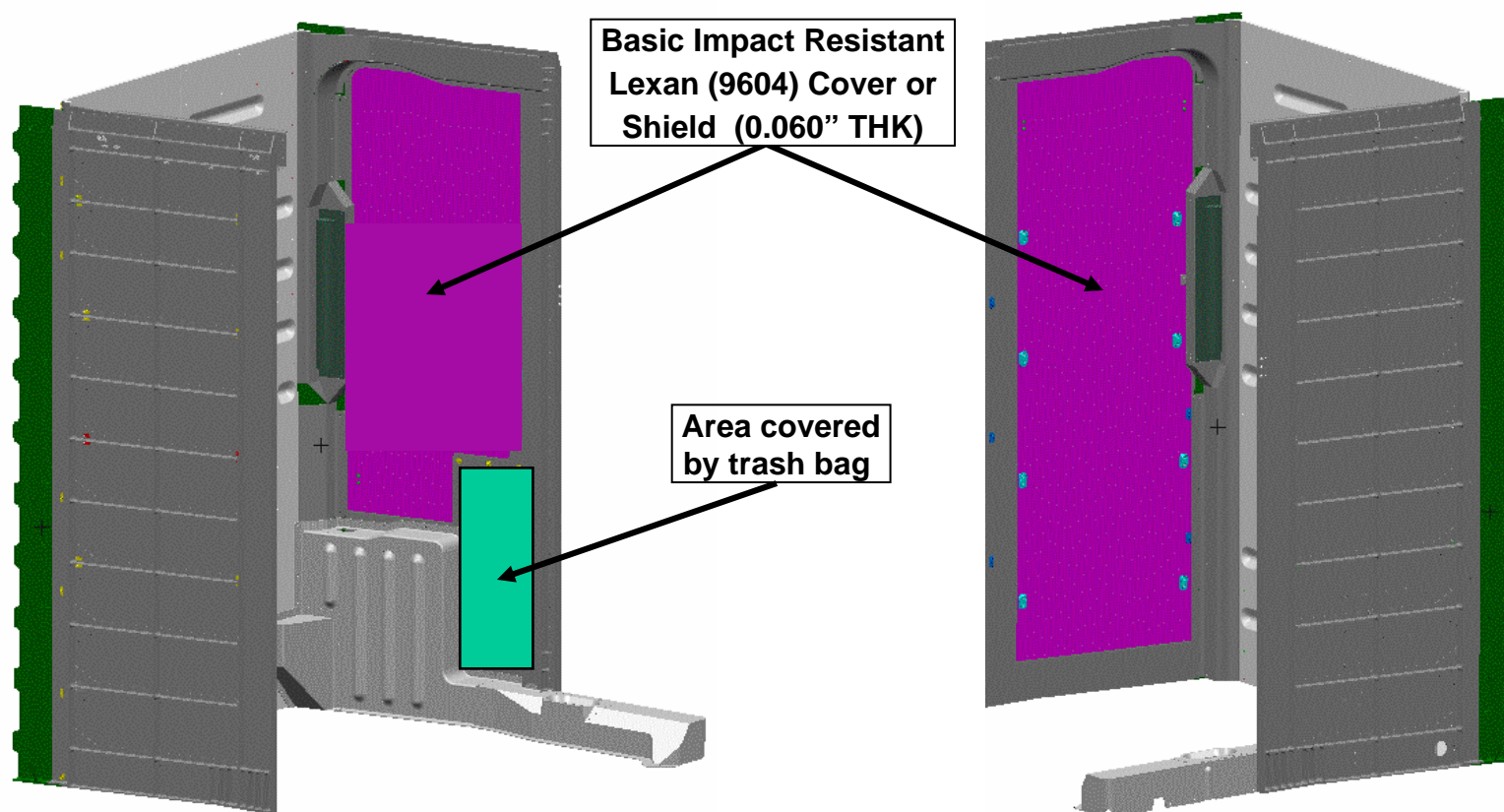
STS-128 OV-104 Flight 31 – Modifications To Be Baselined

TAD 30179 – Mid Deck Partition Panels Protection Mod

- Adds protective covers to two mid deck aft partitions to prevent damage
 - The crew module (CM) PRT reviewed all the critical structures and CM skin exposed to on-orbit traffic and identified two mid deck partitions as a risk area
 - The mid deck partitions are located in high traffic area near the airlock hatch B and are exposed to crew activities
 - The side walls as thin as 0.051 in. thick are exposed to possible impact from other hardware with sharp edges moving nearby
 - Damage in a thin web could result in loss of shear capability for that panel
 - Two partitions carry approximately 34% of the aft bulkhead pressure load
 - Failure of a partition might cause a progressive failure of the aft bulkhead
 - Study recommended the implementation of 0.060” Lexan shields on port partition shield
 - 0.060” Lexan shield can provide adequate partition protection and accommodate proposed new quick-shoe installation on the port partition
 - Modification was approved at OCCB on 7/22/08

STS-128 OV-104 Flight 31 – Modifications To Be Baselined

TAD 30179 – Mid Deck Partition Panels Protection Mod (Cont.)



View looking outboard - Port Partition

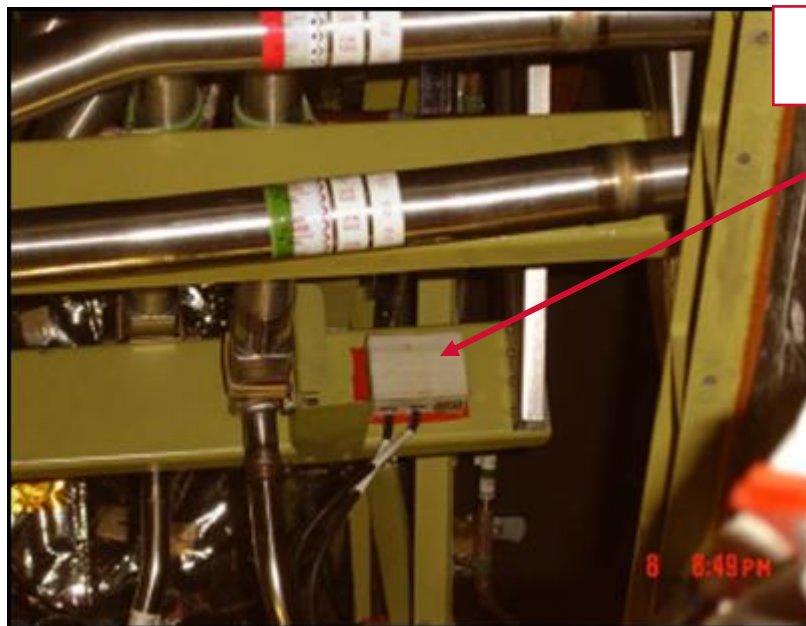
View looking outboard - Starboard Partition

Shield installation: New Velcro pattern and existing nutplates in partition

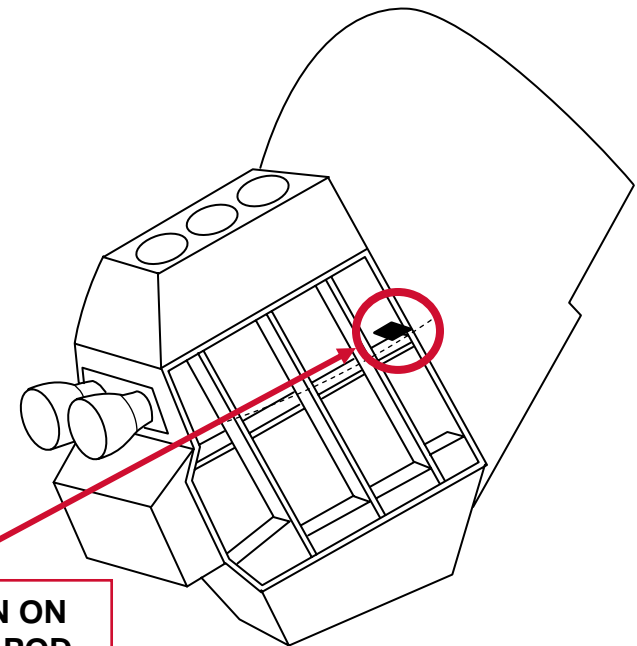
STS-128 OV-104 Flight 31 – Mission Equipment Modifications To Be Baselined

TAD 30186 – OMS Pod Micro-WIS Strain Recorder Removal

- Removes the Micro-WIS Strain Gage Unit (SGU) from the left OMS Pod due to the expired certification
 - The Strain Gauge Unit was installed to obtain environment data for analysis of harmonics observed on STS-100 (OV-105) launch video and was certified for four flights
 - The recorder will be removed and the wiring will be stowed in the immediate area



MICRO SGU
RECORDER BOX



BOX LOCATION ON
THE LEFT OMS POD

STS-128 OV-104 Flight 31 – Mission Equipment Modifications To Be Baselined

TAD 30164 – TriDAR (DTO-701A) Installation

- 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 #2 in the (TCS# 1) location
 - The TCS tech order installation drawings will be updated to establish a unique TriDAR installation configuration



TriDAR Proposed Location

STS-128 OV-104 Flight 31 – Modification To Be Authorized As NFS

MCR 23205 – Acreage Doublers Addition to Avionics Bays 4, 5 and 6

- Installs cold bonded protective doublers to the honeycomb facesheet on the aft avionics bay 4, 5 and 6 doors to provide additional resistance to impact loads and ensure life of honeycomb panels
 - Numerous dents and damages to the avionics bay 4, 5 and 6 doors occur during routine ground processing
 - Panels are honeycomb construction with a thin (0.020) aluminum facesheet located inside the 50-1 and 50-2 aft access doors in a high traffic and very susceptible to impact damage area
 - Damage is assessed each flow and doublers are installed as required
 - Requires PR documentation, detail inspection steps of damage, and stress analysis to support acceptance
 - Tight access makes hot bonded doubler difficult to install
 - Large PRACA history on honeycomb dents requiring MR doubler installation
 - Protective doublers over the entire acreage will prevent future damage and work stoppage during damage assessment and repair effort

STS-128 OV-104 Flight 31 – Tech Orders To Be Baselined

- Update the V072-200208 MECSLSI with the following tech order changes:
 - **WVS S-Band Antenna Installation** (Two S-band antennas at Xo 759 port and starboard are installed per FRD17462-128 Basic)
 - Add M072-744004-013 (Antenna #2)
 - Add M072-744004-017 (Antenna #6)
 - Add M072-794026-002 (Wiring for Antenna #2)
 - Add M072-794026-006 (Wiring for Antenna #6)
 - **WVS Antenna Load Plug Removal**
 - Remove M072-794026-013 (Antenna #6 location)
 - Remove M072-794026-015 (Antenna #2 location)
 - **Aft Fuselage Ballast Removal**
 - Remove M072-851701-054
 - **Airlock Fan and Ducting Installation**
 - Remove M072-643402-010
 - Add M072-643402-009

STS-128 OV-104 Flight 31 – Tech Orders To Be Baselined

- **Update the V072-200208 MECSLSI with the following tech order changes (Cont.):**
 - **OMS Pod Micro-WIS Strain Recorder (OCR/D S164130N)**
 - Remove M072-755111-001 (Micro-WIS SGU)
 - Add M072-755111-002 (SGU wires stowage)
 - **TriDAR Installation**
 - Add M072-730021-TBD (TriDAR installation)
 - Add M072-363838-TBD (TCS blanket)
 - **Light Weight Tool and Stowage Assembly (per FRD17462-128 Basic)**
 - Remove M072-660850-006 (STBD TSA)
 - Remove M072-660854-001 (STBD TSA tools)
 - Add M072-660850-005 (Port TSA)
 - Add M072-660853-002 (Port TSA tools)
 - **ISS ODS Docking System Installation**
 - Add M072-534077-001 (Cross-Hair)
 - Add M072-534077-007 (Light assembly)
 - Add M072-534077-019 (Docking mechanism)
 - Add M072-660828-002 (Centerline camera)

STS-128 OV-104 Flight 31 – Tech Orders To Be Baselined

- Update the V072-200208 MECSLSI with the following tech order changes (Cont.):
 - **Airlock Vent Tee Installation**
 - Add M072-340828-001
 - **N2O2 Docking Base to A/L I/F Installation**
 - Add M072-643416-001
 - **ISS Docking Harness Installation**
 - Add M072-794741-004
 - **OBSS Sensor Package 1 (OCR/D S165141)**
 - Remove M072-710282-007 (PTU -508)
 - Add M072-710282-008 (PTU -510)
 - **SRMS End Effector (EE) Configuration Change (OCR/D S165341)**
 - Remove M072-544502-033 (EE 51140F36-13)
 - Add M072-544502-036 (EE 51140F36-11)

STS-128 OV-104 Flight 31 – Tech Orders To Be Baselined

- Update the V072-200208 MECSLSI with the following tech order changes (Cont.):
 - External Airlock “D” Hatch Installation
 - Add M072-364828-TBD (TPS blanket)
 - Add M072-593828-TBD (“D” hatch)
 - Trajectory Control Sensor
 - Add M072-730021-019
 - Sidewire and EVA Tether
 - Remove M072-544700-016 (Slidewire)
 - Remove M072-661618-016 (Tether)

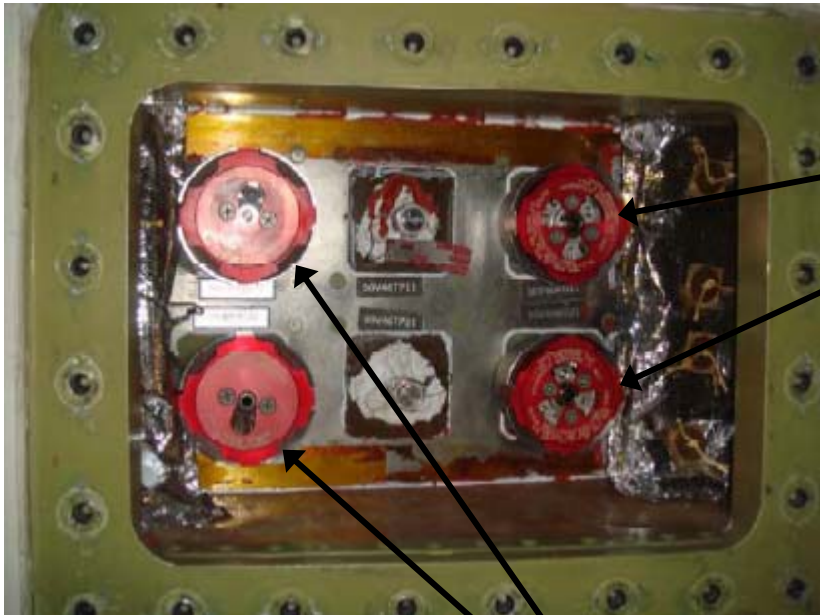
STS-128 OV-104 Flight 31 – Potential Modifications

TAD 30189 – APU QD Heater Modification

- Add a heater to the GN₂ Quick Disconnect (QD) to prevent on-orbit pressure decay of the fuel system
 - During STS-121 and STS-123 APU system 1 experienced an on-orbit pressure decay of the fuel system
 - GN₂ fill QD was isolated as the most likely source of the leak in both cases
 - Post flight testing has identified on-orbit thermal environment as a probable contributor to the leaks
 - Tests of the two QDs which exhibited on-orbit leakage indicate that leakage occurs as a result of synergistic 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
 - Temperature increase may reduce the risk of QD leakage
 - No leakage detectable for either of the leaking QDs at ambient temperature (including helium mass spec at 400psi)
 - Preliminary thermal analysis shows that GN₂ QD temperature can be increased to the desired temperature of 40°F
 - Additional thermal analyses are currently being performed for heater failure conditions for on-orbit design environment of -45°F and to refine the heater distribution at the GN₂ QD

STS-128 OV-104 Flight 31 – Potential Modifications

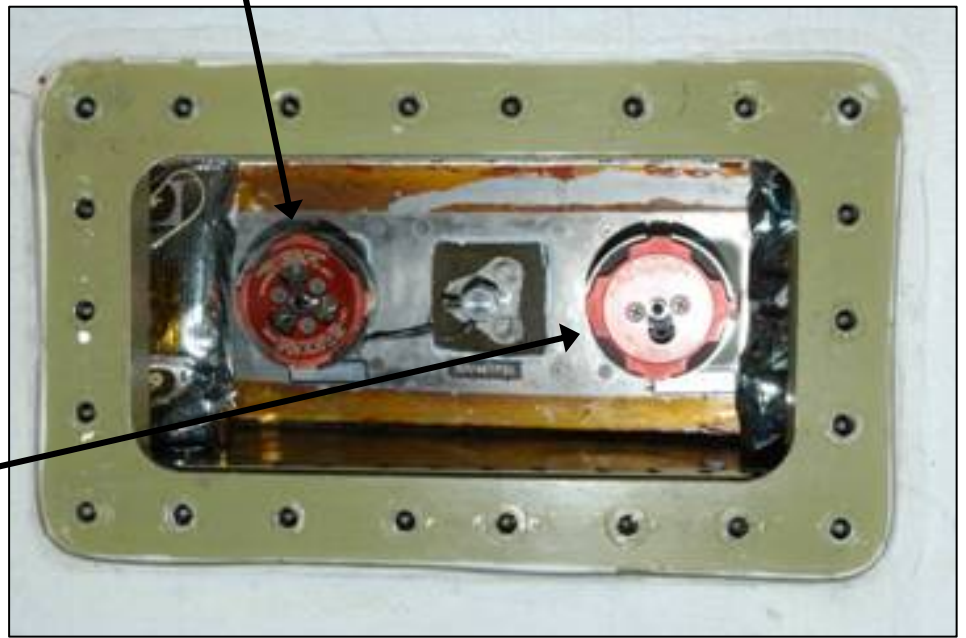
TAD 30189 – APU QD Heater Modification (Cont.)



APU 1 and 2

Fuel QD Locations

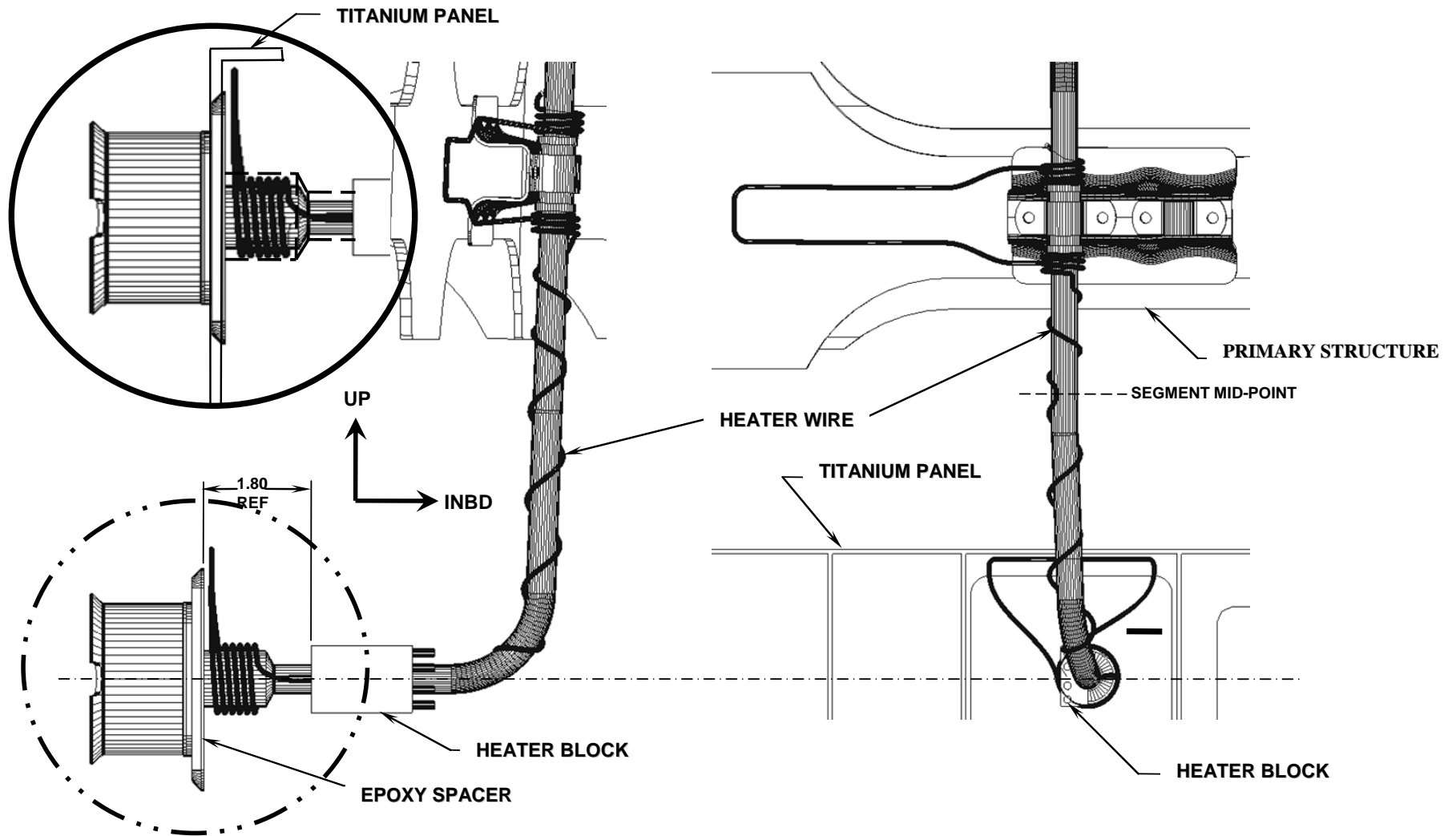
APU 3



GN₂ QD Locations

STS-128 OV-104 Flight 31 – Potential Modifications

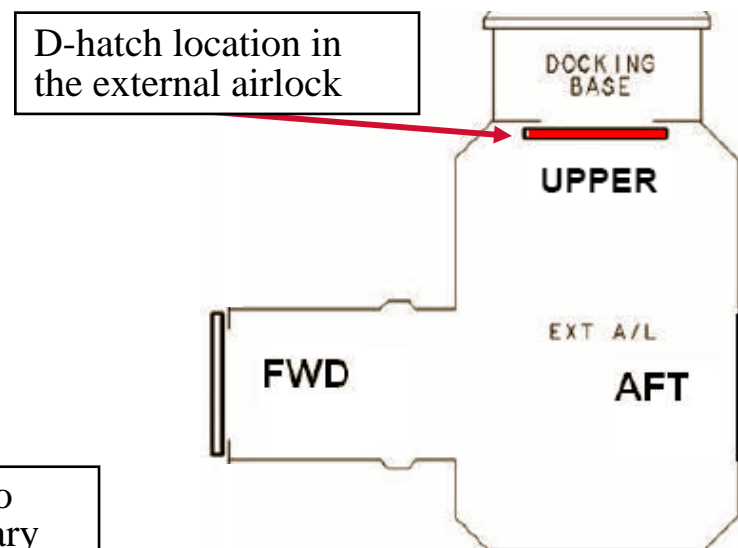
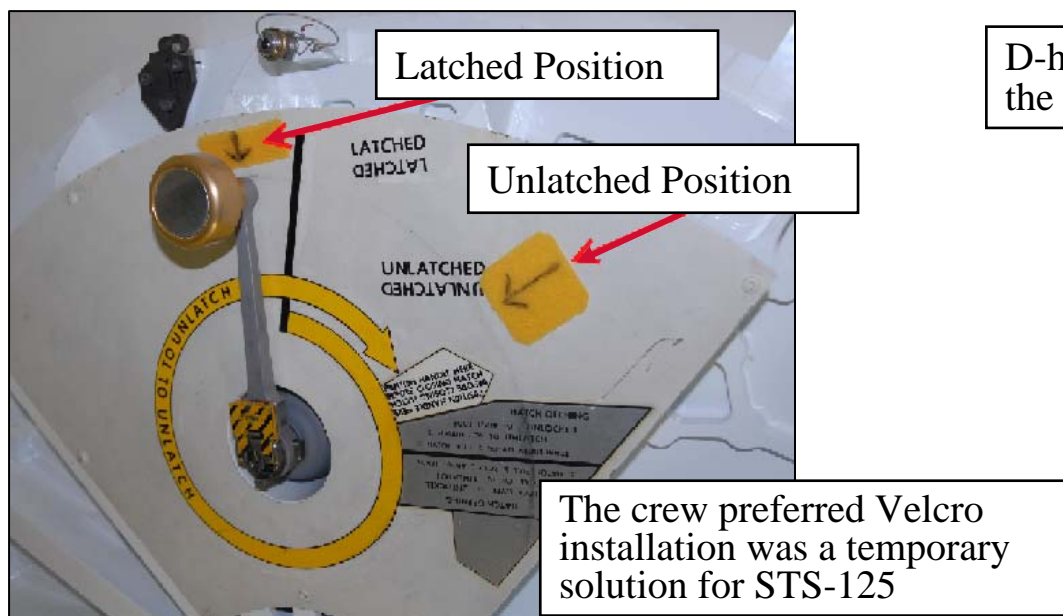
TAD 30189 – APU QD Heater Modification (Cont.)



STS-128 OV-104 Flight 31 – Potential Modifications

TAD 30099 – D-hatch Decal Relocation

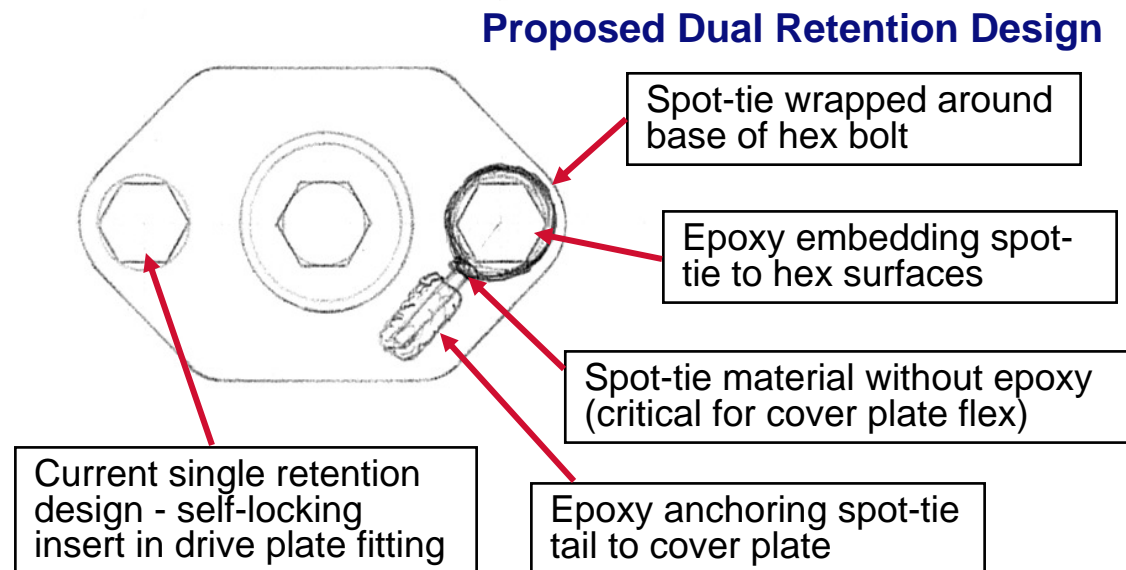
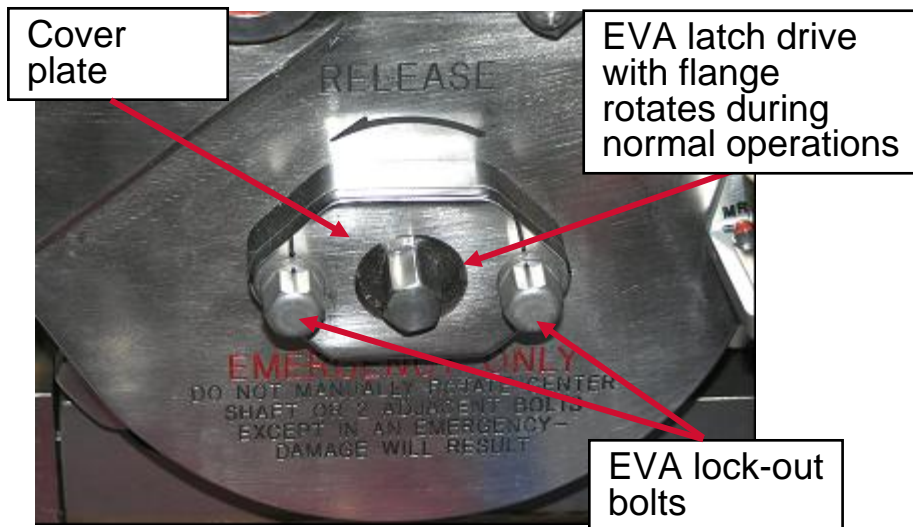
- Relocates actuator handle position decals on the external airlock upper hatch to the correct location
 - The crew reported difficulty closing and latching the external airlock upper hatch during STS-124 (OV-103)
 - Attempts to position the actuator handle over the decal that indicated the correct “pre-closing” position were unsuccessful, as a hard stop was encountered prior to reaching that position (Ref. PR MEQ-3-36-1710)
 - When D hatch was designed in 1982, the decal was inadvertently located in original A/B hatch position (20 degrees from fully unlatched)
 - The D-hatch installation drawings will be updated to reflect the correct decal locations (OCR/D S165361 is in work)



STS-128 OV-104 Flight 31 – Potential Modifications

TAD 30192 – EVA Lock-out Bolt Retention Improvement

- Adds a secondary locking feature to the EVA lock-out bolt on the Payload Retention Latching Assembly (PRLA) standard / heavy weight longeron latch
 - The current hardware has only a single-locking method on the two lock-out bolts which clamp the EVA latch drive in a desired position
 - Prior to using the EVA feature on the latch, the two locking bolts are retained by the locking feature of the inserts
 - The locking inserts for the two bolts maintain the rigging and also keep the bolts from vibrating off
 - If the bolts, which are not preloaded, happen to vibrate off, the operation and/or locking of the EVA feature will be lost
 - The new design concept is a simple rework method for the secondary locking feature that will allow locking without prematurely tightening or loosening the bolt or hindering EVA operations



STS-128 OV-104 Flight 31 – Information Only

TAD 30156 – LiOH Cartridge Protective Cover Implementation

- Adds protective soft cover to LiOH canisters designated for ISS to protect the cartridge and flight wrapper from damage and reduce LiOH dust generation
 - During previous ISS flights, excessive dust was noted inside the wrappers of ISS stockpile LiOH canisters
 - LiOH dust released into the cabin is an irritant hazard
 - Nomex cloth covers placed over the LiOH canister will mitigate dust generation due to can-to-can contact during stowage
 - Also protects can flight wrapper from potential breach resulting in LiOH exposure to atmosphere
 - Fabric cover to be placed on LiOH canisters designated for ISS stockpile
 - Extra covers to be fabricated and flown to ISS for use on already stockpiled canisters
- Additional covers, if required, will be authorized by CCCD Directive



Wing Leading Edge Spar Structural Corrosion Inspection

- OMRSD Requirement
 - Perform a detailed external inspection of the wing leading edge (WLE) spar installation including spar fitting and spar insulator attach holes. Document evidence of structural degradation corrosion or other structural abnormalities. The intent of the requirement is primarily to find corrosion.
 - V30KG0.065: Sample inspection LH wing, RCC panels 9-11 & 20-22
 - V30LG0.065: Sample inspection RH wing, RCC panel 9-11 & 20-22
 - Requires removal of the noted RCC panels and associated attach fittings
- 3 Year sampling requirements noted above are planned for the STS-128, OV-104 Flight 31 flow
 - If significant corrosion is detected it may drive the full inspections earlier
- 4.5 Year full inspection of all 22 panels per side is due January 2010
 - Would be required prior to 104's last scheduled flight, STS-131 Flight 32
 - GO has been requested to assess performing additional inspections during the STS-128 flow
 - Spreading the inspections over the next 2 flows will allow more of an opportunity of assuring the requirements are met

Chits

CHIT	TITLE
J6116	AMES GAP FILLER REMOVAL AND REPLACEMENT (MULTI-FLOW CHIT LOW ON TPS PRIORITY LIST)
J6198	MID FUSELAGE LOCK BOLT SAMPLING (REQUIREMENT WAS COMPLETED ON PREVIOUS FLOWS)
J6275A	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
J6327	WLE RCC JOGGLE INSPECTION
J6329	ASA #2 & #4 AND ATVC #3 & #4 R&R FOR OV-104, FLT 31
J6341A	EVALUATION OF OMS POD LI-900 TILE INSTALLED ON 0.090" SIP
J6351	OV-104 RUDDER / SPEEDBRAKE (RSB) ACTUATOR EXTERIOR INSPECTION
J6378	OV-104 BODY FLAP (BF) POWER DRIVE UNIT (PDU) GEARBOX FLUID LEVEL INSPECTION
J6380	EVA PDU TOOL INTERFACE VERIFICATION
J6387	PASSIVE DOCKING TEST ON OV-104 (IN REVIEW)
J6389	CLOSE CLEARANCE MEASUREMENTS OF ORBITER HARDWARE FOR STS-125
J6399	0-GAUGE PROTECTION FOR OV-103 FLIGHT 32-35 AND OV-104 FLIGHT 27-35 (IN REVIEW)
J6402	MICRO INSPECTIONS OF CAPTIVE GAP FILLERS

STR/TPS Priorities

- **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 only*)
 - Continue G/F R & R on a best effort basis - zones 2B subset
 - **Prioritized Opportunity**
1. BRI-18 Tile - MLGD FWD O/B Corner (complete)
 2. BRI-18 Tile – MLGD FWD Edge (complete)
 3. BRI-18 Tile – MLGD O/B Side (complete)
 4. BRI-18 Tile - STR side of ET Doors Aft & Outboard (complete)
 5. BRI-18 Tile – LESS Carrier Panels 8-10 (complete)
 6. BRI-18 Tile – STR side of ET Doors Inboard side – AFT 4 Tiles (8 Tile)
 7. Inboard Elevon “Hub” Tile Modification – (2 Tiles on OV-104)
 8. I/B Elevon 9lb/90 SIP Upgrade to FRCl-12 – 34 Tiles (17/side) AFT to FWD
 9. O/B Elevon 9lb/90 SIP Upgrade to FRCl-12 – 6 Tiles (3/side)
- 9A. High Priority Putty Repairs – Worst case masses/DTA (2 Tiles on OV-104)**
-

STR/TPS Priorities

10. Structural Corrosion Sampling plan
11. MLGD – Outboard Middle 1/3 - (6 Door/6 STR)
12. MLGD - Outboard AFT 1/3 (1/3 left) 6/door/6 str) - 24 Tile
13. Putty Repairs – 2nd subset of large mass repairs
14. Nose Area 9lb/0.090 SIP Upgrade to FRCI-12 – 14* Tiles (7/side) (*103 16 tiles, *thruster*)
15. Base Heat Shield 9lb/90 SIP Upgrade to FRCI-12 – 42 Tiles (32/stinger, 10/Box Attach point)
16. Gap fillers in Subset 2B (Line across MLGD edge)
17. BRI-18 Tile – Remaining MLGD (Top Priority) / LESS carrier panels/NLGD
 1. MLGD (Inboard, forward edge working to AFT door edge)
 2. LESS - panels 8, 9, 10, 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order)
 3. NLGD (attrition – do leading edge first)
18. Mod work (WLE sneak flow, WLE Horsecollar Gap Fillers)
19. MADS Instrumentation Failures (104 & 105 L/H OMS Pod) (place holder)
20. Remaining Gap Fillers & Window BRI-18
 1. Windows 2, 3, 4, & 5 Upper Carrier Panels (top priority)

Current Vehicle Status - Completed Installations

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	24	complete	complete	2
6. BRI-18 Tile – STR side of ET Doors I/B	8	1 (I/W 7)	1	complete
7. Inboard Elevon “Hub” Tile Mod	4	0 (I/W 4)	2	complete
8. I/B Elevon 9lb/90 SIP	34	2 (I/W 32)	5	17 (I/W 17)
9. O/B Elevon 9lb/90 SIP	6	4 (I/W 2)	3	complete
9A. High Priority Putty Repairs	9 (6,2,1)	0	0	0
10. Structural Corrosion Sampling Plan	25 Zones	13	8	12
11. MLGD – Outboard Middle 1/3	24	0	0	3
12. MLGD - Outboard AFT 1/3	24	0	0	1
13. Putty Repair Removals	22 (11,6,5)	0	0	0
14. Nose Area 9lb/90 SIP	14 (16 ^{OV103})	1	0	0
15. Base Heat Shield 9lb/90 SIP	42	7	24	33
16. Gap fillers in Subset 2B	5 Zones	2	1	0
17. BRI-18 Tile – Remaining MLGD (Top Priority) / LESS carrier panels/NLGD	MLGD 100 NLGD 123 LESS 66	MLGD 0 NLGD 11 LESS 7	MLGD 1 NLGD 19 LESS 2	MLGD 0 NLGD 26 LESS 12
18. Mod work LESS internal	44 locations	37	39	complete
20. Remaining Gap Fillers & Window BRI-18	124	2	2	28



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



STS-128 LSRR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date August 14, 2008	Page 1

STS-128 LSRR FCE/GFE Status

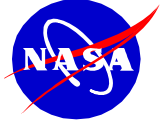
Kenneth Brown
Manager, GFE & Flight Crew Equipment Office
Johnson Space Center



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 2

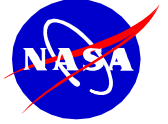
- **Need dates and delivery dates have not yet been partnered. Post CIR, team will work to partner remaining dates**
- **Tech orders and hardware list noted in backup charts, reference only**
- **Changes since STS-125:**
 - **-510 Pan Tilt Unit to be delivered for OBSS Sensor Pack 1, which flew a -508 PTU on STS-125. Remaining Camera/PTU locations flown on STS-125 used -510 PTUs.**
 - **Reconfigure from HST to ISS – reinstall ODS mechanism, TCS, WVS antennas**
 - **OMS pod SGUs removal (end of certified service life)**
 - **Starboard TSA removed**



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 3

- **RMS End Effector (EE) Mod - MDA Upgrading from -11 to -13:**
 - 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)
- **OV-105 and OV-103 RMSs have upgraded EEs (STS-126 and STS-119 flows, respectively)**
- **EE S/N 403 to be returned to KSC late February '09 timeframe**
 - Plan to swap for OV-104 arm EE S/N 402
- **Tech Order M072-544502 has been updated to reflect the new -13 EE configuration**



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 4

- **TriDAR DTO - Combines Triangulation and LIDAR in a single optical path**
 - Largely based on OBSS LCS flight hardware & software
 - Immune to lighting conditions
 - Takes advantage of the complementary nature of triangulation and Time of Flight (TOF)
 - Adds long range IR Camera capability
- **Provides 6DOF relative pose information in real-time from 3D data**
- **Sensor Located on ODS, Next to TCS**
- **Control Software on standard Flight A31P PGSC**
 - Minimal crew time required (start/stop/verify)



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 5

- **OPO implementing a DTO a Thrust Oscillation Seat DTO to gather launch vibration data**
 - **DTO will be done in conjunction with a DSO to record astronaut visual performance to aid in development crew performance specifications**
 - **DTO will instrument three Orbiter Seats (Seats 3, 5, 6 or 7)**
 - **Each seat will be instrumented with three triaxial accelerometers**
 - **Each accelerometer and corresponding sensor box will be attached to the crew seat**
 - **Data will be taken during launch**
 - **DTO is targeted for STS-119, STS-127, STS-128**



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



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Backup Material

FRWG Presentation (With Minor Changes)



	Presenter Shelby Lawson/MO3
	Date 08/14/08 Page 1

Flight Operations and Integration (FO&I)

Flight Requirements:

MIP, PIPs, CIP

FDRD

FRD

Backup Charts



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



STS-128/17A		Presenter Shelby Lawson/MO3
Mission Requirements Status		Date 08/14/08 Page 2

Documentation

ECD/Date

MIP – NSTS 21546, Rev B, (5/28/08)

CR-0003: LMC Control Weight Update

08/14/08

CIP- LMC, NSTS 21494, Rev B, Chg 1-11 (5/28/08) STS-128 Addendum

CR-0025: LMC Control Weight Update

08/14/08

FDRD:

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

PIP – MPLM, NSTS 21499, Rev B, Chg 1-2 (12/7/07)

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

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)

None pending

None pending

None pending

None pending

None pending

None pending



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



STS-128/17A FRD Status	Presenter Frank Richmond/USA	
	Date 08/14/08	Page 3

- **STS-128 Latest FRD Revision**
 - Basic: Dated, June 19, 2008 (<http://sspweb.jsc.nasa.gov/efrd>)
- **Open CRs**
 - **FRD 17462-128-003 - Provide Launch Window Performance Reporting Requirements (3 min window)**

Evaluations Due: 08/11/08
- **Closed CR**
 - **FRD 17462-128-002 - Remove Aft Ballast Boxes from STS-128 (OV-104)**

ECD: 08/11/08 (A)
Disposition: Disapprove.

Back-up

- **Modification Record and MECSLSI Updates Summary**
- **Engineering, Hardware and Certification Status**

Modification Records and MECSLSI Update Summary

MCR/ TAD NO.	TITLE	KIT / MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
Modifications To Be Baselined				
30179	Mid Deck Partition Panels Protection Mod Adds protective covers to two mid deck aft partitions to prevent damage and accommodate a new quick shoe installation.	TBD - Installs 0.060" Lexan shields	No Tech Order Impact	No MECSLSI Impact
Mission Equipment Modifications To Be Baselined				
30186	OMS Pod Micro-WIS Strain Recorder Removal Removes the recorder box from the left OMS Pod and stows the wires.	030186_0014_0 - Stows the remaining wire	Micro-WIS SGU on OMS Pod Installation M072-755111-002 (is) M072-755111-001 (was) MV0886A	MECSLSI Impact
30164	Autonomous Rendezvous and Docking Sensor - TriDAR Installs the TriDAR sensor for autonomous rendezvous and docking in Low Earth Orbit technology demonstration.	030164_0104_0 - Installs the TriDAR sensor and redesigns the blanket	TriDAR Installation M072-730021-TBD TCS Blanket Installation M072-363838-TBD MV0828A	MECSLSI Impact
Modification To Be Authorized As NFS				
23205	Acreege Doublers Addition to Avionics Bays 4, 5 and 6 Installs cold bonded protective doublers to the honeycomb facesheet on the aft avionics bay 4, 5 and 6 top panels to provide additional resistance to impact loads and ensure life of honeycomb panels.	VK70-356734-001_0104_0 - Provides hardware for acreege doublers on honeycomb door panels	No Tech Order Impact	No MECSLSI Impact
Potential Modifications				
30189	APU QD Heating Modification Replaces the fuel fill heater (HR1n6) with a longer heater and runs the extension of the heater to the GN2 Quick Disconnect (QD) to prevent on-orbit pressure decay of the fuel system.	030189_0104_0 - Installs a longer heater to increase the GN ₂ QD temperature	No Tech Order Impact	No MECSLSI Impact
30099	D-hatch Decals Relocation Relocates actuator handle position decals on the external airlock upper hatch to the correct location.	TBD - Relocates "Latched / Unlatched" decals on the airlock upper hatch	M072-593828-TBD M072-650701-TBD M072-364828-TBD	MECSLSI Impact
30192	EVA Lock-out Bolt Retention Improvement Adds a secondary locking feature to the EVA lock-out bolt on the Payload Retention Latching Assembly (PRLA) standard / heavy weight longeron latch.	TBD - Enhances existing design	No Tech Order Impact	No MECSLSI Impact
Information Only				
30156	LiOH Cartridge Protective Cover Implementation Adds protective soft cover to LiOH canisters designated for ISS to protect the cartridge and flight wrapper from damage and reduce LiOH dust generation.	TBD - Installs the LiOH containers with the protective Nomex cloth cover under the middeck floor	Crew Station Equipment Installation M072-661627-TBD MV0627A	CCCD Impact

Engineering, Hardware and Certification Status

MCR/ TAD NO.	TITLE	Est. Engr Release (MM/DD/YY)	G.O. Engr Need (MM/DD/YY)	Est. Hdwe Delivery (MM/DD/YY)	G.O. Hdwe Need (MM/DD/YY)	MOD/CERT GO / NO-GO	CERT SUBMITTAL DATE	CERT APPROVAL DATE	CERTIFICATION CR / CAR (BOEING)	REMARKS
Modifications To Be Baselined										
30179	Mid Deck Partition Panels Protection Mod Adds protective covers to two mid deck aft partitions to prevent damage and accommodate a new quick shoe installation.	9/30/08	9/30/08	10/16/08	10/16/08	GO	10/7/08	12/7/08	CAR# 149-04-331002H	JSERP approved 7/18/08; OCCB approved opt. A 7/22/08
Mission Equipment Modifications To Be Baselined										
30186	OMS Pod Micro-WIS Strain Recorder Removal Removes the recorder box from the left OMS Pod and stows the wires.	7/25/08	7/25/08	N/A	N/A	GO	N/A	N/A	N/A	OCR/D S164130N
30164	Autonomous Rendezvous and Docking Sensor - TriDAR Installs the TriDAR sensor for autonomous rendezvous and docking in Low Earth Orbit technology demonstration.	10/15/08	10/16/08	TBD	10/16/08	GO	TBD	TBD	TBD	FRD17462-128 Basic
Modification To Be Authorized As NFS										
23205	Acreege Doublers Addition to Avionics Bays 4, 5 and 6 Installs cold bonded protective doublers to the honeycomb facesheet on the aft avionics bay 4, 5 and 6 top panels to provide additional resistance to impact loads and ensure life of honeycomb panels.	Released	N/A	Delivered	N/A	TBD	TBD	TBD	TBD	Engineered for flight 31
Potential Modifications										
30189	APU QD Heating Modification Replaces the fuel fill heater (HR1n6) with a longer heater and runs the extension of the heater to the GN2 Quick Disconnect (QD) to prevent on-orbit pressure decay of the fuel system.	TBD	10/16/08	TBD	10/16/08	TBD	TBD	TBD	TBD	Design has not yet been finalized
30099	D-hatch Decals Relocation Relocates actuator handle position decals on the external airlock upper hatch to the correct location.	TBD	TBD	TBD	TBD	GO	TBD	TBD	CR# 28-593201-001S CAR# 12-28-593201-001S	OCR/D S165361 submitted
30192	EVA Lock-out Bolt Retention Improvement Adds a secondary locking feature to the EVA lock-out bolt on the Payload Retention Latching Assembly (PRLA) standard / heavy weight longeron latch.	TBD	12/1/08	TBD	12/1/08	TBD	TBD	TBD	CR# 44-287-0025-0001F CAR# 04-44-287-00251F	OPO is planned for early September, if approved, engineering s/b released by end of November
Information Only										
30156	LiOH Cartridge Protective Cover Implementation* Adds protective soft cover to LiOH canisters designated for ISS to protect the cartridge and flight wrapper from damage and reduce LiOH dust generation.	Released	N/A	Delivered	N/A	TBD	Submitted	Approved	CR# 22-621-0008-0009J CAR# 10-22-621-0008-0009J	* Engineering released and cert submitted for STS-123 (OCR/D S165299)





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



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter
MV5/Kenneth Brown

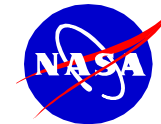
Date
August 14, 2008

Page 1

BACKUP



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



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 2

Tech Order numbers are identified for reference only.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
A (port forward)	M072-750025-076							Camera from STS-119 (-510 Pan & Tilt Unit)	Randall Moore
B (port aft)	M072-750025-077							Camera from STS-119 (-510 Pan & Tilt Unit)	Randall Moore
C (starboard aft)	M072-750025-078							Camera from STS-119 (-510 Pan & Tilt Unit)	Randall Moore
D (starboard forward)	M072-750025-079							Camera from STS-119 (-510 Pan & Tilt Unit)	Randall Moore
Payload Ops camera(s)	M072-340042-006								Randall Moore
SRMS elbow camera	M072-544504-007							Camera from STS-119 (-510 Pan & Tilt Unit)	Randall Moore
SRMS wrist camera	M072-544504-008							Camera from STS-119	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016								Randall Moore
Righthand Umbilical Camera	M072-705001-028 M072-705001-027								Randall Moore
Digital Television (DTV)	M072-710570-007							Installed Hardware.	Larry Schmidt
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001							Installed Hardware.	Larry Schmidt
Tools for Rendezvous and Docking (TRAD)								HHL's only. TCS reinstallation required. TCS Tech order to be back in MECSLSI.	Larry Schmidt
Video Processing Unit (VPU)	M072-710338-006							Installed Hardware.	Larry Schmidt



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



STS-128 LSRR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 3

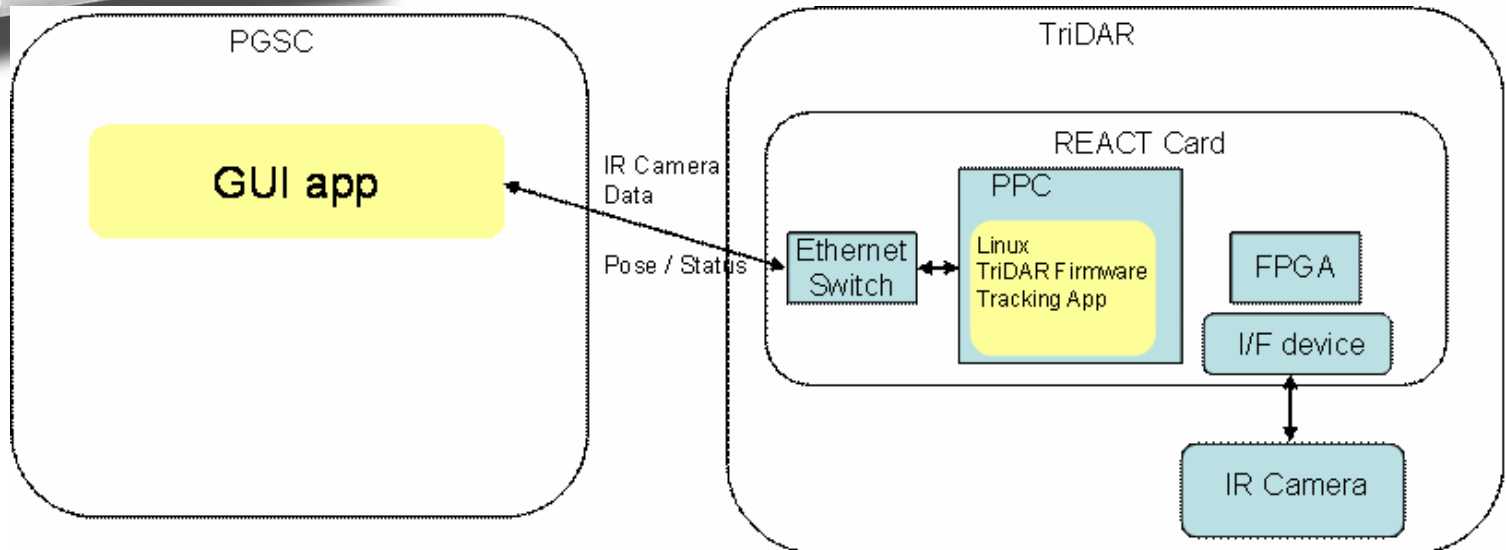
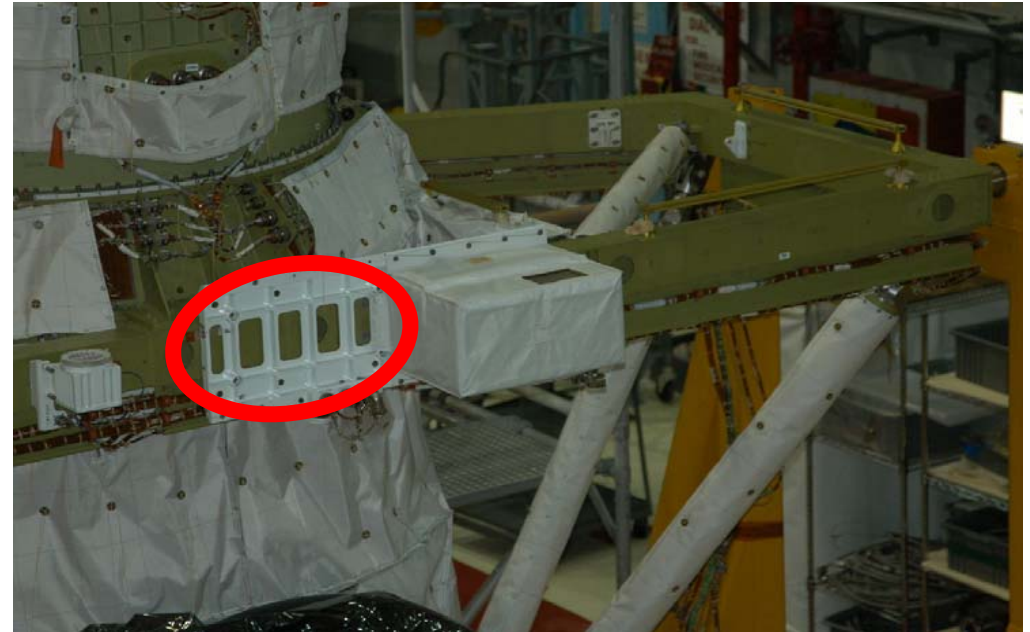
Tech Order numbers are identified for reference only.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Comments	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-012 S-BAND M072-744004-014 S-BAND M072-744004-015 S-BAND M072-744004-016 S-BAND M072-744004-018 S-BAND							Reinstall antennas on OV-104	Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 antenna								Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-004 camera							Camera from STS-119	Randall Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing	M072-756111-007							Installed Hardware	Gary Cox
Wing Leading Edge (WLE) Instrumentation - Right Wing	M072-756111-008							Installed hardware	Gary Cox
OMS Pod Micro-Strain Gauge Unit (SGU)								Remove SGUs from OV-104 (end of certified service life).	Gary Cox
OBSS Sensor Package 2 (OPF)	M072-710282-006								Larry Schmidt
OMS POD MICRO-SGU Batteries	M072-755111-001							KSC has all SGU batteries.	Gary Cox
OBSS SENSOR PACKAGE 1 ** (OPF)	M072-710282-008							OBSS SP1 will fly -510 PTU.	Randall Moore
RMS-13 End Effector	M072-544502-036								Ken Ruta
TriDAR									Larry Schmidt



Prototype TriDAR

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 4





DTO Primary Objectives

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 5

- Intended to demonstrate operation of the sensor and to collect data required for tracking.
 - 1) Collect long-range 3D TriDAR data of the ISS
 - 2) Collect short-range 3D TriDAR data of the ISS
 - 3) Demonstrate geometry based tracking and pose estimation from TriDAR data without using cooperative targets
 - 4) Provide AR&D cues to shuttle crew for demonstration purposes
 - 5) Collect system status and health data (telemetry) for TriDAR hardware
 - 6) Demonstrate TriDAR lighting immunity



KSC Requirements

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 6

Installation

- TriDAR Unit onto the ODS
- Power Cable
- Ethernet Data Cable
- Command and Monitor Cable
- Blanket?

Testing

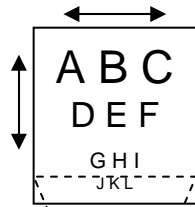
- Unit check out in the FCEL
- OPF IVT from inside the crew cabin
 - Similar to the LCS IVT with Laser Safety

Removal after flight



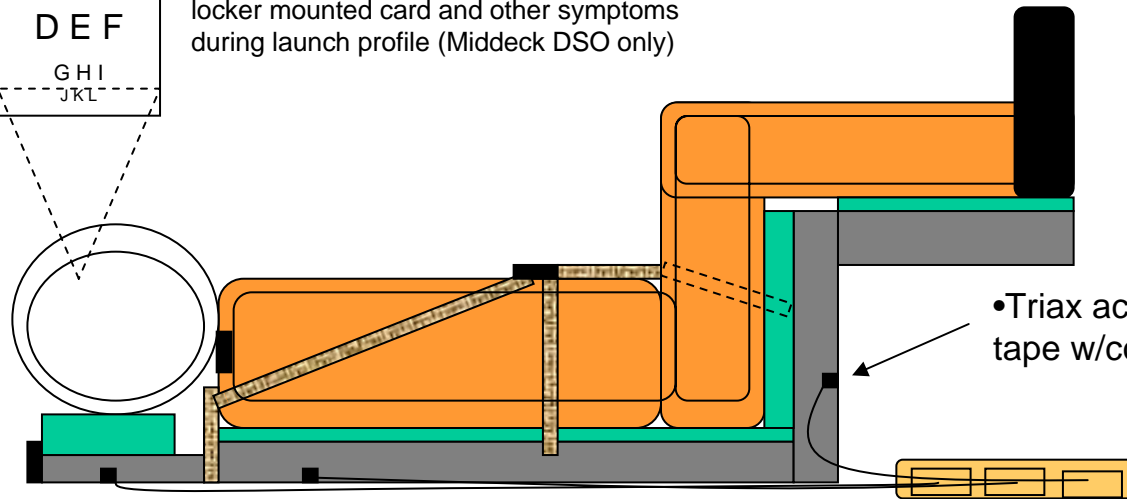
Thrust Oscillation Seat DTO

Presenter MV5/Kenneth Brown	
Date August 14, 2008	Page 7



Astronaut records visual function from middeck locker mounted card and other symptoms during launch profile (Middeck DSO only)

Accelerometer



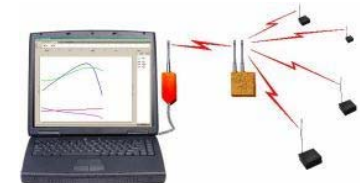
•Triax accel blocks (3), on tape w/courtesy tab



Sensor Unit

Laptop/Software

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





STS-128 Launch Site Requirements Review	Presenter MK-SIO / A. Swift	
	Date 08-14-08	Page 1

Mandatory RCNs:

NONE

Non-Mandatory Value Added RCNs:

NONE

STS-128

Launch Site Requirements Review

Flight Software Overview

Tom Stansel

USA FSW

PRCB 8/14/08

STS-128 LSRR (FSWE)

- **STS-128/OV-104 is the First Scheduled Flight of Operational Increment (OI) 34 Flight Software (FSW)**
 - **SASCB SCR 98107A (pending approval) documents PASS and BFS OI-34 content**
- **STS-128/OV-104 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 LSRR (FSWE)

- **STS-128 Source Changes/Edits for Primary Flight Software (Base)**
 - None
- **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 LSRR (FSWE)

- **Products**

- **STS-128/OV-104 Base Cycle Product delivery schedule (available to field)**

FPSB

- **Shuttle Data Tape**
 - **Mass Memory**

January 15, 2009

January 23, 2009

- **Open Items**

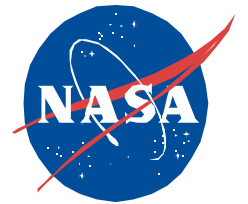
- **None**

- **Concerns/Issues**

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



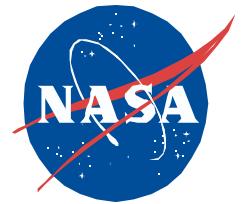
*Extravehicular
Activity
Office*



EVA Status

STS-128/Flight 17A Launch Site Readiness Review

**XA/Maria Tullar
Johnson Space Center
August 14, 2008**



- **Bulkhead PFR – SED33105308-307**
 - Bulkhead PFR installation – Tech Order: M072-661568-029

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

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

STS-128/ISS-17A

**MPLM, LMC and MISSE 6 A&B
DTO-TriDAR**

Launch Site Readiness Review (LSRR)

USA Payload/Cargo Engineering Status

**Abbas Elsabagh
Cargo Mission Manager
281-212-6186
August 14, 2008**

STS-128 / ISS-17A LSRR

Major Milestone

- Initial MECSLSI Release 09/22/08
- CIR data Pack 10/13/08
- CIRD 10/15/08
- CIR 10/27/08
- FRED 01/13/09

Cargo Engineering Status:

- Flight requirements were baselined (FDRD) on 06/19/08

Issues:

- Disconnect of TriDAR cables delivery date vs. KSC need date ECD: CIR

STS-128 / ISS-17A LSRR

ICD Status:

<u>Document</u>	<u>Title</u>	<u>ECD/Date</u>	<u>Status</u>
ICD-A-21342	ODS-ISS	05/24/96	Baselined
– A05608	TriDAR DTO (STS-128 only)	09/05/08	In Development
ICD-A-21546-OOR	ISS-17A On-Orbit ICD	09/12/08	In Development
– A05588	ICD Baseline PIRN		
ICD-A-21494	Lightweight MPESSE Carrier (LMC)	12/18/00	Baselined
ICD-A-21537	MISSE 6	07/10/2007	Baselined
ICD-A-21434-EF	MPLM	02/12/96	Baselined

STS-128 / ISS-17A LSRR

ICD Status:

- The following payload ICDS have been Baselined for STS-128

<u>Document</u>	<u>Title</u>	<u>ECD/Date</u>	<u>Status</u>
ICD-A-21429	DTV	03/10/99	Baselined
ICD-A-21449	MINICAM/DOWNLINK	01/28/99	Baselined
ICD-A-21537	MISSE6	07/10/07	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

STS-128 / ISS-17A LSRR

OMRSD

- FII V2 (Post-Mate)

Baselined Files

- P350 Multi-Purpose Logistics Module (MPLM)
- P430 SL/ORB Generic I/F Requirements (LMC)
- P537 Materials on ISS Experiment (MISSE 6)

RCNS

		<u>Release</u>	<u>Baseline</u>
• TBD	P545 – ISS-17A Baseline	09/01/08	11/27/08
• TBD	P430 – LMC Update	09/01/08	11/27/08
• TBD	P350 – MPLM Update	09/01/08	11/27/08
• TBD	P537– MISSE 6 Update	09/01/08	11/27/08

- FII V4 (PRE-MATE)

RCNS

		<u>Release</u>	<u>Baseline</u>
• DPSXXXX	Mission-Unique List	01/27/08	02/13/09
• DPSXXXX	Adjacent Pin Test	01/27/08	02/13/09
• DPSXXXX	FIII MUL	01/27/08	02/13/09

- Issues / Concerns:
 - None

STS-128 / ISS-17A LSRR

ANNEX 1

	Customer		
• <u>ISS-17A - NSTS 21545</u>	<u>Submittal</u>	<u>CR Release</u>	<u>ECD</u>
– Baseline	06/30/08A	08/11/08	08/29/08
• <u>Data Required</u> – Official weight and mass properties data, payload axis system figure, static length, and mechanical and electrical drawing			
– Interim CR	02/18/09	03/03/09	03/17/09
• <u>Data Required</u> – Safety-critical circuit diagram, FHRC & NTA center of gravity figures (if available)			
– Final Weight Update (L-1 M)	05/19/09	06/02/09	06/16/09
• <u>Issues/Concerns</u>			
– None			

STS-128 / ISS-17A LSRR

ANNEX 1- (Cont.)

	<u>Customer</u>		
	<u>Submittal</u>	<u>CR Release</u>	<u>ECD</u>
• <u>LMC - NSTS 21494</u>			
– Baseline	06/30/08A	08/11/08	08/29/08
• <u>Data Required</u> – Official weight and mass properties data, payload axis system figure, static length, and mechanical and electrical drawing			
– Interim CR	02/18/09	03/03/09	03/17/09
• <u>Data Required</u> – safety-critical circuit diagram, mechanical and electrical drawing updates, and center of gravity figures			
– Final Weight Update (L-1 M)	05/19/09	06/02/09	06/16/09
• <u>Issues/Concerns</u>			
– None			

STS-128 / ISS-17A LSRR

ANNEX 1- (Cont.)

	Customer		
	<u>Submittal</u>	<u>CR Release</u>	<u>ECD</u>
• MISSE 6 - <u>NSTS 21537</u>			
– Baseline	06/30/08A	07/31/08A	08/15/08
• <u>Data Required</u> – Official weight and mass properties data, payload axis system figure, static length, and mechanical and electrical drawing			
– Interim CR	02/18/09	03/03/09	03/17/09
• <u>Data Required</u> – Safety-critical circuit diagram, mechanical and electrical drawing updates, and center of gravity figures			
– Final Weight Update (L-1 M)	05/19/09	06/02/09	06/16/09
• <u>Issues/Concerns</u>			
– None			

STS-128 / ISS-17A LSRR

TGHR

Customer Submittal	03/30/09
Release for Review	04/30/09
Baseline	05/30/09

Issues/Concerns

- None

STS-128 / ISS-17A LSRR

Cargo Close Clearance Process

- The following Close Clearance areas have been identified:
 - MPLM Scuff Plate to MPM
 - CPK on LMC to AFT bulkhead EVA handhold
- Need to determine if CHIT to take as installed measurement required.
Assessment still in work. ECD: LSFR
- Chit measurements will be performed at the PAD after payload installation

STS-128 / ISS-17A LSRR

Cargo Integration Hardware Status

Delivery Status

- All required CIH has been delivered except for TriDAR cables

Issues/Concerns

- Disconnect in delivery of Tri DAR cables between delivery date vs KSC need date



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



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Backup Material

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



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S0721028 on 06-24-08

- **V072-000001-280** (Rev. TBD) Space Shuttle System (Rel. TBD)
 - **V072-200208-001** (Rev. TBD) Mission Equipment Cargo Support (Rel. TBD)
 - **SGD32104451-401** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - 402** Descent
 - **V070-000001-004** Orbiter General Assembly
 - **V070-410100-018** SSME Installation
 - **10100-0061-176** Integrated SRB General Assembly (BI-139)
 - **80901000000-530** External Tank Assembly (ET-132)
- **STS-128 CIR + 70 days Mission Configuration Product Plan (MCP) will be published on 12-29-08 and will be republished at LSRR +18 days on 09-01-08.**



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

SSP System Drawings – (Continued)

Ferry Configuration

- **V072-000001-281** (Rev. TBD) Space Shuttle System Drawing (Rel. TBD)
 - **V072-200208-002** (Rev. TBD) Mission Equipment Cargo Support (Rel. TBD)
 - **SGD32104451-001** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - **V072-300055-023** (Rev. BN01) Ferry Flight Configuration (Rel. 02-20-08)

SCA 905



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE**
- **A total of 6 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
 - **No impacts for all six disciplines** **0**
 - **One or more disciplines with impacts, documentation approved and/or pending approval** **1**
 - **MCR 19271**



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



STS-128 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **08-14-08**

Modification Impact Report – (Continued)

- Possible impacts still under review 5
 - MCRs 30126, 30164, 30186, 19789, and 30189 are being reviewed for impacts

MCR/ECP	STAT SITE	ITEM/KIT NUMBER TCTI NUMBER	SEQ EISN NO.	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
	AUTH KSC	J6116	0104 003 SPAR	AMES GAP FILLER REMOVAL AND REPLACEMENT	ORB-0085B 2006-08-16	MAND 031
	AUTH KSC	J6198	0104 002 SPAR	OV-104 MID FUSELAGE LOCK BOLT OPPORTUNITY SAMPLING AND FASTENER REPLACEMENT	ORB-0085R01 2007-03-12	MAND 031
	AUTH KSC	J6275A	0103 002 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 037
	AUTH KSC	J6275A	0104 001 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 031
	AUTH KSC	J6327	0104 001 SPAR	WLE RCC JOGGLE INSPECTION	S-J6327 2008-02-14	MAND 031
	AUTH KSC	J6329	0104 000 SPAR	ASA #2 & #4 AND ATVC #3 & #4 R&R FOR OV-104, FLT 31	S-J6329 2008-05-15	MAND 031
	AUTH KSC	J6341A	0103 001 SPAR	EVALUATION OF OMS POD LI-900 TILE INSTALLED ON 0.090" SIP LI-900 TILE INSTLD ON .090 SIP WILL BE INSPD FOR DEFECTS PER CHIT ON NEAR TERM FLOWS UNTIL RCN IS	S-J6341A 2008-04-09	MAND 037
	AUTH KSC	J6351	0104 000 SPAR	OV-104 RUDDER/SPEEDBRAKE (RSB) ACTUATOR EXTERIOR INSPECTION	S-J6351 2008-05-15	MAND 031
	AUTH KSC	J6378	0104 000 SPAR	OV-104 BODY FLAP PDU GEARBOX FLUID LEVEL INSPECTION	S-J6378 2008-07-18	MAND 031
	AUTH KSC	J6380	0104 000 SPAR	EVA PDU TOOL INTERFACE VERIFICATION	S-J6380 2008-07-07	MAND 031
	AUTH KSC	J6389	0104 001 SPAR	CLOSE CLEARANCE MEASUREMENTS OF ORBITER HARDWARE	S-J6389 2008-07-10	MAND 031

TOTAL MODS = 11

MCR/ECP	STAT SITE	ITEM/KIT NUMBER TCTI NUMBER	SEQ EISN NO.	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
	AUTH KSC	KLO-1624	2050 000 NSW	INSPECT SSME FLEET ELECTRICAL HARNESS ROUTING AND SLACK	S071807K 2008-08-01	MAND 007

TOTAL MODS = 1

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	
+	E	ORB	S053298ZC EK10572R1 (A)	OMRSD EXCEPTION REQUEST - MISSION LIFE ASSESSMENT OF WING LEADING EDGEINSULATORS (EK10572R1)	104	029 033
			S053298ZD EK10574R1 (A)	OMRSD EXCEPTION REQUEST - WING LEADING EDGE INSULATORS (EK10574R1)	104	029 036
			S053298ZE EK10575R1 (A)	OMRSD EXCEPTION REQUEST - MISSION LIFE ASSESSMENT OF WING LEADING EDGEINSULATORS (EK10575R1)	104	029 031
			S053299AQ EK10592 (A)	OMRSD EXCEPTION REQUEST - DRAG CHUTE DEPLOY SYSTEM 2 LIGHT FAILU RE(EK10592)	104	029 032
			S053299AT EK10593 (A)	OMRSD EXCEPTION REQUEST - DRAG CHUTE DEPLOY SYSTEM 2 LIGHT FAILU RE(EK10593)	104	029 032
	W	ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET	099 999
			OMS S053298NV WK10522 (A)	OMRSD WAIVER REQUEST - RIGHT OMS SECONDARY REGULATOR CREEP RATE(W K10522)	0021	035 043
			ORB S053296YT WK10332R2 (A)	OMRSD WAIVER REQUEST - PV6 PREVALVESCREEEN PARTICLES (WK10332R2)	104	027 031

	S053298HY WK10502 (A)	OMRSD WAIVER REQUEST - BODY FLAP DRIVE RATE TEST (WK10502)	104	027 031
	S053299BLR1 WK10600R2 (A)	OMRSD WAIVER REQUEST - OXYGEN SYSTEM 1 RELIEF VALVE FAILED RESEA TLEAKAGE (WK10600R3)	104	029 032
RCS	S053296GY WK10188R1 (A)	OMRSD WAIVER REQUEST - LRCS OXIDIZER GHE ISOLATION VALVE LEAK(WK 10188R1)	0014	025 032

-

1

Date: 08/06/08 07:42

PCASS

Page: 2

FLIGHT-SPECIFIC

Approved STS-128 OMRS Waivers and Exceptions

WVR	ELEMENT	PRCBD NUMBER WAIVER# (STAT)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
EXC	PROJECT	(INITIAL STS)			
+	W	RCS	S053296YG WK10318R1 (A)	OMRSD WAIVER REQUEST - RIGHT RCS OXIDIZER GHE SYSTEM INTERNAL LEA KAGE (WK10318R1)	0021 034 042
			S053298JF WK10503 (A)	OMRSD WAIVER REQUEST - RRCS OX TANKOUTLET TRANSDUCER ACCURACY (WK 10503)	0021 034 042
			S053299GW WK10634 (A)	OMRSD WAIVER REQUEST - LEFT REACTION CONTROL SYSTEM FUEL GHE ISO LATIONVALVE LEAKAGE (WK10634)	0014 030 032
	SRB	S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

+-----+-----+-----+-----+-----+-----+						
°	°	°	°	°	°	°
Waivers	Except	Deviat	Cannib	Total		
+-----+-----+-----+-----+-----+-----+						
°	10	5	0	0	15	°
+-----+-----+-----+-----+-----+-----+						

-
-
-
-
-
-

ACTIVE WAIVERS FOR
OV-104

Item #	Authority	Date	Waiver Description	Effectivity	Wad
53	S052428A	03/27/91	Allows specified flights to fly with interim TPS repair after each mission to minimize damage to surrounding tile during ferry flight	STS-37, STS-39, STS-40, STS-42 thru STS-999	STAYS OPEN
101	S076972	11/19/91	Permit the modified GPCs (AP101-S) Battery Back-up Unit to fly with annotated fastener improvements without rolling the LRU Part Number	STS-42, STS-44, STS-47 and STS-49 thru STS-999	STAYS OPEN
325	S061956	07/15/03	Blanket on the Control Moment Gyro (CMG) Orbital Replacement Unit (ORU) on the Lightweight MPESS Carrier (LMC) will NOT be re-installed on-orbit per configuration defined in ICD-A-21494. It will be secured around the FSE and attached to the aft bulkhead.	OV-104, Flight 27	
334	S115115JR1	07/19/06	The following requirement is waived to allow OV-104 to fly with the following out-of-configuration condition: Tech Order M072-544501-067 (RMS, MPM over-center stop and MPM pedestal insulation cover fasteners) will be implemented in total, less the requirement to perform bench rigging per updated specification requirements for for OV-104, Flight 27 and subsequent OV-104 flights until such time that all MPMs can be removed and bench rigging can be performed.	OV-104, Flight 27 thru OV-104, Flight 999	STAYS OPEN
339	S063652	07/09/07	The following requirement is waived to allow OV-104 to ferry from DFRC to KSC with the following out-of-configuration condition: Retain RH ET Camera installation for ferry flight MECSLSI V072-200197, reference flag note (3), removes (MV0456A) M072-705001-024 RH ET Sep Camera (Digital Camera with 35 mm lens) for ferry flight. The RH ET Camera needs to remain in flight configuration to support resolution of IFA STS-117-V07 Digital Umbilical Camera Image Corruption. Troubleshooting will be performed on the installed hardware after returning OV-104 to KSC.	OV-104, Flight 28	

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

ACTIVE WAIVERS FOR
OV-104

Item #	Authority	Date	Waiver Description	Effectivity	Wad
340	S063652	07/09/07	<p>The following requirement is waived to allow OV-104, Flight 28 to ferry with the following out-of-configuration conditions:</p> <p>Remove LH OMS Pod LP04 (FIB) blankets prior to ferry flight thermal blanket V070-396376-241 on LOMS Pod lifted at forward leading corner and edges reported on orbit, IFA STS-117-V-02. Two blankets (V070-396376-241 and adjacent V070-396376-051) are removed. RTV ramp applied in cavity up to adjacent blankets per TLP04-28-2520 MRB approval.</p>	OV-104, Flight 28	
343	S115122GR4	12/07/2007	<p>The following requirement is waived to allow OV-104 to fly with the following out-of-configuration condition:</p> <p>Partial installation of Tech Order M072-660010-004, middeck air flow re-routing duct tech order, not to include one each bolt (NAS1003-8A) and one each washer (NAS620C10) in the lower aft corner of the vent housing cover assembly.</p> <p>During vertical stowage, the nut plate (not under USA Tech Order configuration control) was noted missing from behind the starboard closeout panel. Without the nutplate, the bolt and washer cannot be installed. The area cannot be currently accessed to reinstall the missing hardware.</p>	OV-104, Flight 29	ECL-4-A0118 (was ECL-4-29-1637)

ACTIVE WAIVERS FOR
OV-104

Item #	Authority	Date	Waiver Description	Effectivity	Wad
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>	<p>OV-103, Flight 35 OV-104, Flight 30 OV-105, Flight 21</p>	

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 08/08/2008

NO.	SYS	REQT / PART DESC / PART NO	TOP / SEPAR	ANTICIPATED ACTION	CONSTR	ELE
1	PYRO	C00AA0.010.039 TIME DELAY ASSY - LOT NTA SKD26100115-0300	SEPAR - TBD TPS - TBD	REMOVE/REPLACE/RECERT	2	O
2	PYRO	C00AA0.010.133 RETRACTOR CART - LOT HTR SKD26100134-201	SEPAR - TBD V5012.002 V5012.003	REMOVE/REPLACE/RECERT	2	O
3	PYRO	C00AA0.010.135 REEFING LINE CUTTER(DRAG CHUTE) Lot PCA SED26139100-701	SEPAR - TBD V5143.002	REMOVE/REPLACE/RECERT	2	O
4	ECLSS	C00AA0.030.007 PPO2 SENSORs SYS 1 - 3 MC250-0002-3165	SEPAR - TBD VENDOR REFURB	REMOVE/REPLACE	4	O
5	OMS	C00AA0.080.002 GN2 RELIEF VLV RV001 1186804-39	SEPAR - TC08-055 TBD	REFURB/REPLACE	2	O
6	APU	C00AA0.090.010-B APU 1, 2 & 3 MC201-0001-0610	SEPAR - TBD V5U01.XXX	REMOVE/REPLACE	2	O
7	APU	C00AA0.090.020, 022 & 024 CONTROLLER APU #1 - 3 MC201-0001-1005	SEPAR - TBD V1019	RETEST/RECERT	2	O
8	APU	C00AA0.090.026, 028 & 030 HEATERS & THERMOSTATS APU #1 - 3 MC363-002X	SEPAR - TBD V1019	RETEST/RECERT	2	O
9	APU	C00AA0.090.032, 034 & 036 FUEL ISOLATION VALVE APU #1 - 3 V070-465238-00X	SEPAR - TBD V1019	RETEST/RECERT	2	O
10	PYRO	C00AA0.110.032 NASA STANDARD DET. SEB26100094-201	V5032.004 V5029.001	REMOVE/INSTALL	2	O
11	PYRO	C00AA0.110.033 CARTRIDGE SKD26100098-301	V5032.004 V5127	REMOVE/INSTALL	2	O

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 08/08/2008

12	PYRO	C00AA0.110.034 AFT ATTACH BSTR CART. SKD26100099-401	V5032.004 V5029.001	REMOVE/INSTALL	4	O
13	PYRO	C00AA0.110.035 NLG THRUSTER CART. SKD26100100-301	V5032.004 V5127	REMOVE/INSTALL	2	O
14	PYRO	C00AA0.110.043 GAS PRESS CTG. SEB26100001-25X	V5056	INSTALL	4	O
15	PYRO	C00AA0.115.001 GAS SAMPLER BATTERY SED33101116-321	V5012.001 V5029.004	REMOVE/INSTALL	4	O
16	INS	C00AA0.140.004 MADS TAPE RECORDER ME435-0055-0003 THRU 0005	S0007 V1200 V1248	TEST	4	O
17	COM	C00AA0.160.001 GPS RECEIVER (GPS MAGR'S) MC478-0153-0001	V5A71 SEPAR-TBD	R/R BATTERIES EVERY 12 MONTHS	4	O
18	MEQLG	C00AB0.010.003 NLG TIRE MC194-0007-0006 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
19	MEQLG	C00AB0.010.004 MLG TIE BOLTS & NUTS MC621-0051-0038 (4 WHEELS)	V1165.001 V1165.002	REMOVE/INSTALL	2	O
20	MEQLG	C00AB0.010.005 MAIN WHEEL ASSEMBLY MC621-0051-0038 (4)	V1165.001 V1165.002	REMOVE/INSTALL	2	O
21	MEQLG	C00AB0.010.006 NOSE WHEEL ASSEMBLY MC621-0050-0004 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
22	PLM	C00AB0.160.020A VIDEOSPECTION CAMERA ASSY SED39125120-310	TPS-TBD	REMOVE/REFURB/INSTALL	4	M

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 08/08/2008

23	INS-MW	C00AB0.160.021 MICRO-WIS SGU ASSY IVC911001-301	SEPAR - TC08-016 TBD	REMOVE/REPLACE	2	O
24	TPS	C00AB0.170.001 RCC ARROWHEAD PLATE MC621-0007-7009	V5139.001 V5139.002	REMOVE/INSTALL	2	O
25	TPS	C00AB0.170.002 RCC ARROWHEAD PLATE MC621-0007-7010	V5139.001 V5139.002	REMOVE/INSTALL	2	O
26	STR	C00AB0.180.527A LOWER GAP SEAL INSULATOR V070-199843-002	SEPAR - TC07-013 EXCEPTION - EK10575R1	REMOVE/REPLACE	2	O
27	ECLSS	C00AB0.230.100 AVIONICS BAY FIRE EXTINGUISHERS MC282-0065-0001	SEPAR - TBD V1042.002	RECERT/VERIFY WEIGHT	2	O
28	PYRO	C00AD0.030.009 SPHERICAL BEARING ASSY V070-562036-002	V5032.004 V5127	REMOVE/INSTALL	2	O
29	PYRO	C00AD0.030.012 PYRO CENTERING MECHANISM SKD26100098-501	V5032.004 V5127	REMOVE/INSTALL	2	O
30	PLM	JSC24937.30 PORTABLE FOOT RESTRAINT ASSY SED33105308-307	SEPAR - TC08-083 TPS-TBD	REMOVE/REFURBISH/INSTALL	2	M
31	PLM	JSC24937.36 HIGH-STRENGTH BRIDGE CLAMP FITTING SED33107177-305	SEPAR - TC08-084 TPS-TBD	REMOVE/REFURBISH	2	M
32	PLM	JSC24937.45 EVA SLIDEWIRE SUBASSY SED33103377-311	SEPAR - TC08-081 TPS-TBD	REMOVE/REFURBISH	2	M
33	PLM	JSC24937.53 ERCM SAFETY TETHER (2) SED33105087-315	SEPAR - TC08-082 TPS-TBD	REMOVE/REFURBISH/INSTALL	2	M

Constraints

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

Elements

O=ORBITER
M=MISSION EQUIP.

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 08/08/2008

34	FCS	JSC24937.56 EMER EGRESS SLIDE SYS MC623-0015-0023	TPS-TBD	REMOVE/INSTALL	4	M
35	PVD	V05AA0.030/050 WCCS CHECK VALVES ME284-0438-X113	SEPAR - TBD V1076.XXX	REMOVE/REPLACE	2	O
36	ECLSS	V61AIL.010-C LIOH CANNISTER MC621-0008-0409	TPS-TBD	INSTALL AT PAD	4	O
37	ECLSS	V61AIL.015-C HYDRAZINE (CO RMVL CART.) MC621-0008-0060	TPS-TBD	INSTALL AT PAD	4	O
38	ECLSS	V61AIL.016-C ATCO CARTRIDGE MC250-0024-0001	TPS-TBD	INSTALL AT PAD	4	O
39	ECLSS	V61AJ0.141 PPO2 SENSOR MC250-0002-3165	V1053.010	RECALIBRATE SENSORS AT PAD	4	O
40	FCS	V66AIL.060 POLE CREW ESCAPE SYS ASSY SED27101375-322	TPS-TBD	REMOVE/INSTALL	4	M
41	COM	V74AD0.130 MSBLS RF #1, 2 & 3 MC409-0017-0007	OMI-TBD SEPAR-TBD	PERFORM 15 MINUTE TEST	4	O

Constraints

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

Elements
O=ORBITER
M=MISSION EQUIP.