



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



STS-129 Launch Site Flow Review

Presenter Kenneth Nowak

Date 04-16-09

Program Freeze Point

PRCB Presentation

S115129B



STS-129 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-16-09**

Baseline the STS-129 Mission Specific Requirements and Flow Plans.

The STS-129 Integrated Launch Site Requirements were established by PRCBD S115129A dated 03-19-09. This CR and the Associated Data Package were reviewed at the 04-13-09 FRWG.

Flight Management*

Orbiter Engineering*

Payload/Cargo Engineering*

Shuttle Processing*

Requesting Approval

MO3/USA-PI

USA-OE

USA-PI

PH-B2

Status in BackUp

KSC Integration

Flight Software

Orbiter GFE

EVA

MK-SIO

USA-FSW

MV5

XA

Status/Baseline at DLSFR

SSME

KSC ISS and Payload Processing

MP21

UB-R3



STS-129 LSFR

Flight Requirements Status

April 16, 2009

Michael Darnell, Lead MIM



STS-129 LAUNCH SITE FLOW REVIEW

Presenter	Michael Darnell
Date	APRIL 16, 2009

LAUNCH

11/12/09
 39A/ MLP 3
 CREW SIZE: 6UP/7DN

ORBIT

51.6 DEG
 122 NM
 DIRECT INSERTION
 DURATION: 11 + 1 + 2 DAYS

CONFIGURATION

OV-104(31)
 LP04;RP01
 ET-133
 BI-140
 RSRM-108
 (1) TBD (2) TBD (3) TBD
 OI-34
 SRMS,ODS,OBSS

CONSUMABLES

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

PAYLOAD

ISS-ULF3
 (ELC1, ELC2,
 SASA, MISSE 7A,
 MISSE 7B)

MIDDECK P/Ls

ISS-ULF3
 MAUI
 SEITE
 SIMPLEX
 RAMBO-2

LANDING

SITE
 TAL
 ALT. TAL
 SCA

KSC

ZARAGOZA
 MORON & ISTRES
 911



STS-129 LAUNCH SITE FLOW REVIEW

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PERFORMANCE MARGIN

• SIMULATION MARGIN (CIRAF129)		+1977
• WEIGHT CHANGES SINCE SIMULATION		
• PAYLOAD	- 238	
• OPERATOR	+347	
• ORBITER	- 537	
• NPC	- 66	
TOTAL WEIGHT CHANGES	- 494	+494
• OTHER PERFORMANCE PROJECTIONS		
• PROTECTION FOR DOL DISPERSIONS		- 700
• 11/12/09 LAUNCH DATE (PMBT&ATMOS)		- 230
• SRB – M.P. UPDATES		- 191
• SRB – BR / 2.80 MIL HIGHER THAN 0.3705 AVG		+560
• PROJ TO 5 MIN WINDOW FROM INPLANE		- 600
• PERFORMANCE CHANGES ADJUSTMENT		- 34
• CURRENT BASELINED APM (04/14/09)		+ 1276
• MPS INVENTORY & FLIGHT DERIVED DISPERSION UPDATE (GEN 0901S)		- 175
• PROJECTED APM		+ 1101



STS-129 LAUNCH SITE FLOW REVIEW

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FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	205772 (233000)	1081.8 (1075.7)
RTLS	240821 (245000)	1080.8 (1077.2)
TAL	238645 (244000)	1080.6 (1077.2)
AOA	233464 (242000)	1076.4 (1075.7)
CONT RTRN*	235084 (233000)	1078.7 (1075.7)

***CONT RTRN EXCEEDS 233K NEOM LIMIT (See Vol. X Bk. 1 Sec. 3.3.1.1.9)
 PROTECTING FOR NO DOCKED PLS BALLAST CASE, ASSUMES FWD CARGO ELEMENT DEPLOYED FIRST**

**NOTE: RTLS INCLUDES 25 SEC FRCS DUMP
 TAL INCLUDES 65 SEC FRCS DUMP
 1302 LBS AFT BALLAST**

ESTIMATES BASED ON CIRAF129 AND MODIFIED FOR WEIGHT CHANGES THRU 04/14/09.



Flight Requirements Status

Presenter **Michael Darnell**

Date **4/16/09**

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PRCB CR's

- Addition of RAMBO-2 (DoD Payload of Opportunity)
- Scheduled for 4/27/09 FOICB (Recommending OSB/PRCB)

ULF3 MIP (NSTS 21545):

- Current version available on PILS: Basic PCN- 4, 3/12/09
- Pending CRs:
 - NSTS 21545 MIP CR#0010 – Generic ULF3 MIP Update/Post FPSR

Issues/Concerns:

- None Identified

STS-129 LSFR OV-104 FLIGHT 31 CONFIGURATION UPDATES

**Alvin Jenkins
USA / OE**

**Elena Seastrom
Boeing / VPE**

April 16, 2009



4-16-09

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STS-129 OV-104 Flight 31 – LSFR Updates

Program Authorization Is Requested For The Following:

- MECSLSI Updates

Information Only:

- Potential Modification
- Potential Partial Modification Deferral
- Summary of Previously Baselined Modifications
- Wing Leading Edge (WLE) Spar Inspection Status
- Chits

Back-up:

- Modification Records and MECSLSI Updates Summary
- Engineering, Hardware and Certification Status
- Description of Previously Baselined Modifications

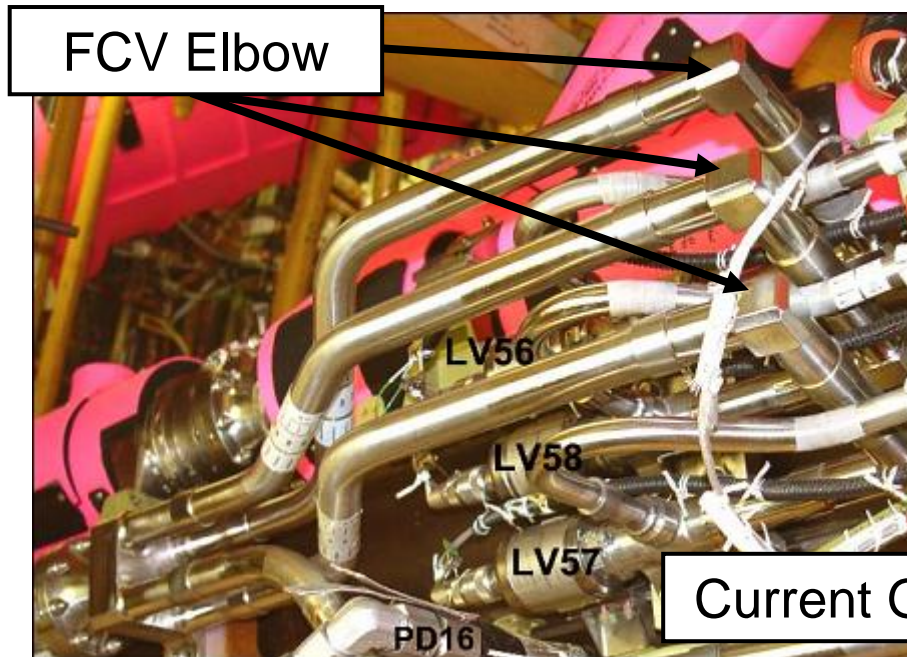
STS-129 OV-104 Flight 31 – MECSLSI Updates

- Update the V072-200209 MECSLSI with the following tech order change:
 - Aft Fuselage Ballast Installation (Ref. FRD 17462-129 Rev. 5)
 - Add M072-851701-072 (1302 lbs)
 - Remove M072-851701-059

STS-129 OV-104 Flight 31 – Potential Modification

TAD 30259 – GH2 Flow Control Valve (FCV) Elbow Redesign

- Modifies the FCV elbow design to provide protection against particle impact resulting in GH2 leakage
 - Proposed redesign of the FCV elbows involves increased wall thickness, a change in material from CRES 304L to 21-6-9 steel, and a longer elbow arm eliminating a tube section and braze joint downstream of each elbow



- Redesigned elbows would be installed in all six downstream locations
- Marginal weight increase would not require vibration testing - certification will be by analysis

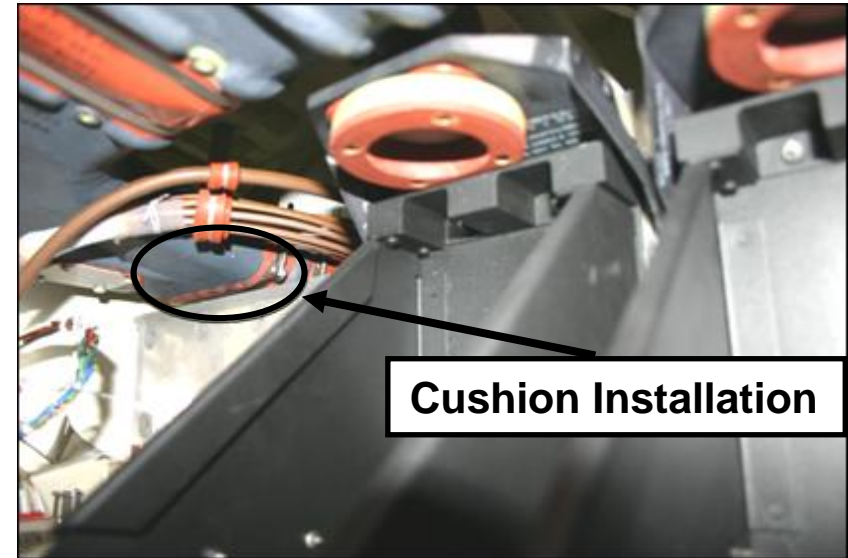
STS-129 OV-104 Flight 31 – Potential Modification Deferral

MCR 19393 – Clamp and Cushion Modification

- ECL duct clamp and cushion installation discrepancies were noted in avionics bays 1 and 2 during flight 27 flow routine inspection
 - Due to limited access to the area – TACAN and MSBLS decoder removal would be required – engineering evaluation determined that the cooling system will continue to perform properly in this configuration, and the missing loop clamp and cushion installation were accepted and deferred to next OMDP on PR ECL-4-A0093
- This engineering is included in the avionics bay 3A duct orifice modification baselined at the LSRR
 - Access to the bay 1 and 2 area is not planned, and it is likely that Program approval will be requested at the Delta LSFR to partially defer mod record VK70-613604-001,0104,0, with implementation planned for the next time access is obtained



Avionics Bay 1 Ducting



Avionics Bay 2 Ducting

STS-129 OV-104 Flight 31 – Previously Approved Modification

The following modifications have been previously baselined

- **TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements**
 - Installs resized orifice in the ducting to middeck avionics bay 3A to provide sufficient airflow to cool the ISS payload
- **TAD 30231 – Rudder Speed Brake Inconel Thermal Barrier Redesign**
 - Installs redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment
- **TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification**
 - Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication
- **TAD 30099 – Relocation of D-Hatch Actuator Handle Position Decal**
 - Relocates actuator handle position decal on the external airlock upper hatch to the correct location
- **TAD 30099 – External Airlock Ducting Configuration Change**
 - Connects the Orbiter Docking System booster fan outlet duct prior to launch to have the airlock fan active from post-insertion through de-orbit preparation

STS-129 OV-104 Flight 31 – Previously Approved Modification

The following modifications have been previously baselined (Cont.)

- **TAD 30186 - OMS Pod Micro-WIS Strain Recorder Removal**
 - Removes the recorder box from the left OMS Pod and stows the wires
- **TAD 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

STS-129 OV-104 Flight 31 – Information

Wing Leading Edge (WLE) Spar Inspection

- Structural inspections of the Wing Leading Edge spars are due prior to the last manifested flight of OV-104 (due date January 22, 2010)
 - Performance of these inspections is intrusive and classified as a significant flow impact
 - Last WLE spar full inspection on OV-104 was performed in July 2003; Prior OMDP inspections were performed in December 1997
 - Coating system refurbishment and re-performance of structural inspections was to be accomplished at the next OV-104 OMDP which was to occur prior to flight 29
- Inspection plan alternatives: Extend interval beyond planned retirement, Incremental performance with full compliance, Incremental performance with partial compliance, Full performance when due, and Sampling based validation
- PRT / OPO recommend performing WLE spar inspection of 8 panels per wing (9-16 LH and RH) during STS-129 flow (alternative #2)
 - PRT can not provide rationale to support non-performance of the inspections
 - Exception and Program accepted risk would be required if inspections are not performed
- DPRCB discussion scheduled for 4/24/09

Chits

CHIT	TITLE
J6116	AMES GAP FILLER REMOVAL AND REPLACEMENT
J6327	WLE RCC JOGGLE INSPECTION
J6378	OV-104 BODY FLAP (BF) POWER DRIVE UNIT (PDU) GEARBOX FLUID LEVEL INSPECTION
J6380	EVA PDU TOOL INTERFACE VERIFICATION
J6389	CLOSE CLEARANCE MEASUREMENTS OF ORBITER HARDWARE FOR STS-125 (post flight)
J6399	0-GAUGE PROTECTION FOR OV-103 FLIGHT 32-35 AND OV-104 FLIGHT 27-35
J6402	MICRO INSPECTIONS OF CAPTIVE GAP FILLERS
J6407	CLOSE CLEARANCE MEASUREMENTS OF SRMS MPM AND OBSS
J6410A	AFT STUB CRACKED TILE INSPECTION
J6447	STS-126 POST FLIGHT INSPECTION AND CONTAMINATION SAMPLING OF LASER CAMERA SYSTEM AND ORBITER LOCATIONS
J6466	OMS POD PILLOW GAP FILLER INSTALLATIONS
J6481	MIDDECK PAYLOAD COOLING TEST FOR OV-104
J6497	OV-104 PUTTY REPAIR RCC AND WINDOW DTA

STS-129
ISS-ULF3 ELC 1, ELC2, MISSE 7A & 7B, SASA
Launch Site Flow Review

Payload Cargo Engineering Status

Yvette Carmona

281-212-6492

04/16/09

STS-129 LSFR

Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Rev</u>	<u>EO</u>	<u>Released</u>
V072-200209	MECSLSI	Basic	-	01/15/09A
VA72-200209	Cargo Arrangement	Basic	-	01/15/09A
VD72-200209	Avionics Diagram	Basic	-	01/19/09A
VS72-200209	Integrated Schematic	Basic	-	01/19/09A
VS70-540403	Retention Schematic	A	A01	01/16/09A

Engineering Open Work

- FRED
- M072-710729 - Payload Bay Wiring Tech Order
- Assessment of ELC power-safety inhibits for contingency EVA ops reviewed by Joint Safety Panels
 - Agreed that no Payload Power Switching Units (PPSUs) for 2nd safety inhibit required
 - FOICB to review issue
 - PPSU additions would impact multiple engineering products, ICDs and OMRS, plus drive late hardware builds: 1 New Cable , 2 Cable Re-makes, 2 PPSU Adapter Plates
- Middeck Avionics Bay Flow Test Chit for OV-104
- ELC MGSE Design Incorporation (CDR May 2009)

ECD

04/24/09

04/29/09

Standardization

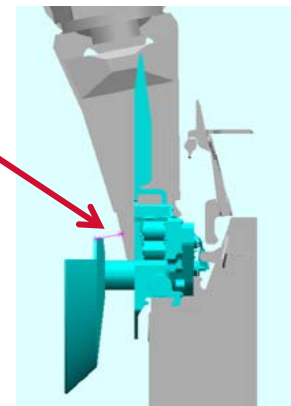
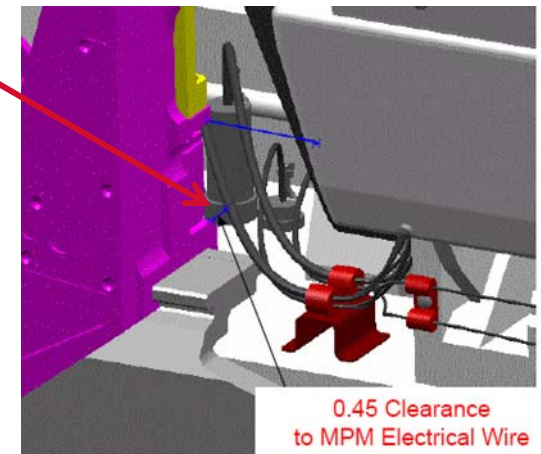
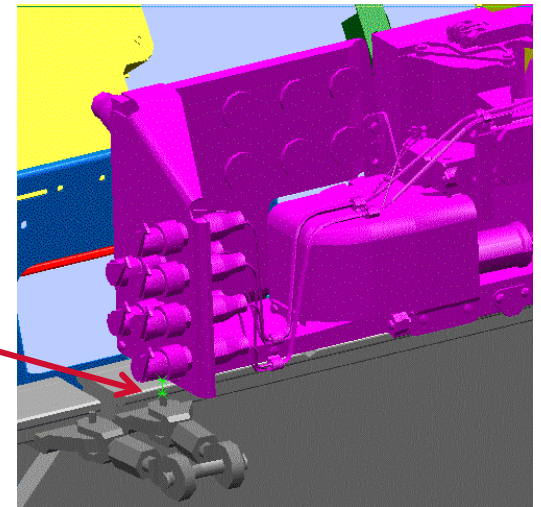
- Mission Configuration does comply with Orbiter/Payload Integration Standardization Document NSTS 60523
 - Deviation from standardization to be requested if FSW updates needed for PPSU monitoring

STS-129 LSFR

Cargo Close-Clearance Process

The following Close-Clearance areas have been identified:

- Starboard ROEU-to-stabilizer link bolt
 - 0.45” static, 0.26” dynamic
 - As-installed OPF measurements required
 - Chit to be approved by May 2009
 - Draft chit in work
- Latch at X_o 892 and MPM wiring (port and starboard)
 - 0.45” static (approx) when latch travels full aft
 - Measurement not required
 - Re-dress of MPM cabling may be required if potential for contact
- Potential: MPM and scuff plate at X_o 1242
 - Less than 3” static, but currently >1” dynamic
 - As installed measurement only required if VLA shows less than 1” dynamic (ECD: 07/16/09)



KSC Launch and Landing Project

STS-129

Launch Site Flow Review

April 16, 2009





Multi Flow

A. Brewer

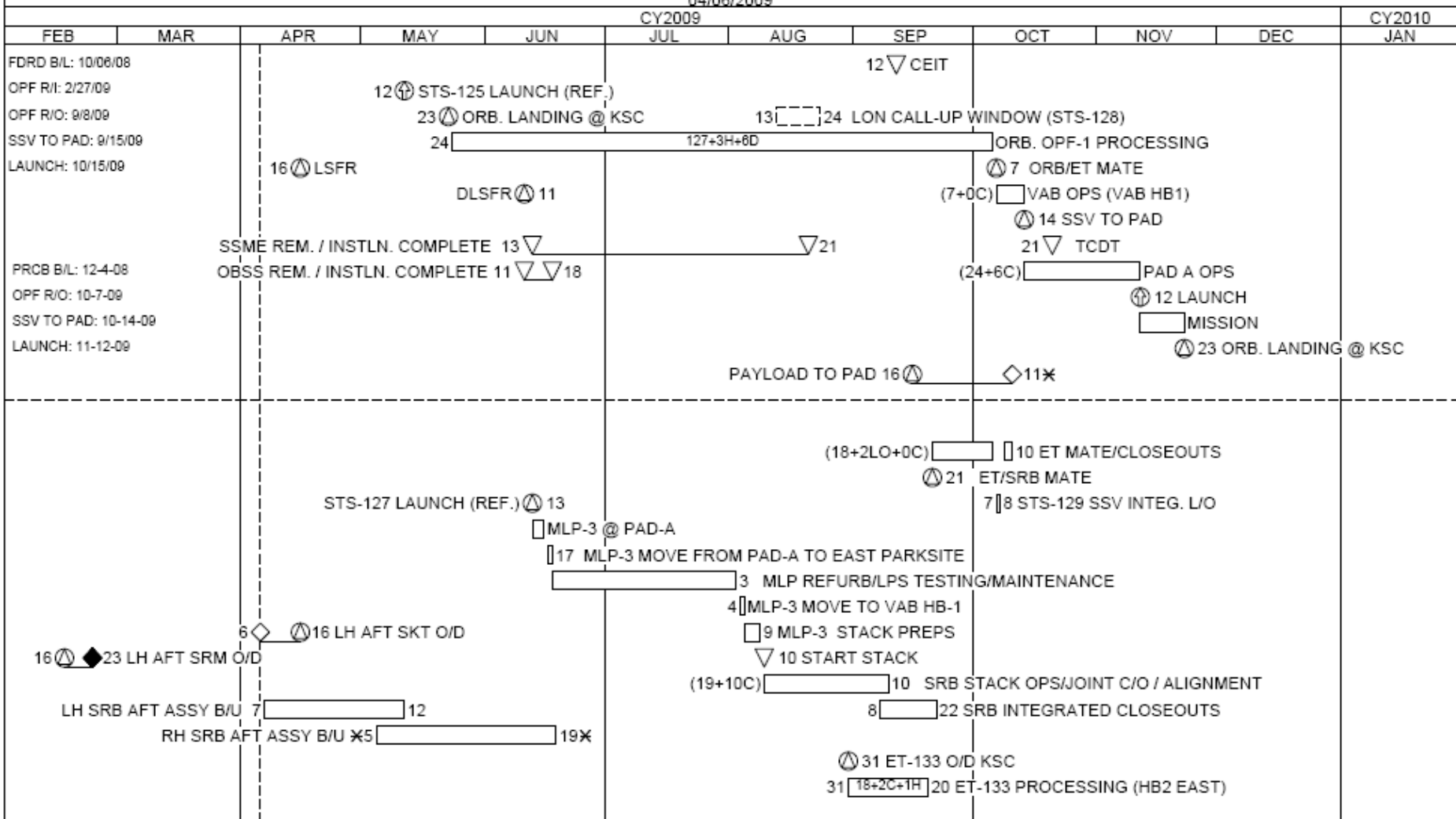


STS-129 KSC Milestone Interface Chart

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

OV-104 / 31 / ISS-31-UJF3 / ELC1 / ELC2
CREW / DURATION: 6 UP - 7 DOWN / 11
ET-133 / BI-140 / RSRM 108 / MLP-3 / PAD-A / VAB HB3

SSP APPROVED PRCB 12-4-08 (REF. CR #S042013HQ)
Status as of:
04/06/2009



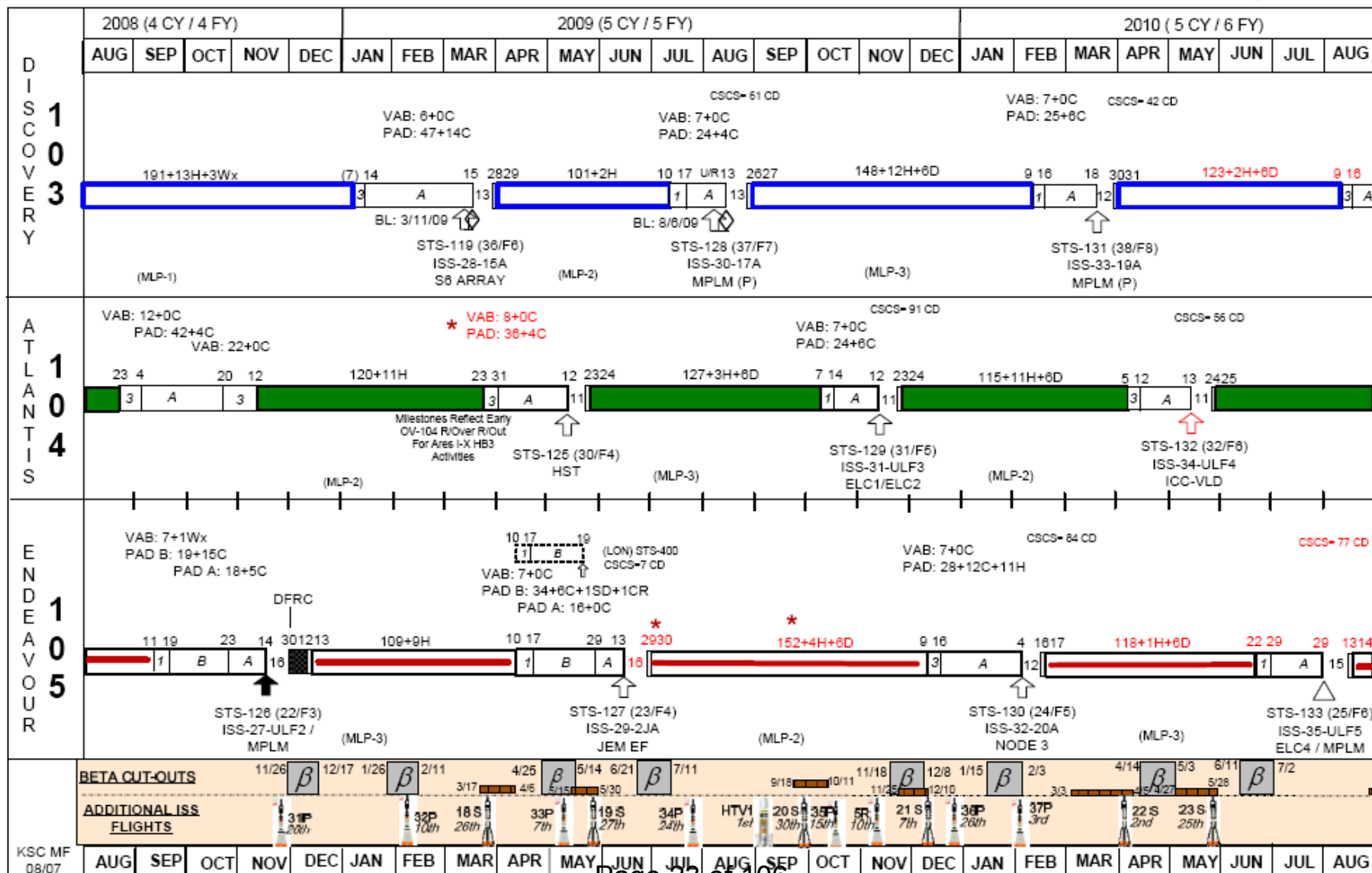
THREATS: _____ NOTES: 1. THIRTY-FIRST ISS/SSP FLIGHT

KSC ASSESSMENT / ORB MULTI-FLOW

SSP APPROVED MANIFEST

MANIFEST REF. 09A-17

1300 EDT, 6 APR 2009



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

MLP TO VAB / START STACK / ET - SRB MATE / ET - MATE CLOSEOUTS COMPLETE

Flight Element Processing

R. Propst



Flight Element Processing Overview

- **Non-Standard Processing Activities** **Presented**
- **Modification Summary** **Presented**
- **Chit Summary** **Presented**
- **OPF Flow Milestones** **Presented**
- **TPS Work Content** **Presented**
- **Issues and Concerns** **Presented**
- **Integrated Operations Summary** **Presented**



Non-Standard Processing Activities

- **RMS End Effector Replacement**
- **ODS Installation**
- **Ammonia Boiler Alcohol Flush**
- **Fuel Cell Replacement**



CHITS

Chit	Title
J6116	AMES Gap Filler Removal And Replacement
J6327	WLE RCC Joggle Inspection
J6378	OV-104 Body Flap (BF) Power Drive Unit (PDU) Gearbox Fluid Level Inspection
J6380	EVA PDU Tool Interface Verification
J6389	Close Clearance Measurements Of Orbiter Hardware For STS-125 (Post Flight)
J6399	0-Gauge Protection For OV-103 Flights 32-35 & OV-104 Flights 27-35
J6402	Micro Inspection Of Captive Gap Fillers
J6407	Close Clearance Measurements Of SRMS MPM and OBSS
J6410	Aft Stub Tile Inspection
J6447	STS-126 Post Flight Inspection & Contamination Sampling of Laser Camera System And Orbiter Locations
J6466	OMS Pod Pillow Gap Filler Installations
J6481	Middeck Payload Cooling Test For OV-104
J6497	OV-104 Putty Repair In RCC & Window DTA Zones



Modification Work Summary

TAD 30240	Middeck ISS Payload cooling Requirements
TAD 30231	Rudder Speed Brake Inconel Thermal Barrier Redesign
TAD 30250	Oxygen Crossover Valve Signal Talkback
TAD 30099	Relocation of D-Hatch Actuator Handle Position Decal
TAD 30099	External Airlock Ducting Configuration Change



TPS Work Content

TPS Removals

<u>Priority</u>	<u>Description</u>	<u>LSFR</u>
Mand	Deferred Tile/ Fib For 1 Flight (Minimum)	3
Mand	In-flight Tile/Blanket Damage (Estimate)	25
Mand	Estimated Putty Removals (Grindouts)	14
Mand	Operational Damage (Estimate)	20
Mand	Putty Repairs in RCC and Window DTA Zones	10
Mand	I/B Elevon 9lb/90 SIP Tile Upgrade (14 To Go)	14
Mand	Instrumentation	2
13	Nose Area 9lb/90 SIP Tile Upgrade	14

BRI Replacement:

6	ET Inboard Structure Side	7
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Projected TPS Removals TOTAL (Estimate) *109

*** Final TPS Work Content Will Be Baselined At The Delta LSFR**



TPS Work Content (Additional Work)

Planned Work:

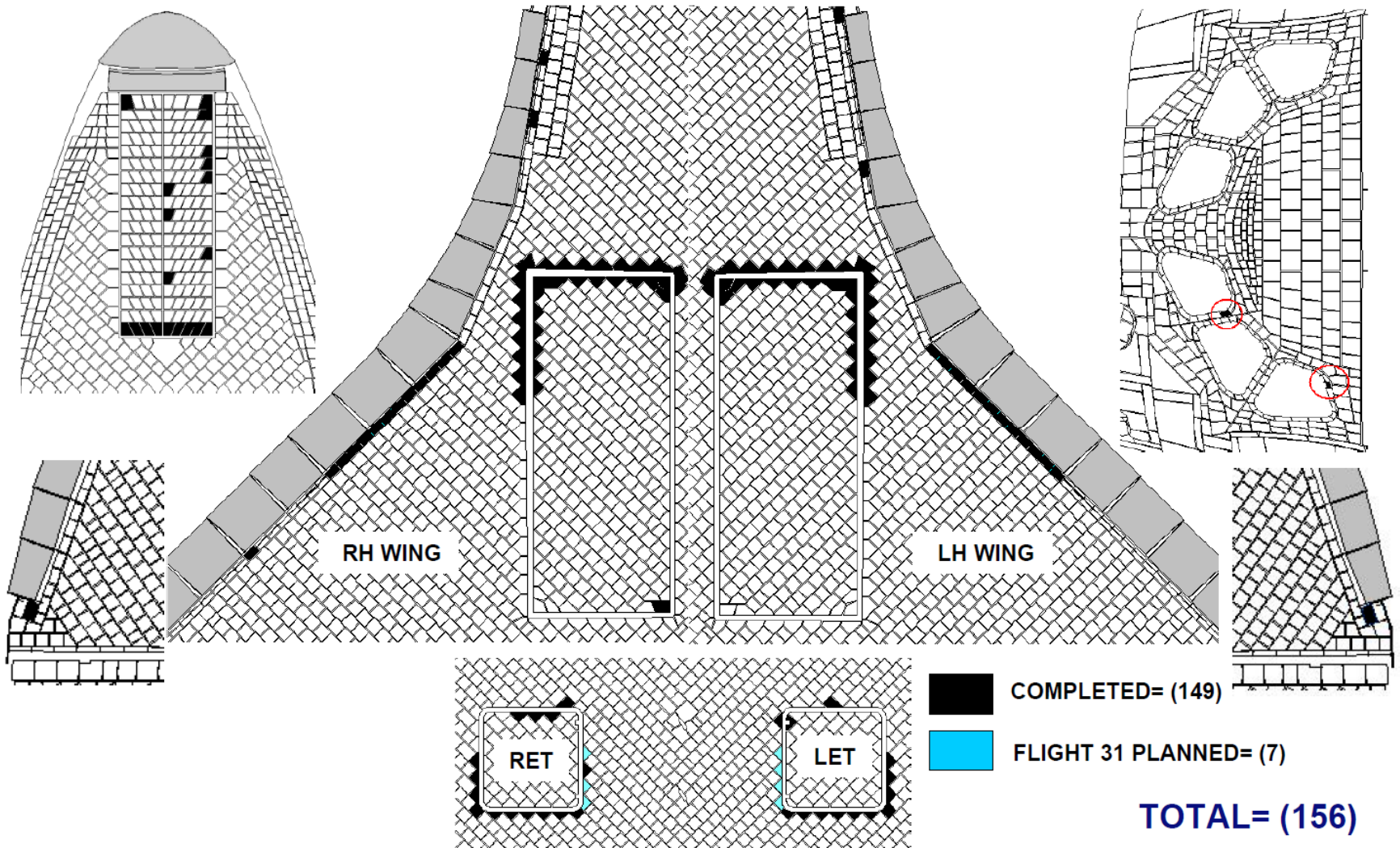
- LESS access panels
 - (2) planned removals (Restricted work 17R/22R)
 - Complete Priority 17 Sneak Flow Mod (2 panels remaining-2L/4R)
- Elevon cove access panel removals (Elevon cove leak check)

Potential Work:

- AMES R&R – Zone 29 of 2A (fwd RH MLGD)



TPS Work Content (BRI Locations)



Issues and Concerns

- **Work Content/Potential Growth**
 - Midbody Reconfigurations From HST To ULF3
 - IFA'S
 - TPS Work Content/Growth

- **DFRC Landing**



STATUS

OPR: USA - J. Taylor, INTEG FM (1-7420)
NASA -A. Brewer , PH-A (1-9104)

USA NASA

C C

CONCUR

Creation Date: 08 JAN 09
Revision Date: 23 MAR 09
Revision: NEW - 1

STS-129 / OV-104

Integrated Operations Assessment Summary

Payloads: ISS-31-ULF3 ECL1 / ECL2 (VERT)

2009

OCTOBER

NOVEMBER

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

▲ ORB/ET MATE

◇ ▲ PL TO PAD

▲ SSV TO PAD

▲ TCDT

▲ STS-129 LAUNCH

VAB HB-1/MLP-3

■ S0004 ORB/ET MATE
■ S0008 / V1149 SHUTTLE I/F TEST / UMB I/F CKS
■ ET CLOSEOUTS
■ A5214 ROLLOUT PREPS
■ S0044 SIM RUN

PAD A

■ A5214 SSV XFER TO PAD
■ S0009 LAUNCH PAD VALIDATION
■ V1308 /V1046.001/2/3V1202 ENG FRT/He SIG TEST/BALL SEAL LK CKS
■ S0017 TCDT
■ S0024 HYPER PREPS
S0600.001 PL INSTL-PCR ■
S0600.001 OPEN PLBDs ■
S0600.001 PL INSTL-PLB / CONN ■ / OBSS SENSORS / IVT
F/C SHARP EDGE INSP ▲
S08129 PLB CLOSEOUTS / CLOSE PLBDs ■
■ V1103 EMU FUNCTIONAL/CKOUT/AL C/O
■ FCE 1ST VERTICAL STOW
■ S5009 ORD INSTL-PART 3
■ S1005/S1006 ET PURGES
■ S0071 HYPER/MPS PRESS/CLOSEOUTS
■ S1287 ORB AFT CLOSEOUT
■ S0007 LAUNCH COUNTDOWN
▲ T-0
□ CONTINGENCY

Workdays Required
7 VAB (0 C)
24 PAD (6 C)

PLBD OPEN / PCU VALVE CLOSE / CLOSE PLBDs FOR FLT (NET L-100 Hrs)



STS-129 Launch Site Flow Review	Presenter Kenneth Nowak
	Date 04-16-09

Backup Material

FRWG Presentation (With Minor Changes)



Presenter **Michael Darnell**

Date **4/16/09**

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Backup

STS-129 FRD Status

- **STS-129 FRD Latest Revision: 005, dated March 24, 2009**
 - **Open CR's**
 - **None**

Back-up

- **Modification Record and MECSLSI Updates Summary**
- **Engineering, Hardware and Certification Status**
- **Description of Previously Baselined Modifications**

Modification Records and MECSLSI Update Summary

MCR/ TAD NO.	TITLE	KIT / MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
<u>Potential Modification</u>				
30259	<u>GH2 Flow Control Valve (FCV) Elbow Redesign</u> Provides a means of reinforcing the MPS GH2 FCV elbow.	TBD	No Tech Order Impact	No MECSLSI Impact
<u>Modification Previously Baseline</u>				
30186	<u>OMS Pod Micro-WIS Strain Recorder Removal</u> Removes the recorder box from the left OMS Pod and stows the wires.	TCTIM0030186REF_0003_0 - Stows the remaining wire	Micro-WIS SGU on OMS Pod Installation M072-755111-002 (is) M072-755111-001 (was) MV0886A	MECSLSI Impact
23205	<u>Acreage Doublers Addition to Avionics Bays 4, 5 and 6</u> 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.	VK70-356734-001_0104_0 - Provides hardware for acreage doublers on honeycomb door panels	No Tech Order Impact	No MECSLSI Impact
30240/ 19393	<u>Middeck ISS Payload Cooling Requirements</u> Installs resized orifice in the existing ducting to the middeck avionics bay 3 to provide sufficient airflow balance to cool the ISS payload.	VK70-613604-001_0104_0 - Installs resized orifice in 3 locations VK70-613604-002_0104_0 - Installs a new bracket to support installation of a new orifice K609-613004-001_0002_0 - Provides caps for the duct	Middeck Bay 3A Cooling Installation M072-613800-005 (CCCD) Avionics HX & Fan Installation M072-613999-002 (MECSLSI)	CCCD Impact MECSLSI Impact
30231	<u>Rudder Speed Brake Inconel Thermal Barrier Redesign</u> Installs redesigned the Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment.	TCTIV2930231REF_0104_0 - Installs redesigned RSB inconel thermal barrier tabs	No Tech Order Impact	No MECSLSI Impact
30250	<u>Oxygen Crossover Valve Signal Talkback Modification</u> Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication.	TCTIV7930250REF_0104_0 - Repins the connector at the N2/O2 control panel and reworking the MDM and signal conditioners in the avionics bay	No Tech Order Impact	No MECSLSI Impact
30099	<u>Relocation of D-Hatch Actuator Handle Position Decal</u> Relocates actuator handle position decal on the external airlock upper hatch / blanket to the correct location.	TCTIM3330099REF_0001_0 - Relocates "Latched / Unlatched" decals on the airlock upper hatch TCTIM0030099REF_0001_0 - Relocates decal on the blanket	D-Hatch M072-593828-005 MV0828A Blanket M072-364828-004 MV0828A	MECSLSI Impact
30099	<u>External Airlock Ducting Configuration Change</u> Connects the Orbiter Docking System booster fan outlet duct to the booster fan outlet prior to launch.	N/A	ISS Fan & Ducting M072-643402-011 MV0828A	MECSLSI 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
Potential Modifications										
30259	<u>GH2 Flow Control Valve (FCV) Elbow Redesign</u> Provides a means of reinforcing the MPS GH2 FCV elbow.	6/19/09	7/22/09	6/1/09	7/24/09	TBD	8/28/09	TBD	TBD	
Modifications Previously Baseline										
30186	<u>OMS Pod Micro-WIS Strain Recorder Removal</u> Removes the recorder box from the left OMS Pod and stows the wires.	Released	N/A	N/A	N/A	GO	N/A	N/A	N/A	OCR/D S164130N Baselined at STS-128 LSRR
23205	<u>Acreege Doublers Addition to Avionics Bays 4, 5 and 6</u> 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.	Released	N/A	Delivered	N/A	GO	N/A	N/A	N/A	Baselined as NFS at STS-128 LSRR Engineered for flight 30
30240 / 19393	<u>Middeck ISS Payload Cooling Requirements</u> Installs resized orifice in the existing ducting to the middeck avionics bay 3A to provide sufficient airflow balance to cool the ISS payload.	Released	N/A	5/15/09	5/24/09	GO	Submitted	4/21/09	22-613400-001N 14-22-613400-001N	OCCB approved 10/28/08 (S165384A) OCR/D S165384A
30231	<u>Rudder Speed Brake Inconel Thermal Barrier Redesign</u> Installs redesigned the Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment.	5/27/09*	5/27/09	5/24/09	5/24/09	GO	6/15/09	7/15/09	07-290101-001R 18-07-290101-001R	OCCB approved 1/27/09 OCR/D S165399 *Detail drawings are released
30250	<u>Oxygen Crossover Valve Signal Talkback Modification</u> Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication.	Released	N/A	N/A	N/A	GO	N/A	N/A	N/A	OCCB approved 2/24/09 OCR/D S165404
30099	<u>Relocation of D-Hatch Actuator Handle Position Decal</u> Relocates actuator handle position decal on the external airlock upper hatch / blanket to the correct location.	Released	N/A	N/A	N/A	GO	Submitted Submitted	Approved Approved	Hatch Actuator CR# 28-593201-001T CAR# 12-28-593201-001T Hatch Blanket CR# 09-362000-001CJ CAR# 71-09-362000-001CJ	*OCR/D S165361 approved
30099	<u>External Airlock Ducting Configuration Change</u> Connects the Orbiter Docking System booster fan outlet duct to the booster fan outlet prior to launch.	Released	N/A	N/A	N/A	GO	Submitted	Approved Approved	CR# 35-643500-002W CAR# 20-35-643500-002W	*OCR/D S165375 approved

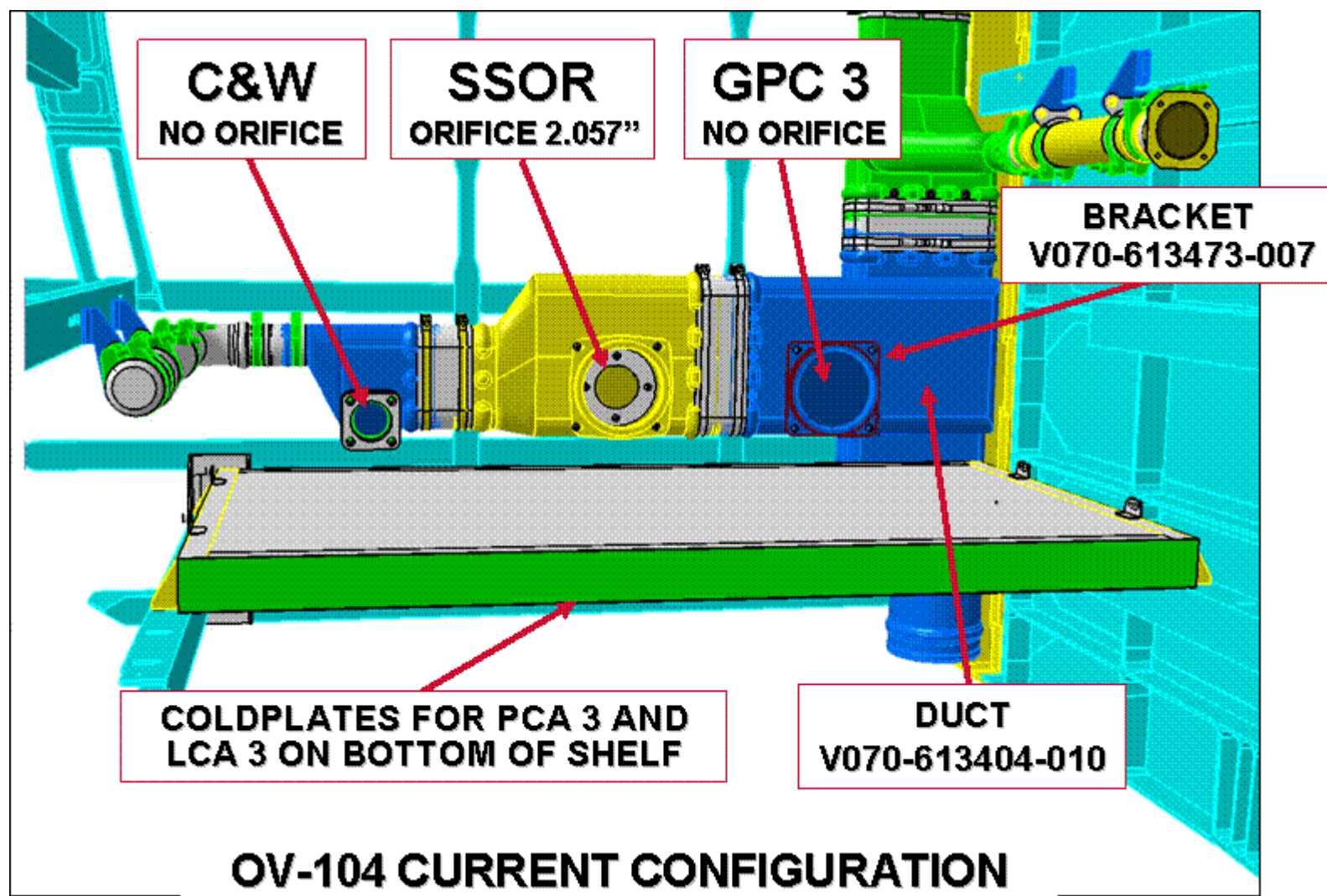
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements

- Installs resized orifice in the ducting to middeck avionics bay 3A to provide sufficient airflow to cool the ISS payload
 - The ISS payload, Mice Drawer System (MDS), is currently planned to be installed in middeck avionics bay 3A
 - The current Orbiter configuration does not provide sufficient airflow to accommodate rear breathing payload in the middeck avionics bay 3A
 - Modification, increases the airflow to this location, providing the capability for avionics cooling in support of the MDS
 - Bay 3A requires installation of a bracket in the duct to allow the installation of an upgraded orifice at GPC 3 location, and installation of an upgraded orifice at SSOR and C&W locations
 - OCCB approved the implementation of the modification for bay 3A for flight 31 on 10/28/08

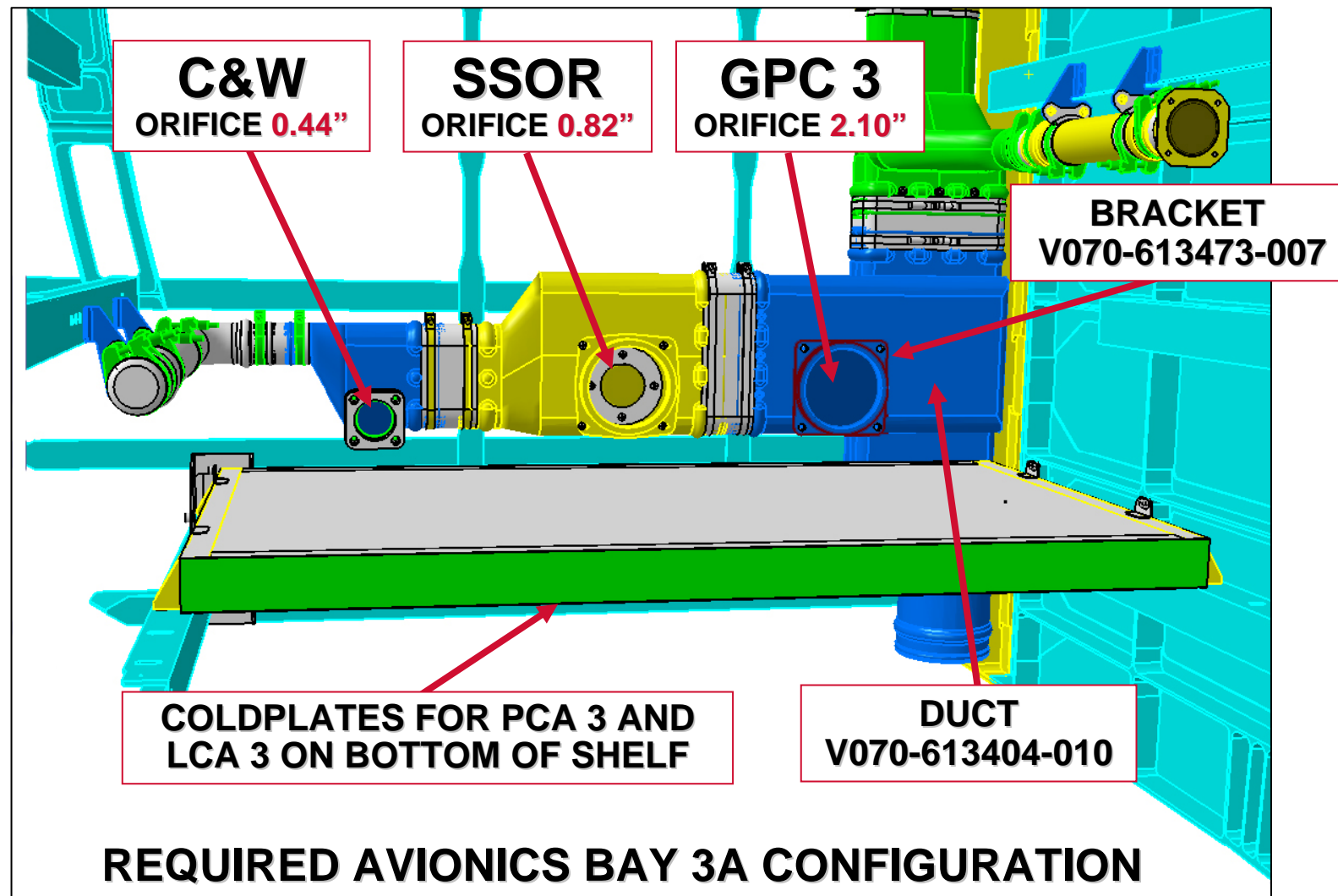
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements (Cont.)



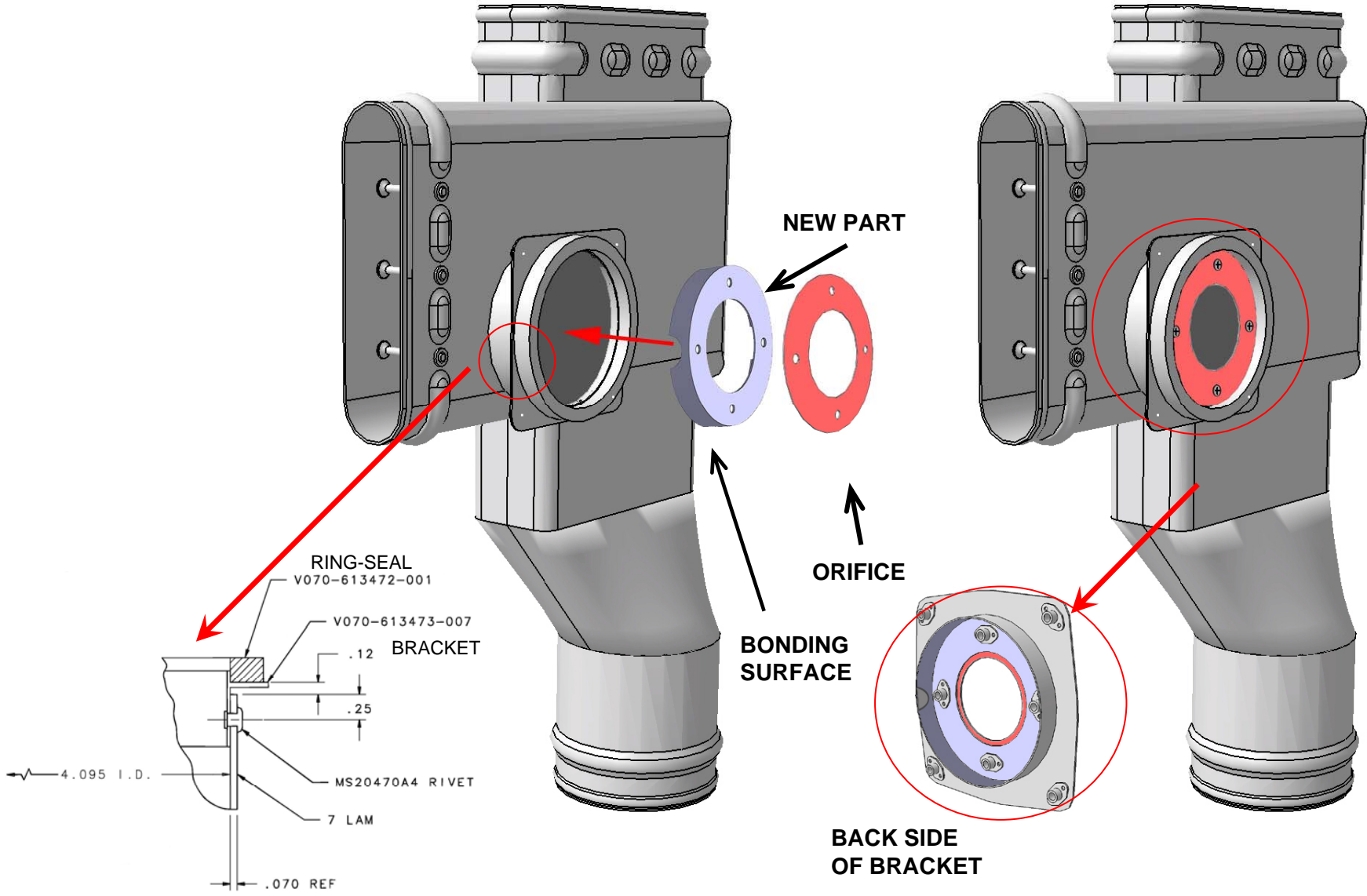
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements (Cont.)



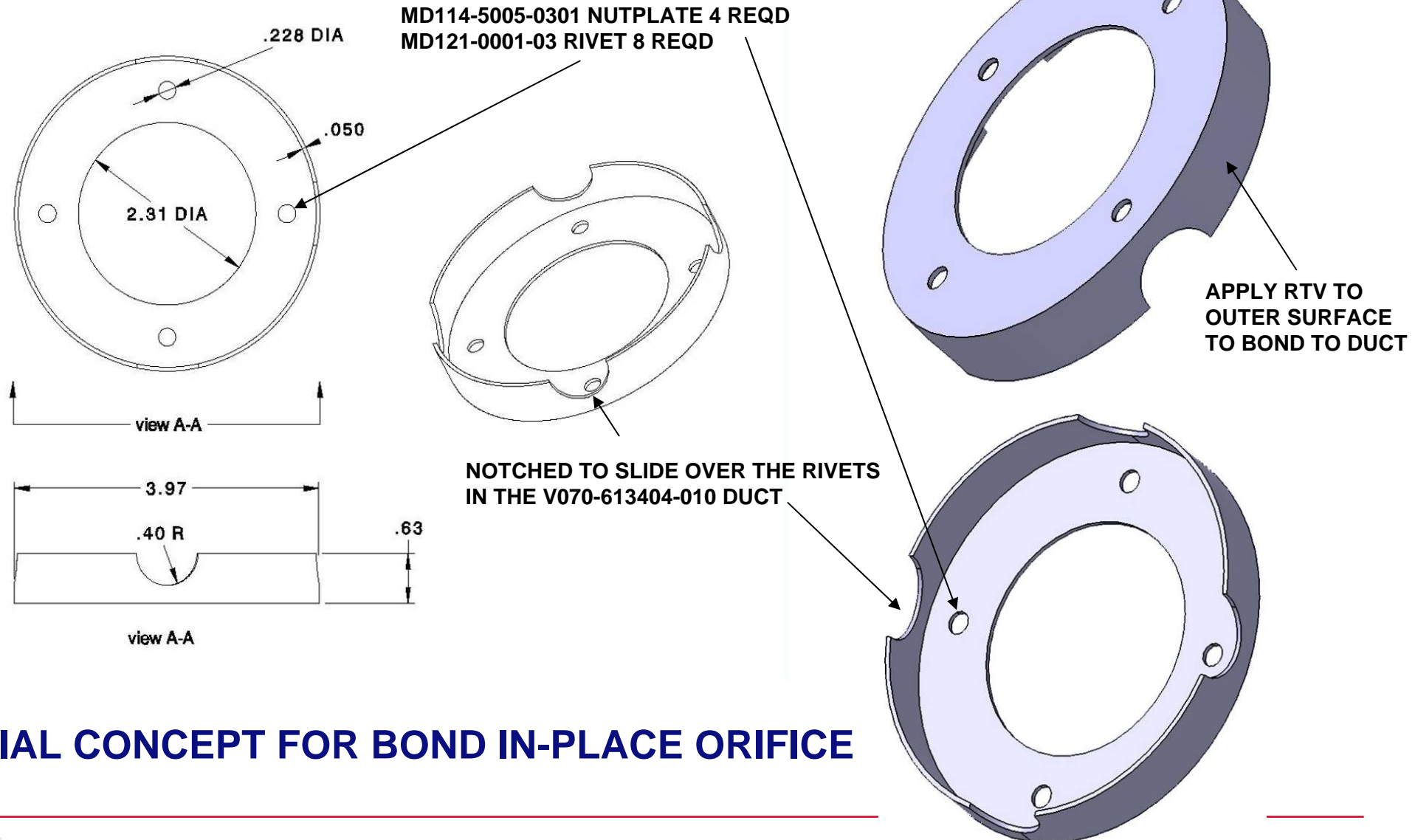
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements (Cont.)



STS-129 OV-104 Flight 31 – Modifications To Be Baselined

TAD 30240 / MCR 19393 – Middeck ISS Payload Cooling Requirements (Cont.)

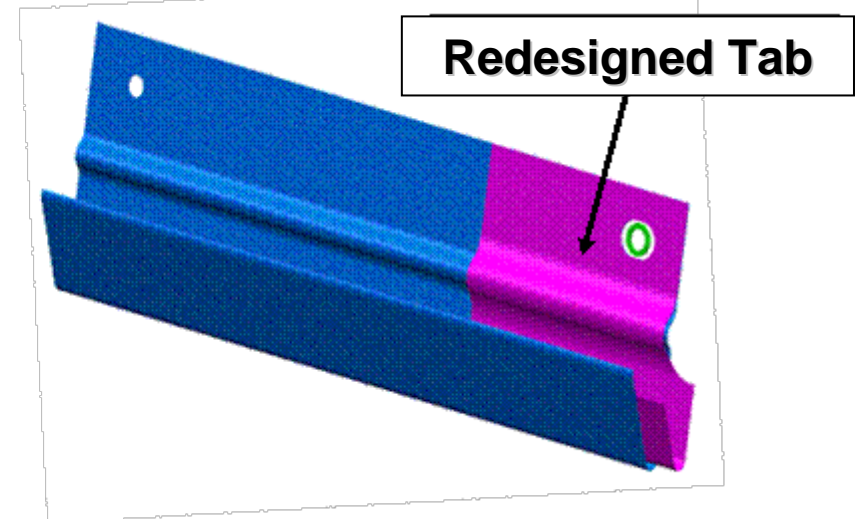
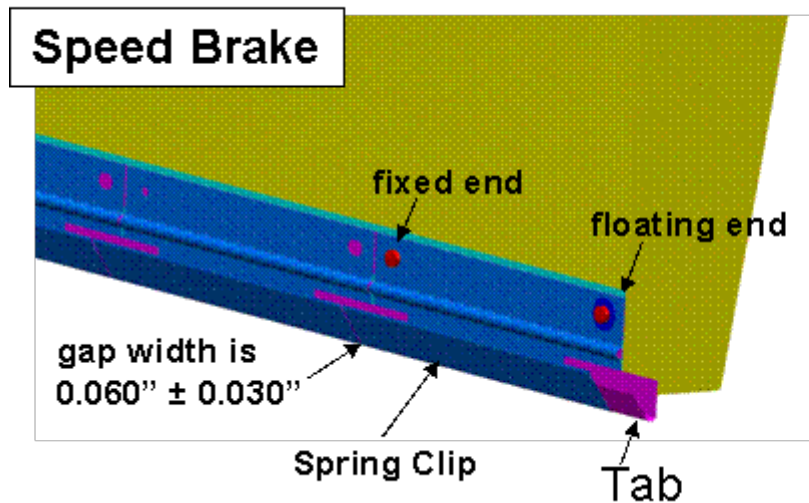


INITIAL CONCEPT FOR BOND IN-PLACE ORIFICE

STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30231 – Rudder Speed Brake Inconel Thermal Barrier Redesign

- Installs redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment
 - During STS-124 an inconel tab was seen floating away from the vehicle while on orbit
 - STS-126 post-flight inspection found 7 inconel tabs were missing, even though improved pre-flight ground inspection procedures were used
- The redesign effort will reduce the moment arm and stress to the spot welds, and will provide a secondary mechanical attachment
 - Redesign lengthens tab to reach screw, slides tab into spring by .70" (.30" overhang), includes more spot welds and changes the spot weld from Class "C" to Class "B" (additional quality control to ensure weld conformance)



STS-129 OV-104 Flight 31 – Previously Approved Modification

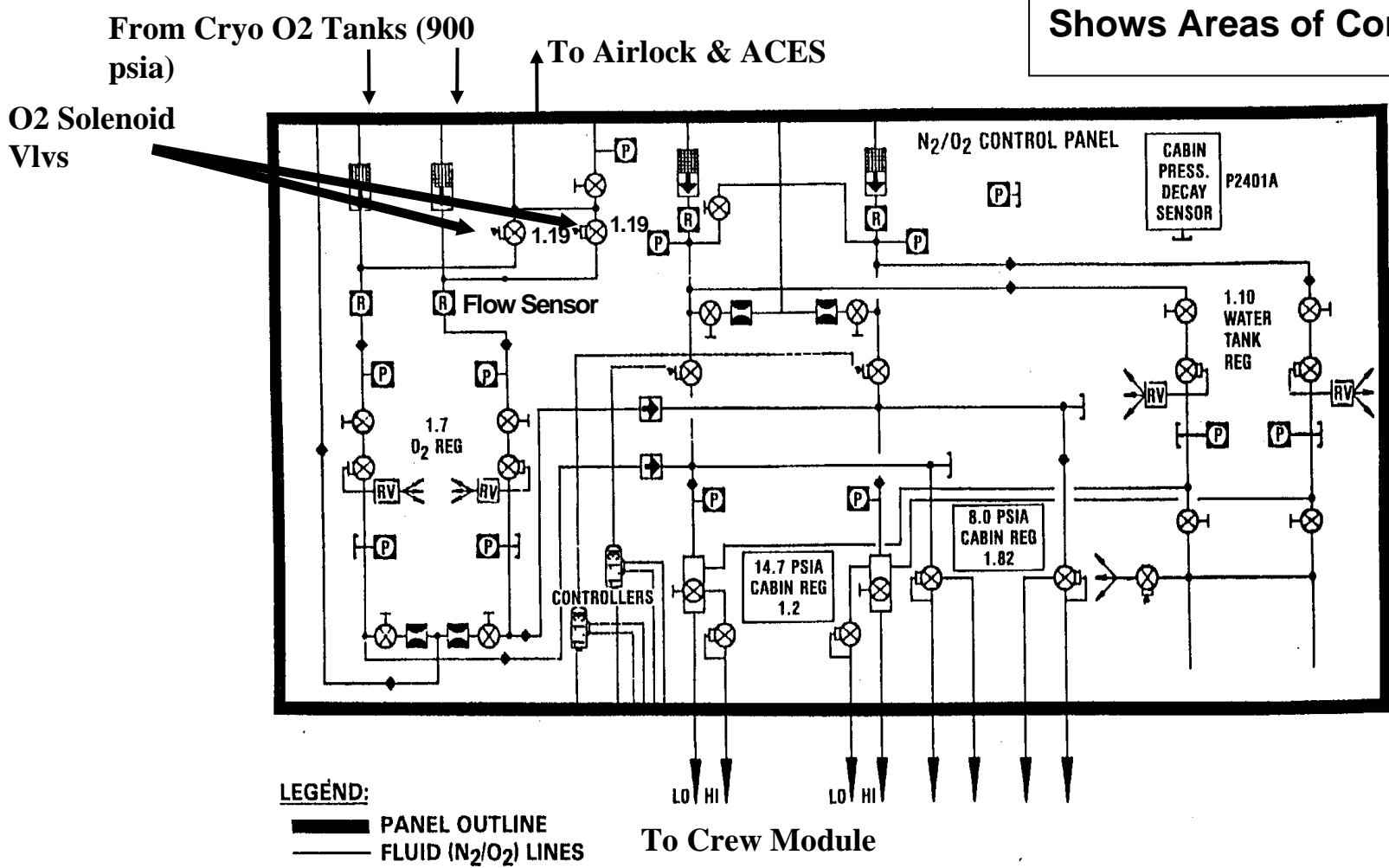
TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification

- Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication
 - The N2/O2 control panel supports O2 and N2 flow to the crew cabin and provides O2 to the crew Launch Escape Suits (LES) and airlock
 - The O2 crossover valves are required to be open to support crew breathing on the Advanced Crew Escape Suit (ACES)
 - Current Orbiter configuration provides only switch scan instrumentation which verifies power applied to valve but not position indication
 - O2 crossover valve failure closed could result in the loss of oxygen to LES
 - The O2 crossover valve position indication is provided at the N2/O2 control panel electrical connector
 - Connecting to the available N2/O2 valve position will provide a reliable method for verifying that the O2 crossover valve is open
 - Electrical modification requires repinning the connector at the N2/O2 control panel and reworking the MDM and signal conditioners in the avionics bay
 - Utilizes two existing spare MSIDs for valve position indication
 - The first implementation of the modification is planned for STS-128, OV-103
 - Implementation on STS-129, OV-104 is contingent upon sufficient slack in harness to allow repinning of connectors without removal of MO10W panel

STS-129 OV-104 Flight 31 – Previously Approved Modification

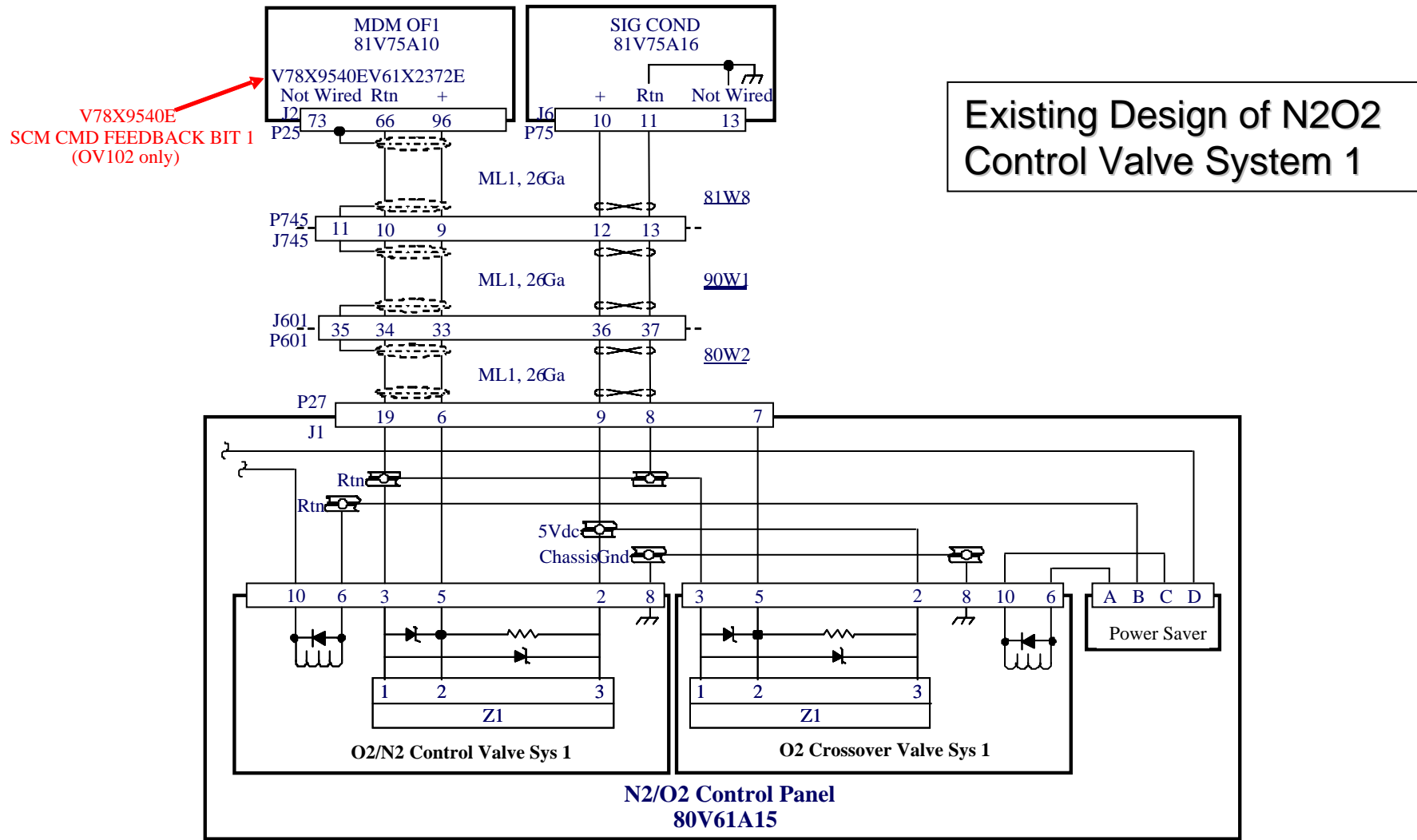
TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification

N2/O2 Panel Schematic Shows Areas of Concern



STS-129 OV-104 Flight 31 – Previously Approved Modification

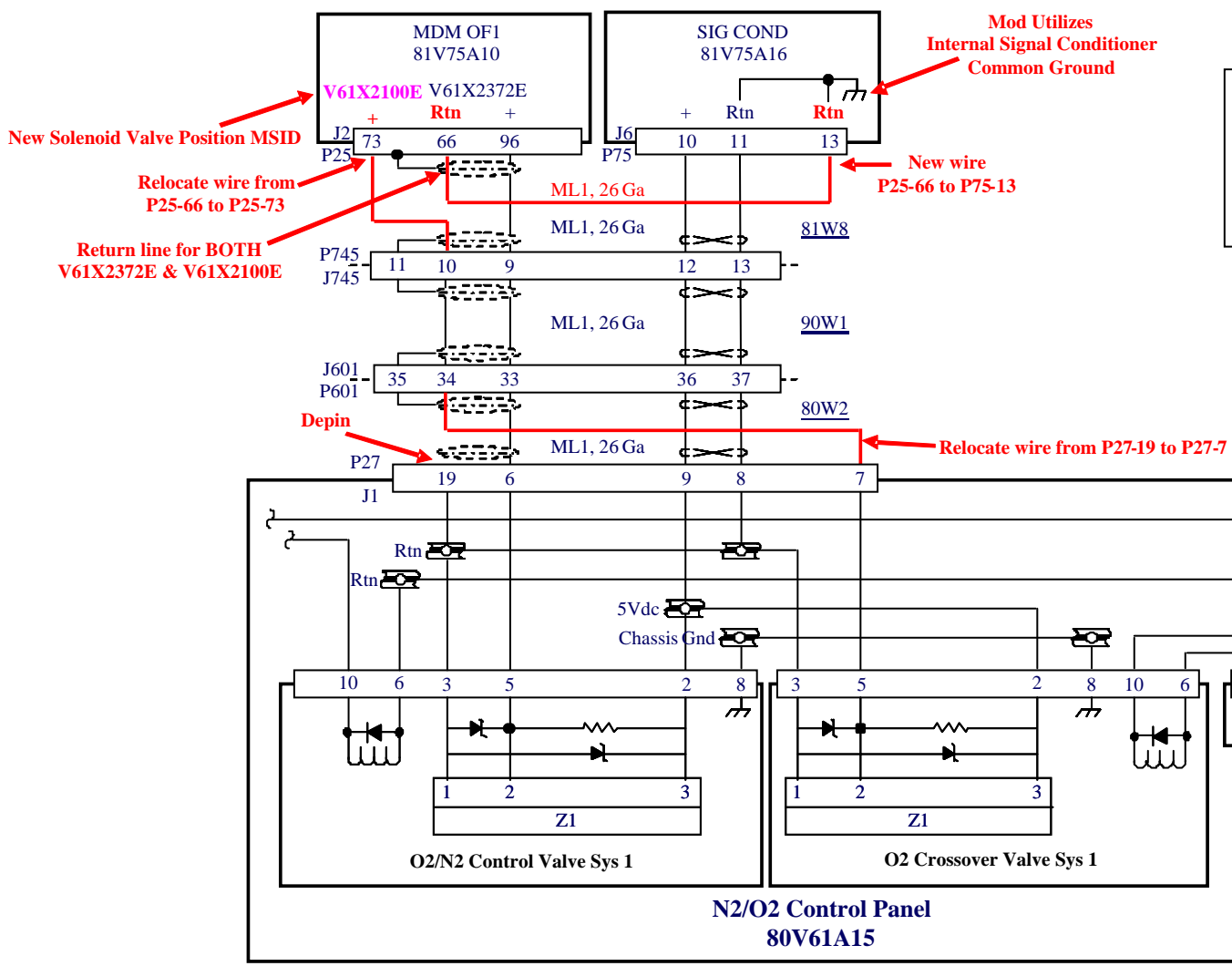
TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification (Cont.)



Existing Design of N2O2 Control Valve System 1

STS-129 OV-104 Flight 31 – Previously Approved Modification

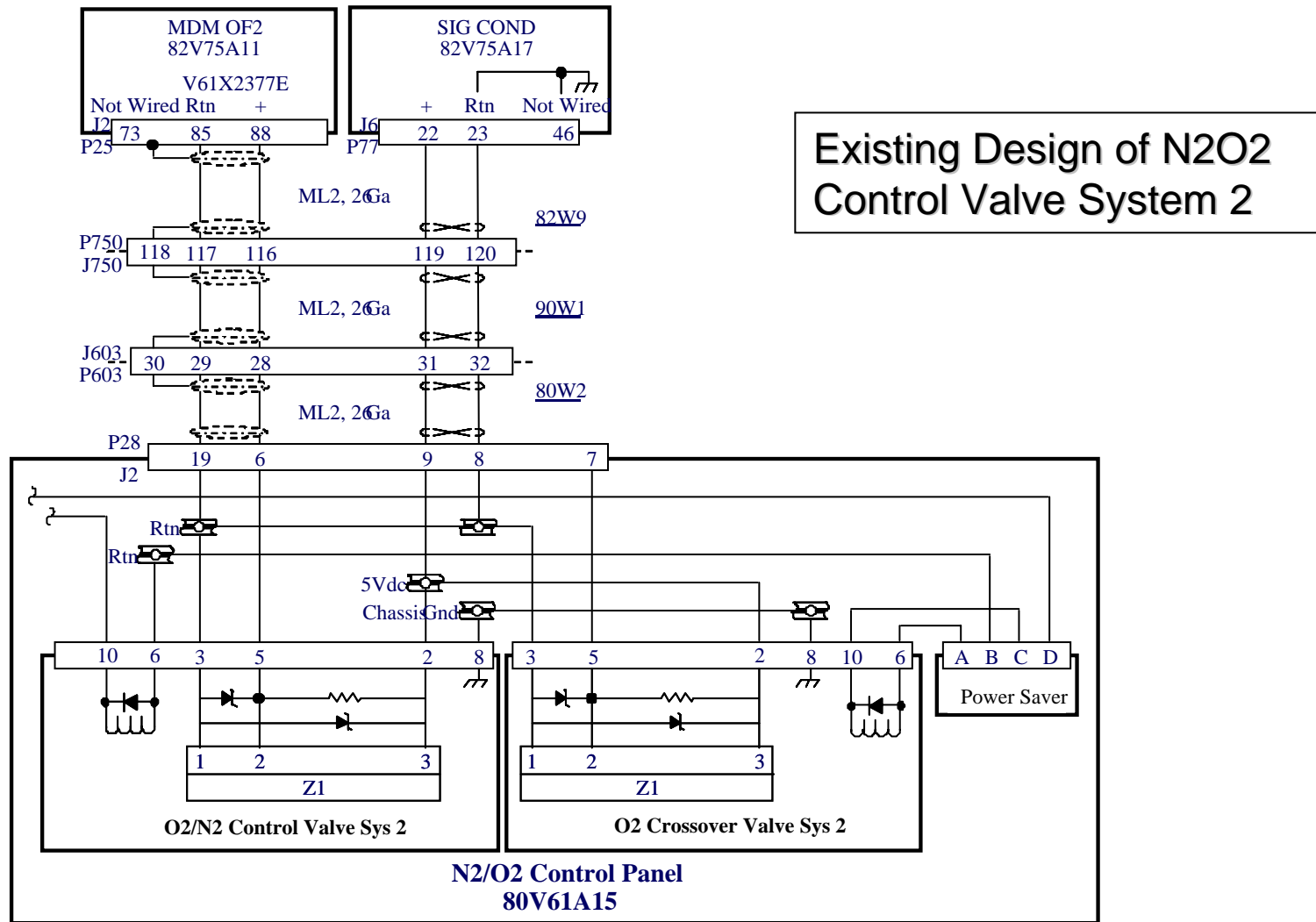
TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification (Cont.)



Proposed Modification of N2O2 Control Valve System 1 Design

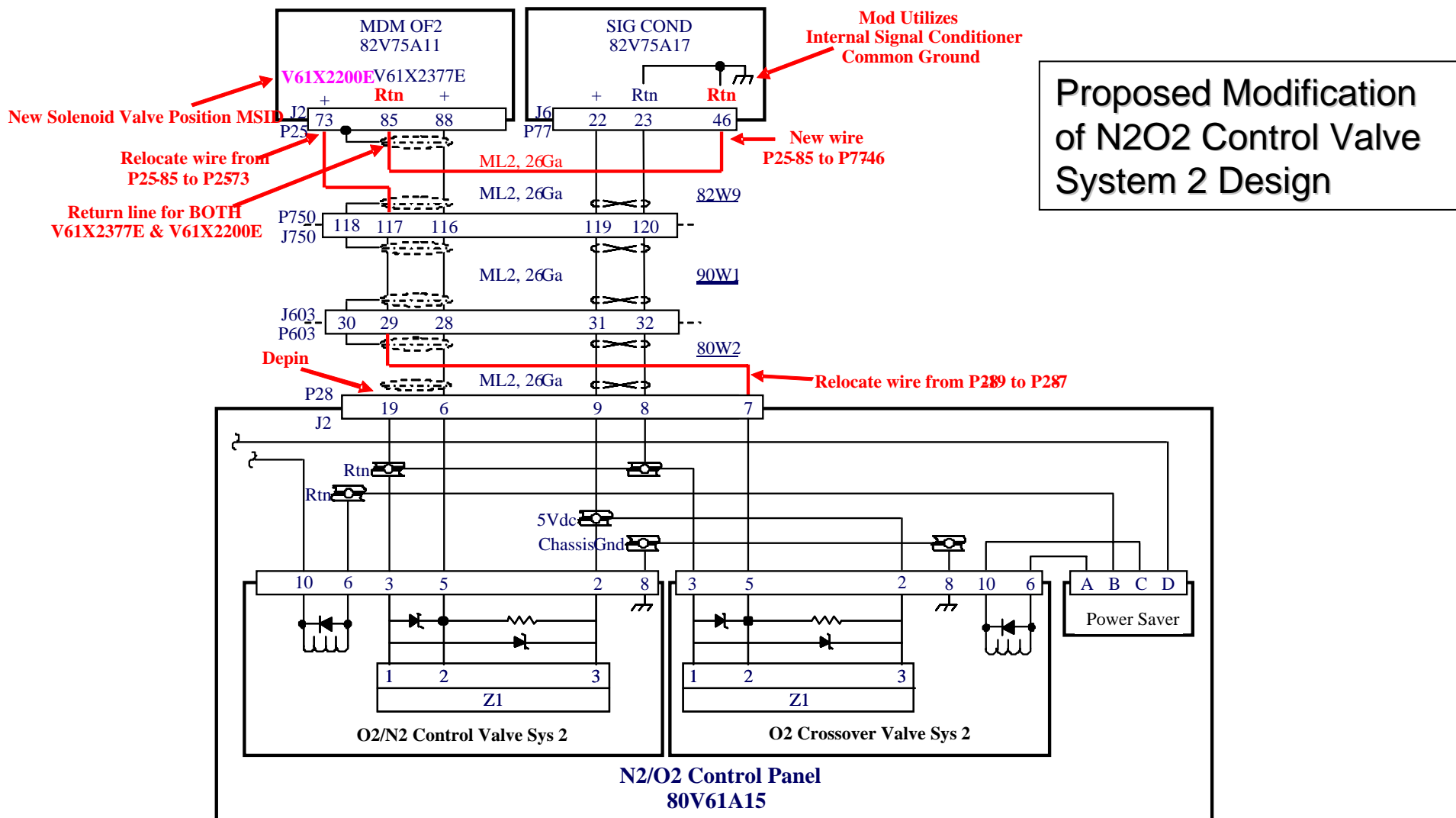
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification (Cont.)



STS-129 OV-104 Flight 31 – Previously Approved Modification

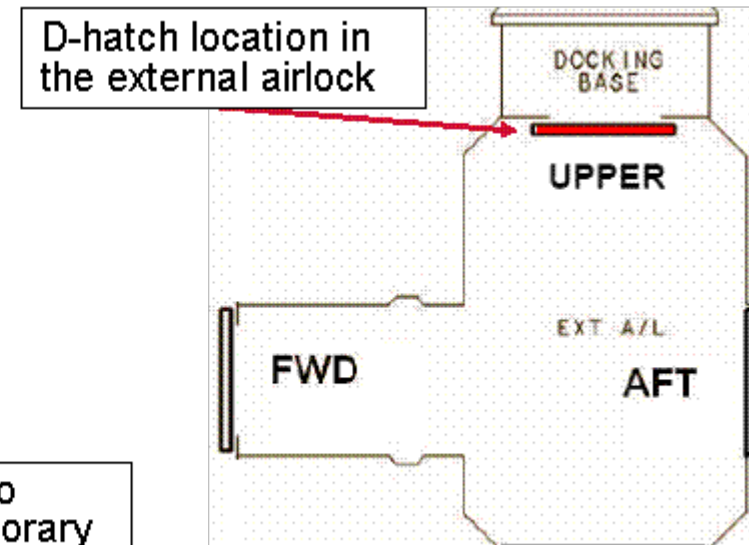
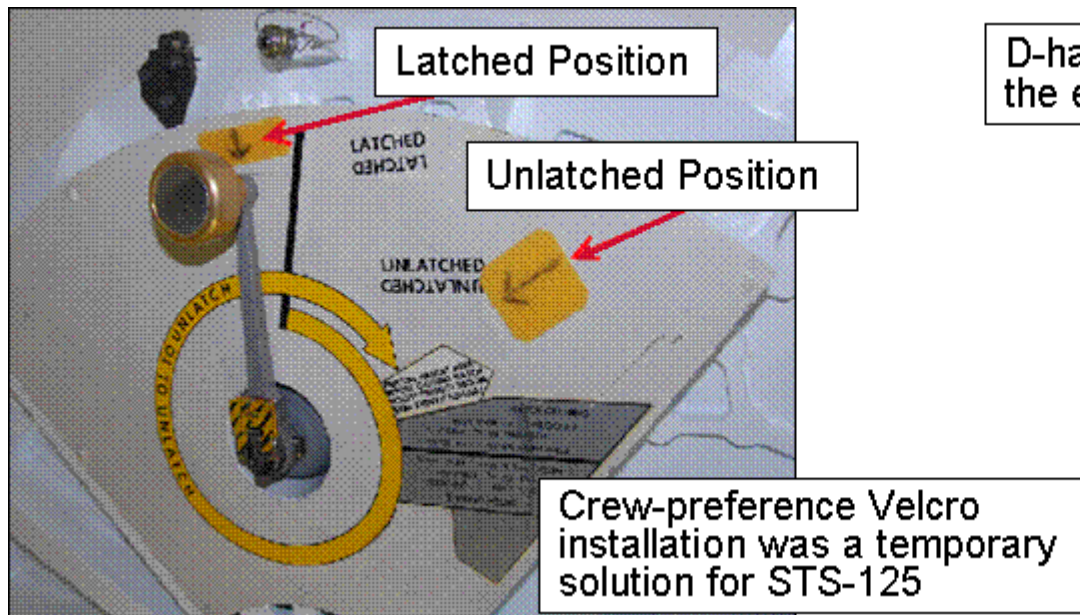
TAD 30250 – Oxygen Crossover Valve Signal Talkback Modification (Cont.)



STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30099 – Relocation of D-Hatch Actuator Handle Position Decal

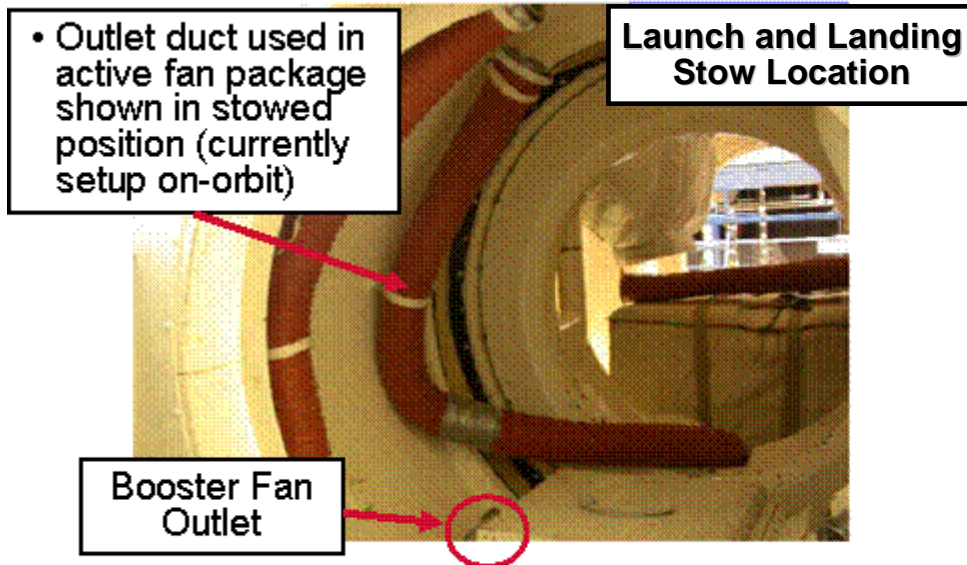
- Relocates actuator handle position decal on the external airlock upper hatch to the correct location
 - The crew reported difficulty closing and latching the external airlock upper hatch during STS-124 (OV-103)
 - Attempts to position the actuator handle over the decal that indicated the correct “pre-closing” 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 are updated to reflect the correct decal locations



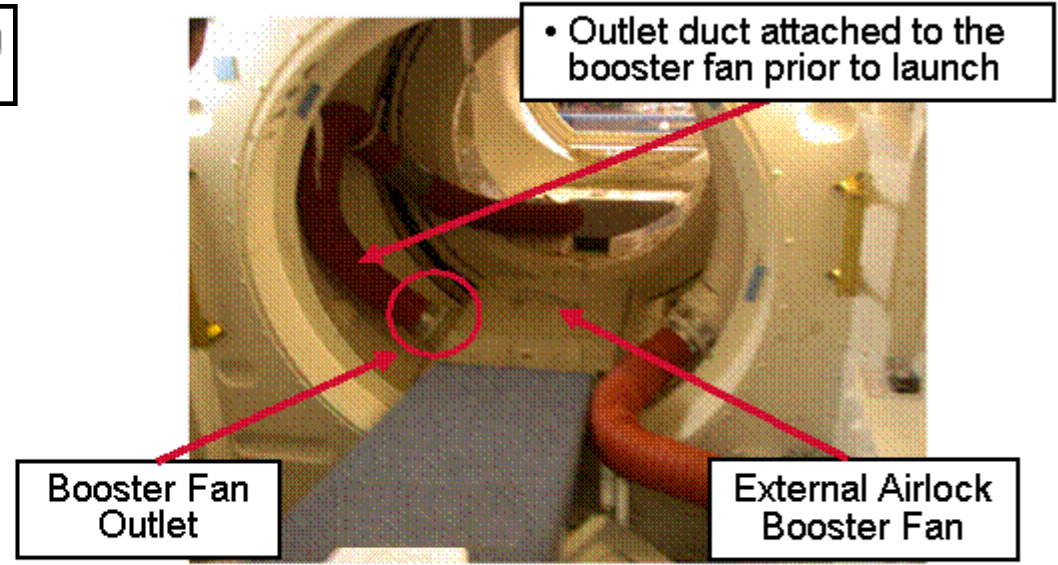
STS-129 OV-104 Flight 31 – Previously Approved Modification

TAD 30099 – External Airlock Ducting Configuration Change

- Connects the Orbiter Docking System booster fan outlet duct prior to launch to have the airlock fan active from post-insertion through de-orbit preparation
 - MOD has indicated that future missions will not require the cryo savings associated with use of the booster fan bypass duct
 - The new duct configuration will reduce crew setup activity associated with booster fan operations
 - The mylar tape will not be required around the forward middeck floor diffuser; eliminating a crew procedure to remove the tape seal which can be misplaced during the mission
 - The option to fly the booster fan bypass duct will still be available



Airlock Booster Fan and Ducting Stowed for Launch (Current Configuration)

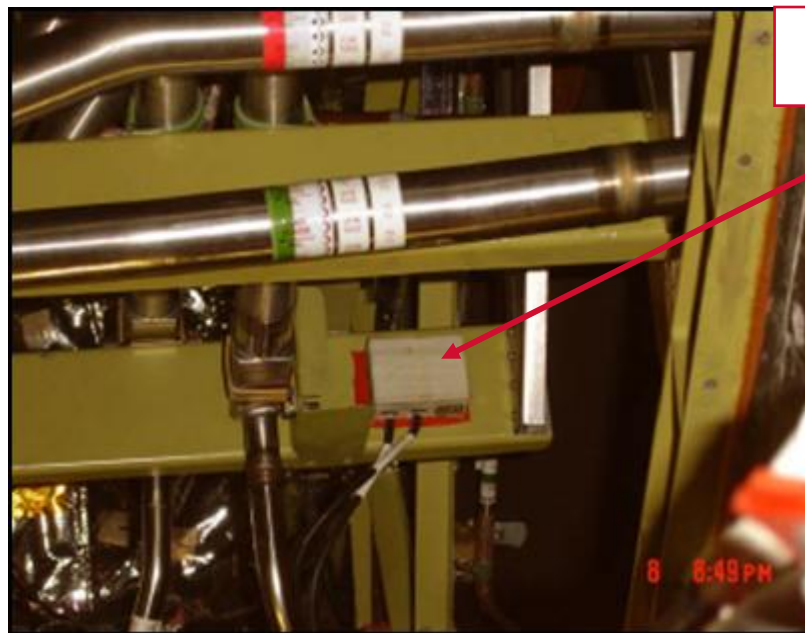


Airlock Booster Fan and Ducting in Active Booster Fan Arrangement for Launch (Proposed Configuration)

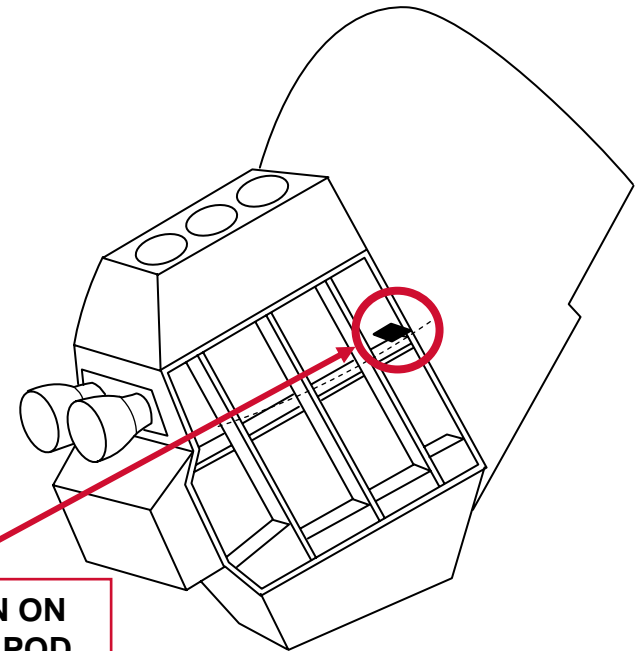
STS-129 OV-104 Flight 31 – Previously Approved Modification

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
- Tech order M072-755111 was updated to -002 and added to the MECSLSI



**MICRO SGU
RECORDER BOX**



**BOX LOCATION ON
THE LEFT OMS POD**

STS-129 OV-104 Flight 31 – Previously Approved Modification

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
 - 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

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 (103 & 104)	24	complete	complete	n/a
6. BRI-18 Tile – STR side of ET Doors I/B	8	complete	1	complete
7. Inboard Elevon “Hub” Tile Mod	4	complete	2	complete
8. I/B Elevon 9lb/90 SIP	34	complete	20	complete
9. O/B Elevon 9lb/90 SIP	6	complete	complete	complete
10. MLGD – Outboard Middle 1/3	24	0	0	3
11. ET Door remaining STR side	40	1	7	0
12. MLGD - Outboard AFT 1/3	24	0	0	1
13. Nose Area 9lb/90 SIP	14 (16 ^{OV103})	1	0	0
14. Base Heat Shield 9lb/90 SIP	42	8	Complete	36
15. Gap fillers in Subset 2B	5 Zones	2	1	0
16. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD	MLGD 100	MLGD 0	MLGD 1	MLGD 0
	NLGD 123	NLGD 12	NLGD 19	NLGD 47
	LESS 68 (90 ^{OV-105})	LESS 7	LESS 5	LESS 12
	ET Door 28	ET Door 5	ET Door 0	ET Door 1
17. Mod work LESS internal	44 locations	38	39	complete
19. Remaining Gap Fillers & Window BRI-18	124	2	2	19
Structural Corrosion Sampling Plan	See Special Chart			
2nd Subset Putty Repair Removals	11 / 6 / 5	6	complete	0

TPS Priorities

Mandatory (everyflow expectation)

- **Flight damage, OMRS Rqmts/Chits, LRU access, & deferred work**

- Multi-flow
Chits
- Corrosion Sampling (10% of total tile allocation) *Chit J6275A*
 - Putty repairs in RCC & Window DTA Zones of influence (10 tiles) (Chit Pending)
 - Continue G/F R & R on a best effort basis - zones 2B subset
 - *Deferred work may be redeferred with acceptable inspection*
-

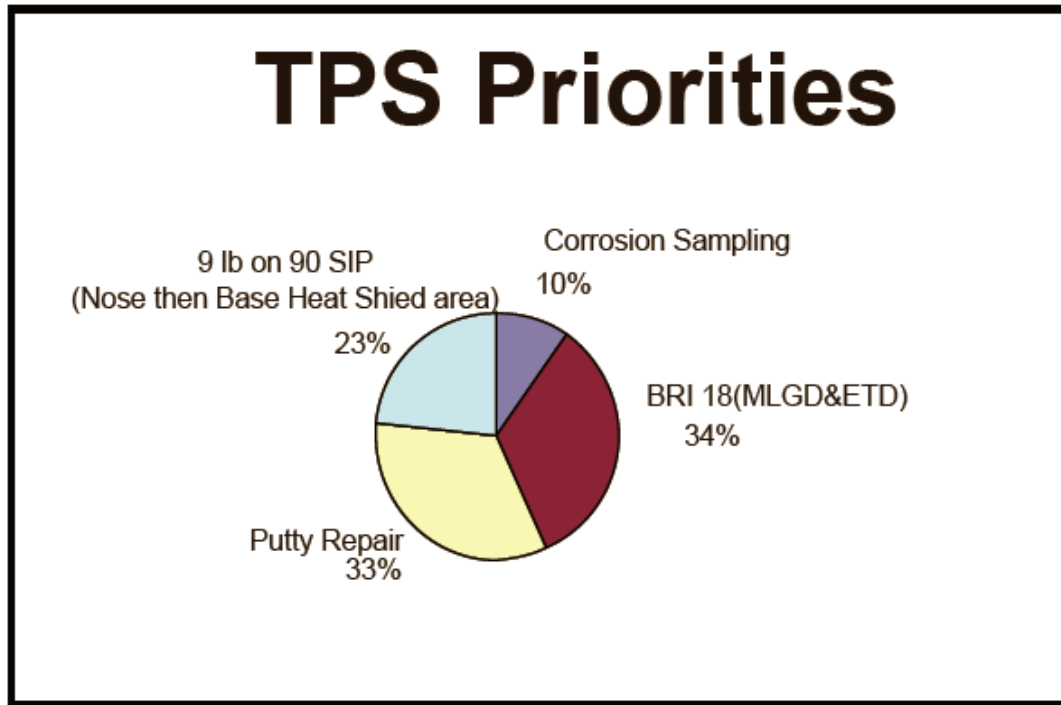
Prioritized Opportunity

- 1 - 5 1 thru 5 complete on all vehicles**
- 6 BRI-18 Tile** – STR side of ET Doors Inboard side – *AFT 4 Tiles (8 Tile)*
- 7 Inboard Elevon “Hub” Tile Modification** – *104 only remaining (2 Tiles)*
- 8 I/B Elevon 9lb/90 SIP Upgrade to FRCI-12** – AFT to FWD, 34 Tiles (17/side)
- 9 O/B Elevon 9lb/90 SIP Upgrade to FRCI-12** – 6 Tiles (3/side)
- 10 MLGD** – Outboard Middle 1/3 - (6 Door/6 STR)

TPS Priorities Continued

- 11 **ET Door - Remaining STR side of Door & leading edge on Door - 40 tiles (24 STR/ 16 door)**
- 12 **MLGD - Outboard AFT 1/3 - 24 Tile (6 door/6 str)**
- 13 **Nose Area 9lb/90 SIP Upgrade to FRCI-12 – 14* Tiles (7/side) (*103 16 tiles,thruster)**
- 14 **Base Heat Shield 9lb/90 SIP Upgrade to FRCI-12 – 42 Tiles (32/stinger, 10/Box Attach point)**
- 15 **Gap fillers in Subset 2B (Line across MLGD edge)**
- 16 **Remaining BRI-18 Tile – Remaining MLGD (top priority) / ET Door / LESS carrier panels/NLGD**
 - MLGD (Inboard, forward edge working to AFT door edge)
 - ET Door
 - LESS - panels 8, 9, 10, 7, 6, 5, 4, 3, 2, 1, 11, 12, 13 (in that order)
 - NLGD (attrition – do leading edge first)
- 17 **Mod work (WLE sneak flow, WLE Horsecollar Gap Fillers,)**
- 18 **MADS Instrumentation Failures (104 & 105 L/H OMS Pod)(place holder)**
- 19 **Remaining Gap Fillers & Window BRI-18**
 - Windows 2, 3, 4, & 5 Upper Carrier Panels (top priority)

TPS Priorities



Example	60 tile Allocation at DLSF
Corrosion Sampling	6
BRI-18 MLGD&ETD	20
Putty Repair	20
9lb on 90 SIP	14

- Orbiter's expectations for the work areas are shown on the pie chart
 - The above table is for reference only – exact #'s are determined by the KSC Team
 - Access/configuration/length of flow
 - Distribution provides data/risk reduction in all areas of the list
 - Does not allocate all the resources in one area
 - OV-104 to utilize this break down upon completion of priority numbers 6 & 8

Current Vehicle Status – Corrosion Under TPS

The Special Chart

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

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

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

HEATSINK PERIMETER INSPECTIONS (EACH SAMPLE SITE IS ONE 2 LINEAR FOOT SECTIION)				
HEATSINK PERIMETER - BODYFLAP	3	3	3	3
HEATSINK PERIMETER - LH OB ELEVON	1	1	1	COMPLETE
HEATSINK PERIMETER - LOWER FWD FUSELAGE	3	3	3	3
HEATSINK PERIMETER - RH IB ELEVON	2	2	2	1
HEATSINK PERIMETER - RH OB ELEVON	1	1	1	COMPLETE
HEATSINK PERIMETER - LH IB ELEVON	2	2	2	1

Backup Charts

STS-129 LSFR

OMRS Status

Baselined Files

- None

Open Work

ECD

- RCNs
 - FII, V2 Post Mate
 - PP17851 ISS-ULF3 Baseline (P545) 04/21/09
 - PP17850 MISSE 7 Baseline (P548) 04/21/09
 - FII, V4 Pre-Mate
 - PS TBD F2/V4 Mission-Unique List 05/26/09
 - PS TBD FIII MUL 05/26/09
 - PS TBD Adjacent Bent Pin Test 05/26/09
 - FII, V6 Shuttle Experiments
 - None

Issues/Concerns

- None

STS-129 LSFR

Cargo Integration Hardware Status

Delivery Status

- **ROEU Cable Harnesses – (Re-Make)**
 - Hardware Delivery Date: 06/18/09
 - Certification Approval Date: N/A
 - KSC Need Date: 06/18/09

Issues/Concerns

- **Possible addition of PPSUs**
 - Awaiting NASA Safety decision on need

STS-129 LSFR

Annex 1

Baselined Files

- ISS-ULF3 MIP Annex 1 **Baselined**
- MISSE 7 PIP Annex 1 **03/10/09A**

Open Work

- ISS-1J A01 – NSTS 21370 **ECD**
 - Weight & Mass Properties Update **04/09/09A**
 - Part Number Update **04/21/09**
 - Post-CIR Update **04/24/09**
 - Customer input: ELC1 & 2 Mechanical & Electrical Drawings, ELC1 & 2 Functional Flow Diagram, ELC1 & 2 Electrical Schematic Diagram, ELC1 & 2 Safety-Critical Circuit Diagram, Landing Mass Properties for ELC1 & 2, ELC1 & 2 Grapple Fixture Fundamental Vibration Frequencies and Stiffness Matrices Safety Critical Switch List **04/17/09**
- Issues/Concerns
 - None

TGHR Status

- Customer Submittal **07/13/09**
- Release For Review **08/12/09**
- Baseline **09/11/09**
- No Issues/Concerns

STS-129 LSFR

Payload ICDs/PIRNs

All Payload-Unique ICDs are baselined

PIRNS that Impact Flight Products

<u>PIRN #</u>	<u>CD/Payload</u>	<u>Title</u>	<u>ECD</u>
A05687	ICD-A-21545-ELC1	Update Cargo to Orbiter Bond Strap	05/15/09
A05716	ICD-A-21545-ELC1	Incorporate IRNs 131, 132, 134, 139 & 144	04/30/09
A05679	ICD-A-21545-ELC2	Update Sec 3.0 Figures and Section 20	04/22/09
A05684	ICD-A-21545-ELC2	Change Sec 3 Bond Strap to Applicable	05/05/09
A05707	ICD-A-21545-ELC2	Update with Stress Analysis Report Data	04/13/09
A05715	ICD-A-21545-ELC2	Incorporate IRNs 131, 132, 134, 139 & 144	05/04/09
A05714	ICD-A-21548-MISSE7	48" EVA Non Compliance	04/27/09
A05718	ICD-A-21548-MISSE7	MISSE7 ICAPC Relocation	05/11/09
A05713	ICD-A-21548-SASA	48" EVA Non Compliance	04/27/09

Issues/Concerns

- None

Rescue Flight Status

STS-129 Reconfiguration Engineering Products will be developed by the Engineering Order To Follow (EOTF) process.

BACKUP



CONFIGURATION / Facilities

- **OV-104: Flight 31**
- **OMS Pods: LP04 / RP01**
- **ET: 133**
- **SRB: BI-140/RSRM 108**
- **SSME: 2061 (#1), 2051 (#2), 2058 (#3)**
- **Payload:**
- **Flight Software: OI-34**
- **Firing Room: 4**
- **OPF Bay: 1**
- **MLP: 3**
- **VAB High Bay: 1**
- **Pad: A**



STS-129

Launch Site Flow Review

Flight Software Overview

Judi Powell

USA FSW

FRWG 04/13/09

PRCB 04/16/09

STS-129 LSFR (FSW)

- **STS-129/OV-104 Flight Software (FSW) Versions**
 - Second scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS OI-34 content)
 - Second scheduled flight of MEDS IDP VI 07.00/MDUF VI 06.00 (SASCB SCR 98113 documents content)
 - Third scheduled flight of MAGRS-3S Link 613-996-008 Software (Link-008) (SASCB SCR 98115 documents content)
- **STS-129/OV-104 Flight Software Payload/Vehicle Support:**
 - ISS ULF3
 - Orbiter Interface Unit (OIU)
 - Sequential Still Video (SSV)
 - Orbiter Docking System (ODS)
 - Trajectory Control System (TCS)
 - 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-129 LSFR (FSW)

- **STS-129 Source Changes/Edits for Primary Flight Software (Base)**
 - SCR 93211A Update of SSMEC Vehicle Data Table (VDT) for Enhanced Accelerometer
 - SCR 93262A Film ET Camera
 - SCR 93267A Removal of the Set and Reset to False Cmds For the RCS Tank Iso Valves
 - DR 126366 SM GPC Failure to Send GCIL Commands
- **STS-129 Patch Implementation for Primary Flight Software**
 - None
- **STS-129 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - None
- **STS-129 Patch Implementation for Backup Flight Software**
 - None

STS-129 LSFR (FSW)

- **Products**

- **STS-129/OV-104 Base delivery schedule (available to field)**
 - FPSB**
 - **Shuttle Data Tape** **March 10, 2009A**
 - **Mass Memory Unit** **March 30, 2009A**
- **An STS-129/OV-104 ADTL SDT will be required to support the O2 Cross Over Valve (PRCB CR S070006)** **FPSB**
 - **Shuttle Data Tape** **August 06, 2009**
 - **The ADTL Mass Memory may not be required.**
 - **Decision to deliver this product will be made in May, 2009**
 - **Mass Memory Unit** **August 20, 2009**

- **Open Items**

- **Potential new requirements for an additional power safety inhibit to disconnect one or both of the Express Logistics Carrier (ELC)s from their associated Remotely Operated Electrical Umbilical (ROEU) (potentially implemented via a Payload Power Switching Unit (PPSU)).**

- **Concerns/Issues**

- **No issues or concerns with STS-129 at this time**



STS-129 LSFR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date April 16, 2009	Page 1

STS-129 LSFR

FCE/GFE Status

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



STS-129 LSFR Flight Crew Equipment/GFE		Presenter MV5/Kenneth Brown	
		Date April 16, 2009	Page 2

- **No Changes Since LSRR**
- **Except for RMS End Effector, need dates and delivery dates have been partnered. Delivery of modified RMS End-Effector is presently 2 days past KSC need date. GFE team will work with KSC team to refine dates**
- **Tech orders and hardware list noted in backup charts, reference only**
- **Changes since STS-125:**
 - **Reconfigure from HST to ISS – reinstall ODS mechanism, TCS, WVS antennas**
 - **NOTE: WVS antennas at Xo 1126 location (bay 10) not installed due to interference with ELC2 primary latches**
 - **OMS pod SGUs removal (end of certified service life)**



STS-129 LSFR Flight Crew Equipment/GFE		Presenter MV5/Kenneth Brown	
		Date April 16, 2009	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 RMS EE was upgraded during STS-126 flow**
- **OV-103 RMS EE will be upgraded during STS-128 flow (EE S/N 403)**
- **OV-104 RMS EE will be upgraded during STS-129 flow (EE S/N 402)**
 - EE S/N 402 will be upgraded following STS-119 and returned in August for installation on OV-104
- **Tech Order M072-544502-036 reflects the new -13 EE configuration**

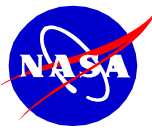


STS-129 LSFR Flight Crew Equipment/GFE	Presenter MV5/Kenneth Brown	
	Date April 16, 2009	Page 4

BACKUP



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



STS-129 LSFR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date April 16, 2009	Page 5

Tech Order numbers are identified for reference only. Report generated April 3, 2009.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Remarks	JSC Contact
A (port forward)	M072-750025-076	7/3/09	1/17/07	1/15/09	C	8/3/09	8/3/09	Camera/PTU from STS-127.	Randall Moore
B (port aft)	M072-750025-077	7/3/09	1/17/07	1/15/09	C	8/3/09	8/3/09	Camera/PTU from STS-127.	Randall Moore
C (starboard aft)	M072-750025-078	7/3/09	1/17/07	1/15/09	C	8/3/09	8/3/09	Camera/PTU from STS-127.	Randall Moore
D (starboard forward)	M072-750025-079	7/3/09	1/17/07	1/15/09	C	8/3/09	8/3/09	Camera/PTU from STS-127.	Randall Moore
SRMS elbow camera	M072-544504-014	7/3/09		1/15/09	C	8/3/09	8/3/09	Camera/PTU from STS-127.	Randall Moore
SRMS wrist camera	M072-544504-008	7/3/09	1/17/07	1/15/09	C	8/3/09	8/3/09	Camera from STS-127.	Randall Moore
Centerline Airlock Camera (stowed)	M072-660828-002, plus CCCD stow		3/17/99	1/15/09	C			Units last flown STS-127	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	8/30/09	10/28/04	1/15/09	C	9/30/09	9/30/09	OPF Rdl out planned for 10/07/2009.	Randall Moore
Righthand Umbilical Camera	M072-705001-028 M072-705001-027	8/30/09	10/28/04 10/28/04	1/15/09	C	9/30/09	9/30/09	OPF Rdl out planned for 10/07/2009.	Randall Moore
Digital Television (DTV)	M072-710570-007		11/15/07		C			Installed Hardware	Larry Schmidt
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001		3/7/00	1/15/09	C			Installed Hardware	Larry Schmidt
Portable Foot Restraint (PFR)	M072-661568-029	7/14/09	3/11/05	1/15/09	C	8/14/09	8/14/09	If required	Andrew Willis
Tools for Rendezvous and Docking (TRAD)	M072-730021-019	7/13/09	7/20/07	1/15/09	C	8/13/09	8/13/09		Larry Schmidt
Video Processing Unit (VPU)	M072-710338-007		3/2/08	1/15/09	C			Installed Hardware	Larry Schmidt



STS-129 LSFR
Flight Crew Equipment/GFE

Presenter MV5/Kenneth Brown	
Date April 16, 2009	Page 6

Tech Order numbers are identified for reference only. Report generated April 3, 2009.

Hardware	Tech Order	KSC Eng Need	Eng(TO) Release	In MEC	Cert O/C	KSC Need	JSC Planned	Remarks	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-013 S-BAND M072-744004-012 S-BAND M072-744004-015 S-BAND M072-744004-017 S-BAND M072-744004-018 S-BAND		6/2/04	1/15/09	O			Installed Hardware	Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002		9/24/04	1/15/09	C			Installed	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-006 camera	9/14/09	11/24/04	1/15/09	C	10/14/09	10/14/09	Camera from STS-127 after repressurization. SSV to PAD A 10/14/2009	Randall Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing	M072-756111-007		8/21/07	1/15/09	C			Insatlled Hardware	Micheal Wright
Wing Leading Edge (WLE) Instrumentation - Right Wing	M072-756111-008		8/21/07	1/15/09	C			Installed Hardware	Micheal Wright
OBSS Sensor Package 2 *** (OPF)	M072-710282-006	7/17/09	4/18/08	1/15/09	C	8/18/09	8/18/09		Larry Schmidt
OBSS SENSOR PACKAGE 1 ** (OPF)	M072-710282-008	7/17/09	4/18/08	1/15/09	C	8/18/09	8/18/09	Same configuration as STS-127. S/N 1007 will fly.	Russell Yates
RMS-13 End Effector	M072-544502-036	7/13/09		1/15/09	C	8/12/09	8/14/09	The current plan is to swap the End Effector on OV-103 post STS-119 and return that End Effector back to MDA for upgrade and eventual use on STS-129. RMS guys at KSC will need no more that a few days in their lab to perform their off line check out and then a day or two to install in the vehicle.	Kenneth Ruta

EVA Status STS-129/ULF3 Launch Site Flow Review

**Marc Ciupitu
EVA Office
Johnson Space Center
April 16, 2009**

- **Forward Bulkhead PFR**
 - Portable Foot Restraint, SED33105308-307 installed on forward bulkhead.
 - Released Tech Order: M072-661568-029
 - Required to protect for contingency EVA TPS inspection
- **Lightweight Port TSA**
 - Port LWTSA installation – Tech Order: M072-660850-005
 - Port LWTSA Tools installation – Tech Order: M072-660853-002
 - Port LWTSA Tools installation (MSA) – Tech Order: M072-660853-TBD
- **Lightweight Starboard TSA**
 - Starboard LWTSA installation – Tech Order: M072-660850-006
 - Starboard LWTSA Tools installation – Tech Order: M072-66085X-001
- **Winches**
 - Winch P/N SED33101570-327 on Forward Bulkhead
 - Winch P/N SED33101570-325 on Aft Bulkhead

Backup Charts

STS-129 LSFR

OMRS Status

Baselined Files

- None

Open Work

ECD

- RCNs
 - FII, V2 Post Mate
 - PP17851 ISS-ULF3 Baseline (P545) 04/21/09
 - PP17850 MISSE 7 Baseline (P548) 04/21/09
 - FII, V4 Pre-Mate
 - PS TBD F2/V4 Mission-Unique List 05/26/09
 - PS TBD FIII MUL 05/26/09
 - PS TBD Adjacent Bent Pin Test 05/26/09
 - FII, V6 Shuttle Experiments
 - None

Issues/Concerns

- None

STS-129 LSFR

Cargo Integration Hardware Status

Delivery Status

- **ROEU Cable Harnesses – (Re-Make)**
 - Hardware Delivery Date: 06/18/09
 - Certification Approval Date: N/A
 - KSC Need Date: 06/18/09

Issues/Concerns

- **Possible addition of PPSUs**
 - Awaiting NASA Safety decision on need

STS-129 LSFR

Annex 1

Baselined Files

- ISS-ULF3 MIP Annex 1 Baselined
- MISSE 7 PIP Annex 1 03/10/09A

Open Work

- ISS-1J A01 – NSTS 21370 ECD
 - Weight & Mass Properties Update 04/09/09A
 - Part Number Update 04/21/09
 - Post-CIR Update 04/24/09
 - Customer input: ELC1 & 2 Mechanical & Electrical Drawings, ELC1 & 2 Functional Flow Diagram, ELC1 & 2 Electrical Schematic Diagram, ELC1 & 2 Safety-Critical Circuit Diagram, Landing Mass Properties for ELC1 & 2, ELC1 & 2 Grapple Fixture Fundamental Vibration Frequencies and Stiffness Matrices Safety Critical Switch List 04/17/09
- Issues/Concerns
- None

TGHR Status

- Customer Submittal 07/13/09
- Release For Review 08/12/09
- Baseline 09/11/09
- No Issues/Concerns

STS-129 LSFR

Payload ICDs/PIRNs

All Payload-Unique ICDs are baselined

PIRNS that Impact Flight Products

<u>PIRN #</u>	<u>CD/Payload</u>	<u>Title</u>	<u>ECD</u>
A05687	ICD-A-21545-ELC1	Update Cargo to Orbiter Bond Strap	05/15/09
A05716	ICD-A-21545-ELC1	Incorporate IRNs 131, 132, 134, 139 & 144	04/30/09
A05679	ICD-A-21545-ELC2	Update Sec 3.0 Figures and Section 20	04/22/09
A05684	ICD-A-21545-ELC2	Change Sec 3 Bond Strap to Applicable	05/05/09
A05707	ICD-A-21545-ELC2	Update with Stress Analysis Report Data	04/13/09
A05715	ICD-A-21545-ELC2	Incorporate IRNs 131, 132, 134, 139 & 144	05/04/09
A05714	ICD-A-21548-MISSE7	48" EVA Non Compliance	04/27/09
A05718	ICD-A-21548-MISSE7	MISSE7 ICAPC Relocation	05/11/09
A05713	ICD-A-21548-SASA	48" EVA Non Compliance	04/27/09

Issues/Concerns

- None

Rescue Flight Status

STS-129 Reconfiguration Engineering Products will be developed by the Engineering Order To Follow (EOTF) process.



STS-129 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-16-09**

Backup Material

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



STS-129 Launch Site Flow Review

Presenter
MK-SIO / A. Swift

Date **04-16-09** Page **1**

Mandatory RCNs:

NONE

Non-Mandatory Value Added RCNs:

NONE



STS-129 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-16-09**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115129 on 02-23-09

- V072-000001-282 (Rev. VW) Space Shuttle System (Rel. 03-06-09)
 - V072-200209-001 (Rev. NEW) Mission Equipment Cargo Support (Rel. 01-15-09)
 - SGD32104452-401 (Rev. A) Crew Compartment Configuration (Rel. 03-19-09)
 - 402 Descent
 - V070-000001-004 Orbiter General Assembly
 - V070-410100-018 SSME Installation
 - 10100-0061-177 Integrated SRB General Assembly (BI-140)
 - 80901000000-530 External Tank Assembly (ET-133)
- STS-129 CIR + 70 days Mission Configuration Product Plan (MCP) will be published on 04-17-09 and will be republished at LSRR +18 days on 04-06-09.



STS-129 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-16-09**

SSP System Drawings – (Continued)

Ferry Configuration

- **V072-000001-283** (Rev. VW) Space Shuttle System Drawing (Rel. 03-06-09)
 - **V072-200209-002** (Rev. NEW) Mission Equipment Cargo Support (Rel. 01-15-09)
 - **SGD32104452-001** (Rev. A) Crew Compartment Configuration (Rel. 03-19-09)
 - **V072-300055-025** (Rev. BT01) Ferry Flight Configuration (Rel. 12-11-08)

SCA 911

LW MAR
8929-324

ML60B 6013
-310
PRIME C/L CAM
GFE TV CONTROL

ML60E TBD
-XXX
PGSC ACCESS

ML60M 6014
-312
B/U C/L CAM
LEAK DETECTOR

VOL B 7436
(MA73J) -TBD

VOL 3B 7425
(MA73J) -320
QUICK DON
MASKS(2)/CABIN AIR
CLEANER/AUD.DOS.
BTA/LCD MONITOR/
DCS 760 CAM/SPOT-
LIGHT/400MM LENS/
PD100 CAMCDR/FLASH
28-70MM LENS

A16 8706
-314
CAM BAG
PILOT

CDR	CHARLIE HOBAUGH
PLT	BUTCH WILMORE
M/S #1	LELAND MELVIN
M/S #2	MIKE FOREMAN
M/S #3	RANDY BRESNIK
M/S #4	ROBERT SATCHER
M/S #5 (DN)	

MODULAR LOCKER LAYOUT ASCENT

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

MF43C 1900 M/S #2 -309 CLOTHING	MF57C 8072 M/S #3 -302 CLOTHING	MF71C 3005 M/S #4 -305 CLOTHING
---------------------------------------	---------------------------------------	---------------------------------------

MIDDECK FORWARD

MF14E 2760 FRESH FOOD -306	MF28E/G 0644 GLACIER -301
MF14G 2761 MENU FOOD -308	MF28H XXXX IFM BREAKOUT BOX -334 ALTIMETER
MF14H 2763 MENU FOOD -304	MF28K 0655 IFM TOOLS -301
MF14M 2765 MENU FOOD -304	MF28M 2762 MENU FOOD -307
MF14O 2766 MENU FOOD -305	MF28O 2767 M/S #5 DN CLOTH -304

MF43E 0631 HH LIDAR W/ NIGHTSCOPE 2ND HHL (TRAD) SSV BPSMU -TBD	MF57E 6240 ORBITER FDF SODF -311	MF71E TBD IPT RESERVE -XXX
--	--	-------------------------------

MF43G 1902 CDR -309 CLOTHING	MF57G 8073 M/S #1 -302 CLOTHING	MF71G 1903 PLT -306 CLOTHING
------------------------------------	---------------------------------------	------------------------------------

MF43H 0305 CREW PREF (HCTB) -304	MF57H 5473 ORBITER FDF -305	MF71H 0645 CREW CARE PKG -301
--	-----------------------------------	-------------------------------------

MF43K 1901 POST INSERTION -306	MF57K 6291 SODF -311	MF71K HYGIENE
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MF43M 0641 HYGIENE -301	MF57M 1908 CREW SUPPORT -309	MF71M 8965 CONDENSATE COLL SUPA(12) INGRESS HDWR O-RING/BRAYCOTE STS CSA-CP -311
----------------------------	---------------------------------	---

MF71O 6299 COAS/FLUOR LT SHIELDS/DCS 760 AUDIO DOSIMETER BTA -318	MA9N 7432-317 SOFT STWG BAGS PHKS (6) 4980-309 CCK/LIGHT STICKS/COMM PHK 8071-312 RSTRNTS/FLUID LOAD FIBERSCOPE 8070-302
---	--

LEADER: _____

DATE: 01-23-09

LAUNCH: 11-12-09

FLIGHT: STS-129/ULF3

VEHICLE: OV-104

CREW: 7 MAN 11 + 1 + 2 DAYS

RQMTS: SRMS, ERGOMETER,
SORG, NO RCRS,
SLEEPING BAGS

MIDDECK AFT

MA9D XXX ISS RESERVE -327	LOCKER TRAD SPARE DTV MUX SPARE DTV DSR SPARE DTV VIP
------------------------------	---

MA9F 6250 SOMS/RESUC -353	MA9G 8737 RCC COLD BAG ASSY -306	MA16G 8047 DC VAC -304 CTB (6015-326)
------------------------------	--	---

MA9J 6269 PRINTER TRAYS IODINE REMOVAL 6256-303	MA16J 8723 PHOTO/TV STOW-N-GO -302 (CTB)
--	---

MA9L 6629 COLOR PRINTER -306 (CTB)	MA16L 0634 PCS LAPTOP PCS ACCESSORIES PGSC ACCESSORIES CD STOWAGE CASE -305
--	---

MA16N 3006 MED KITS MAK (2) -305
--

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

VOLUME D (MD52C)
RCC TOOLS

VOLUME F (MD76M)
WET TRASH

VOLUME G (MD80R)
CONT UCDs
WASTE MGMT

VOLUME H (MD23R)
EVA ACCESS (INBD)
EVA ACCESS (OBD)

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

EXT AIRLOCK 5555
2-EMUs (PORT) -320
EXT A/L FLOOR
EVA TOOLS (PORT) -TBD

MD CEIL (PORT 1) TBD

ISS RESERVE

MD CEIL (PORT 2) 0654
-301

RSK ACES

MD CEIL (STBD 1) 0275
-306

RFTA
NODE 3 HDW

MD CEIL (STBD 2) 6665
-343

NODE 3 HDW

MD FLOOR (PORT 2) 0637
-TBD

4 MLE (IPT RESERVE)
ANTIMICROBIAL APP

MD FLOOR (PORT 1) TBD

WATER TRANSFER
RFTA
CheCS

MD FLOOR (STBD 2) TBD

EMU HDWR

MD FLOOR (STBD 1) 0657
-TBD

EMU HDWR

31 LIQH- 29 + 1 ATCO IN LIQH BOX, 2 INSTLD (7435-320)
6 G-SUITS

WINDOW SHADE BAG - WINDOW SHADES (5548-352)
IFM CABLES & HOSES (4259-343)
MONITOR SHIELDS

L10A1: AVIU (6686-331)
L10A2: DTV MUX
L10A3: DTV VTR/VIP
L1: PDIP 2 OIU 1/2
L12A1: SSP 1
L12A2: SSP 2
L12A3: PDIP 1
R12A1: VPU
R12A2: OBSS/OPP

* NOT APPROVED
O LATE LOAD
X SWAP
X 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. SGD32104452
/USR/DWGS/LOCKER/STS129
CCMM: T. HUNT 483-3063

NOTE: LOCKER LAYOUTS ARE FOR REFERENCE ONLY AND ARE NOT RELEASED DRAWINGS.
FOR RELEASED DRAWINGS, REFER TO CCCD DRAWING # SGD32104442



STS-129 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **04-16-09**

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 10 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
- **No impacts for all six disciplines 5**
- **One or more disciplines with impacts, documentation approved 1**
 and/or pending approval
 - **MCRs 19271**



STS-129 Launch Site Flow Review	Presenter Kenneth Nowak	
	Date 04-16-09	

Modification Impact Report – (Continued)

- Possible impacts still under review 4
 - MCR 30164, 30186, 30250 is being reviewed for EMI impacts
 - MCR 30231 is being reviewed for OMRSD and GSE impacts

1MRCs REPT. 4650-1
PAGE NO. 1

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0129

MEQ

ECP-MCR/KIT SEQUENCE

RUN TIME

15:10 DATE 04/06/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
019393	AUTH	K609-613004-001	0002 000	AVIONICS HEAT EXCHNR INSTLN, ORIFICE RESIZE-BAY 3, ECLSS
S115129A	MAND			
2009-03-31	KSC	NOT REQUIRED		ADDED BY EDS I/F & K609-613004 NEW
	031			
030099	AUTH	TCTIM0030099REF	0001 000	D-HATCH DECALS RELOCATION ON UPPER HATCH BLANKET
S115129A	MAND			
2009-03-31	KSC			ADDED PER V828-000002 F18 & V828-390179 A02 MVD TO STS-129
	031			FRM STS-128 PER REMANIF/S042013HQ
	AUTH	TCTIM3330099REF	0001 000	RELOCATE ACTUATOR HATCH HANDLE POSITION DECAL, MV0828A
S115129A	MAND			
2009-03-31	KSC			ADDED PER V519-331035 A08 & V519-331051 A16
	031			
030186	AUTH	TCTIM0030186REF	0003 000	OMS POD MICRO-WIS STRAIN RECORDER REMOVAL
S115128	MAND			
2008-08-25	KSC			ADDED PER V886-000002 A14, REPLACES 030186,0014,0 MOVED TO
	031			STS-129 FROM STS-128 PER REMANIFEST
TOTAL MODS =		4		

1MRC5 REPT. 4650-1
PAGE NO. 2

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0129

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

15:10 DATE 04/06/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRIO	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
ORB-0085B	AUTH	J6116	0104 003	AMES GAP FILLER REMOVAL AND REPLACEMENT
2006-08-16	MAND			
	KSC		SPAR	
	031			
ORB-0085R01	COMP	J6198	0104 002	OV-104 MID FUSELAGE LOCK BOLT OPPORTUNITY SAMPLING AND
2007-03-12	MAND			
	KSC		SPAR	FASTENER REPLACEMENT
	031			
S-J6275A	AUTH	J6275A	0104 001	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
2008-02-26	MAND			
	KSC		SPAR	CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT LSFR,
	031			AND FINALIZED AT DLSFR FOR EACH FLOW.
S-J6327	AUTH	J6327	0104 001	WLE RCC JOGGLE INSPECTION
2008-02-14	MAND			
	KSC		SPAR	
	031			
S-J6329	COMP	J6329	0104 000	ASA #2 & #4 AND ATVC #3 & #4 R&R FOR OV-104, FLT 31
2008-05-15	MAND			
	KSC		SPAR	PER USA PE:JEFF SCHIECK, TO PERF ON FLT 30, NOT 31
	031			
S-J6341A	AUTH	J6341A	0104 000	EVALUATION OF OMS POD LI-900 TILE INSTALLED ON 0.090" SIP
2008-04-09	MAND			
	KSC		SPAR	
	031			

S-J6351	COMP MAND KSC 031	J6351	0104 000	OV-104 RUDDER/SPEEDBRAKE (RSB) ACTUATOR EXTERIOR INSPECTION
2008-05-15			SPAR	PER USA PE, JEFF SCHEICK TO PERF ON FLT 30, NOT 31
S-J6378	AUTH MAND KSC 031	J6378	0104 000	OV-104 BODY FLAP PDU GEARBOX FLUID LEVEL INSPECTION
2008-07-18			SPAR	
S-J6380	AUTH MAND KSC 031	J6380	0104 000	EVA PDU TOOL INTERFACE VERIFICATION
2008-07-07			SPAR	
S-J6387	COMP MAND KSC 031	J6387	0104 000	PASSIVE DOCKING TEST ON OV-104
2008-08-15			SPAR	WORKED ON FLT 30 DUE TO ROLLBACK
S-J6389	AUTH MAND KSC 031	J6389	0104 001	CLOSE CLEARANCE MEASUREMENTS OF ORBITER HARDWARE
2008-07-10			SPAR	
S-J6399	AUTH MAND KSC 031	J6399	0104 000	0-GAUGE PROTECTION FOR OV-104, FLIGHTS 31-35
2008-10-03			SPAR	
S-J6402	AUTH MAND KSC 031	J6402	0104 001	MICRO INSPECTION OF CAPTIVE GAP FILLERS
2008-08-08			SPAR	DOCUMENTS MICRO INSPECTION OF SPECIFIC CAPTIVE GAP FILLERS DUE TO OBSERVED FLT DEGRADATION.
S-J6407	AUTH MAND KSC 031	J6407	0104 001	STS-125 CLOSE CLEARANCE MEASUREMENTS OF SRMS MPM AND OBSS
2008-09-02			SPAR	VEH/EFF:OV-104 FLTS 30, 31.

S-J6410	AUTH J6410	0104 000	AFT STUB CRACKED TILE INSPECTION
	MAND		
	KSC		SPAR
2008-09-18	031		
S-J6414A	AUTH J6414A	0104 000	RUDDER SPEED BRAKE THERMAL TAB INSPECTION
	MAND		
	KSC		SPAR
2008-12-19	031		
S-J6430	COMP J6430	0104 000	MIDDECK PARTITION INSPECTION
	MAND		
	KSC		SPAR
2008-10-14	031		WILL BE WORKED DURING FLT 30 PROCESSING DUE TO ORB ROLLBACK

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0129

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

15:10 DATE 04/06/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S-J6441	AUTH	J6441	0104 001	OV-104 LARGE PUTTY REPAIRS
2008-11-20	MAND			
	KSC		SPAR	TPS REPLACEMNT WILL BE PARALLEL TO PLANNED OPF PRO CESSG.
	031			TILE REPLCMT FOR OV104-F30:OPPORTUNITY BASIS
S-J6447	AUTH	J6447	0104 000	STS-126 POST FLT INSP AND CONTAMINATION SAMPLING
2008-12-19	MAND			
	KSC		SPAR	
	031			
S-J6466	AUTH	J6466	0104 001	OMS POD PILLOW GAP FILLER INSTALLATIONS
2009-02-09	MAND			
	KSC		SPAR	
	031			
019393 S115129A	AUTH	VK70-613604-001	0104 000	AVIONICS BAY 3A FAN MOD, OV 104 (W/W -002 KIT)
2009-03-31	MAND			
	KSC	NOT REQUIRED		PAR'D FROM FLT 30 TO J3 PER KSC-1879 (TO BE WORKED UNDER
	031			TAD 30240) W/W-002 KIT
S115129A	AUTH	VK70-613604-002	0104 000	KIT - AVIONICS BAY 3A FAN MOD, OV 104 (W/W -001 KIT)
2009-03-31	MAND			
	KSC	NOT REQUIRED		ADDED BY EDS I/F & VK70-613604 A02 OV-104/31 (STS-129)
	031			
019735 S115117CR4	AUTH	TCTIV1019735REF	0104 004	WLE FRONT SPAR PROTECTION FOR SNEAK FLOW - STRUCTURES
2006-11-21	MAND			
	KSC			TRANSFERRED TO GEU FROM GC5. PART DEF FROM OV-104/27. REF
	031			

SEQ 1/STS-117, SEQ 2/STS-122, SEQ 3/125

030231	AUTH	TCTIV2930231REF	0104 000	RUDDER SPEED BREAK INCONEL THERMAL BARRIER REDESIGN STUDY
S115129A	MAND			
	KSC	NOT REQUIRED		ADDED BY EDS I/F & V070-298115 A07
2009-03-31	031			
030250	AUTH	TCTIV7930250REF	0104 000	O2 CROSSOVER VALVE SIGNAL TALKBACK MOD, REF ECN 25005
S115129A	MAND			
	KSC	NOT REQUIRED		ADDED BY EDS I/F & V070-778302 D05
2009-03-31	031			

TOTAL MODS = 25

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0129

PIH

ECP-MCR/KIT SEQUENCE

RUN TIME

15:10 DATE 04/06/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
008836	APPD	TCTIM0008836REF	0020 000	PROVISIONS TO SUPPORT EXPRESS LOGISTICS CARRIER (ELC) PDA
NOT REQD	KSC			ADDED PER V785-714912 E07 - MOVED TO STS-128 FROM STS-129
031				PER REMANIFEST PER S042013HQ
008850	APPD	K712-774041-001	0005 000	ADDITIONAL HARDWARE REQUIREMENT TO SUPPORT STS-129, CIH KIT
NOT REQD	KSC			ADDED PER KIT EO NEW
031				
TOTAL MODS =		2		

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SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0129

SRB

ECP-MCR/KIT SEQUENCE

RUN TIME

15:10 DATE 04/06/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
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S084539LR3	AUTH	FEC A-10358B	B140 000	EDAS SENSOR INSTALLATION SUPPLEMENT FOR BI140 SRB'S
2009-03-10	KAS			
S084539LR3	AUTH	FEC A-10361B	B140 000	SUPPLEMENTAL EDAS INSTALLATION FOR BI140
2009-03-10	KAS			
TOTAL MODS =		2		

Approved STS-129 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS	BEG	END
		WAIVER# (STAT) (INITIAL STS)					
+	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

Approved STS-129 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
+	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

+	-----+						
o		o Waivers	o Except	o Deviat	o Cannib	o Total	o
o	-----+						
o	Total Extracted	o 10	o 5	o 0	o 0	o 15	o
+	-----+						

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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	<p>The following requirement is waived to allow OV-104 to fly with the following out-of-configuration condition:</p> <p>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.</p>	OV-104, Flight 27 thru OV-104, Flight 999	STAYS OPEN
339	S063652	07/09/07	<p>The following requirement is waived to allow OV-104 to ferry from DFRC to KSC with the following out-of-configuration condition:</p> <p>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.</p>	OV-104, Flight 28	

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