



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



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Program Freeze Point

PRCB Presentation

S115130A



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Baseline the STS-130 Mission Specific Requirements and Flow Plans. This CR and the associated Data Package were reviewed at the 04-20-09 FRWG.

Flight Management

MO3/USA-PI

Orbiter Engineering*

Requesting Approval

USA-OE

Payload/Cargo Engineering*

USA-PI

Status in BackUp

KSC Integration

MK-SIO

Flight Software

USA-FSW

Orbiter GFE

MV5

EVA

XA

SSME

Baseline at LSFR

MP21



STS-130 LSRR

PRCB

Flight Requirements Status

April 23, 2009

Todd Hellner, Lead MIM
James Flores, USA Flight Mgr.



STS-130 LAUNCH SITE REQUIREMENTS REVIEW

Presenter Todd Hellner
Date April 23, 2009

LAUNCH

02/04/10
 39A/ MLP 2
 CREW SIZE: 6UP/6DN

CONFIGURATION

OV-105(24)
 OMS: LP03;RP04
 ET-134
 BI-141
 RSRM-109
 SSME: (1) TBD (2) TBD (3) TBD
 OI-34 (3rd FLT)
 SSPTS, SRMS, OBSS,
 ODS, SPDUS

PAYLOAD

ISS-20A (NODE 3 W/ CUPOLA)
 MAUI
 SEITE
 SIMPLEX

ORBIT

51.6 DEG
 122 NM
 DIRECT INSERTION
 DURATION: 12 + 1 + 2 DAYS
 EVAs: 3 + 1

CONSUMABLES

CRYO TANK SETS	5 (OFFLOAD 500 lbs)
GN2 TANKS	6 (OFFLOAD 66 lbs)
FWD RCS	1912# (MIN)
AFT RCS	4970# (FULL)
OMS	22760# (FULL)

LANDING

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

RESCUE FLIGHT FOR STS-129



STS-130 LAUNCH SITE REQUIREMENTS REVIEW

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Date April 23, 2009

PERFORMANCE MARGIN

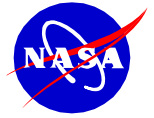
- SIMULATION MARGIN (OCFAF130) +1552

- WEIGHT CHANGES SINCE SIMULATION
 - ORBITER - 4
 - MPS PROP (NOT INERT) +260
 - RECONSTRUCTED ASCENT PERF COLLECTOR - 94
 - TOTAL WEIGHT CHANGES +162 - 162

- OTHER PERFORMANCE PROJECTIONS
 - PROTECTION FOR DOL DISPERSIONS - 700
 - USABLE IMPULSE FOR MPS BGT GEN0901S - 17
 - SRB – M.P. UPDATES - 4
 - SRB – BR / 0.35 MIL HIGHER THAN 0.3705 AVG +70
 - ISP/THST FOR GEN BLOCK 2 @ 104.5% +6
 - PROJ TO 3 MIN WINDOW FROM INPLANE - 300
 - PERFORMANCE CHANGES ADJUSTMENT +12

- CURRENT BASELINED APM (04/21/09) +457

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



STS-130 LAUNCH SITE REQUIREMENTS REVIEW

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FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5 X C.G. inches (LIMIT)</u>
NOMINAL	200651 (233000)	1081.9 (1075.7)
RTLS	239008 (245000)	1083.3 (1077.2)
TAL	237624 (244000)	1083.4 (1077.2)
AOA	233935 (242000)	1081.1 (1075.7)
CONT RTRN*	235400 (233000)	1083.0 (1075.7)

***CONT RTRN EXCEEDS 233K NEOM LIMIT (See Vol. X Bk. 1 Sec. 3.3.1.1.9)
 (NO DOCK PLS CASE)**

**NOTE: RTLS INCLUDES 185 SEC ARCS & 25 SEC FRCS DUMPS
 TAL INCLUDES 120 SEC ARCS & 65 SEC FRCS DUMPS
 126 LBS AFT BALLAST (EMPTY BOXES)**

ESTIMATES BASED ON OCF130 AND MODIFIED FOR WEIGHT CHANGES THRU 04/21/09.



STS-130 LAUNCH SITE REQUIREMENTS REVIEW

Presenter

Todd Hellner

Date

April 23, 2009

Flight Requirements Status

PRCB CR's

- None

20A MIP (NSTS 21549):

- Current version available on PILS: Basic + Chg 1-3, 3/5/09
- Pending MIP CRs:
 - None

STS-130 FRD (NSTS 17462-130):

- Latest revision: 003, dated 3/17/09
- Pending FRD CRs:
 - None

Issues/Concerns:

- None Identified

STS-130 OV-105 Flight 24 LSRR Orbiter Element

Kim Guodace
Scott Copenhaver

USA/OE
Boeing / VMMO

April 23, 2009

STS-130 OV-105 Flight 24 LSRR Orbiter

Purpose:

- Obtain program authorization for baseline of modifications to be performed prior to STS-130, OV-105 Flight 24.
 - Mandatory Mods – 2
 - Rudder Speed Brake Inconel Thermal Barrier Redesign
 - O2 Crossover Valve Signal Talkback
 - Potential Mods – 1
 - MPS Flow Control Valve Reinforced Elbow Mod (Details in back-up)
 - Mission Kit Mods - None
- Present summary of other requirements
 - RCNs / Chits

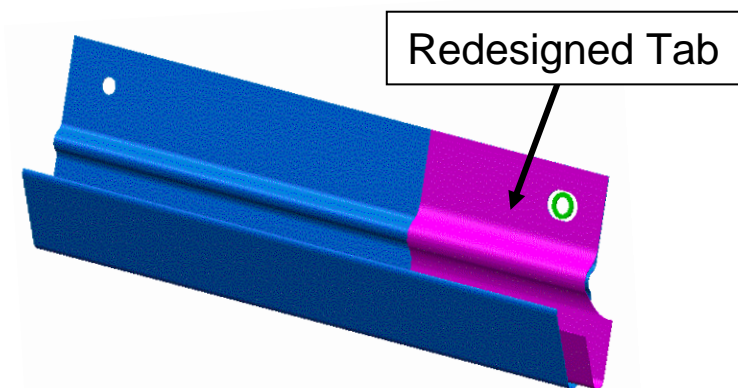
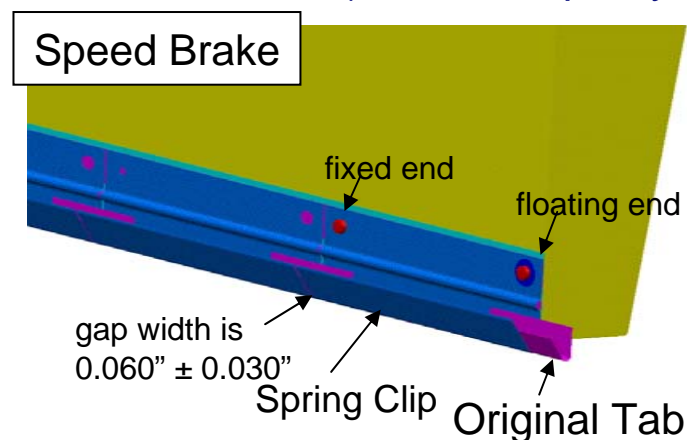
Back-up

- Modification Matrix / Open Mod Certification
- BRI-18 priority status

STS-130 OV-105 Flight 24 - LSRR Baseline

Request authorization to baseline the following mod

- **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-130 OV-105 Flight 24 - LSRR Baseline

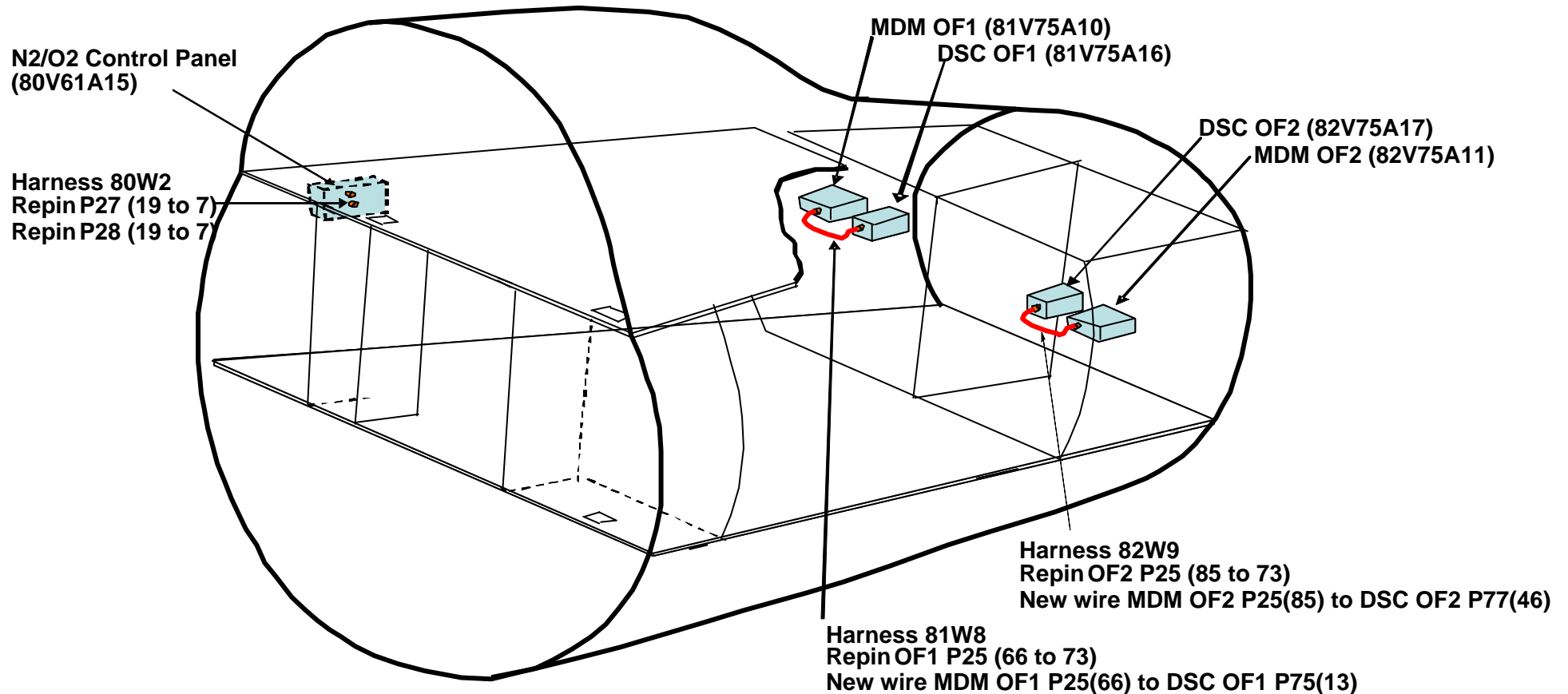
Request authorization to baseline the following mod

- **TAD 30250 – O2 Crossover Valve Signal Talkback**

- 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
 - Provides visibility of valve position for ground monitoring only (LCC requirement)

STS-130 OV-105 Flight 24 - LSRR Baseline

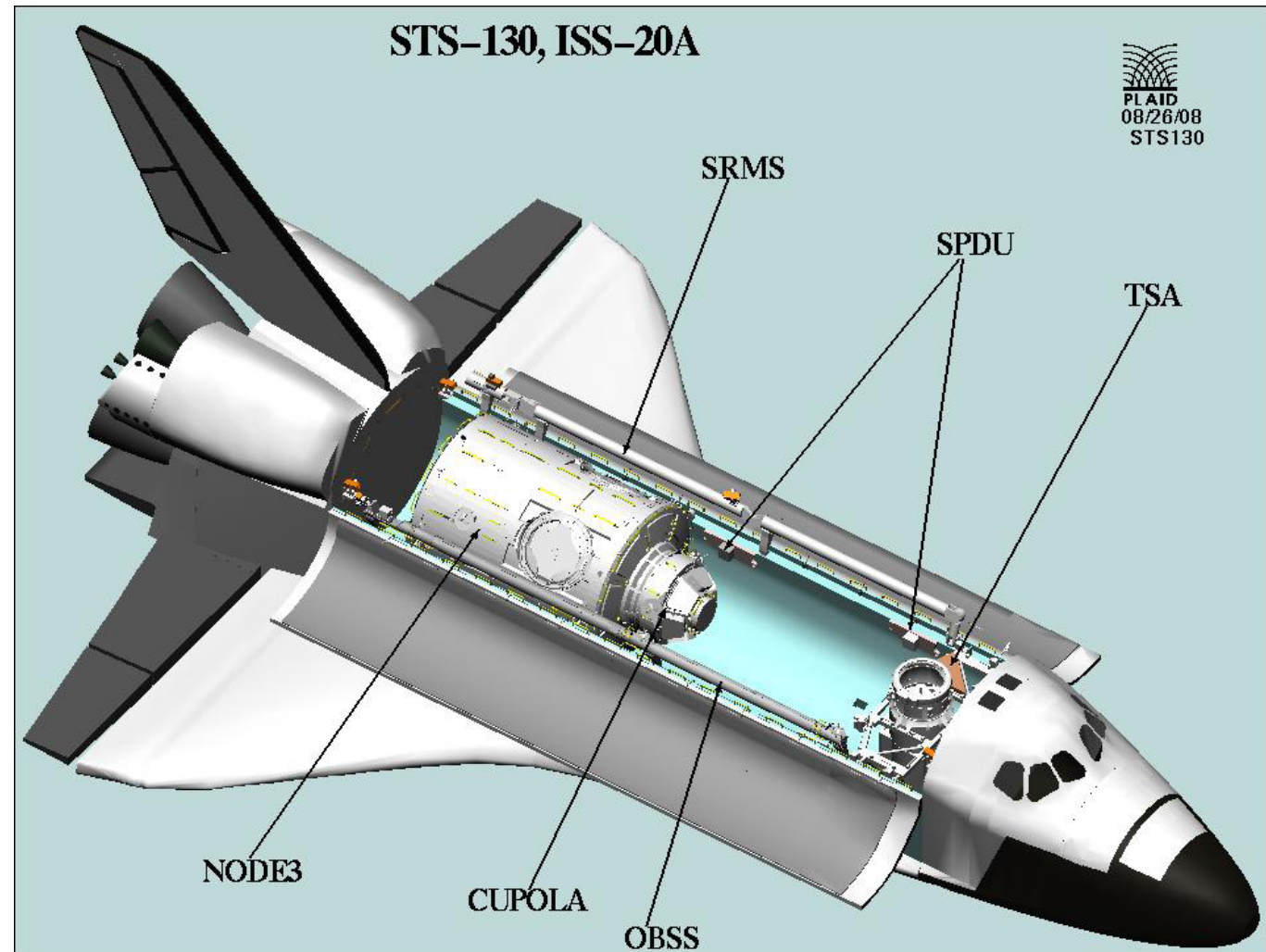
Overview of N2/O2 Control Panel & MDM/DSC's Wire Mods



STS-130 OV-105 Flight 24 - LSRR Baseline

Mission Kit modifications

- None



RCNs/Chits

The following are presented for information only

Pending RCNs No.	Title/Description	Notes
OV17826	APU GN2 QD Heater Functional	In Draft

Chit No.	Title	Description
J6116	AMES Gap Filler Removal and Replacement	Approved prior to STS-118. Priority areas completed.
J6275A	Orbiter Structure IML Surface Corrosion Sampling Inspection	Approved
J6372	Post Flight Inspection of Orbiter Windows for Micro-Meteoroid Impact	Withdrawn - PRT determined MMOD Eval per KSC Work Instruction is adequate
J6379	OV-105 Body Flap (BF) Power Drive Unit (PDU) Gearbox Fluid Level Inspection	Approved
J6414A	Rudder Speed Brake Thermal Tab Inspection	Approved – (may be superceded by mod?)
J6495	MAGR-3S Link-008 Firmware Upgrade on Remaining Receivers	Pending
JXXXX	OV-105 Large Putty Repair removal	In Draft
JYYYY	Node 3 Close Clearance measurements of Orbiter Hardware	In Draft
	MDM Waveform Monitoring (Similar to Chit J6487 for OV-103)	Potential chit for risk mitigation due to diode concerns. Under Review with OPO.

**STS-130/20A NODE3 / Cupola
Launch Site Requirements Review
Payload Cargo Engineering Status**

ABBAS ELSABAGH

281.212.6186

04-23-2009

STS-130 LSRR

Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Released</u>
V072-200210	MECSLSI	02-27-09
VA72-200210	Cargo Arrangement	02-27-09
VD72-200210	Avionics Diagram	02-27-09
VS72-200210	Integrated Schematic	02-27-09
VS70-540365	Retention Schematic	02-27-09

- The above engineering released represent STS-130 CIR datapack on OV-105.

Engineering Open Work

- FRED

ECD: 06-05-2009

Standardization

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

STS-130 LSRR

Payload ICDs/PIRNs

Payload-Unique ICD: ICD-A-21549-NODE3 is baselined

Open Work

- **Future Standard Work**
 - **Sect 20 for Close Clearance Analysis**
 - **Structure/Loads Reference Reports (L-5)**
 - **Thermal Report (L-5)**
 - **Hazard Report**
 - **Potential update per 04/24/09 CAD (PVGf added)**
 - **Incorporate ISS IDD IRNs (L-5)**

Issues/Concerns

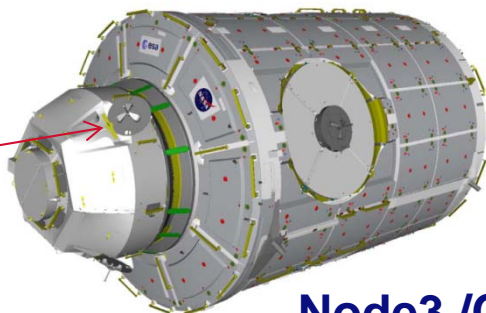
- **None**

STS-130 LSRR

CIR - ICD Discussion

- Two non-standard FRGFs mounted on Cupola
 - Spacers added to provide additional clearance for EVA removal of FRGF
 - Non-standard configuration will be documented in STS-130 On-Orbit ICD
 - FRGF used only during on-orbit operation
 - On-Orbit ICD CR Closure ECD: 05/08/09
 - Node3 ICD will provide a pointer to the On-orbit ICD for this Configuration
 - PIRN closure ECD: 06/17/09
 - KSC/ISS Payload PR was issued to document the non-STD FRGF configuration
 - PR closure is due on 07/16/09
 - No impact to payload cargo engineering products

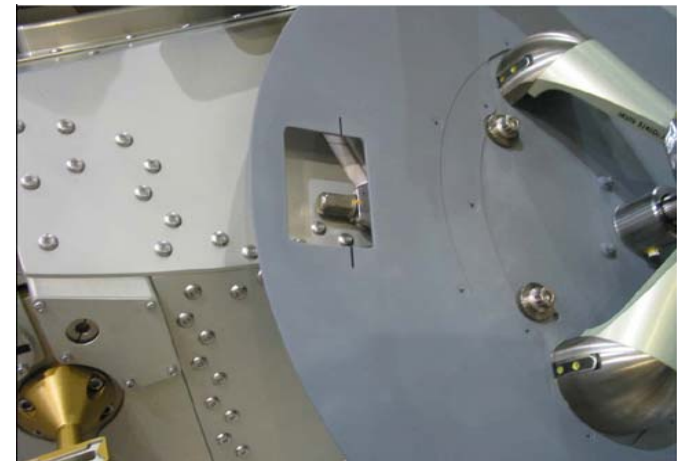
FRGF On Cupola
1 of 2



Node3 /Cupola



Side View of EVA Release Rod/Cupola Interference



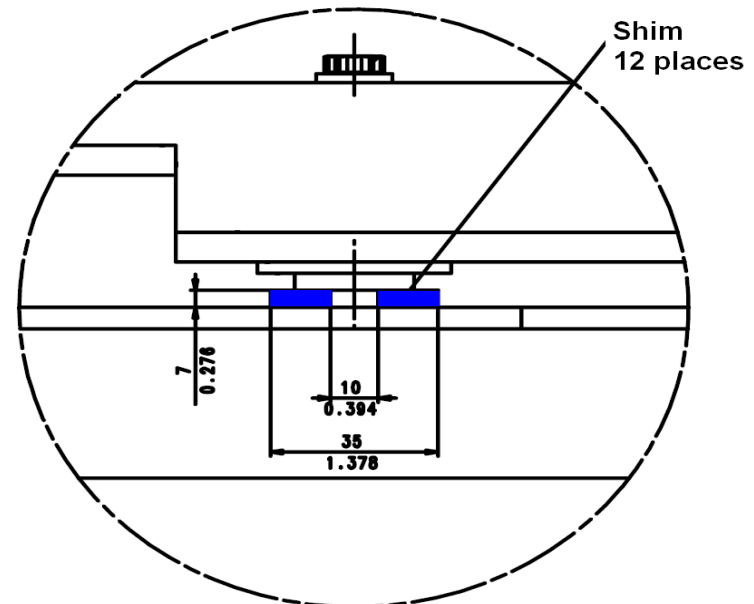
Top View of EVA Release Rod/Cupola Interference

STS-130 LSRR

CIR - ICD Discussion



End View of EVA Release Rod/Cupola Interference



Dimensions of Proposed Spacer

STS-130 LSRR

Cargo Close Clearance Process

- 34 points on Node 3 have less than 1” dynamic clearance (all greater than 0.5”)
- One point on Node 3 has dynamic interference of 0.4”
 - J6YY connector and MLI blanket to SRMS boom

CIR Assessment

Static Clearance: 2.15”

Dynamic Clearance:

Liftoff: 0.9”

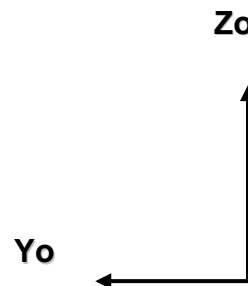
Ascent: -0.4”

Descent: 0.2”

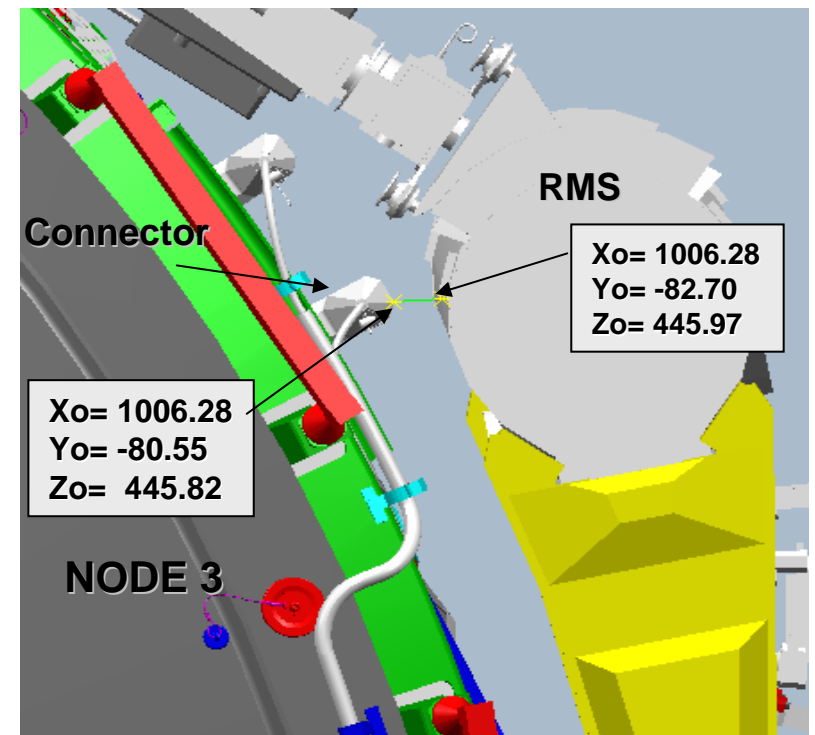
Abort landing: -0.2”

Options

1. Move/modify RMS
2. Move/modify connector on Node 3
3. Refine analysis



NODE 3 J6YY Connector to RMS



STS-130 LSRR

Cargo Close Clearance Process Continue

Option 1 – Move /modify RMS

- Orbiter determined option not acceptable and not feasible

Option 2 – Move or Modify connector/Node 3

- Launch Package (LP) has asked Alenia to assess the high level impacts of moving the connector ECD: 05/08/09

Option 3 – Refine Analysis

- Several actions were assigned ECD: 05/08/09
- Cargo Integration (CI) (USA/Boeing) to revisit assumptions used in the analysis including tolerances, MPM alignment specific to OV-105, etc.
- CI to investigate benefit of running an ascent quasi-static analysis with Node 2 and updated RMS model
- LP investigating connector model to verify it is accurate and investigating the impacts if the connector is not present (removal)

At least one joint ISS/SSP meeting will be held once a month to status

- First meeting was Thursday, 04/16/09A
- Next meeting on Tuesday 04/28/09

STS-130 LSRR

Cargo Close Clearance Process Continue

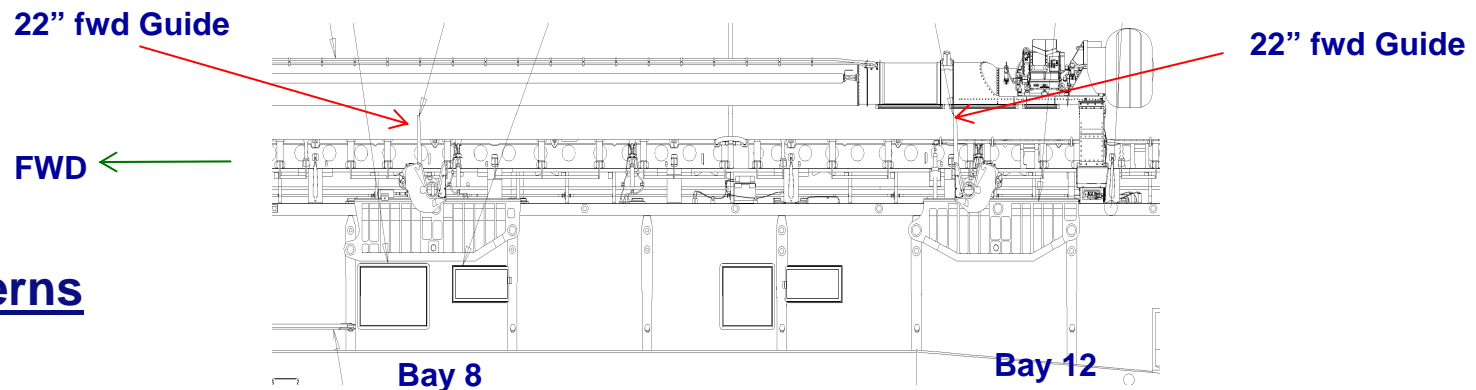
Open Work

- All points with less than 1” dynamic clearance (including interference) will be provided to ISS CAD DPA team for measurement ECD: 05/08/09
 - Part of standard work for large diameter payloads
 - May include several points with clearance between 1.0” and 1.25” to cover possibility of clearance reduction during VLA assessment
- Chit to measure Orbiter close clearance points ECD: 05/08/09
 - Radiator, egress, wiretray, blankets and RMS

STS-130 LSRR

Cargo Integration Hardware Status

- No new Cargo Integration Hardware (CIH) is required for this mission
- Verified that bridges, latches, and CIH is available to support the latest SSP manifest dated April 2, 2009 for the following missions:
 - STS-128 (OV-103, FLT 37, 08/06/2009 LAUNCH)
 - STS-129 (OV-104, FLT 31, 11/12/2009 LAUNCH)
 - STS-130 (OV-105, FLT 24, 02/04/2010 LAUNCH)
- Latch guide allocation was verified (22" single guide in FWD position of each latch)



Issues/Concerns

- None



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Backup Material

FRWG Presentation (With Minor Changes)

Back-up

Modifications Matrix / Open Mod Certification

MCR NO.	MCR TITLE	KIT/ MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
<u>Mandatory Modifications to be Baselined at LSRR</u>				
30231	<u>Rudder Speed Brake Inconel Thermal Barrier Redesign</u> Installs the redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment.	TCTIV2930231REF, 0105, 0 - Installs redesigned RSB inconel thermal barrier tabs	No Tech Order Impact	No MECSLSI Impact
30250	<u>O2 Crossover Valve Signal Talkback Modification</u> Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication.	TCTIV7930250REF, 0105, 0 - Repins the connector at the N2/O2 control panel and reworks the MDM and signal conditioners in the avionics bay	No Tech Order Impact	No MECSLSI Impact
<u>Potential Modifications</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

STS-130 Open Mod Certification (as of 4/14/09)

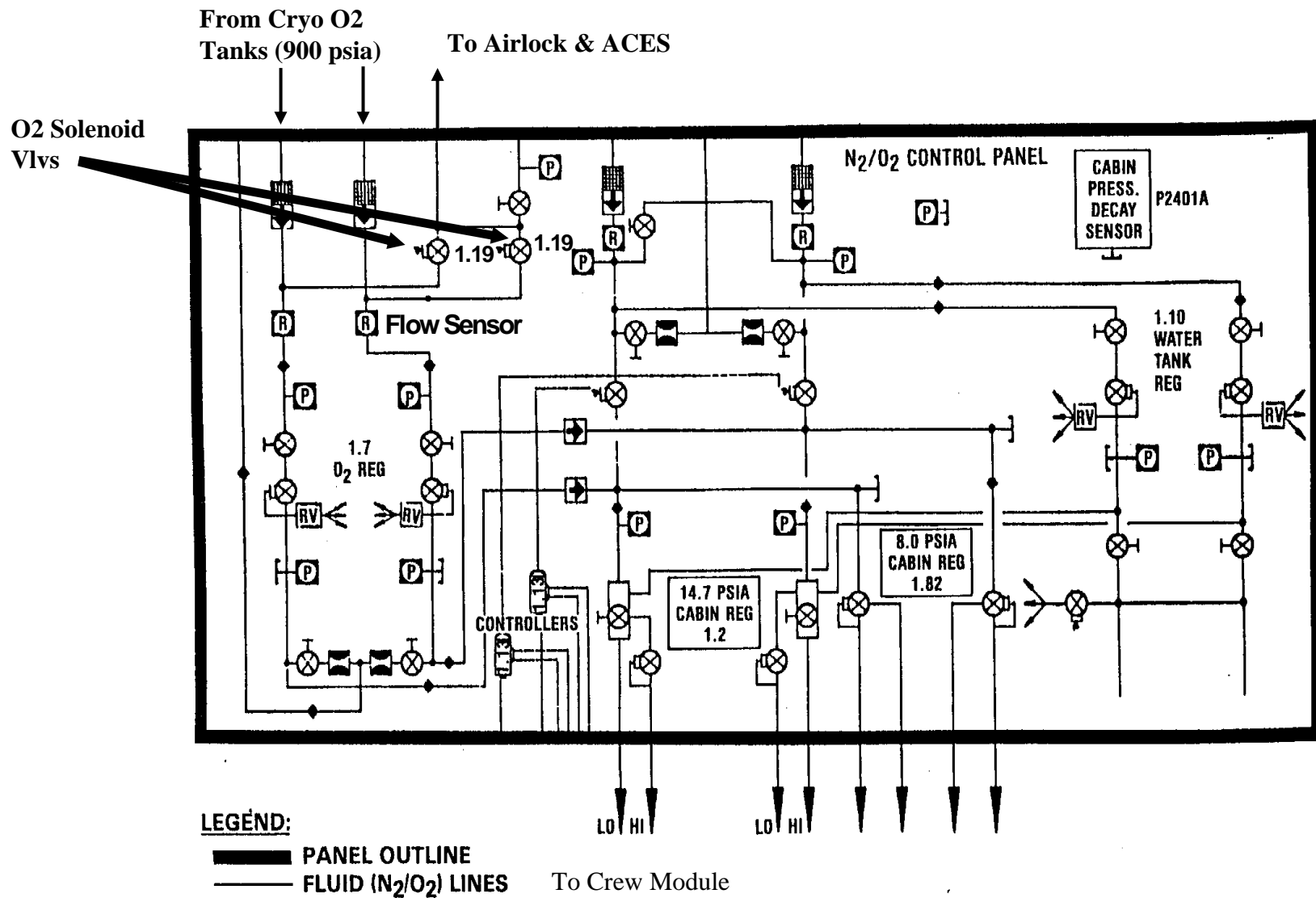
- 2 open CRs/CARs

Boeing Log #	USA Tracking Number	Document #	Part Name	CR	CAR	GSA	ERR	Subm to USA	Plnd Apvl Date	Comments/Description of Change
6499	129	07-290101-001S	External Insulation (RSB T/B)	X				5/29/09P		Certification for Rudder Speed Brake Inconel Thermal Barrier Tab Redesign.
6500		20-07-290101-001S			X					

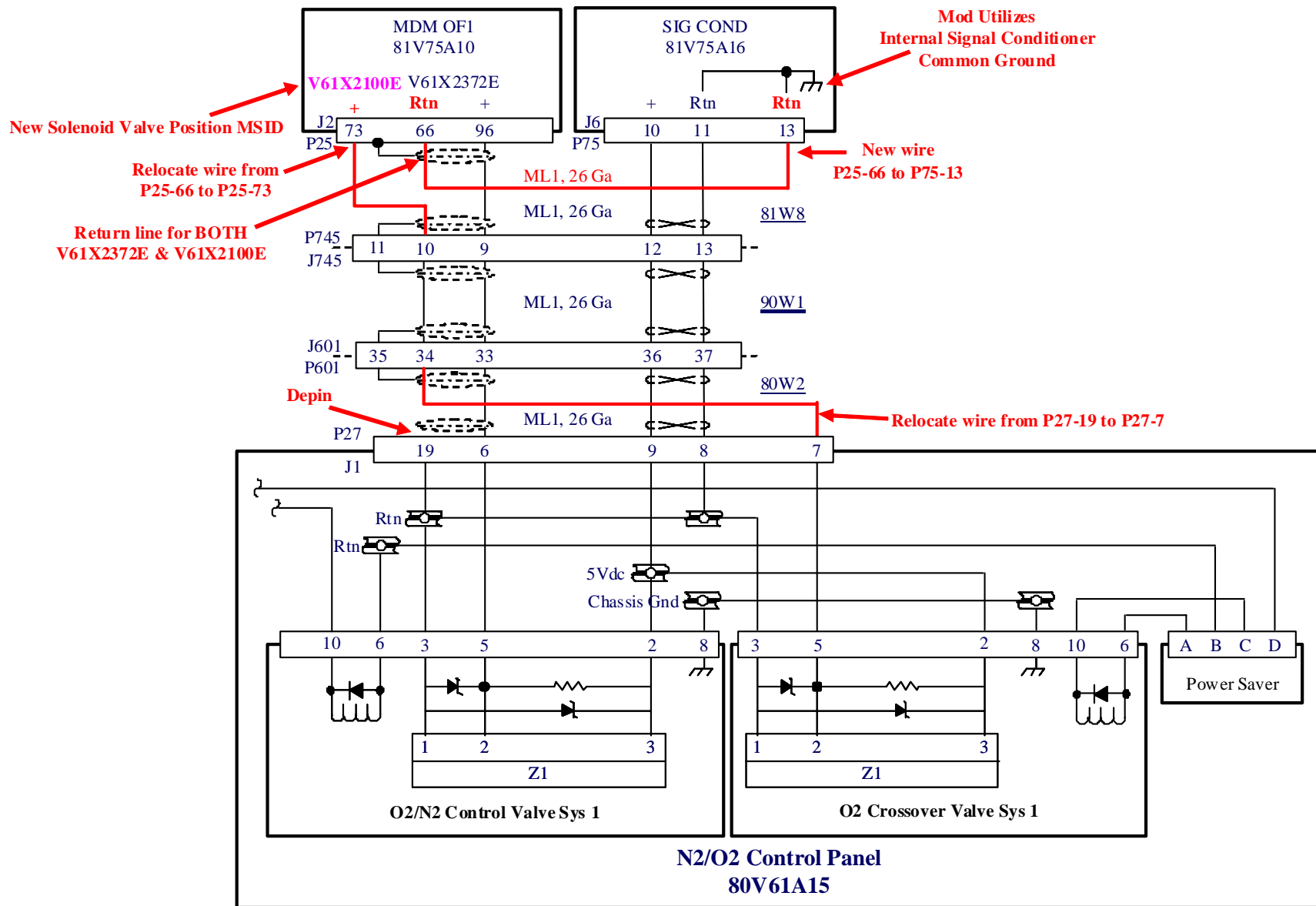
TPS Priorities - STS-130 LSRR

UPDATED 2-18-2009 Bold indicates changes during STS-127 flow				
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 ^{OV-103})	1	0	0
14. Base Heat Shield 9lb/90 SIP	42	8	complete	complete
15. Gap fillers in Subset 2B	5 Zones	2	1	0
16. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD	MLGD 100	MLGD 0	MLGD 1	MLGD 0
	NLGD 123	NLGD 12	NLGD 19	NLGD 47
	LESS 68 (92 ^{OV-105})	LESS 7	LESS 5	LESS 19
	ET Door 28	ET Door 5	ET Door 0	ET Door 1
17. Mod work LESS internal	44 locations	38	39	complete
19. Remaining Gap Fillers & Window BRI-18	124	2	2	19
Structural Corrosion Sampling Plan	See Special Chart			
2nd Subset Putty Repair Removals	11 / 6 / 5	6	complete	complete

O2 Crossover Valve Signal Talkback – N2/O2 Panel Schematic



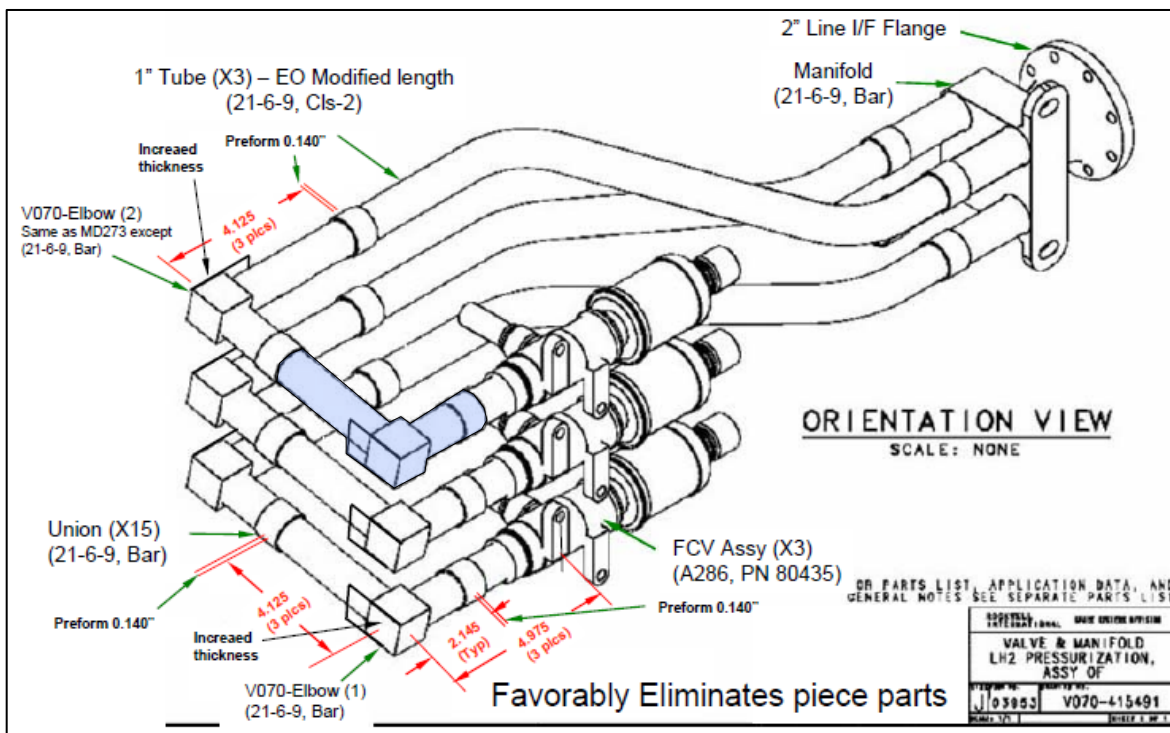
O2 Crossover Valve Signal Talkback – N2/O2 Control Valve System 1 Proposed Mod (System 2 Similar)



STS-130 OV-105 Flight 24 – 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

Cargo Engineering Backup

STS-130 LSRR

OMRSD

- **FII V2 Payload (Post-Mate)**

RCNs

- PP17901 P1549 – ISS-20A Baseline

Release

01/19/09A

Baseline

05/12/09

- **FII V4 (Pre-Mate)**

RCNs

- PS TBD S07 – STS-130 FII V4 MUL
- PS TBD S07 – STS-130 FIII MUL
- PS TBD S07 – STS-130 Adjacent Bent Pin Test

Release

06/26/09

06/26/09

06/26/09

Baseline

07/07/09

07/07/09

07/07/09

- **FII V6 (Shuttle Experiments) – None**

Issues / Concerns

- None

STS-130 LSRR

Annex 1: ISS-20A-NSTS 21549-A01

Activity	ECD
Baseline	02/12/09A
Post-CIR Update	
• Customer Submittal	04/24/09
• CR approval	05/08/09
L-4 Month Update	
• Customer submittal	09/14/09
• CR approval	10/05/09
L-1 Month Update	
• Customer Submittal	12/14/09
• CR Approval	01/04/10
• Final weight log	01/21/10
Issues/Concern	
•None	

STS-130 LSRR

TGHR Status

- Customer Submittal 08/10/09
- Release for Review 09/10/09
- Baseline 10/09/09

Issues/Concerns

- None

STS-130

Launch Site Requirements Review

Flight Software Overview

Tom Stansel
USA FSW

PRCB 04/23/09

STS-130 LSRR (FSW)

- **STS-130/OV-105 Flight Software (FSW) Versions**
 - Third scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS OI-34 content)
 - Third scheduled flight of MEDS IDP VI 07.00/MDUF VI 06.00 (SASCB SCR 98113 documents content)
 - Fourth scheduled flight of MAGRS-3S Link 613-996-008 Software (Link-008) (SASCB SCR 98115 documents content)
- **STS-130/OV-105 Flight Software Payload Support:**
 - ISS 20A
 - 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-130 LSRR (FSW)

- **STS-130 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-130 Patch Implementation for Primary Flight Software**
 - None
- **STS-130 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - None
- **STS-130 Patch Implementation for Backup Flight Software**
 - None

STS-130 LSRR (FSW)

- **Products**

- **STS-130/OV-105 Base delivery schedule (available to field)**

FPSB

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

May 29, 2009

June 16, 2009

- **Open Items**

- **None**

- **Concerns/Issues**

- **No issues or concerns with STS-130 at this time**



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-130 LSRR FLIGHT CREW EQUIPMENT/GFE	Presenter Kenneth Brown	
	Date April 23, 2009	Page 1

STS-130 LSRR 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-130 LSRR FLIGHT CREW EQUIPMENT/GFE

Presenter
Kenneth Brown

Date April 23, 2009

Page **2**

- Delivery dates partnered at STS-130 Cargo Integration Review
 - Delivery dates shown are already delivered h/w or transferred from STS-128



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-130 LSRR FLIGHT CREW EQUIPMENT/GFE	
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Presenter Kenneth Brown

Date April 23, 2009

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BACKUP



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-130 LSRR FLIGHT CREW EQUIPMENT/GFE

Presenter
Kenneth Brown

Date April 23, 2009

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Hardware	Tech Order	Cert O/C	KSC Need	JSC Planned	JSC Remarks	JSC Contact
A (port forward)	M072-750025-080	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
B (port aft)	M072-750025-081	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
C (starboard aft)	M072-750025-082	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
D (starboard forward)	M072-750025-083	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
SRMS elbow camera	M072-544504-009	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
SRMS wrist camera	M072-544504-010	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
Centerline Airlock Camera (stowed)	M072-660828-002, CCCD	C			Installed	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	C	12/07/09	12/07/09		Randall Moore



SPACE SHUTTLE PROGRAM

Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-130 LSRR FLIGHT CREW EQUIPMENT/GFE

Presenter
Kenneth Brown

Date April 23, 2009

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Hardware	Tech Order	Cert O/C	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Righthand Umbilical Camera	M072-705001-028	O	12/07/09	12/07/09		Randall Moore
Digital Television (DTV)	M072-710570-007	C			Installed hardware.	Randall Moore
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001	O			Installed hardware.	Larry Schmidt
Portable Foot Restraint (PFR)	M072-661568-029	C	10/20/09	10/20/09		Sandy Peterson
Tools for Rendezvous and Docking (TRAD)	M072-730021-020	O			Installed hardware.	Larry Schmidt
Tool Stowage Assembly (TSA)	M072-660853-002 M072-660850-005	C	10/23/09	10/23/09		Sandy Peterson
Video Processing Unit (VPU)	M072-710338-007	C			Installed hardware.	Larry Schmidt
Winches	V070-650007-085	C			Installed hardware.	Sandy Peterson



SPACE SHUTTLE PROGRAM

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STS-130 LSRR FLIGHT CREW EQUIPMENT/GFE

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Hardware	Tech Order	C e r t i f i c a t e d	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-012 S-BAND M072-744004-013 S-BAND M072-744004-014 S-BAND M072-744004-015 S-BAND M072-744004-016 S-BAND M072-744004-017 S-BAND M072-744004-018 S-BAND	C			Installed hardware.	Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 antenna	C			Installed hardware.	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-006 camera	C	1/08/10	1/08/10		Randall Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing**	M072-756111-007	O			Installed hardware.	Michael Wright
Wing Leading Edge (WLE) Instrumentation - Right Wing**	M072-756111-008	O			Installed hardware.	Michael Wright
SCU	M072-661606-012	C			Installed hardware.	Sandy Peterson
OBSS Sensor Package 1	M072-710282-008		10/01/09	10/01/09		
OBSS Sensor Package 2	M072-710282-006	O	10/01/09	10/01/09		Larry Schmidt
Airlock Adapter Plate	SJD32101440-032	O			Installed hardware.	Sandy Peterson

EVA Status STS-130/20A Launch Site Readiness Review

**David Foltz
EVA Office
Johnson Space Center
April 23, 2009**

- **Forward Bulkhead PFR**
 - Portable Foot Restraint, SED33105308-307 installed on forward bulkhead.
 - Released T.O. M072-661568-029
 - Required to protect for contingency EVA TPS inspection
- **Lightweight Port TSA**
 - Port LWTSA installation – Tech Order: M072-660850-005
 - Port LWTSA Tools installation – Tech Order: M072-660853-002
- **No Starboard TSA**
- **Winches**
 - Winch P/N SED33101570-327 on Forward Bulkhead
 - Winch P/N SED33101570-325 on Aft Bulkhead



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Backup Material

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



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Overview

- **SSP System Drawings**
- **SSP Authorized Modifications/Non-Standard Work**
- **SSP OMRS Changes (RCNs)**

No Issues*

No Issues*

To Be Presented*



STS-130 Launch Site Requirements Review	Presenter MK-SIO / A. Swift	
	Date 04-23-09	Page 1

Mandatory RCNs:

NONE

Non-Mandatory Value Added RCNs:

NONE



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115130 on TBD

- V072-000001-284 (Rev. TBD) Space Shuttle System (Rel. TBD)
 - V072-200210-001 (Rev. NEW) Mission Equipment Cargo Support (Rel. 02-27-09)
 - SGD32104453-501 (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - 502 Descent
 - V070-000001-005 Orbiter General Assembly
 - V070-410100-018 SSME Installation
 - 10100-0061-178 Integrated SRB General Assembly (BI-141)
 - 80901000000-530 External Tank Assembly (ET-134)
- STS-130 LSRR +18 days Mission Configuration Product Plan (MCP) will be published on 05-11-09 and will be republished at CIR +70 days on 06-01-09.



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

SSP System Drawings – Continued

Ferry Configuration

- **V072-000001-285** (Rev. TBD) Space Shuttle System Drawing (Rel. TBD)
 - **V072-200210-002** (Rev. NEW) Mission Equipment Cargo Support (Rel. 02-27-09)
 - **SGD32104453-001** (Rev. TBD) Crew Compartment Configuration (Rel. TBD)
 - **V072-300055-028** (Rev. TBD) Ferry Flight Configuration (Rel. TBD)

SCA 905

LW MAR
SJD32108929-TBD

CDR GEORGE ZAMKA
PLT TERRY VIRTS
M/S #1 KATHRYN HIRE
M/S #2 STEPHEN ROBINSON
M/S #3 NICHOLAS PATRICK
M/S #4 ROBERT BEHNKEN

MODULAR LOCKER LAYOUT ASCENT

PANTRY FOOD (SNACKS) 1622 -308	MF57A PANTRY FOOD (UTENSILS) 1622 -308	PANTRY FOOD (BEVERAGES) 1622 -302
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LEADER: KEITH CAMPBELL
DATE: 03-04-09
LAUNCH: 02-04-10
FLIGHT: STS-130/20A NODE 3
VEHICLE: OV-105
CREW: 6 MAN 12 + 1 + 2 DAYS
RQMTS: TEPC, ERGOMETER, GALLEY
SLEEPING BAGS

MD CEIL (PORT 1) TBD -301
JUMPER ASSY(2)
MD CEIL (PORT 2) 0704 -TBD
LCVG(3)
LCVG W/BIOMED
ECOK/EMU BATT
COMM CARRIER(2)
PHASE VI GLOVE(4PR)
ENTRY GARMENTS

MIDDECK FORWARD

MF14E 2760 -306 FRESH FOOD FRESH FOOD	MF28E/G 7493 -301 GLACIER	MF43C 1900 -308 CDR CLOTHING	MF57C 8965 -TBD CWC/YELLOW HOSE SUPA(13) DOCK MECH KIT STS CSA-CP	MF71C 1901 -305 PLT CLOTHING
MF14G TBD -308 MENU FOOD MENU FOOD	MF43E 5473 -305 ORBITER FDF	MF43F 1902 -308 M/S #1 CLOTHING	MF57E 6240 -311 ORBITER FDF SODF (ZIPLOCK)	MF71E 6291 -311 SODF (CTB)
MF14H 2763 -304 MENU FOOD MENU FOOD	MF28H 6684 -TBD MED KITS ALTIMETER	MF43G 1902 -308 M/S #1 CLOTHING	MF57G 8047 -304 DC VAC (CTB)	MF71G 1903 -305 M/S #2 CLOTHING
MF14K 2764 -306 MENU FOOD MENU FOOD	MF28K 8967 -TBD MAK CRYO GLOVES SAMPLE PURGE KIT SILVER BIOCIDES KIT PRINTER PAPER	MF43H 0693 -TBD ERADK HRM(2) SOMS RESUSC	MF57H TBD WATER KIT CREW CARE PKG	MF71H 0298 -301 PWR (CTB 8852-302)
MF14M 2765 -304 MENU FOOD MENU FOOD	MF28M TBD POST INSERTION #2 MENU FOOD	MF43I 1904 -307 M/S #3 CLOTHING	MF57I TBD G-SUITS(6)	MF71I 3005 -304 M/S #4 CLOTHING
MF14N 2766 -305 MENU FOOD MENU FOOD	MF28N 2769 -309 MENU FOOD MENU FOOD	MF43J 1904 -307 M/S #3 CLOTHING	MF57J TBD G-SUITS(6)	MF71J 6697 -332 HH LIDAR W/NIGHTSCOPE 2ND HHL (TRAD)/SSV/BPSMU

MIDDECK AFT

MA9D/F 9882 -TBD TRAD LIOH	MA16D 5452 -327 IFM BREAKOUT BOX TURNBUCKLES AIR BOTTLES WWD FLT/RMS KIT DUXSEAL
MA9G 8737 -310 RCC COLD BAG ASSY	MA16F 6250 -353 IFM TOOLS 2163-302 2161-305 2162-307 MULTIMETER
MA9H 8719 -309 COLOR PRINTER & PAPER (CTB 6066-334)	MA16G 6299 -321 COAS/WORK LIGHT SHIELDS/D2XS AUDIO DOSIMETER BTA
MA9I 5962 -303 PRINTER TRAYS IODINE REMOVAL 6256-306	MA16H 8723 -302 PHOTO/TV STOW&GO (CTB)
MA9J 7432-328 SOFT STWVG BAGS PHK5(6) 4980-311 CCK/LIGHT STICKS/COMM PHK 8071-312 RSTRNITS/FLUID LD FIBERSCOPE 8070-302	MA16I 1908 -309 CREW SUPPORT

MD CEIL (STBD 1) TBD -301
JUMPER ASSY(2)
MD CEIL (STBD 2) TBD -301
JUMPER CABLES(7)
COMK/ADPTR TEE
IPT RESERVE

MD FLOOR (PORT 2) TBD -301
DUCT ASSY(2)
NODES BRKT ASSY
CWC(4)
MD FLOOR (PORT 1) TBD -301
AXIAL PORT SHIELD

MD FLOOR (STBD 2) TBD -301
ISS RESERVE
MD FLOOR (STBD 1) TBD -301
HYGIENE
TORQUE WRENCH/BAG
IPT RESERVE

A16 7490 -TBD
PGSC DESK(3)
CAM BAG
PILOT HC
BOGAN ARM(3)

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

VOLUME D (MD52C) 7498 -301
RCC REPAIR HDWR
B/U DTV HDWR

VOLUME F (MD76M) 1403 -306
WET TRASH

VOLUME G (MD80R) 1800 -346
CONT UCDs
WASTE MGMT
CWC(2)

VOLUME H (MD23H) 8068 -318
EMU SERVICE KIT
EHIP BATT(4)
(INBD)
EVA ACCESS (OBD) 8065 -313

WMC (MAR24H) 0914 -332
TOWELS AND
RESUPPLY ITEMS
WMC DISPENSER
1st DAY CLOTH
SUPA(1)
1641-330

EXT AIRLOCK
2-EMUs (PORT)
EXT A/L FLOOR
SAFER
WAIST TETH(4)/AET(6)
TRASH BAG/BRT/MWS
CCC(4)/BS TETH(2)
RETS(1)/DIDB(8)

32 LIOH: 29 + 1 ATCO IN LIOH BOX, 2 INSTLD,
1 IN MA9D/F
(7435-TBD)

WINDOW SHADE BAG - WINDOW SHADES
(5548-369)
IFM CABLES & HOSES (4259-344)
MONITOR SHIELDS/OCA CABLE

L10A1: AVIU/MPC (6686-336)
L10A2: DTV MUX
L10A3: DTV VTR/VIP
L11: PDIP 2 OIU 1/2
L12A1: SSP 1
L12A2: SSP 2
L12A3: PDIP 1
R12A1: VPU
R12A2: OBSS/OPP

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

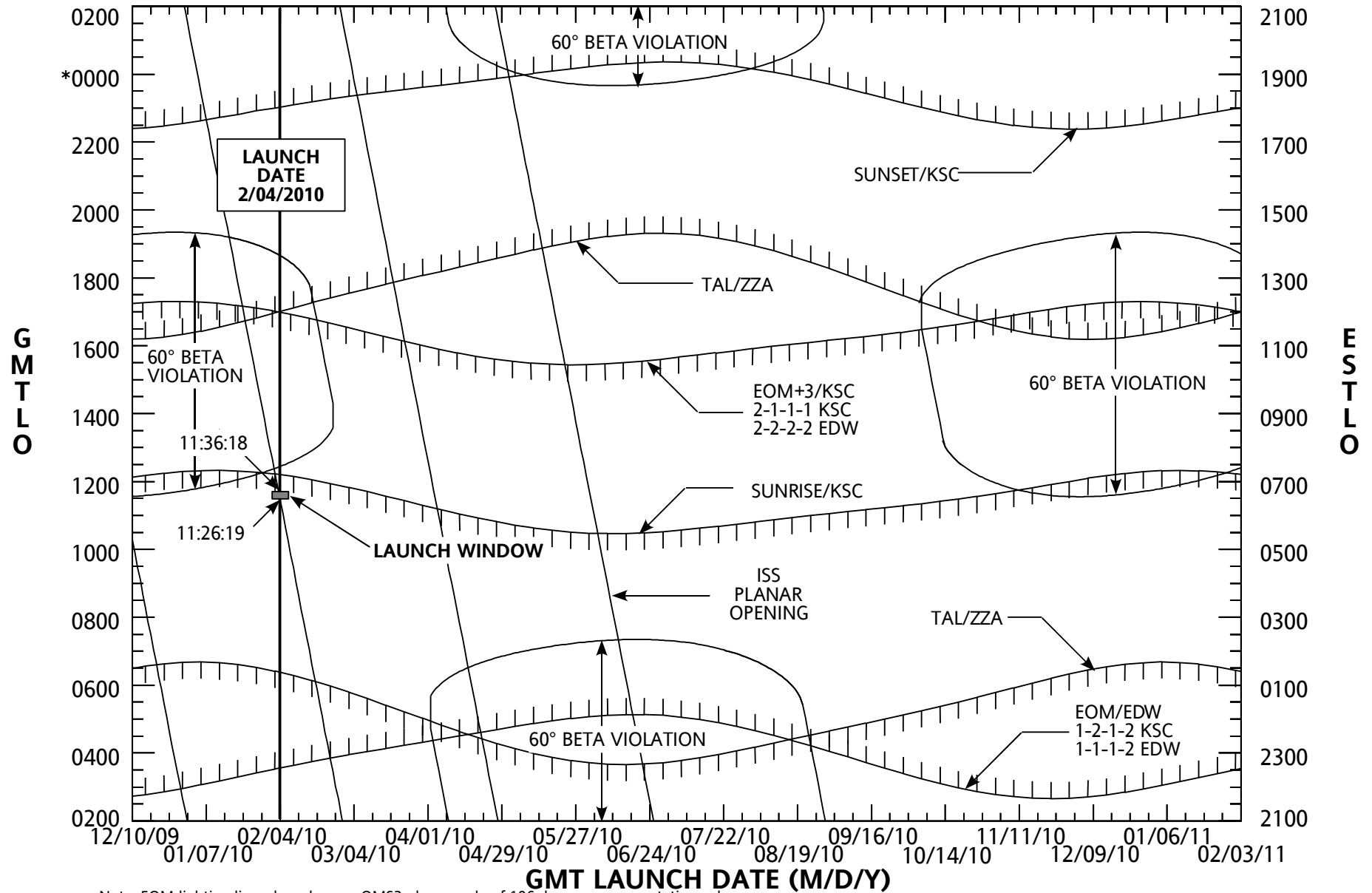
C/D JSC TBD
P/D JSC TBD
C/D KSC TBD
P/D KSC TBD
CEIT KIT TBD
MDK LBL TBD
DWG NO. SGD32104453
/USR/DWGS/LOCKER/STS130
CCMM: M. CDONALD 483-1384

NOTE: LOCKER LAYOUTS ARE FOR REFERENCE ONLY AND ARE NOT RELEASED DRAWINGS.
FOR RELEASED DRAWINGS, REFER TO CCD DRAWING # SGD32104453

Mission Duration = 12+1+2
 Inclination = 51.6°
 OMS2 ha/hp = 124 x 85 nmi.
 Target ha/hp = 194 x 185 nmi.

C. Oliver/USH-483L
 P. Gentry/USH-483L
 December 12, 2008

STS-130 CFP LAUNCH WINDOW



Note: EOM lighting lines, based on an OMS2 phase angle of 196 deg, are representative only.
 The ISS beta angle ($|\beta| < 60^\circ$) for mated operation is beginning ~ 1/20:59:13 MET (FD3 Rendezvous) and ending ~ 10/15:19:00 MET
 * indicates the dateline. Launch times above this point are on subsequent days from the date indicated on the corresponding date axis.



STS-130 Integrated Launch Site Requirements Review

Presenter	Kenneth Nowak	
Date	04-23-09	

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 2 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
 - **No impacts for all six disciplines** **1**
 - **One or more disciplines with impacts, documentation approved and/or pending approval** **0**



STS-130 Integrated Launch Site Requirements Review

Presenter **Kenneth Nowak**

Date **04-23-09**

Modification Impact Report – Continued

- Possible impacts still under review 1
 - MCR 30250 is being reviewed for all impacts

1MRC5 REPT. 4650-1
PAGE NO. 1

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0130

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

10:24 DATE 04/13/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S-J6275A	AUTH	J6275A	0105 002	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
2008-02-26	MAND		SPAR	CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT LSFR, AND FINALIZED AT DLSFR FOR EACH FLOW.
	KSC			
	024			
S-J6379	AUTH	J6379	0105 000	OV-105 BODY FLAP PDU GEARBOX FLUID LEVEL INSPECTION
2008-07-15	MAND		SPAR	
	KSC			
	024			
S-J6414A	AUTH	J6414A	0105 001	RUDDER SPEED BRAKE THERMAL TAB INSPECTION
2008-12-19	MAND		SPAR	
	KSC			
	024			
TOTAL MODS =		3		

Approved STS-130 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END	
+	E	SSME	S053298HG EK10501 (A)	OMRSD EXCEPTION REQUEST - SSME HE BARRIER SYSTEM INFLATION EXCEPT ION(EK10501)	2056	005 005
	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
			S053299HG WK10648R2 (A)	OMRSD WAIVER REQUEST - LEFT OMS PODHELIUM ISOLATION VALVE INTERNA L LEAK(WK10648R2)	0013	033 036
		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
S053299HE WK10639R1	(A)	OMRSD WAIVER REQUEST - AUXILIARY POWER UNIT 1 GAS GENERATOR CHAMB ERPRESSURE BIAS (WK10639R1)	105	022 025
S053299LM WK10655	(A)	OMRSD WAIVER REQUEST - FUEL CELL POWER PLANT CELL PERFORMANCE MON ITORSTACK DELTA VOLTAGE 1 AT 510	105	022 025

Approved STS-130 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END
		S053299LM WK10655	***** CONTINUED ***** MILLIVOLTS (WK10655)		
W	ORB	S053299QE WK10684R1 (A)	OMRSD WAIVER REQUEST - FRCS FUEL CELL CHECK VALVE 101 ELEMENT #3 FAILEDLEAK CHECK (WK10684R1)	105	023 025
	RCS	S053296PV WK10275 (A)	OMRSD WAIVER REQUEST - RRCS FUEL A& B LEG REG LOCKUP PRESSURE(WK 10275)	0024	026 034
	SRB	S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

+-----+-----+-----+-----+-----+-----+								
	Waivers	Except	Deviat	Cannib	Total			
+-----+-----+-----+-----+-----+-----+								
° Total Extracted	° 12	° 1	° 0	° 0	° 13			
+-----+-----+-----+-----+-----+-----+								

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	
345	S115123AR5	03/03/08	<p>The following requirement is waived to allow OV-105 to fly with the following out-of-configuration condition:</p> <p>Tech Order M072-544504-009, (CATIA) RMS elbow camera, fly with the RMS elbow camera/PTU assembly angle change from 10.6 degrees to 0 degrees for STS-123 launch.</p> <p>A dynamic clearance assessment for STS-123 identified an interference between the camera/PTU assembly and the Payload Bay Door radiators. A decision was made to change the tilt angle from 10.6 degrees to 0 degrees for launch.</p>	OV-105, Flight 21	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
346	S115126AR3	05/16/08	<p>The following requirement is waived to allow OV-105 (STS-400/LON) to fly with the following out-of-configuration condition:</p> <p>Allow the use of STS-126 reconfiguration engineering products on OV-105 Flight 22 for the configuration of STS-400 (engineering reflects STS-126 requirements and vehicle is in STS-400 configuration at roll-out, as-designed vs. as-built).</p> <p>Given time constraints after STS-400 is ordered to launch, approval of this configuration waiver provides the least costly and most efficient means to document the STS-400 launch configuration.</p>	STS-400/LON (OV-105, Flight 22)	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad												
347	S115126AR5	08/22/2008	<p>The following requirement is waived to allow OV-105 (STS-400/LON) to fly with the following out-of-configuration condition:</p> <p>Active latches without extended guides in Bays 8 and 12 will replace the respective STS-126 requirements:</p> <table border="0"><tr><td>Bay 8 STBD</td><td>M072-544201-203</td></tr><tr><td>Bay 8 Port</td><td>M072-544201-204</td></tr><tr><td>BAY 12 STBD</td><td>M072-544101-028</td></tr><tr><td>Bay 12 Port</td><td>M072-544101-027</td></tr></table> <p>Latches changed from secondary to primary:</p> <table border="0"><tr><td>Bay 12 STBD</td><td>M072-002112-043 Partial in Lieu of M072-002212-045</td></tr><tr><td>Bay 12 Port</td><td>M072-002112-044 Partial in Lieu of M072-002212-046</td></tr></table> <p>The following Tech Orders will not be installed:</p> <p>M072-000423-001 M072-710801-001 M072-544001-008</p> <p>The following Tech Orders will be partially installed:</p> <p>M072-544752-003 ROEU installed but not mated and grease application not accomplished.</p> <p>M072-000442-004 Orbiter aft bulkhead handrails removed, but LMC installation not accomplished.</p> <p>M072-002113-003 and M072-002113-004 latch cap bolt MD111-4026-1635 torque to 20 +/- 5 ft-lbs.</p>	Bay 8 STBD	M072-544201-203	Bay 8 Port	M072-544201-204	BAY 12 STBD	M072-544101-028	Bay 12 Port	M072-544101-027	Bay 12 STBD	M072-002112-043 Partial in Lieu of M072-002212-045	Bay 12 Port	M072-002112-044 Partial in Lieu of M072-002212-046	STS-400/LON (OV-105, Flight 22)	
Bay 8 STBD	M072-544201-203																
Bay 8 Port	M072-544201-204																
BAY 12 STBD	M072-544101-028																
Bay 12 Port	M072-544101-027																
Bay 12 STBD	M072-002112-043 Partial in Lieu of M072-002212-045																
Bay 12 Port	M072-002112-044 Partial in Lieu of M072-002212-046																

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
348	S115126AR7	12/17/2008	<p>The following requirement, approved baseline return configuration, is waived to allow OV-105 to ferry from DFRC to KSC with out-of-configuration conditions for H2 and O2 supply line valves for fuel cell #2.</p> <p>During power operations, loss of power occurred on main B Bus. Fuel cell #2 coolant pump experienced a loss of power at this time due to the fact that Bus B provides AC2 power to fuel cell #2. Because of this loss of power, an overtemp condition may have occurred. During ferry, fuel cell #2 will be flown in a depressurized state. The addition of the jumper to the H2 and O2 lines is required to avoid potential damage to the fuel cell. This additional hardware is not part of the ferry flight configuration. Discharge water line from the fuel cell has been disconnected and secured in place. Reason being is this allows the removal of the water from the fuel cell and Orbiter line separately for freeze protection during ferry.</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-105, Flight 22 (Ferry Flight)	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
349	S115126AR7	12/17/2008	<p>The following requirement, approved baseline return configuration, is waived to allow OV-105 to ferry from DFRC to KSC with the following out-of configuration conditions:</p> <p>Discharge water line disconnected from fuel cell.</p> <p>TCS insulation blanket V070-362917-001 not installed.</p> <p>TCS blanket covers a frame and GSE disconnects. During ferry flight, temperatures will not be high enough or low enough to damage Orbiter hardware. TCS blanket V070-362917-001 was inadvertently left out of the midbody before Door 44 was installed for ferry flight. Discharge water line from the fuel cell has been disconnected and secured in place. Reason being is this allows the removal of the water from the fuel cell and Orbiter line separately for freeze protection during ferry.</p>	OV-105, Flight 22 (Ferry Flight)	

VEHICLE LIMITED LIFE STATUS REPORT

PRELIMINARY SUBMITTED 04/08/2009

1	PYRO	C00AA0.010.066 CREW ESCAPE - WINDOW #8 MC325-0027-0007 LOT WAA	CERT SHEET TC08-106	REMOVE/REPLACE/RECERT (EXPIRES 11/30/09)	2	O
2	PYRO	C00AA0.010.066A X-CORD TO WINDOW ASSY #8 51988-1 LOT WAE	CERT SHEET TC08-097R1	REMOVE/REPLACE/RECERT (EXPIRES 11/30/09)	2	O
3	PYRO	C00AA0.010.135 REEFING LINE CUTTER, DRAG CHUTE SED26139100-701 LOT PCA	CERT SHEET SEPAR - TBD	REMOVE/REPLACE/RECERT (EXPIRES 08/31/09)	2	O
4	PYRO	C00AA0.010.124 SIDE CREW ESCAPE - CART ASSY SKD26100123-201 LOT NWA	CERT SHEET TC08-104R1	REMOVE/REPLACE/RECERT (EXPIRES 09/30/09)	2	O
5	PYRO	C00AA0.110.032 NASA STANDARD DET. SEB26100094-201	V5032.004 V5029.001	REMOVE/INSTALL	2	O
6	PYRO	C00AA0.110.033 CARTRIDGE SKD26100098-301	V5032.004 V5127	REMOVE/INSTALL	2	O
7	PYRO	C00AA0.110.034 AFT ATTACH BSTR CART. SKD26100099-401	V5032.004 V5029.001	REMOVE/INSTALL	4	O
8	PYRO	C00AA0.110.035 NLG THRUSTER CART. SKD26100100-301	V5032.004 V5127	REMOVE/INSTALL	2	O
9	PYRO	C00AA0.110.039 COMMON PRESSURE CART SKD26100105-301 LOT HHC	CERT SHEET TC08-102R1	REMOVE/REPLACE/RECERT (EXPIRES 10/31/09)	2	O
10	PYRO	C00AA0.110.043 GAS PRESS CTG. SEB26100001-25X	V5056	INSTALL	4	O
11	PYRO	C00AA0.115.001 GAS SAMPLER BATTERY SED33101116-321	V5012.001 V5029.004	REMOVE/INSTALL	4	O

Constraints

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

Elements

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12	INS	C00AA0.140.004 MADS TAPE RECORDER ME435-0055-0003 THRU 0005	S0007 V1200 V1248	TEST	4	O
13	COM	C00AA0.160.001 GPS RECEIVER (GPS MAGR'S) MC478-0153-0001	V5A71 SEPAR-TBD	R/R BATTERIES EVERY 12 MONTHS	4	O
14	MEQLG	C00AB0.010.003 NLG TIRE MC194-0007-0006 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
15	MEQLG	C00AB0.010.004 MLG TIE BOLTS & NUTS MC621-0051-0038 (4 WHEELS)	V1165.001 V1165.002	REMOVE/INSTALL	2	O
16	MEQLG	C00AB0.010.005 MAIN WHEEL ASSEMBLY MC621-0051-0038 (4)	V1165.001 V1165.002	REMOVE/INSTALL	2	O
17	MEQLG	C00AB0.010.006 NOSE WHEEL ASSEMBLY MC621-0050-0004 (2)	V1165.003 V1165.004	REMOVE/INSTALL	2	O
18	PYRO	C00AB0.015.004 FRAME, DRAG CHUTE DOOR V070-524153-005	STR-5-24-TBD TC08-030	REMOVE AND REPLACE	2	O
19	PLM	C00AB0.160.020 VIDEOSPECTION CAMERA ASSY SED39125120-302 & 305	TPS-TBD TC09-025, 26 & 27	REMOVE/REFURB/INSTALL	4	O
20	TPS	C00AB0.170.001 RCC ARROWHEAD PLATE MC621-0007-7009	V5139.001 V5139.002	REMOVE/INSTALL	2	O
21	TPS	C00AB0.170.002 RCC ARROWHEAD PLATE MC621-0007-7010	V5139.001 V5139.002	REMOVE/INSTALL	2	O
22	PYRO	C00AD0.030.009 SPHERICAL BEARING ASSY V070-562036-002	V5032.004 V5127	REMOVE/INSTALL	2	O

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23	PYRO	C00AD0.030.012 PYRO CENTERING MECHANISM SKD26100098-501	V5032.004 V5127	REMOVE/INSTALL	2	O
24	PLM	JSC24937.30 PORTABLE FOOT RESTRAINT ASSY SED33105308-307	TPS-TBD TC09-024	REMOVE/REFURBISH/INSTALL	2	M
25	FCS	JSC24937.56 EMER EGRESS SLIDE SYS MC623-0015-0023	TPS-TBD	REMOVE/INSTALL	4	M
26	ECLSS	V61AIL.010-C LIOH CANNISTER MC621-0008-0409	TPS-TBD	INSTALL AT PAD	4	O
27	ECLSS	V61AIL.015-C HYDRAZINE (CO RMVL CART.) MC621-0008-0060	TPS-TBD	INSTALL AT PAD	4	O
28	ECLSS	V61AIL.016-C ATCO CARTRIDGE MC250-0024-0001	TPS-TBD	INSTALL AT PAD	4	O
29	ECLSS	V61AJ0.141 PPO2 SENSOR MC250-0002-3165	V1053.010	RECALIBRATE SENSORS AT PAD	4	O
30	FCS	V66AIL.060 POLE CREW ESCAPE SYS ASSY SED27101375-322	TPS-TBD	REMOVE/INSTALL	4	M
31	COM	V74AD0.130 MSBLS RF #1, 2 & 3 MC409-0017-0007	OMI-TBD SEPAR-TBD	PERFORM 15 MINUTE TEST	4	O

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