



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



STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

Program Freeze Point

PRCB Presentation

S115126C



STS-126 Launch Site Flow Review

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Baseline the STS-126 Mission Specific Requirements and Flow Plans.

The STS-126 Integrated Launch Site Requirements were established by PRCBD S115125A dated 12-13-07. This CR and the Associated Data Package were reviewed at the 03-03-08 FRWG.

Flight Management*

Orbiter Engineering*

Shuttle Processing*

Requesting Approval

Status in BackUp

MO3/USA-PI

USA-OE

PH-B2

KSC Integration

Flight Software

FCE

EVA

Payload Cargo Engineering

KSC ISS and Payload Processing

MK-SIO

USA-FSW

MV5

XA

USA-PI

UB-R3

Baseline at DLSFR

SSME

MP21

*BackUp Material



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



STS-126/ULF2

Launch Site Flow Review (LSFR)

Flight Requirements Status

PRCB March 6, 2008

Shelby Lawson, STS-126 MIM

James Flores, USA Flight Mgr.

Adam Richards/Boeing Mass Properties



STS-126 LAUNCH SITE FLOW REVIEW	Presenter Shelby Lawson/MO3	
	Date 03/06/08	Page 2

LAUNCH

10/16/08
 39A/ MLP3
 CREW SIZE: 7UP/7DN (One crew rotation)

ORBIT

51.6 DEG
 122 NM
 DIRECT INSERTION (190 NM altitude)
 DURATION: 15 + 1 + 2 DAYS (4 EVAs)

CONFIGURATION

OV-105 (22)
 LP03;RP04
 ET-129
 BI-136
 RSRM-104
 (1) TBD (2) TBD (3) TBD
 OI-33
 SRMS,ODS,OBSS,SSPTS

CONSUMABLES

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

PAYLOAD

ISS-ULF2	ISS-ULF2
MPLM	MAUI
LMC	SEITE
SSPL/PSSC	

LANDING

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



STS-126 LAUNCH SITE FLOW REVIEW	Presenter Shelby Lawson/MO3	
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PERFORMANCE MARGIN

• SIMULATION MARGIN (OCFAF126)		+2153
• WEIGHT CHANGES SINCE SIMULATION		
• PAYLOAD	+151	
• OPERATOR	+43	
• ORBITER	-2	
• CREW COMPARTMENT	<u>-314</u>	
TOTAL WEIGHT CHANGES	-122	+122
• OTHER PERFORMANCE PROJECTIONS		
• PROTECTION FOR DOL DISPERSIONS		-700
• 10/16/08 LAUNCH DATE (PMBT & ATMOS)		+390
• SRB-M/P UPDATES		-213
• SRB – BR / 0.05 MIL LOWER THAN 0.3705 AVG		-18
• PROJ TO 5 MIN WINDOW FROM INPLANE		-600
• PERFORMANCE CHANGES ADJUSTMENT		<u>-8</u>
• CURRENT BASELINED APM (02/26/08)		+1126
• IPT PROJECTIONS		
• PROJECTED ORBITER WEIGHING IMPACT (STS-123)		<u>-90</u>
• PROJECTED APM		+1036

**VOLUME III: ASCENT PERFORMANCE MANAGER'S RESERVE GUIDELINE AT FPSR/CIR IS 800 LBS
 GUIDELINE ONCE SSME ASSIGNED IS 400 LBS**



STS-126 LAUNCH SITE FLOW REVIEW	Presenter Shelby Lawson/MO3	
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FLIGHT MASS PROPERTIES
WEIGHTS AND CG'S ARE WITHIN ACCEPTABLE LIMITS

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	223228 (233000)	1086.6 (1075.7)
RTLS	239018 (245000)	1086.0 (1077.2)
TAL	237637 (244000)	1086.1 (1077.2)
AOA	233942 (242000)	1083.7 (1075.7)
CONT RTRN	204444 (233000)	1084.3 (1075.7)

(CONT RTRN CASE IS NO MPLM, LMC IN LAUNCH CONFIGURATION (FHRC RTN) Fwd CG case)

NOTE: RTLS INCLUDES 185 SEC ARCS, 25 SEC FRCS DUMPS

TAL INCLUDES 120 SEC ARCS, 65 SEC FRCS DUMPS

126 LBS AFT BALLAST (BOXES ONLY)

ESTIMATES BASED ON TDDP OCFAF126 AND MODIFIED FOR WEIGHT CHANGES THRU 02/26/08.



STS-126 Launch Site Flow Review

Presenter	Shelby Lawson	
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- **STS-126 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.) (Max CM Ballast (2014 lbs) + 875 lbs additional CCGD items, No Fluids Off-Loaded, No Payload Bay Opening)	225212	1113.7 (1409.5)	0.2 (N/A)	374.0 (516.5)
<u>AOA - Orbiter c.g.</u> (SCA c.g.) (Max CM Ballast (2014 lbs) + 275 lbs additional CCGD items, No Fluids Off-Loaded, No Payload Bay Opening)	232373	1113.7 (1409.6)	0.3 (N/A)	375.1 (517.6)
<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)	209269	1081.2 (1377.0)	0.3 (N/A)	372.3 (516.5)

X c.g. Limits (Orbiter Coordinates)

Nominal	=	1060.0 TO 1116.0
AOA	=	1060.0 TO 1116.0
TAL	=	1060.0 TO 1123.6

Z c.g. Limits (Orbiter Coordinates)

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

STS-126 OV-105 Flight 22 LSFR Orbiter Element

L.R. (Bert) Wagster
Doug Cline

USA/OE
Boeing / VMMO

March 6, 2008

STS-126, OV-105 Flight 22 LSFR Orbiter

Purpose:

- Obtain program authorization for baseline of modifications to be performed prior to STS-126, OV-105 Flight 22.
 - Mandatory Mods – No new requirements
 - Mod Deferrals – One deferral request
 - Mission Kit updates – No new requirements
 - Potential Mods and Mod Summary

- Present summary of other requirements
 - Chits

Back-up

- Modification Matrix
- Description of mods to be baselined/deferred
- BRI-18 priority status

STS-126 OV-105 Flight 22 –Modifications to be Deferred

Request deferral of the following modification to a future flight

- **30091 – Boundary Layer Transition DTO** – Modification installs specially designed tile and instrumentation to obtain data during re-entry of heating effects due to early boundary layer transition
 - Request deferral of mod implementation to future flight
 - Scope of Work content while preparing for two LON missions, STS-326 and STS-400 adds undue schedule risk
 - Current plan is to fly on OV-103, STS-119
 - OPO concurred with deferral of mod for OV-105 to a future flight (TBD)

STS-126 OV-105 Flight 22 – Mod Summary

No significant potential modifications for Flight 22

Modification to be authorized separately

30010 Crew Seat Inertia Reel Changeout

- Plan for STS-126 to perform crew seat inertia reel changeout on all M/S, Pilot and Commander seats
 - PLT and CDR seats may be modified while installed in crew module
- Tech order updates manifested on CCCD
 - CR for authorization and CCCD update is in signature

RCNs/Chits

The following are presented for information only

Chit No.	Title	Description/status
J5927	OV-105 Body Flap (BF) Power Drive Unit (PDU) Gearbox Fluid Level Inspection	Performs second of two fluid checks to assess potential fluid leakage during flight
J6275A	Orbiter Structure IML Surface Corrosion Sampling Inspection	Approved - Performs inspections beneath tile in specified areas to complete sampling started under previous chit J5930
J6295	OV-105 IR Thermography, RCC panels 14L, 13L 9R joggle areas	Previously approved thermography to observe joggle area indications after mission cycle
J6306	OV-105 Mid Fuselage Lockbolt collar inspections	Approved – Performs sampling prior to Flights 21, 22 and 23
J6313	AMEC power-off Spurious output test	Approved – Second test to verify spurious outputs will not adversely affect range safety system
J6327	WLE RCC Joggle inspections –	Approved - Performs visual and tactile inspections of the inboard slipline joggle regions
J6328	Wing Leading Edge Structural Noise Measurements During OPF or MDD Vehicle transfers	Approved – Activates WLEIDS to record data during changes to vehicle orientation or support
J6330	Flight Pin Installation into LMC Secondary Passive Latches in Support of STS-400 Launch Configuration	Approved – Provides for installation of flight pins for OPF rollout
J6337	Air flow verification of middeck supply and return air register locations	Draft under review – measures air flow in cabin to characterize pockets of CO2 build-up
JXXXX	MLG axle tempilabel installation	Under review – Requests removal of brake assemblies and installation of tempilabels to provide date for shorter temporary runway at Edwards

KSC Launch and Landing Project

STS-126

Launch Site Flow Review

March 6, 2008





Multi Flow

K. Tenbusch



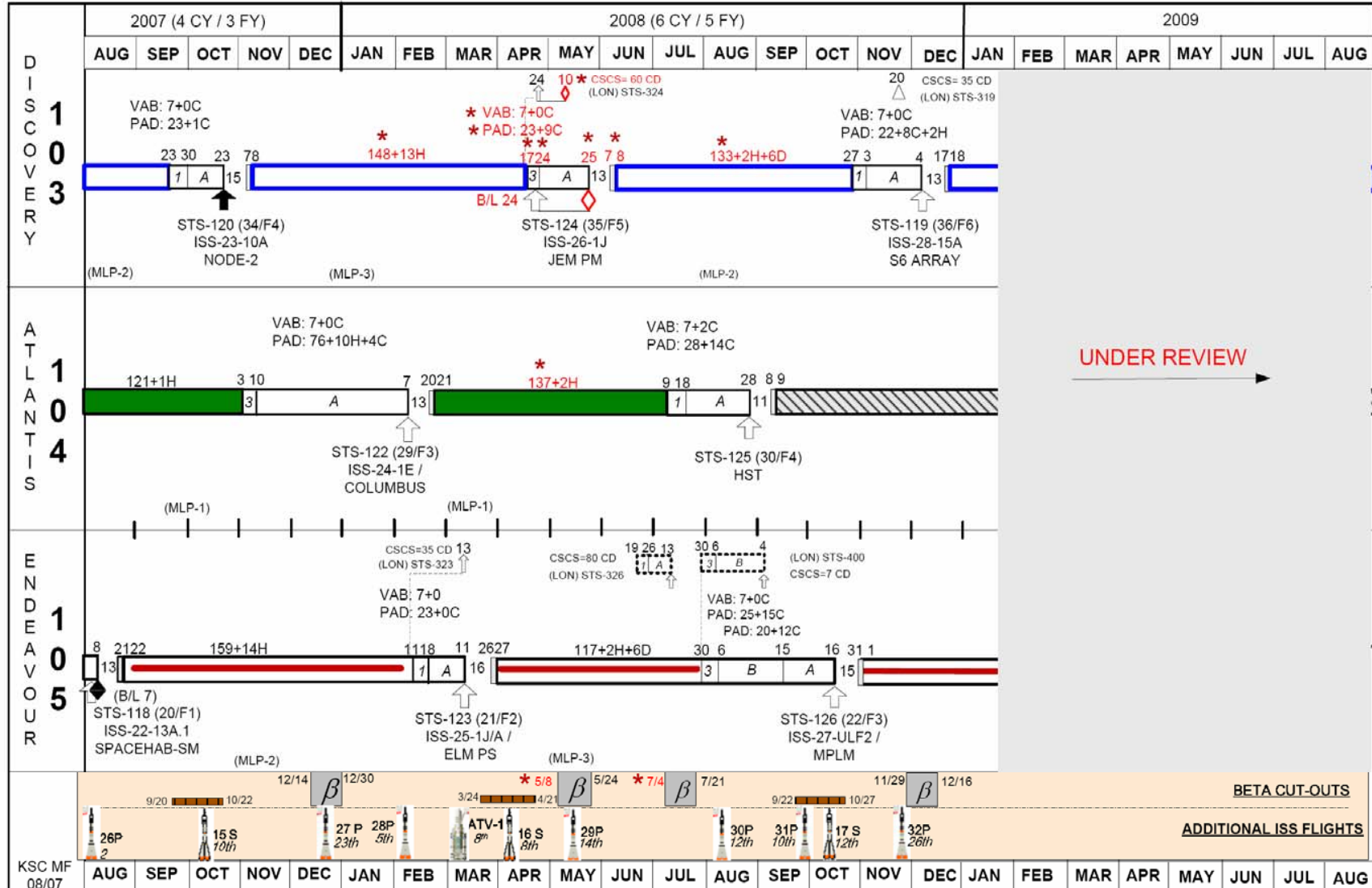
 BASELINE MANIFEST (FDRD) / PREL. PROGRAM PLAN
 KSC ASSESSMENT (SLIP or OPTION)
 * DENOTES CHANGES TO BASELINE MANIFEST

KSC ASSESSMENT / ORB MULTI-FLOW

SSP APPROVED MANIFEST (FAWG OPT. 08A-4B)

OPR: USA - R. GILLETTE, MFM
NASA - C. FORD, PH-0

1100 EST, 25 FEB 2008



UNDER REVIEW →

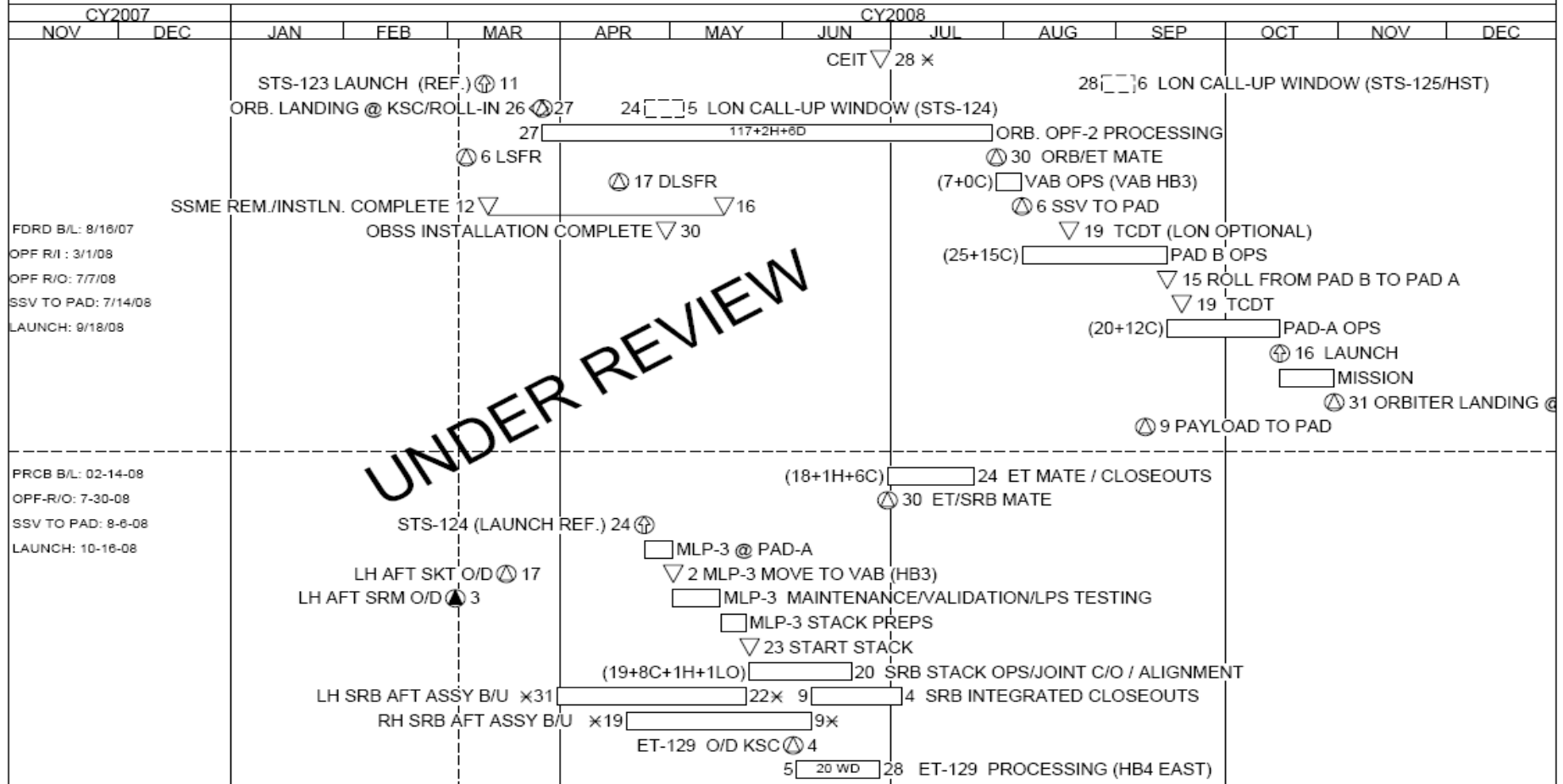
Contact: S. Wierszalowski, USA Near-Term Manifest Planning (321)861-8701

STS-126 KSC Milestone Interface Chart

OPR: USA: R. GILLETTE, INTEG. OPS.
NASA: C. FORD, PH-O

OV-105/22 ISS-27-ULF2 / MPLM
CREW / DURATION: 7 UP - 7 DWN / 15
ET 129 / Bi136 / RSRM 104 / MLP-3 / PAD-A / VAB HB3

SSP APPROVED MANIFEST PRCB 2-14-08 (REF. CR# S042013HD)
Status as of:
03/04/2008



UNDER REVIEW

STS-126 LSFR
J. F. Kennedy Space Center



Flight Element Processing

R. Goodman



Flight Element Processing Overview

- Processing Deltas Presented
- OPF Flow Milestones Presented
- Issues and Concerns Presented
- TPS Work Content Presented
- Stoplight Chart Presented
- Integrated Operations Summary Presented
- Configuration/Facilities Backup
- Lock Bolt Inspection Map Backup
- BRI Implementation Map Backup



Processing Deltas

- **OBSS Installation and MPM Rigging**
- **Mods:**
 - Two Additional Base Plates For FCS Multi-Use Bracket Mod
 - Crew Seat Inertia Reel Changeout
 - WLE Sensor System Firmware Upgrade
- **Chits:**
 - J5927 Body Flap Power Drive (PDU) Gearbox Fluid Level Inspection
 - J6275A Orbiter Structure IML Surface Corrosion Inspection
 - J6295 1R Thermography Request
 - J6306 Mid Fuselage Lock Bolt Inspection
 - J6313 AMEC Power OPF Spurious Output Test
 - J6327 WLE RCC Joggle Inspection
 - J6328 WLE Sensor Record Data During Jack Transfer
 - J6330 Flight Pin Installation Into LMC Secondary Passive Latches (pending)
 - J6337 Air Flow Verification of Middeck Supply and Return (pending)
- **Time & Cycle**
 - Fuel Cell #1 Time Cycle Replacement
- **Deferred to Flight 22**
 - PVD Purge Circuit #1 Inspection
 - System #2 Hydraulic Flexhose Leak
 - Panel R13 Caution and Warning Sticky Push Button
 - LH OMS Pod Failed MADS Measurement (FIB R&R)



STATUS	
USA	NASA
C	C
C=CONCUR	NC=NOT-CONCUR

STS-126/OV-105 OPF FLOW MILESTONES
 DOWN PAYLOAD:ISS-25-1J/A - UP PAYLOAD:ISS-27-ULF2/MPLM

Creation Date: 4-OCT-2007
 Revision Date: 14-NOV-2007
 Revision :A

OPR:USA-GOODMON, RANDAL D
 NASA-TENBUSCH, KENNETH E

2008																			
MAR	APR			MAY			JUN			JUL									
24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	A
FLOW MILESTONES																			
△ 26 KSC LANDING																			
△ 26 ORBITER AT OPF DOOR																			
△ 27 CRYO OFFLOAD COMPLETE																			
△ 29 PLBD'S OPEN COMPLETE																			
△ 4 PAYLOAD REMOVAL COMPLETE																			
△ 4 HEATSHIELD REMOVAL COMPLETE																			
△ 6 SSME REMOVAL COMPLETE																			
△ 9 HYPER OFFLOAD COMPLETE																			
△ 22 FUEL CELL #1 R&R COMPLETE																			
△ 30 OBSS INSTALLATION COMPLETE																			
△ 20 ET DOOR FUNCTIONAL COMPLETE																			
SSME INSTALLATION COMPLETE 3 △																			
PAYLOAD PREMATE TEST COMPLETE 13 △																			
ORBITER/PAYLOAD IVT COMPLETE 16 △																			
HEAT SHIELD INSTALLATION COMPLETE 17 △																			
INTEGRATED HYD OPS COMPLETE 23 △																			
CEIT COMPLETE 28 △																			
FINAL PLB DOORS CLOSED 10 △																			
WGT/CG COMPLETE 28 △																			
ROLLOUT FIRST MOTION 30 △																			

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

STATUS DATE: 3-MAR-2008:1 PLOT DATE: 3-MAR-2008, 7.17 am NETWORK: OPF126.724 CONTACT: L.P. TUTEN ,1-0673 OPF BAY-2 EXE:CUSOPFSU.27

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Issues and Concerns

- **High Work Content/Growth**
 - Payload Download/Upload (GFE From STS-124)
 - Shared Resources With STS-125 Flow
 - Potential Problem Areas:
 - Chin Panel
 - Windows 7 & 8
 - Lock Bolts
 - PVD PC #1 Contamination
 - Potential CHITS:
 - MLG Axle Temperature Labels
 - Radiator Retract Hose Inspections at 88 Degrees
 - IWIT Scanning of Windows 1 thru 6



STS-126 Cavity Estimate

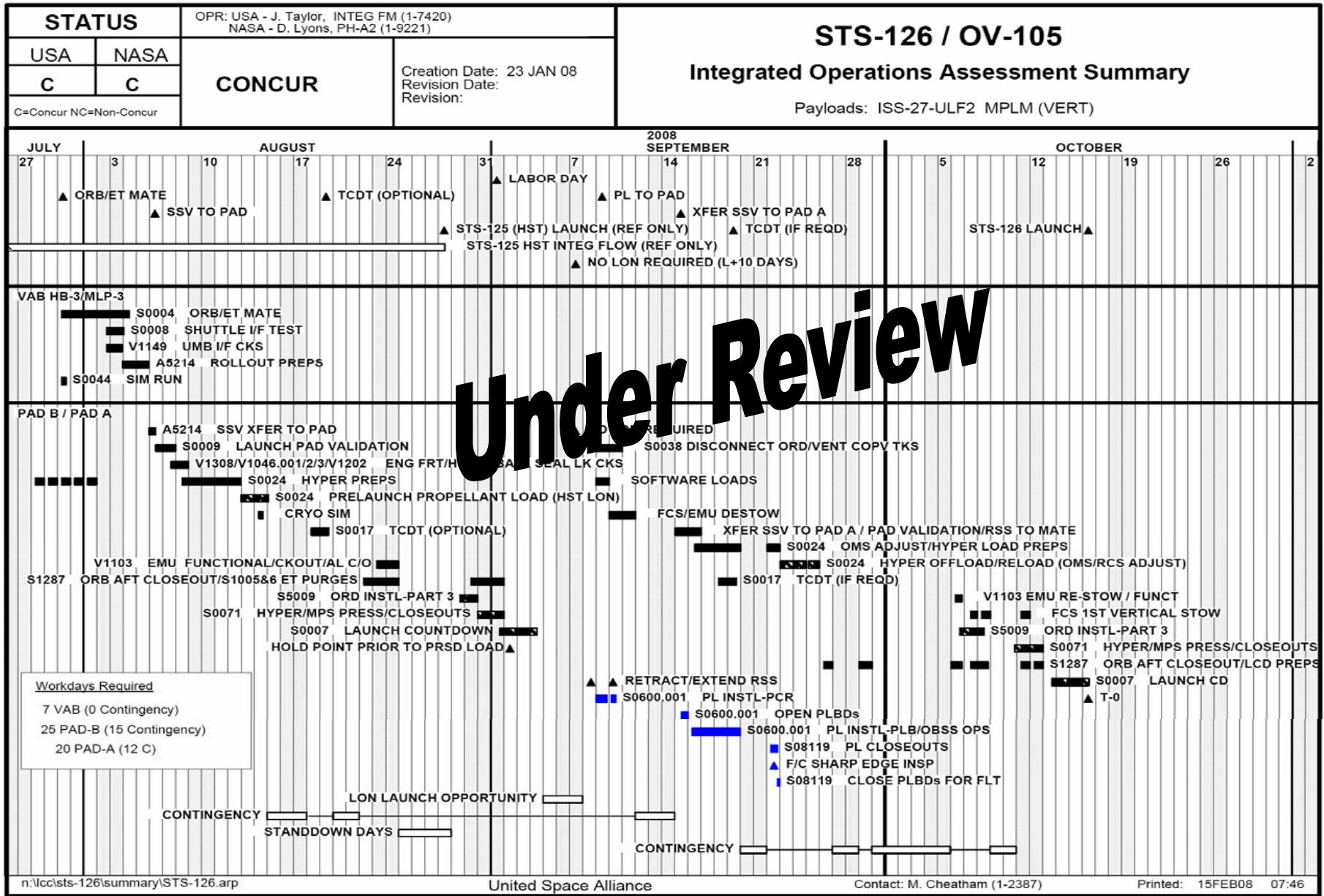
<u>Priority</u>	<u>Description</u>	<u>Proposed</u>
1	Deferred Tile/Fib for 1-Flight	13
1	In-Flight Tile/Fib Damage	65
1	Insert Inspections	2
1	Oms Pod Leading Edge (12-Tile/11-Fib)	Complete
1	Operational (Adjacent Ops,C/P Ops,Veh Suppt)	18
8	Structure IML Surface Corrosion Inspection	0
12	Gap Fillers	0
<u>BRI Implementation</u>		
1-3	MLGD Doors	Complete
4	ET Door Structure-Side	20
5	LESS Hot-Panels 8-10	0
TPS Removal TOTAL (Estimate)		118



STS-126/OV-105 Ground Ops Processing

Overall to Launch Window Opening G		Program Baseline Milestones (Ref Manifest 08A-4B)			
Critical Path: <ul style="list-style-type: none"> • Parallel OPF & Integrated Flow with STS-125 • STS-400 requirement to be able to launch no later than 7 days after the HST launch • ET-129 delivery and processing 		Processing Schedule	Milestones	Date	Status
		VAB/PAD	LAUNCH	10/16/08	
		OPF	ORBITER/ET MATE	7/30/08	
		ET/SRB CLOSEOUTS	ORBITER/ET MATE	7/30/08	
		SRB STACKING	ET/SRB MATE	6/30/08	
		ET STANDALONE	ET/SRB MATE	6/30/08	
ISSUES / POTENTIALS					
OPF PROCESSING		117 + 2H			
OPF POTENTIALS					
ET/SRB PROCESSING					
LON STS-319 (LON on OV-103)	LON				
G No Significant Risk				➔ Remains Unchanged	
Y Significant Risk Identified that Threatens a Program Milestone, Recoverable with Mitigation				⬆ Improving	
R Unachievable, Impact to a Program Milestone				⬇ Deteriorating	





STS-126 LSRF
J. F. Kennedy Space Center





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



STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

Backup Material

FRWG Presentation (With Minor Changes)



	Presenter Shelby Lawson/MO3
	Date 03/06/08 Page 5

Flight Operations and Integration (FO&I)

Flight Requirements:

MIP, PIPs, CIP

FDRD

FRD

Backup Charts



STS-126/ULF2		Presenter Shelby Lawson/MO3
Mission Requirements Status		Date 03/06/08 Page 6

Documentation

ECD/Date

MIP – NSTS 21514, Rev A, Chg 1-3 (2/04/08)

CR-0009: Appendix E inputs

3/18/08

CR-0010: Section 9.0 inputs

3/18/08

CR-00xx: Mission Priorities update

Post LSFR

IP – DTO 848 TPS, NSTS 21517, Rev C (1/30/08)

CR-0014: Add TSBA for 1J/A, 1J, ULF2

1/30/08 (A)

FDRD

CR-S042013GZ: Add SEITE to STS-126, Remove PSSC from STS-326

12/11/07 (A)

CR-S042013HD: Update Launch Dates for STS-125 and Subs

2/07/08 (A)

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

None pending

PIP – SSPL 5510/PSSC, NSTS 21539, Basic, Chg 1 (12/7/07)

None pending

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

None pending

PIP- MAUI, NSTS 21530, Basic, Chg 1 (3/29/06)

None pending

CIP- LMC, NSTS 21494, Rev B, Chg 1-9 (2/4/08) STS-126 Addendum

None pending



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



STS-126/ULF2 FRD Status	Presenter James Flores/USA	
	Date 03/06/08	Page 7

- **STS-126 FRD Latest Revision: 002, dated February 27, 2008**
(<http://sspweb.jsc.nasa.gov/efrd>)

CRs in work:

- FRD17462-126-009: Add Boundary Layer Transition (BLT) DTO (Withdrawn 2/28/08)

CRs Approved:

- FRD17462-126-003: Update Middeck Weight
- FRD17462-126-004: Add Photo TV Configuration Table
- FRD17462-126-005: Update Tools for Rendezvous and Docking (TRAD) in Table 2
- FRD17462-126-006: DTO 848 Update and Removal of Sample Box
- FRD17462-126-007: Add Shuttle Exhaust Ion Turbulence Experiments (SEITE)
- FRD17462-126-008: Update Launch Date

- **STS-326 Latest Revision: Revision 002, dated February 26, 2008**
(<http://sspweb.jsc.nasa.gov/efrd>)

Open CRs: None

CRs in work: None



STS-400 Flight Requirements Status	Presenter Todd Hellner/Frank Richmond	
	Date 03/06/08	Page 8

STS-400 HST Rescue Flight MIP (NSTS 21543), Basic Dated 12/7/07:

Issues/Concerns:

–None Identified

STS – 400 Latest FRD Revision

–Revision 003, Dated February 20, 2008 (<http://sspweb.jsc.nasa.gov/efrd>)

Open CRs:

– None

CRs in Work:

– None

Back-up

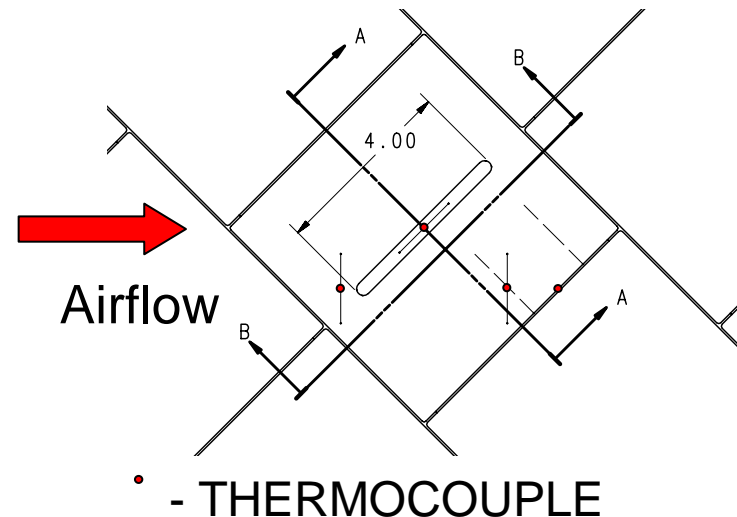
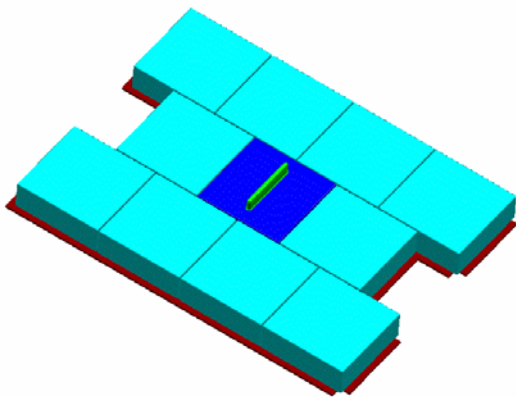
Modifications Matrix

MCR NO.	MCR TITLE	KIT/ MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
<u>Modifications to be Deferred at LSFR</u>				
30091	Boundary Layer Transition DTO	K439-774105-001, 0001, TCTIM1930091REF, 0002, 0 VK70-100055-001, 0105, 0 VK70-776005-001, 0105, 0 The MCR authorizes installation of tile with a protuberance and instrumentation to evaluate heating effects due to early boundary layer transition. 3/3/08 update: Per latest direction mod to be deferred on OV-105 to a future flight.	M072-784656 M070-191001	MECSLSI IMPACT
<u>Modifications Separately Authorized</u>				
30010	Implmentation of Inertia reel Mod on Crew Module Seats	Installs iimproved Inertia reels on PLT, CDRand M/S seats.	CCCD manifest Item	CR authorization in work separately (CR S063027Y)
<u>Potential Mods</u>				
30025	Main Landging Gear Door Thermal Barrier Cavity Mod	Installs Thermal inhibitor material in MLGD cavity to protect pressure seal in the event of a tile or thermal barrrier breach	none	Pending future Review at OP for possible implementation. Not considered a potential candidate for STS-126.

STS-126 OV-105 Flight 22 - LSRR Baseline

Request authorization to baseline the following mod

- **30091 – Boundary Layer Transition DTO** – Modification installs specially designed tile and instrumentation to obtain data during re-entry of heating effects due to early boundary layer transition
 - Installs a “trip tile” with a machined in protrusion to trip the boundary layer at Mach ≤ 15 for STS-126
 - Subsequent flight will install trip tile for Mach ≤ 18 , Mach ≤ 19
 - Mod will install wiring provisions for ten thermocouple instrumented tiles on left hand wing downstream of trip tile

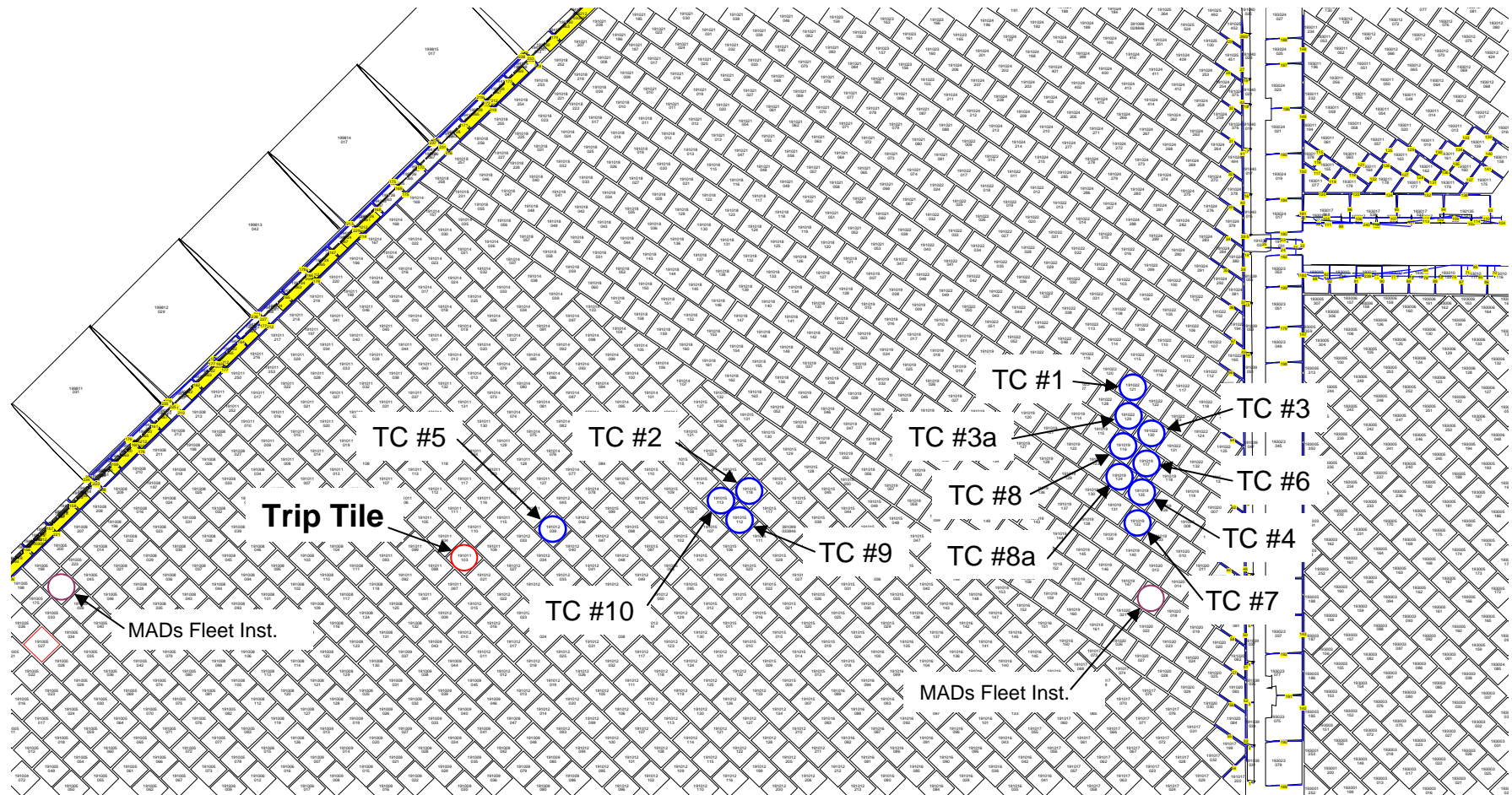


STS-126 OV-105 Flight 22 - LSRR Baseline

Boundary Layer Transition DTO Cont.

View of tile and instrumentation layout on LH Wing

Approximate locations



TPS Priorities - STS-126 LSFR (Feb '08)

Mandatory

- Flight damage, OMRS Requirements/Chits, LRU access, & deferred work
 - Deferred work may be re-deferred with acceptable inspection

Note: Gap Filler R&R –To be worked on a best effort basis as resources allow.






Prioritized Opportunity

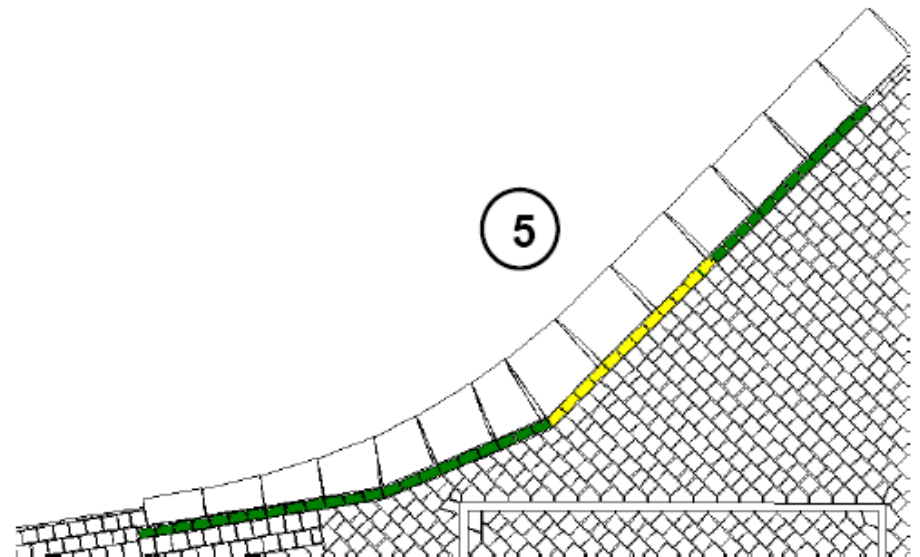
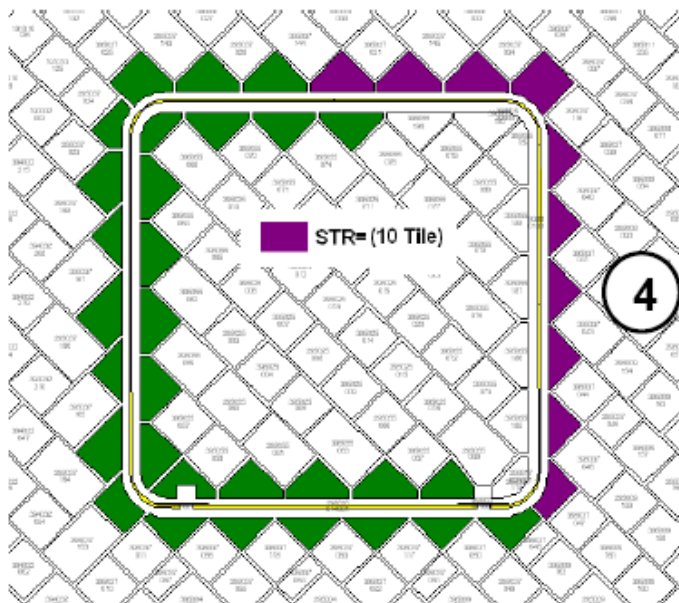
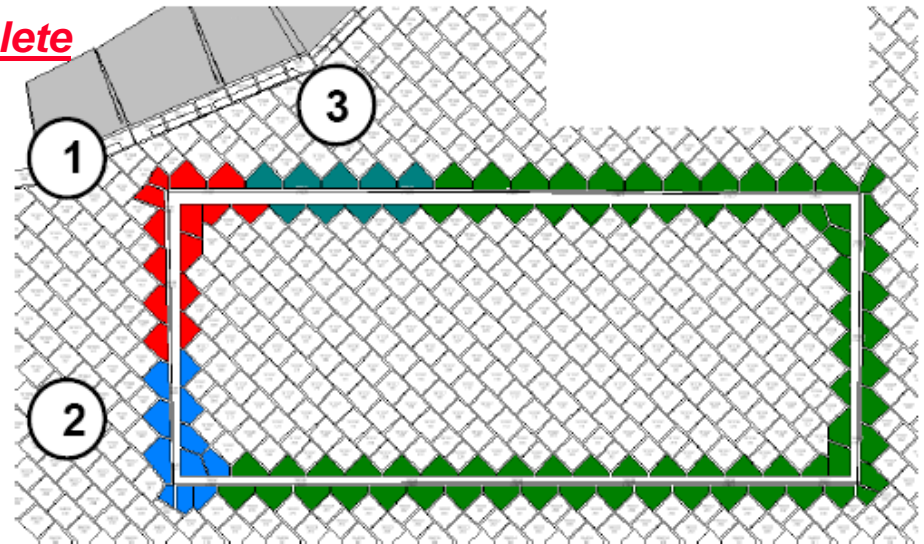
1. **BRI-18 Tile - MLGD (28 tile)**
 - 1st subset – fwd & o/b corner – 14/door **Complete**
2. **BRI-18 Tile - MLGD FWD Edge (22 tile)**
 - 2nd subset – fwd & o/b sides – 11/door **Complete**
3. **BRI-18 Tile - MLGD O/B Side (18 tile)**
 - 3rd subset – O/B side – 9/door outboard side **Complete**
4.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

TPS Priorities - STS-126 LSFR (Feb.08)

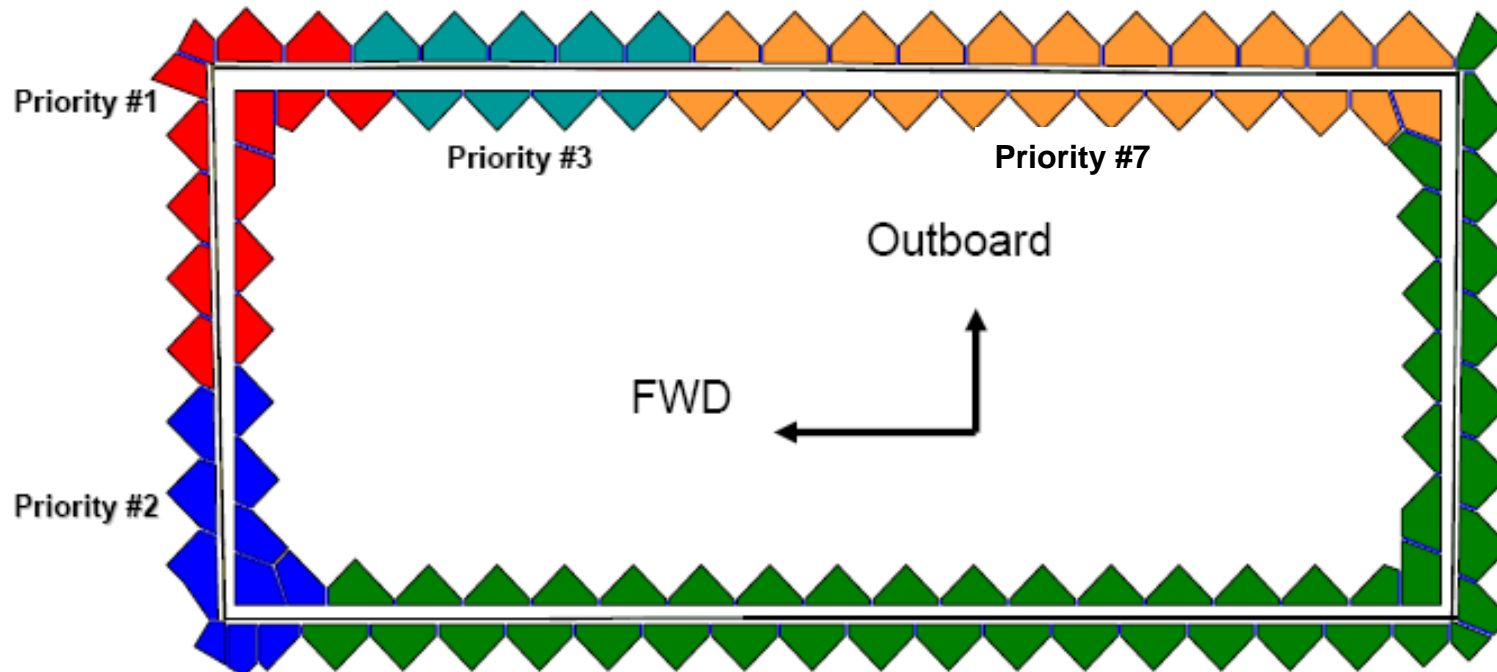
6. BRI-18 Tile - STR side of ET Doors Inboard side Aft four tiles (8 tiles total)
7. BRI-18 Tile - MLGD – Outboard Middle 1/3 – (6 door/6 structure), Outboard Aft (1/3 left) (6 door/6 structure) – 24 tile per side (48 total – LH and RH sides)
8. Corrosion Sampling – Heatsink Areas (Elevons/Body Flap)
9. Gap fillers in Subset 2B (Line across MLGD edge)
10. BRI-18 Tile – Remaining MLGD (Top Priority)/LESS carrier panels/NLGD
 1. MLGD (Inboard forward edge working to AFT door edge)
 2. LESS -panels 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order)
 3. NLGD (attrition –do leading edge first)
11. Mod work BLT DTO, MLGD sneak flow (Hub Tile **Complete**, WLE sneak flow **Complete**, Horsecollar Gap Fillers **Complete**,)
12. Remaining Gap Fillers and Windows BRI-18
 1. Windows 2, 3, 4, & 5 Upper Carrier Panels (top priority)
 2. Window locations 1 & 6 Upper Carrier Panels 1st/Lower C/P's 1 –6 last

BRI-18 Top Risk Reduction Areas (Priorities 1-5)

1.  **MLGD- FWD/OB Corner** Complete
2.  **MLGD-(2A) Subset** Complete
3.  **MLGD-(2B) Subset** Complete
4.  **ET Doors- STR Side**
5.  **LESS "Hot Panels" (8-10)**

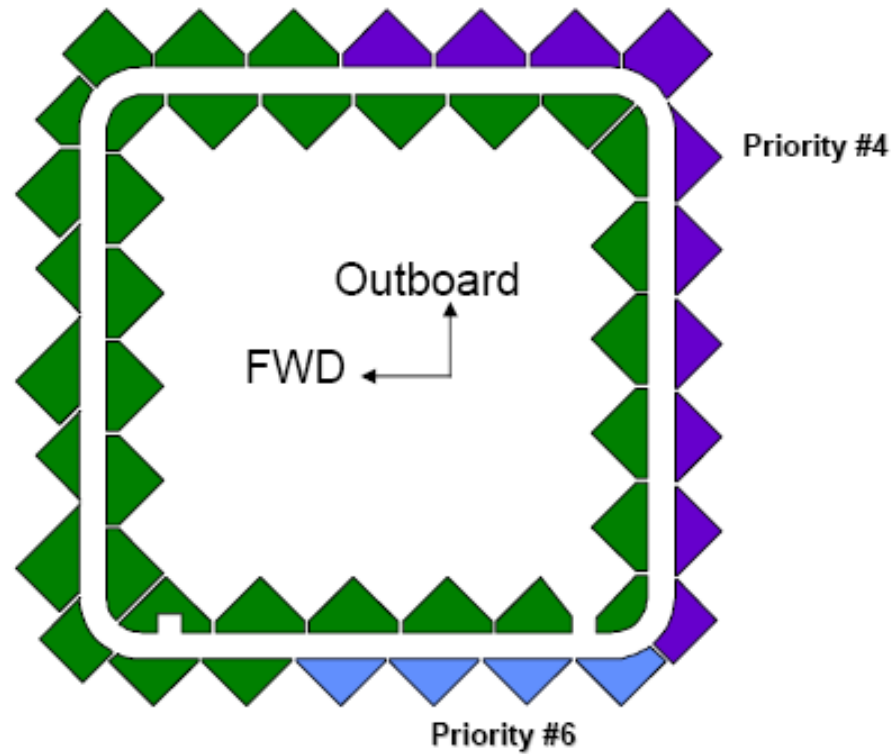


BRI-18 Top Risk Reduction Areas (MLGD)



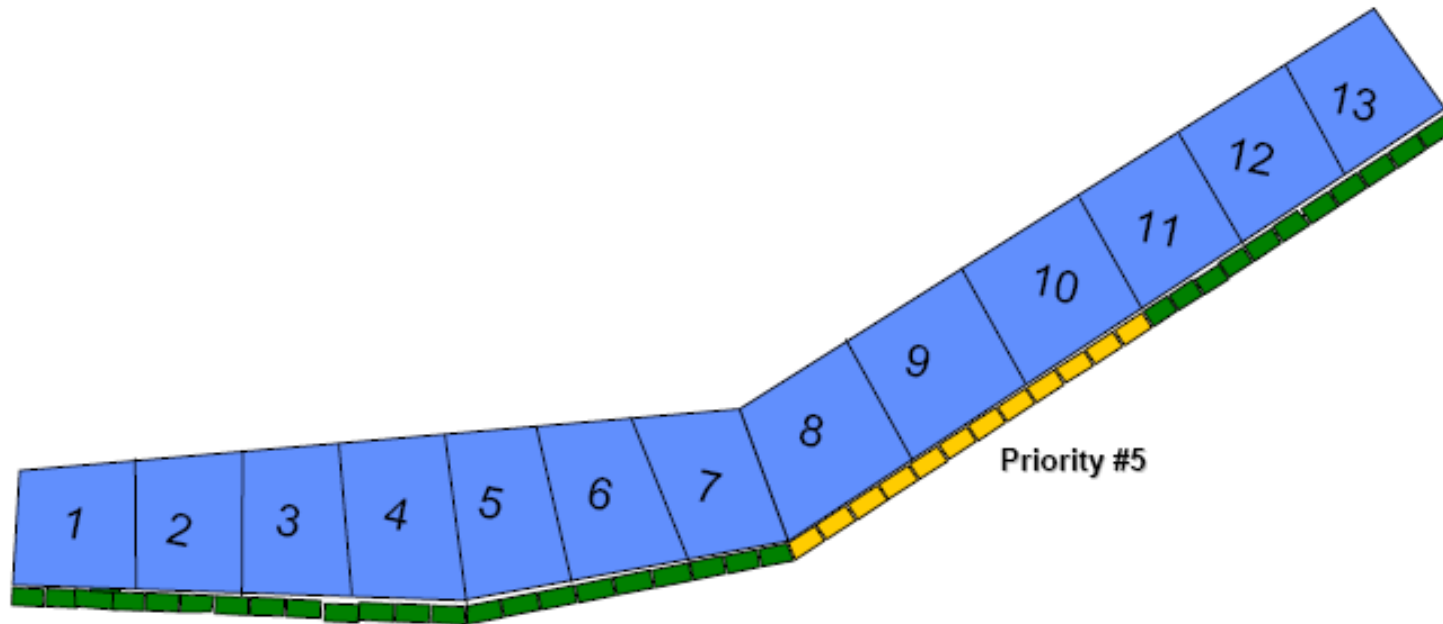
- 1. Note replace, door side tiles first within its priority coloring.***
- 2. When replacing “Green Level tiles” work outboard edge first STR and Door side***

BRI-18 Top Risk Reduction Areas (ET Door)



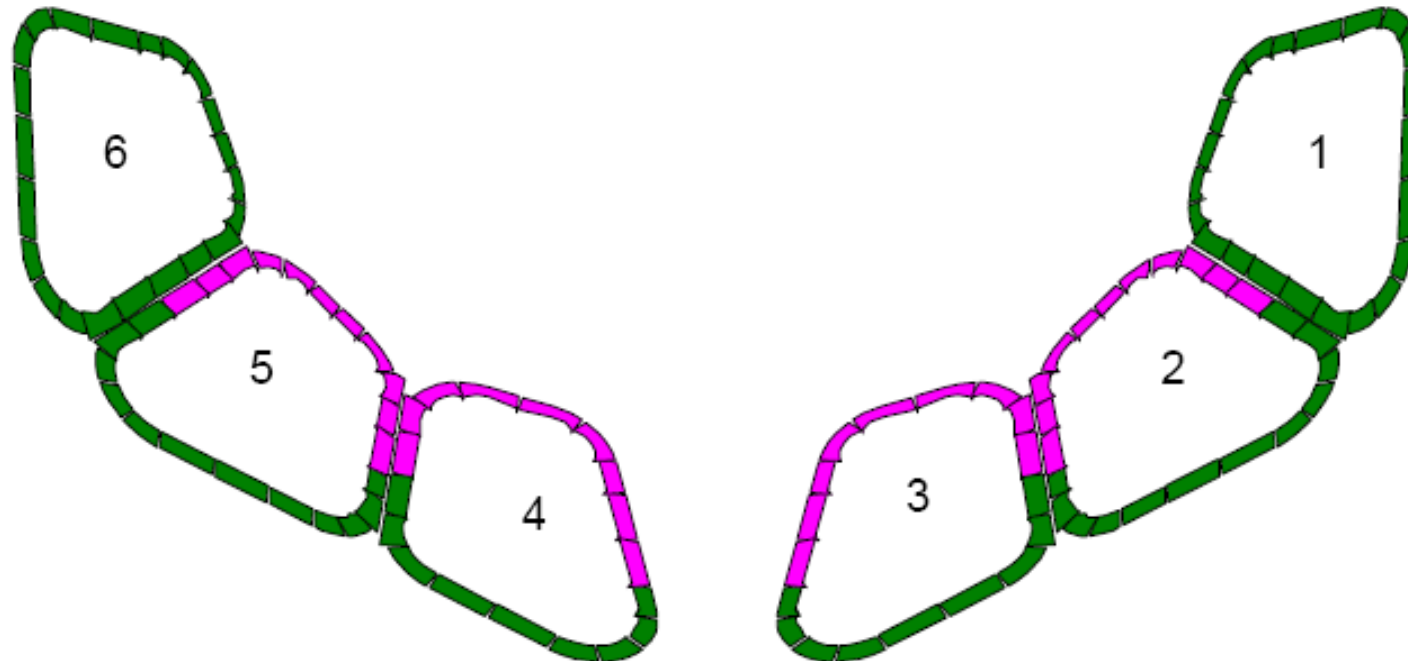
1. *When replacing “Green level priority” tiles work Inboard/Outboard Structure side tiles first.*

BRI-18 Top Risk Reduction Areas (LESS Carrier Panels)



- ***When replacing “Green level priority” tiles work the following sequence in this order: Carrier panel # 7, 6, 5, 4, 3, 2, 1, 11, 12, 13,***

BRI-18 Top Risk Reduction Areas (Window Carrier Panels)



- ***When working the “Green level priority” tiles work the following Carrier panel in this order: Uppers on Windows 1 & 6, Lowers on windows 3 & 4, Lowers on windows 2 & 5.***

BACKUP

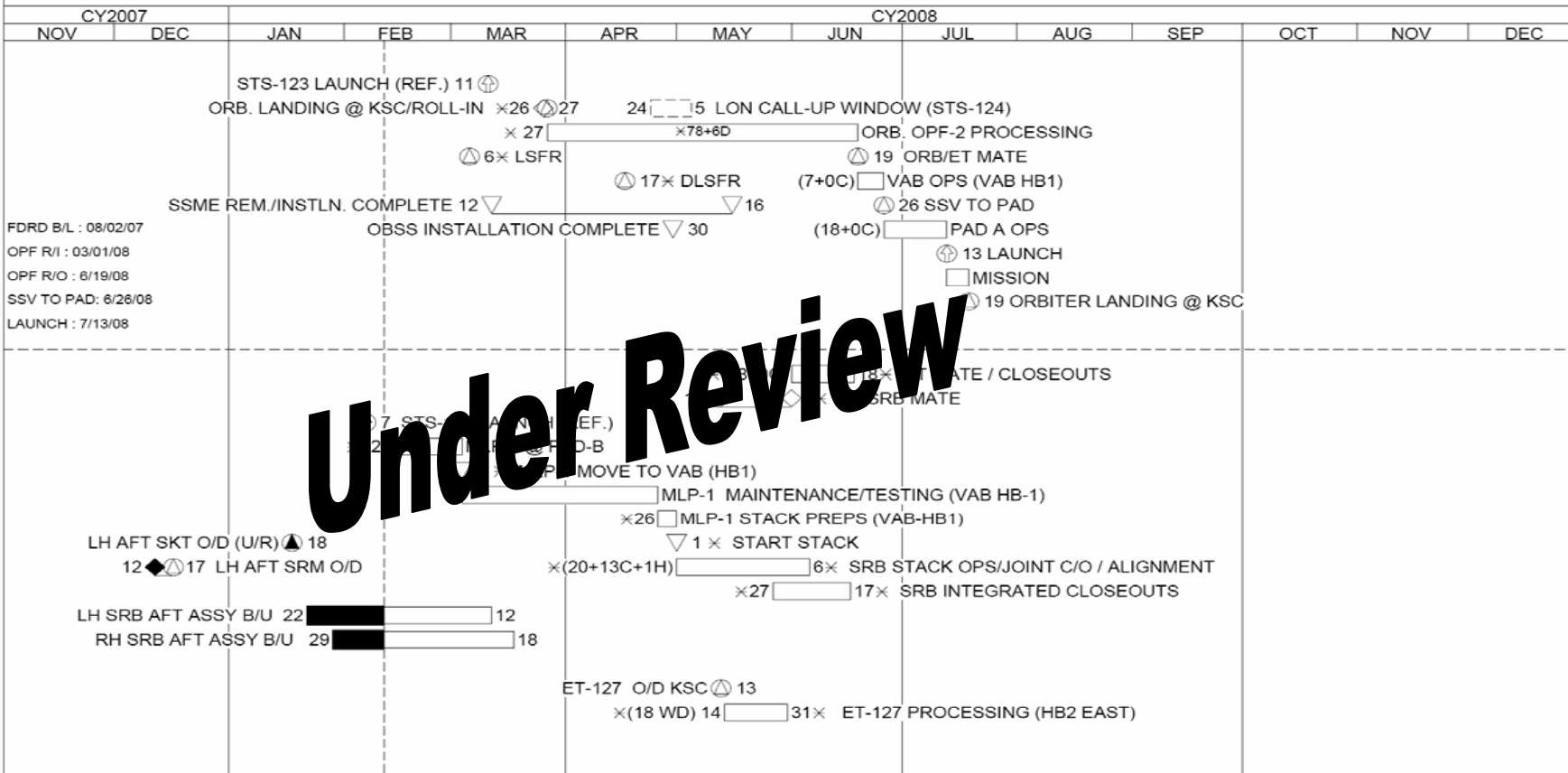


STS-326 LON Milestone Interface Chart

OPR: USA: R. GILLETTE, INTEG. OPS.
NASA: C. FORD, PH-O

OV-105/22
CREW / DURATION: 4 UP - 11 DWN / 6
ET 127 / B135 / RSRM 103 / MLP-1 / PAD-A / VAB HB1

SSP APPROVED MANIFEST PRCB 8-2-07 (REF. CR # S042013GT)
Status as of:
02/15/2008



THREATS: 1. ET DELIVERY

NOTES: 1. LON IN SUPPORT OF STS-124/OV-103
2. ET REASSIGNMENT (ET-127 TO ET-129)
3. STS-326 STACK REASSIGNMENT TO STS-125 STACK (ET-127)

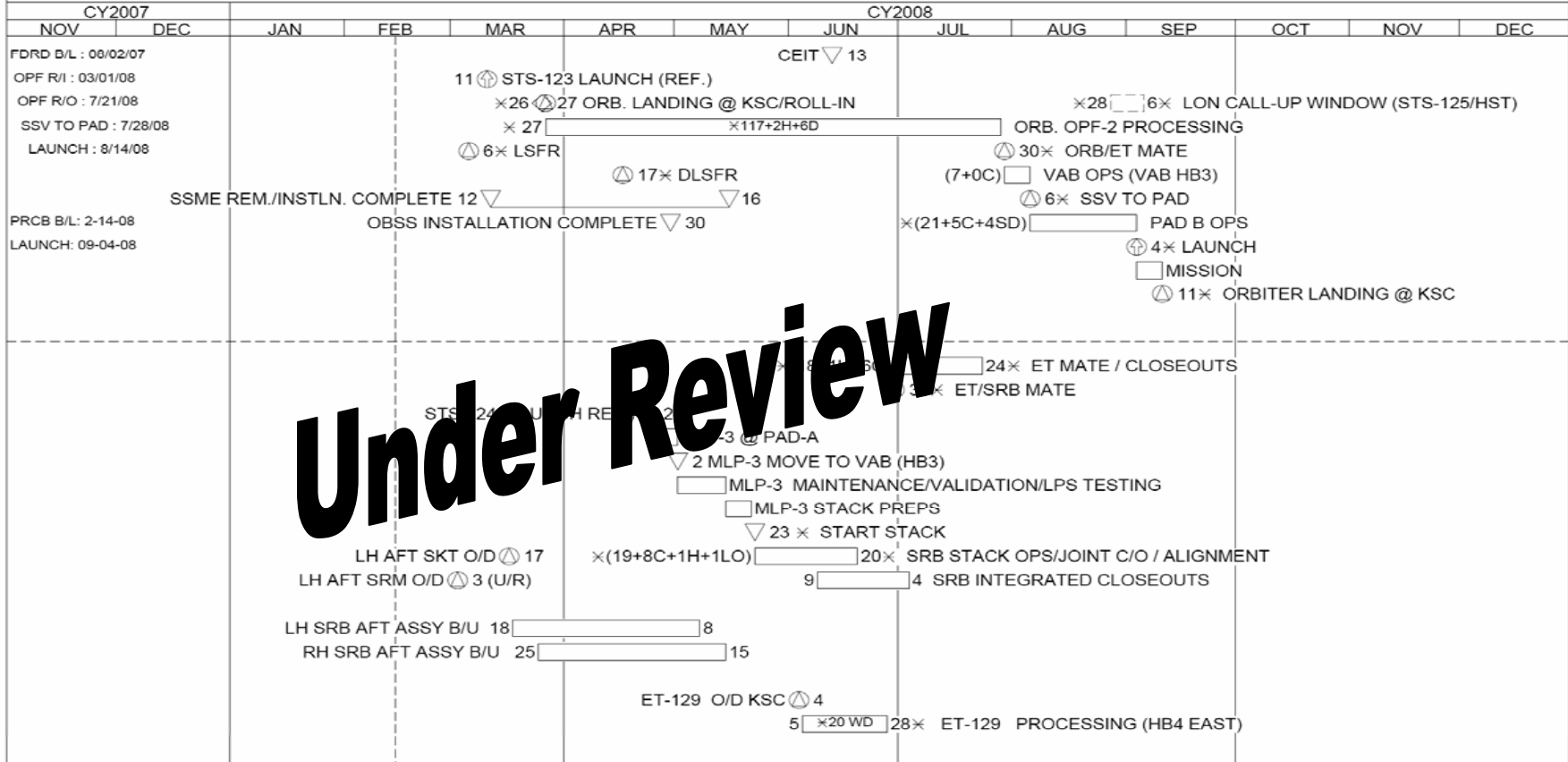


STS-400 LON Milestone Interface Chart

OPR: USA: R. GILLETTE, INTEG. OPS.
NASA: C. FORD, PH-O

OV-105/22
CREW / DURATION: 4 UP - 11 DWN / 7
ET 129 Bi136 / RSRM 104 / MLP-3 / PAD-B / VAB HB3

SSP APPROVED MANIFEST PRCB 02-14-08 (REF. CR #S042013HD)
Status as of:
02/15/2008



Under Review

THREATS: 1. REMAINING SRB SEGMENT DELIVERY

NOTES: 1. LON IN SUPPORT OF STS-125/OV-104 HST
2. PARALLEL OPS WITH STS-125 HST VEHICLE @ PAD A
3. ET REASSIGNMENT (ET-127 TO ET-129)

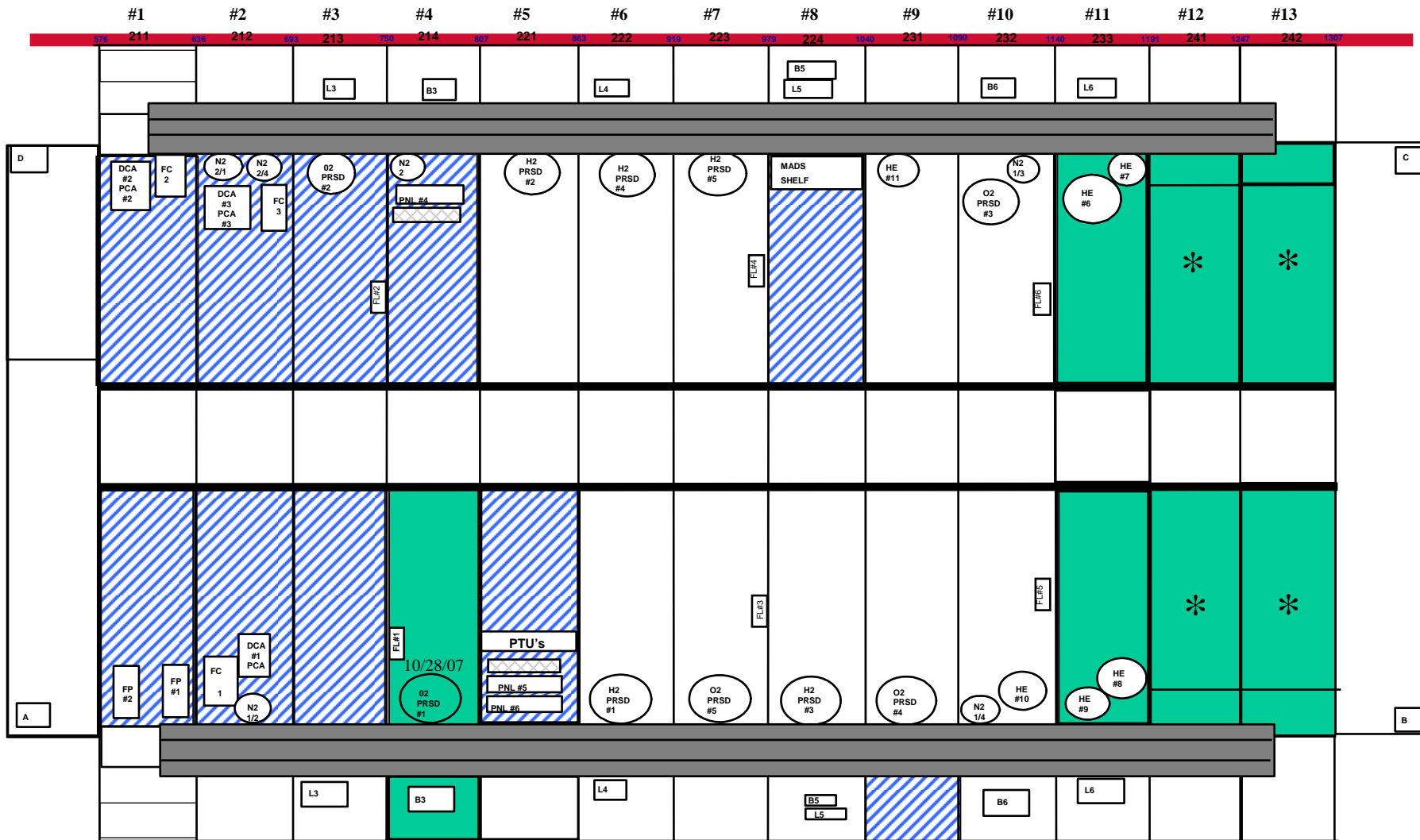


CONFIGURATION / Facilities

- **OV-105: Flight 22**
- **OMS Pods: LP03 / RP04**
- **ET: 129**
- **SRB: BI-136/RSRM 104**
- **SSME: TBD(#1), TBD (#2), TBD (#3) U/R**
- **Payload: ISS-ULF2, MPLM, PSSC, SPDU**
- **Flight Software: OI-33**
- **Firing Room: 4**
- **OPF Bay: 2**
- **MLP: 3**
- **VAB High Bay: 3**
- **Pad: B/A**



Lock Bolt Inspection J6306



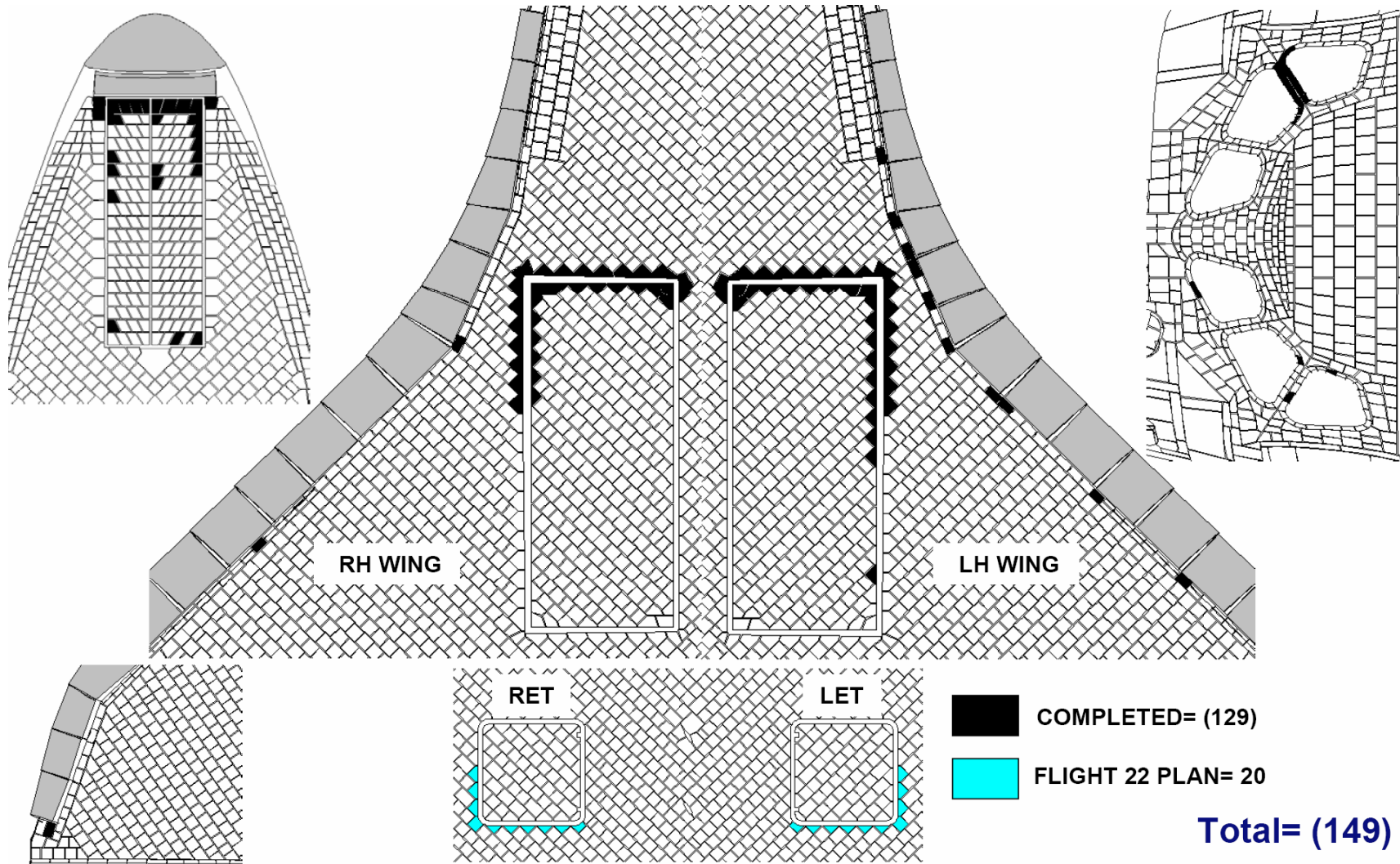
LOCKBOLT INSPECTION COMPLETE *under carry through only
 PLANNED INSPECTION FOR STS-126

Note: Inspections involves only bays opened for other work. Floor blanket removal not required, NDE only those areas accessible. Visual and borescope is the norm.

STS-126 LSFR
J. F. Kennedy Space Center



BRI Future Planning (OV-105 Flight 22)



STS-126/STS-326/STS-400 Launch Site Flow Review Flight Software Overview

Tom Stansel

FRWG 3/03/08

PRCB 3/06/08

STS-126 LSFR (FSWE)

- **STS-126/OV-105 is the First Scheduled Flight of Operational Increment (OI) 33 Flight Software (FSW)**
 - SASCBC SCR 98100A documents PASS and BFS OI-33 content
- **STS-126/OV-105 Flight Software Payload Support:**
 - ULF-2
 - Orbiter Interface Unit (OIU)
 - Sequential Still Video (SSV)
 - Orbiter Docking System (ODS)
 - Trajectory Control System (TCS)
 - Multi-Purpose Logistics Module (MPLM)
 - 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-126 LSFR (FSWE)

- **STS-126 Source Changes/Edits for Primary Flight Software (Base)**
 - SCR 92882 - Allow Three String GPS for STS-116 and Subsequent OV-105 Flights
 - SCR 93211A - Update of SSMEC Downlist for Enhanced Accelerometer Operations
 - SCR 93215A - Protect Ascent Bearing Spec From MM 104 Retrograde Guidance Solution
 - DR 124995 - Runway Label Not Displayed Above Runway
 - DR 124997 - Wrong DEU for Spec 54 Auto Ascent to Entry Bearing Switch
 - DR 126166 I-Load Constraint Checker for STS 126 Failed with an Abend
- **STS-126 Source Changes/Edits for Primary Flight Software (ADTL)**
 - DR 126187 Entry Bearing Display not Displayed on CRTs with Unsupported MF after MM602 Transition
- **STS-126 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - SCR 93223 - Change N2/02 BFS FDA K-Loads to I-Loads
 - DR 121410 - BFS Setting of Unused Bits in Feature Control Words

STS-126 LSFR (FSWE)

- **Products**

- **STS-126/OV-105 Base Cycle Product delivery schedule (available to field)**
FPSB
 - **Shuttle Data Tape** Jan. 24, 2008 A
 - **Mass Memory** Feb. 29, 2008
- **STS-126/OV-105 ADTL Cycle Product delivery schedule (available to field)**
FPSB
 - **Shuttle Data Tape** Under Review
 - **Mass Memory** Under Review
- **STS-326/OV-105 deliveries will consist of the STS-123 OV-105 Base SDT/Mass Memory, STS-123 patches, STS-123 PASS GMEM, STS-323 Flight Specific I-Loads and post call-up changes if required**
 - **Living SCR 98096 Mod D, defines the Rescue LON Flight Software configuration for OV-105 (STS-326)**
- **STS-400/OV-105 deliveries will consist of the STS-123 OV-105 Base Mass Memory, STS-400 Flight Specific SDT and I-Loads, and post call-up changes if required**
 - **Living SCR 98096 Mod D, defines the Rescue LON Flight Software configuration for OV-105 (STS-400)**
 - **STS-400 specific SDT required to support SCR 93236/93211A – Update of SSMEC Downlist for Enhanced Accelerometer Operations**
 - **STS-400 Flight Specific I-Loads scheduled for SASCB approval on March 13, 2008**

STS-126 LSFR (FSWE)

- **Open Items**
 - None
- **Concerns/Issues**
 - No issues or concerns with STS-126, STS-326 or STS-400 at this time



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE	Presenter Kenneth Brown	
	Date March 5, 2008	Page 1

STS-126 LSFR FCE/GFE Status

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



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



STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE	Presenter Kenneth Brown	
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- Delivery dates are partnered
 - If STS-326 call up, hardware will come from OV-104
 - STS-400/126, hardware from OV-103



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



STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE	Presenter Kenneth Brown	
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BACKUP



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE		Presenter Kenneth Brown
		Date March 5, 2008 Page 4

Hardware	Tech Order	KSC Need	JSC Planned	JSC Remarks	JSC Contact
A (port forward)	M072-750025-080	5/30/08	5/23/08	From STS-124.	Randall Moore
B (port aft)	M072-750025-081	5/30/08	5/23/08	From STS-124.	Randall Moore
C (starboard aft)	M072-750025-082	5/30/08	5/23/08	From STS-124.	Randall Moore
D (starboard forward)	M072-750025-083	5/30/08	5/23/08	From STS-124.	Randall Moore
Payload Ops camera	M072-340109-002	5/19/08	5/19/08	From STS-124	Randall Moore
SRMS elbow camera	M072-544504-009	5/23/08	5/23/08	From STS-124.	Randall Moore
SRMS wrist camera	M072-544504-010	6/02/08	5/23/08	From STS-124.	Randall Moore
Centerline Airlock Camera (stowed)	M072-660828-002, CCCD			On-dock, from STS-123.	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	7/07/08	7/07/08	Camera not available for 326. Two units in inventory, installed for STS-124/125	Randall Moore



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE		Presenter Kenneth Brown	
		Date March 5, 2008	Page 5

Hardware	Tech Order	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Righthand Umbilical Camera	M072-705001-028	7/28/08	6/19/08		Randall Moore
Digital Television (DTV)	M072-710570-007			Installed hardware.	Randall Moore
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001			Installed hardware.	Larry Schmidt
Portable Foot Restraint (PFR)	M072-661568-029	5/5/08	5/5/08		Sandy Peterson
Tools for Rendezvous and Docking (TRAD)	M072-730021-020			Installed hardware.	Larry Schmidt
Tool Stowage Assembly (TSA)	M072-660853-002 M072-660850-005	5/21/08	5/21/08		Sandy Peterson
Video Processing Unit (VPU)	M072-710338-006			Installed hardware.	Larry Schmidt
Winches	V070-650007-085			Installed hardware.	Sandy Peterson



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas

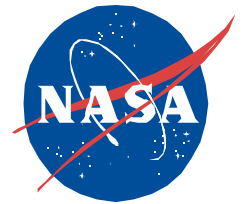


STS-126 LSFR FLIGHT CREW EQUIPMENT/GFE		Presenter Kenneth Brown
Date	March 5, 2008	Page 6

Hardware	Tech Order	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-013 S-BAND M072-744004-014 S-BAND M072-744004-012 S-BAND M072-744004-015 S-BAND M072-744004-017 S-BAND M072-744004-018 S-BAND M072-744004-016 S-BAND			Installed hardware.	Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 antenna			Installed hardware.	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-004 camera	6/2/08	6/2/08	OPF install.	Randall Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing	M072-756111-007	5/12/08	5/12/08	Upgraded firmware.	Gary Cox
Wing Leading Edge (WLE) Instrumentation - Right Wing	M072-756111-008	5/12/08	5/12/08	Upgraded firmware.	Gary Cox
OBSS Sensor package1	M072-710282-008	5/19/08	5/19/08	OPF install.	
SCU	M072-661606-012			Installed hardware.	Sandy Peterson
OBSS Sensor Package 2	M072-710282-006	5/19/08	5/19/08	OPF install.	Larry Schmidt
Airlock Adapter Plate	SJD32101440-302			Installed hardware.	Sandy Peterson



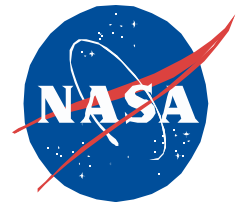
*Extravehicular
Activity
Office*



EVA Status

STS-126/ULF-2 Launch Site Flow Review

**XA/Maria Tullar
Johnson Space Center
March 6, 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 (launch)/003 (return)

- **Starboard LWTSA**
 - Starboard LWTSA Installation – Tech Order: M072-660850-006
 - Starboard TSA Tool Installation – Tech Order: M072-660852-019 (launch)/020 (return)

**STS-126/ULF2 – MPLM, LMC, PSSC
LAUNCH SITE FLOW REVIEW
(LSFR)**

PAYLOAD CARGO ENGINEERING STATUS

**Abbas Elsabagh
Cargo Mission Manager
281-212-6186
March 06, 2008**

STS-126 LSFR

ENGINEERING FLIGHT PRODUCT STATUS

<u>DRAWING NO</u>	<u>TITLE</u>	<u>REV</u>	<u>EO</u>	<u>RELEASED</u>
V072-200206	MECSLSI	A	A01	02-11-08
VA72-200206	CARGO ARRANGEMENT	NEW		11-15-07
VD72-200206	AVIONICS DIAGRAM	A	A01	02-11-08
VS72-200206	INTEGRATED SCHEMATIC	A	A01	02-11-08
VS70-540335	RETENTION SCHEMATIC	A	A01	02-12-08

ENGINEERING OPEN WORK

- DELTA FRED MECSLSI ECD: 03-20-08
- DELTA FRED PSSC T.O. ECD: 02-29-08
- DELTA FRED CARGO ARRANGEMENT DRAWING ECD: TBD

STANDARDIZATION

- MISSION CONFIGURATION DOES COMPLY WITH ORBITER/PAYLOAD INTEGRATION STANDARDIZATION DOCUMENT NSTS 60523

RESCUE FLIGHT STATUS

- STS-326 RECONFIGURATION ENGINEERING PRODUCTS WILL BE DEVELOPED BY THE ENGINEERING ORDER TO FOLLOW (EOTF) PROCESS

STS-126 LSFR

RESCUE FLIGHT STATUS CONTINUE:

- **FOR STS-400: OV-105 WILL BE CONFIGURED PER STS-400 REQUIREMENT PRIOR TO OPF ROLL-OUT. A CONFIGURATION WAIVER WILL BE SUBMITTED FOR PROGRAM APPROVAL AT dLSFR**

- **STS-400 PAYLOAD CARGO ENGINEERING IMPLEMENTATION:**
 - **THE PAYLOAD BAY CONFIGURATION DIFFERENCES BETWEEN STS-126 AND STS-400 WILL BE:**
 - **NO MPLM OR LMC INSTALLED**
 - **MPLM KEEL LATCH OPEN TO PREVENT SLIDING**
 - **ROEU IN UNMATED/STOWED CONFIGURATION**
 - **PAYLOAD MATE TECH ORDER (LMC TO LIP CABLE) NOT INSTALLED**
 - **LIP CONNECTOR CAPPED**
 - **SECONDARY PASSIVE LATCHES PINNED (LMC)**
 - **NO LATCH GUIDES ON MPLM LATCHES**

 - **SINGLE MECSLSI CONFIGURED TO STS-126 REQUIREMENTS**
 - **DELAY INSTALLATION OF PAYLOAD, PAYLOAD MATE, AND LATCH GUIDE TECH ORDERS UNTIL AFTER RELEASE FROM STS-400**
 - **USE CHIT TO AUTHORIZE TEMPORARY INSTALLATION OF FLIGHT PIN IN SECONDARY PASSIVE LATCHES**
ECD: 02/13/08 A
 - **CAP UNUSED CONNECTOR ON LIP FOR LMC POWER PER WIRING SPECIFICATION**

 - **PROGRAM CONFIGURATION WAIVER WILL BE SUBMITTED AT dLSFR SCHEDULED IN MARCH 2008 TO DOCUMENT THE DIFFERENCES BETWEEN STS-400 AND STS-126 AND TO ALLOW THE LAUNCH OF STS-400 WITHOUT MECSLSI UPDATE**

STS-400 CONFIGURATION WAIVER T.Os

- **MANIFEST ACTIVE LATCHES W/O EXTENDED GUIDES FOR STS-400 IN BAYS 8 AND 12:**
 - BAY 8 STBD: M072-544201-203
 - BAY 8 PORT: M072-544201-204
 - BAY 12 STBD: M072-544101-028
 - BAY 12 PORT: M072-544101-027
- **THE FOLLOWING T.Os WILL BE REMOVED FROM STS-126 MECSLSI IN SUPPORT OF STS-400 FLIGHT:**
 - M072-000423-001 (MV0072P)
 - M072-000442-004 (MV0072P)
 - M072-710801-001 (MV0712A)
- **CHANGES OF T.Os IN THE STS-126 MECSLSI TO SUPPORT STS-400 FLIGHT:**
 - FROM: M072-002212-045 (MV0073A); TO: M072-002112-043
 - FROM: M072-002212-046 (MV0073A); TO: M072-002112-044

STS-126 LSFR

OMRSD

- FII V2 (POST-MATE)

BASELINED FILES

- P350 MULTI-PURPOSE LOGISTICS MODULE (MPLM)
- P430 SL/ORB GENERIC I/F REQUIREMENTS (LMC)

RCNS

	<u>RELEASE</u>	<u>BASELINE</u>
• PP17554 P514 – ISS-ULF2 BASELINE	11/07/07A	02/06/08A
• TBD P430 – LMC UPDATE	03/28/08	04/29/08
• PP17578R1P1539 – SSPL/PSSC BASELINE	01/29/08A	02/19/08A
• TBD P350 – MPLM UPDATE	03/28/08	04/29/08

- FII V4 (PRE-MATE)

RCNS

	<u>RELEASE</u>	<u>BASELINE</u>
• DPS12547 MISSION-UNIQUE LIST	02/26/08	03/28/08
• DPS12548 FIII MUL	02/26/08	03/28/08
• DPS12595 ADJACENT PIN TEST	02/26/08	03/28/08

- FII V6 (SHUTTLE EXPERIMENTS) – NONE

- ISSUES / CONCERNS: NONE

STS-126 LSFR

ANNEX 1

ISS-ULF2 - NSTS 21514

- BASELINE
- FHRC & NTA MP Add
- INTERIM CR

CUSTOMER SUBMITTAL

10/18/07A
02/07/08A

CR RELEASE

10/18/07A
02/26/08A

ECD

11/27/07A
03/14/08

DATA REQUIRED – SAFETY-CRITICAL CIRCUIT DIAGRAM, FHRC & NTA CENTER OF GRAVITY FIGURES
(IF AVAILABLE)

- FINAL WEIGHT UPDATE (L-1 M)

05/26/08

06/02/08

06/16/08

09/02/08

09/09/08

09/16/08

ISSUES/CONCERNS

- None

STS-126 LSFR

ANNEX 1- CONT.

LMC - NSTS 21494

- **BASELINE**

DATA REQUIRED – OFFICIAL WEIGHT AND MASS PROPERTIES DATA, PAYLOAD AXIS SYSTEM FIGURE, STATIC LENGTH, AND MECHANICAL AND ELECTRICAL DRAWING

- **INTERIM CR**

DATA REQUIRED – SAFETY-CRITICAL CIRCUIT DIAGRAM, MECHANICAL AND ELECTRICAL DRAWING UPDATES, AND CENTER OF GRAVITY FIGURES

- **FINAL WEIGHT UPDATE (L-1 M)**

CUSTOMER

SUBMITTAL

CR RELEASE

ECD

01/15/08A

01/15/08A

02/19/08A

05/26/08

06/02/08

06/16/08

09/02/08

09/09/08

09/16/08

ISSUES/CONCERNS

- None

STS-126 LSFR

ANNEX 1- CONT.

<u>SSPL/PSSC - NSTS 21539</u>	<u>CUSTOMER SUBMITTAL</u>	<u>CR RELEASE</u>	<u>ECD</u>
• BASELINE	10/19/07A	10/29/07A	11/12/07A
• POST-CIR UPDATE	02/29/08	02/29/08	03/17/08
<u>DATA REQUIRED</u> – PAYLOAD CONFIGURATION NUMBER, ELECTRICAL/AVIONICS CABLE DATA, FUNCTIONAL FLOW DIAGRAM, Payload Location			
• INTERIM CR	05/26/08	06/02/08	06/16/08
<u>DATA REQUIRED</u> – SAFETY CRITICAL CIRCUIT DIAGRAM, MECHANICAL DRAWINGS, SPUN-UP PAYLOAD DATA			
• FINAL WEIGHT UPDATE (L-1 M)	09/02/08	09/09/08	09/16/08

ISSUES/CONCERNS

- NONE

STS-126 LSFR

TGHR STATUS

CUSTOMER SUBMITTAL	6-16-08
RELEASE FOR REVIEW	7-16-08
BASELINE	8-15-08

ISSUES/CONCERNS

- None

STS-126 LSFR

ICD Status (* = Impact Flight Products)

<u>Document</u>	<u>Title</u>	<u>ECD</u>	<u>Status</u>
ICD-A-21494	LMC	12/18/00	Baselined
TBD*	As Flown Configuration Update	TBD	Pending Figures
TBD*	Update Power and pin tables Pending Model and MIP update	10-24-08	Hold
TBD	Incorporate ISS IDD IRNs (Approx L-5 mo)		
ICD-A-21350	MPLM	02/12/96	Baselined
A05277*	Remove "Active" MPLM Dataset	03-10-08	In Review
Future Work:	Incorporate ISS IDD IRNs (Approx L-5 mo) Document Trunnion Scratch		

STS-126 LSFR

ICD Status (* = Impact Flight Products)

<u>Document</u>	<u>Title</u>	<u>ECD</u>	<u>Status</u>
ICD-A-21514-OOR	ISS-ULF2	12-04-07	Baselined
Future Work:			
Add Hazard Report Number			
Add Loads/Robotics data (Approx L-1 month)			
On-Orbit Translation Clearance Violations (Approx L-3 month)			
Update Thermal Data (L-5 months)			

STS-126 LSFR

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
ICD-A-21539	SSPL/PSSC	02-15-08	Baselined

STS-126 LSFR

CARGO CLOSE CLEARANCE PROCESS

- THE FOLLOWING CLOSE CLEARANCE AREAS HAVE BEEN IDENTIFIED AND WILL REQUIRE AS INSTALLED MEASUREMENTS:
 - MPLM SCUFF PLATE TO MPM ECD: 07/01/08

STS-126 LSFR

CARGO INTEGRATION HARDWARE STATUS

DELIVERY STATUS

- ALL REQUIRED CIH HAS BEEN DELIVERED

ISSUES/CONCERNS

- NONE

STS-126 Launch Site Flow Review

ULF-2
STS-126
MPLM/LMC

KSC ISS & Spacecraft Processing
Joseph T. Delai, NASA, KSC Mission Manager
Mike Kinslow, Boeing, KSC Flow Manager
Mar 06, 2008



Planned Processing Milestones

PRE-SHUTTLE INTEGRATION ACTIVITIES

Space Station Processing Facility

- ULF-2
 - LMC/ORU Processing 02-14-08 to 09-12-08
 - MPLM Rack Integration 06-09-08 to 09-08-08
 - MPLM Internal/External Closeouts 08-07-08 to 08-21-08
 - MPLM/LMC ICD Walk down 08-07-08 to 08-20-08
 - Internal CEIT 08-14-08
 - Hatch Closure 08-22-08
 - External CEIT 09-09-08
 - Payload to Pad 09-18-08 U/R



Planned Processing Milestones

SHUTTLE INTEGRATION ACTIVITIES

Orbiter Processing Facility

- PICOSAT Integration 05-30-08

PAD

- Payload to Pad 09-18-08 U/R
- Payload installed into Orbiter 09-24-08 U/R
- Payload IVT 09-25-08 U/R
- Payload Closeouts 10-03-08 U/R
- LAUNCH 10-16-08



KSC/ISS Processing Summary

Watch Items:

- Change Request 10534 = Accelerate the delivery dates for 6-person crew habitability hardware
- PRAB Risk 5108 = Technical challenges in the development of the 6-person crew habitation hardware

The KSC STS-126/ULF2 - ISS Mission Processing Team is ready to proceed with processing the STS-126 Mission payload complement.





STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

Backup Material

- **SSP Systems Drawings** **Attachment 1**
- **SSP Authorized Modifications/Non-Standard Work** **Attachment 2**
- **SSP OMRS Waivers and Exceptions** **Attachment 3**
- **Launch Window** **Attachment 4**
- **Open Configuration Waivers** **Attachment 5**



STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115126 on 12-05-07

- V072-000001-276 (Rev. VF01) Space Shuttle System (Rel. 12-13-07)
 - V072-200206-001 (Rev. A01) Mission Equipment Cargo Support (Rel. 02-11-08)
 - SGD32104492-501* (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - 502 Descent
 - V070-000001-005 Orbiter General Assembly
 - V070-41010-018 SSME Installation
 - 10100-0061-172 Integrated SRB General Assembly (BI-136)
 - 80901000000-529 External Tank Assembly (ET-129)
- STS-126 CIR + 70 days Mission Configuration Product Plan (MCPD) was published on 02-11-08 and will be republished at ORR -14 days on TBD.
- *STS-400 CCD for LON mission for STS-125. Upon Stand down of STS-400, STS-126 CCD is SGD32104449-501 (Rev. NC) released 01-07-08.



STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

SSP System Drawings – (Continued)

Ferry Configuration

- V072-000001-277 (Rev. VF) Space Shuttle System Drawing (Rel. 12-13-07)
- V072-200206-002 (Rev. A01) Mission Equipment Cargo Support (Rel. 02-11-08)
- SGD32104492-001 (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
- V072-300055-014 (Rev. BM01) Ferry Flight Configuration (Rel. 07-24-07)

SCA 905

LW MAR
SJD32108929-TBD

MODULAR LOCKER LAYOUT ASCENT

LEADER: KEITH CAMPBELL
DATE: 12-13-07
LAUNCH: 09-18-08
FLIGHT: STS-126/ULF2 MPLM
VEHICLE: OV-105
CREW: 7 MAN 15 + 1 + 2 DAYS
RQMTS: SRMS, ERGOMETER,
SORG, NO RCRS,
SLEEPING BAGS

MD CEIL (PORT 1)	0275 -TBD
RCC REPAIR HDWR TILE REPAIR HDWR	
MD CEIL (PORT 2)	9895 -TBD
RSK/ACES	

CDR CHRIS FERGUSON
PLT ERIC BOE
M/S #1 DON PETTIT
M/S #2 STEVE BOWEN
M/S #3 HEIDE STEFANYSHYN-PIPER
M/S #4 SHANE KIMBROUGH
M/S #5 (UP) SANDY MAGNUS
M/S #5 (DN) GREG CHAMITOFF

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

MF43C 1900 -308 CDR CLOTHING	MF57C SAL KIT(2) BLOOD KIT(2) ACTWATCH(5) LOGBOOK(4) KUBIK/ PADIAC/ ROADL CLOTHING	MF71C 1901 -305 PLT CLOTHING
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MIDDECK FORWARD

MF14E 2760 -306 FRESH FOOD FRESH FOOD	MF28E/G TBD -301 GLACIER	MF43E 5473 -305 ORBITER FDF	MF57E 6240 -311 ORBITER FDF SODF (ZIPLOCK)	MF71E 8965 -TBD CONDENSATE COLL SUPA INGRESS HDWR O-RINGS STS CSA-CP
MF14G 2761 -308 FRESH FOOD MENU FOOD		MF43G 1902 -308 M/S #1 CLOTHING	MF57G ENOSE/ICE-CELL BLOOD COLL KIT SALIVA COLL KIT ALENDRONATE KIT (CTB)	MF71G 1903 -305 M/S #2 CLOTHING
MF14H 2763 -304 MENU FOOD MENU FOOD	MF28H 6684 -330 MED KITS ALTIMETER	MF43H SOMS RESCUS/ CDM G-SUIT(4) 8739-TBD	MF57H 8969 -TBD POST INSERTION #1	MF71H 8969 -TBD POST INSERTION #2 G-SUIT(2) (CTB)
MF14K 2764 -306 MENU FOOD MENU FOOD	MF28K TBD -TBD MENU FOOD	MF43K 1904 -307 M/S #3 CLOTHING	MF57K 6291 -310 SODF (CTB)	MF71K TBD -TBD CHECS (CTB)
MF14M 2765 -304 MENU FOOD MENU FOOD	MF28M MENU FOOD	MF43M ENTRY GARMENTS	MF57M 6015 -326 DC VAC (CTB)	MF71M 3005 -304 M/S #4 CLOTHING
MF14O 2766 -305 MENU FOOD MENU FOOD	MF28O 2767 -304 MENU FOOD			MF71O 1908 -309 CREW SUPPORT

MIDDECK AFT

MA16D 8737 -306 RCC COLD BAG ASSY	MA16D 5452 -324 IFM BREAKOUT BOX TURNBUCKLES AIR BOTTLES WWD FLT/RMS KIT FOAM APPL ASSY(2)
MA16F 8723 -302 PHOTO/TV STOW&GO (CTB)	6300 -345 MA16F 6250 -345 IFM TOOLS 2163-302 2161-305 2162-306 MULTIMETER
MA9D TBD -TBD PGSC	MA16G 6299 -318 COAS/FLUOR LT SHIELDS/DCS 760 AUDIO DOSIMETER BTA
MA9F 6066 -326 COLOR PRINTER & PAPER (CTB)	MA16J 6687 -325 HH LIDAR W/NIGHTSCOPE 2ND HHL (TRAD)/SSV/BPSMU
5962 -303 MA9G 6269 -307 PRINTER TRAYS IODINE REMOVAL 6256-303	MA16L PCS LAPTOP PCS ACCESSORIES PGSC ACCESSORIES CD STORAGE CASE ACCESS POINT
4575 -314 MA9N 7432-317 SOFT STWG BAGS PHKS (6) 4980-309 CCK/LIGHT STICKS/COMM PHK 8071-312 RESTRAINTS/RE-ENT FIBERSCOPE 8070-302	MA16N 3006 -304 M/S #5 CLOTH (UP) M/S #5 CLOTH (DN)

MD CEIL (STBD 1)	TBD
CLOTHING-6 HCTB HYGIENE	
MD CEIL (STBD 2)	6665 -TBD
IELK RUNNING SHOES	

MD FLOOR (PORT 2)	TBD -301
CREW CARE PKG AMIA IODINE CWC(10) CSA-CP RESUPPLY(2) HCTB-G5C(9)	
MD FLOOR (PORT 1)	0297 -TBD
LTA/LOWER ARM(2) ECOK/COM CAP(2) LEG ASSY/BOOT ARM SIZE RING 0.5"(2) THIGH SIZE RING(PR) 0.5" LEG SIZE RING(PR) 1.0" LEG SIZE RING(PR) DIDB(6)	

MD FLOOR (STBD 2)	TBD -301
ISS RESERVE	
MD FLOOR (STBD 1)	TBD -301
HYGIENE IPT RESERVE	

A16 8706 -310 PGSC DESK/ CAM BAG PILOT LEG BAR ASSY BOGAN ARMS

A17 7424 -304 CORE CC SYS BAG DTV CAMERA BAG QUICK DON MASK(4) HATCH TOOL

VOLUME D (MD52C) -TBD 85' SAFETY TETH(2) B/U DTV HDWR NH3 DETEC KIT B/U OCA CBL/BRT EMU BATTERY RCC REPAIR PALETT(2)

VOLUME F (MD76M) 1403 -306 WET TRASH

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

VOLUME H (MD23R) 8068 -TBD EVA ACCESS (INBD) EVA ACCESS (OBD) 8065 -TBD

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

EXT AIRLOCK TBD 2-EMUs EXT A/L FLOOR CCC(2) LCVG(5)/GLOVES(4PR) LCVG(2) MINIWORKSTATION RETS

31 LIOH: 29 + 1 ATCO IN LIOH BOX, 2 INSTLD (7435-TBD)

WINDOW SHADE BAG - WINDOW SHADES (5548-345) IFM CABLES & HOSES (4259-343) MONITOR SHIELDS

L10A1: AVIU (6686-324) L10A2: DTV MUX L10A3: DTV VTR/VIP L1: PDIP 2 OIU 1/2 L12A1: SSP 1 L12A2: SSP 2 L12A3: PDIP 1 R12A1: VPU L12A2: OBSS/OPP

* NOT APPROVED LATE LOAD SWAP TRANSFER TO ISS CTB-CARGO TRANSFER BAG HCTB-HALF CARGO TRANSFER BAG

C/D JSC TBD P/D JSC TBD C/D KSC TBD P/D KSC TBD CEIT KIT TBD MDK LBL TBD DWG NO. SGD32104449 /USR/DWGS/LOCKER/STS126 CCMM: M. MCDONALD 483-1384



STS-126 Launch Site Flow Review

Presenter **Ken Nowak**

Date **03-06-08**

Modification Impact Report

- **MMission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A A total of 2 MCRs have been approved and/or pending mods**
- **CCurrent MCR impact status:**
- **NTwo impacts for all six disciplines 2**
- **One or more disciplines with impacts, documentation approved and/or pending approval 0**
- **Possible impacts still under review 0**

MCR/ECP	STAT	ITEM/KIT NUMBER	SEQ	DESCRIPTION / GENERAL REMARKS	PRCB	PRIOR
-----	SITE	TCTI NUMBER	EISN NO.	-----	AUTHDATE	FLT
030091	AUTH KSC	K439-774105-001	0001 000	PROVISIONS FOR BOUNDARY LAYER TRANSITION (BLT) ASSESSMENT ADDED PER V439-774001 A11, TO BE DEBASELINED AT DL SFR?	S115126A 2007-12-20	MAND 022
	AUTH KSC	TCTIM1930091REF	0002 000	BOUNDARY LAYER TRANSITION, TILE ADDED PER V880-191011 NEW	S115126A 2007-12-20	MAND 022

TOTAL MODS = 2

MCR/ECP	STAT SITE	ITEM/KIT NUMBER TCTI NUMBER	SEQ EISN NO.	DESCRIPTION / GENERAL REMARKS	PRCB AUTHDATE	PRIO FLT
	AUTH KSC	J5765	0105 001	WSB POST FLIGHT TANK OFFLOAD QUANTITY	ORB-0077 B 2005-03-09	MAND 022
	AUTH KSC	J6295	0105 001	OV-105 IR THERMOGRAPHY REQUEST	S-J6295 2007-11-07	MAND 022
	AUTH KSC	J6306	0105 001	OV-105 MID FUSELAGE LOCK BOLT INSPECTION	S-J6306 2007-11-27	MAND 022
	AUTH KSC	J6313	0105 000	STS-124 OV-103, STS-125 OV-104, STS-126 OV-105 AMEC POWER OFF SPURIOUS OUTPUT TEST	S-J6313 2008-01-09	MAND 022
	AUTH KSC	J6327	0105 000	WLE RCC JOGGLE INSPECTION	S-J6327 2008-02-14	MAND 022
	AUTH KSC	J6328	0105 000	WING LEADING EDGE STRUCTURAL NOISE MEASUREMENTS DURING OFF OR MDD VEHICLE TRANSFERS	S-J6328 2008-02-12	MAND 022
030010	AUTH KSC	030010	0105 000	INSTL OF BOGEN BRACKET BASE PLATES IN ORB AFT MIDDECK AREA ADDED PER A. LOZANO REQUEST FOR 1/29/08 DAILY	S115126B 2008-02-01	022
030091	AUTH KSC	VK70-100055-001 NOT REQUIRED	0105 000	BRACKET - TRJ (BLT), WING KIT ADDED BY EDS I/F & VR70-100168 NEW	S115126A 2007-12-20	MAND 022
	AUTH KSC	VK70-776005-001 NOT REQUIRED	0105 000	MOD KIT - BOUNDARY LAYER TRANSITION ASSESSMENT ADDED BY EDS I/F & V070-776551 A04 & -776553 A04	S115126A 2007-12-20	MAND 022

TOTAL MODS =

9

Approved STS-126 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
+	E ORB	S053296PJ EK10261 (A)	OMRSD EXCEPTION REQUEST - WING LEADING EDGE RCC PANEL REFURBISHME NT(EK10261)	105	019 023
	W ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET	099 999
	OMS	S053294ZV WK10093 (A)	OMRSD WAIVER REQUEST - OMS HEATER RESISTANCE (WK10093)	0024	024 031
		S053296UN WK10301R1 (A)	OMRSD WAIVER REQUEST - LOMS HELIUM ISOLATION VALVE LEAKAGE (WK103 01R1)	0013	031 034
	ORB	S053296LJ WK10240 (A)	OMRSD WAIVER REQUEST - WSB 2 GN2 REG PRESS BELOW OMRSD (WK10240)	105	018 026
		S053298TA WK10538 (A)	OMRSD WAIVER REQUEST - MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER 1 FREQUENCY CALIBRATIONOV- 105 (WK10538)	105	020 026
		S053298TB WK10540 (A)	OMRSD WAIVER REQUEST - MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER 2 MUX CH. 1 DATA SHIFT OV-105 (WK10540)	105	020 026

	S053299DQ WK10614 (A)	OMRSD WAIVER REQUEST - MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER-M1A, NOISE RATIO/NOISE LEVEL (WK10614)	105	021 026
RCS	S053296DC WK10138 (A)	OMRSD WAIVER REQUEST - RRCS FUEL HELIUM REGULATOR LEAKAGE (WK1013 8)	0024	025 030
	S053296PV WK10275 (A)	OMRSD WAIVER REQUEST - RRCS FUEL A& B LEG REG LOCKUP PRESSURE(WK 10275)	0024	026 034

-
1

Date: 02/27/08 05:25

PCASS

Page: 2

FLIGHT-SPECIFIC

Approved STS-126 OMRs Waivers and Exceptions

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

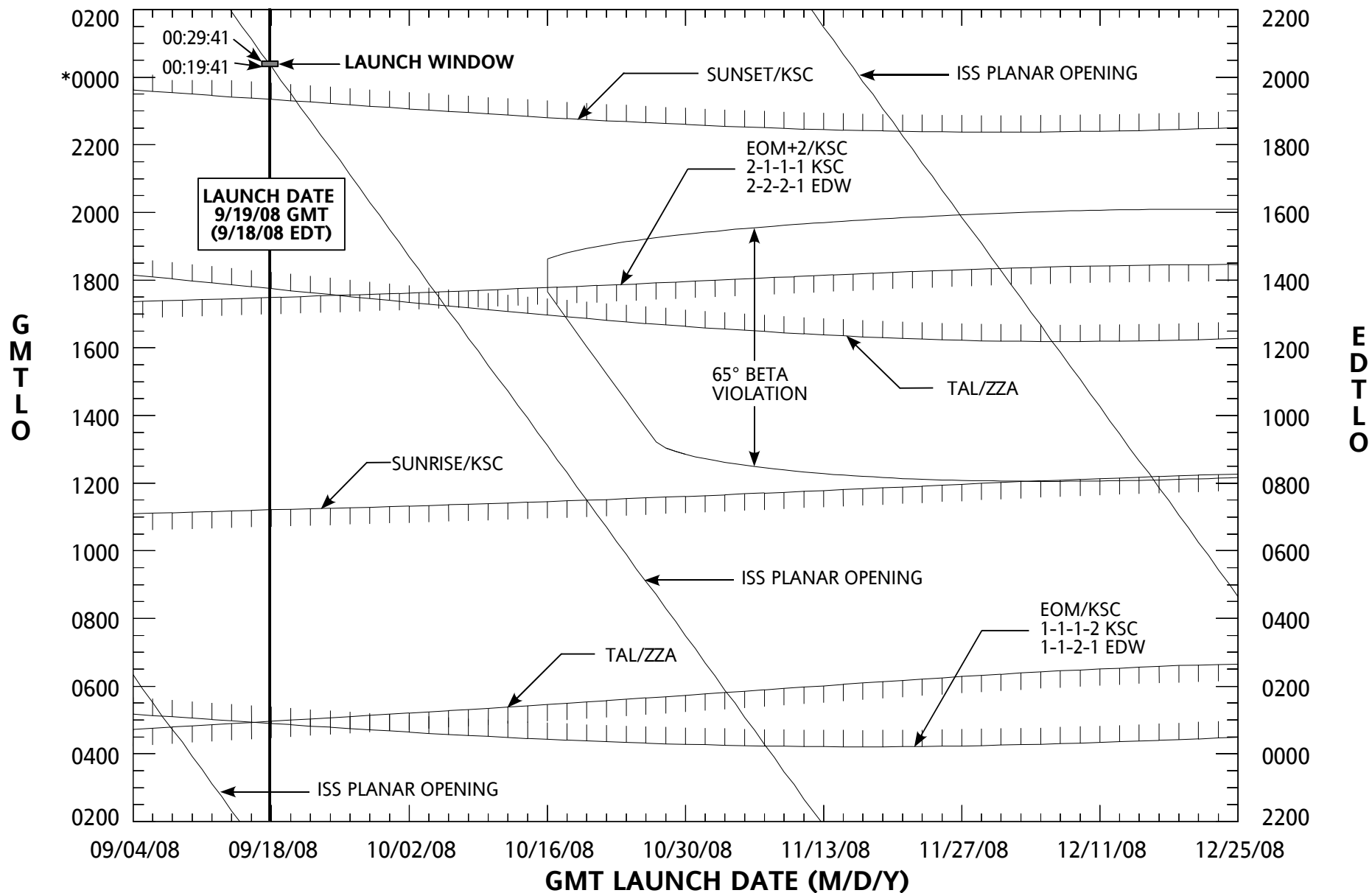
+	-----+											
o		o	Waivers	o	Except	o	Deviat	o	Cannib	o	Total	o
o	-----+											
o	Total Extracted	o	10	o	1	o	0	o	0	o	11	o
+	-----+											

-
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Mission Duration = 15+1+2
 Inclination = 51.6°
 OMS2 ha/hp = 124 x 85 nmi.
 Target ha/hp = 195 x 184 nmi.

STS-126 OCF LAUNCH WINDOW

C. Osgood/USH-483L
 M. Jamroz/USH-483L
 October 9, 2007



Note: EOM lighting lines, based on an OMS2 phase angle of 278 deg, are representative only.
 The ISS beta angle ($|\beta| < 65^\circ$) for mated operation is beginning 09/18/08 (FD3 Rendezvous) and ending ~ 13/15:19:00 MET
 * Indicates the dateline. Launch times above this point are on subsequent days from the date indicated on the corresponding date axis.

ACTIVE WAIVERS FOR
OV-105

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
341	S063701	08/07/07	<p>The following requirement is waived to allow OV-105 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 bolt (NAS1003-8A) and 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 controlled) was noted missing from behind the starboard closeout panel. Without the nut plate, the bolt and washer cannot be installed. The area cannot be currently accessed to re-install the missing hardware. (NOTE: MRB in work on PR FCS-5-20-0476 to approve use of tape on the open hole. Lost and found PR LAF-5-20-0440 written to document lost nut plate.</p>	OV-105, Flight 20	

ACTIVE WAIVERS FOR
OV-105

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>	OV-103, Flight 35 OV-104, Flight 30 OV-105, Flight 21	