

STS-115 / 12A

FD 03 Execute Package



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029	---	FD03 MMT Summary (pdf - Electronic Only)

Approved by FAO: M. Scheib

Last Updated: Sep 11 2006 3:48AM GMT

JEDI (Joint Execute package Development and Integration), v2.04.0003

FD03

GMT 09/11/06 (254)

09/10/06 22:23:34

REPLANNED NO EXERCISE

MET Day 001

STS-115	CDR JETT	SLEEP	MNVR POST SLEEP	IMU	POST SLEEP	GP RP RP UP	NC4					ISS RNDZ OPS					RPM APPROACH W/RPM		DOCKING		ATT H/O	P/4 T/SU	SAFTY BRIEF	P/TV 06 S/U	UN BERTH P3/4	MU NP V D R A T	XFER OPS	02 P/B CNFG
	PLT FERGUSON	SLEEP	PS OL SE T E P	SIMO INIT	POST SLEEP	GP RP RP UP	PS OL SE T E P	STE MR OM	R E T E R N	ISS RNDZ OPS					APPROACH W/RPM		DOCKING		DA PP SW TR D D K N	HC R 3 P / L 4	W	SAFTY BRIEF	B S P E S T MU P	UN BERTH P3/4		*		
	MS1/EV1 TANNER	SLEEP	S LOG AG	POST SLEEP			EUP AD T	WVS COND S/U	PS TEN T F OUG *	FILL EMU DRINK BAGS		CNFG *	P/TV02 DOCK OPS		DOCKING		PD TE VA O C 2 T	HATCH LEAK CHECK	ODS PREP FOR INGR	HATCH OPEN	E	SAFTY BRIEF	PST DK EVA XFR	R E B A *	R C / B O A	E L K PREP	EVA TOOL CNFG	
	MS2/EV3 BURBANK	SLEEP	S LOG AG	POST SLEEP			PS OL SE T E P	EXERCISE		ISS RNDZ OPS		R E C K	ISS RNDZ OPS	APPROACH W/RPM		DOCKING		POST RNDZ PGSC CNFG	WLS EV - 2	HC R 3 P / L 4	G P 3 P / L 4	C	SAFTY BRIEF	UN BERTH P3/4		⊕		
	MS3/EV2 PIPER	SLEEP	S LOG AG	POST SLEEP			ISS RNDZ OPS		FILL EMU DRINK BAGS		ISS RNDZ OPS		APPROACH W/RPM		DOCKING		DOCKING		ODS PREP FOR INGR	HATCH OPEN	0	SAFTY BRIEF	PST DK EVA XFR	R E B A *	R C / B O A	E L K PREP	EVA TOOL CNFG	
	MS4/EV4 MACLEAN	SLEEP	S LOG AG	POST SLEEP			C O U L A	ISS RNDZ OPS					APPROACH W/RPM		DOCKING		DOCKING		HATCH LEAK CHECK	D C H S R G	M		SAFTY BRIEF	SSRMS FD3 RCNFG	EXERCISE		P3P4 HAND OFF	
ISS	ISS CDR	SLEEP - ISS	POST SLEEP - ISS		PWDPC	CNFG	IMS EDIT	TVIS		P/TV RPM CNFG VRFY	MIDDAY-MEAL		4 F DO I L CMM	COX MNT	DOCKING		AS KM 1 P L	HOPE CNH	SAFTY BRIEF	TVIS		POC SSC DEPLOY						
	FE-1	SLEEP - ISS	POST SLEEP - ISS		PWDPC	E L I X R N P M N P S D R C * N	CEVIS		P/TV RPM CNFG VRFY	MIDDAY-MEAL		8 F DO I L CMM	D / L	ACS ARVL THRST	C R T I C	HATCH LK CK-ISS	HATCH OPEN	SAFTY BRIEF	SSRMS FD3 RCNFG	RED		P3P4 HAND OFF						
	FE-2	SLEEP - ISS	POST SLEEP - ISS		PWDPC	VELO + HC			MIDDAY-MEAL		V I T T I I I D M M E E E O R R	DOCK VIDEO		DOCKING		DOCKING		SAFTY BRIEF	PST DK EVA XFR	R E B A *	R C / B O A	E L K PREP	02 P/B CNFG					
DAY/NIGHT																												
ORBIT		24	25	26		27		28		29		30		31		32												
DAILY ORBIT		13	14	15		1		2		3		4		5		6												
TDRS		W -171.0																										
		E -46.0																										
		Z -275.0																										
ORB ATT		-ZLV -XVV		-ZLV +YVV		RNDZ					DOCKING					BIAS -XLV -ZVV					BIAS -XLV -ZVV							
NOTES		*ALTEA-P/L-DEACT *CABLE CNCT *GALLEY OVERNIGHT *GALLEY MORNING ^OPEN *TLF-TST ΔVOICE CHK *RCNFG POST DOCK *TLF-TST *INSTALL ⊕P3/4 ⊕P3/4																										
		*1/19:31																										

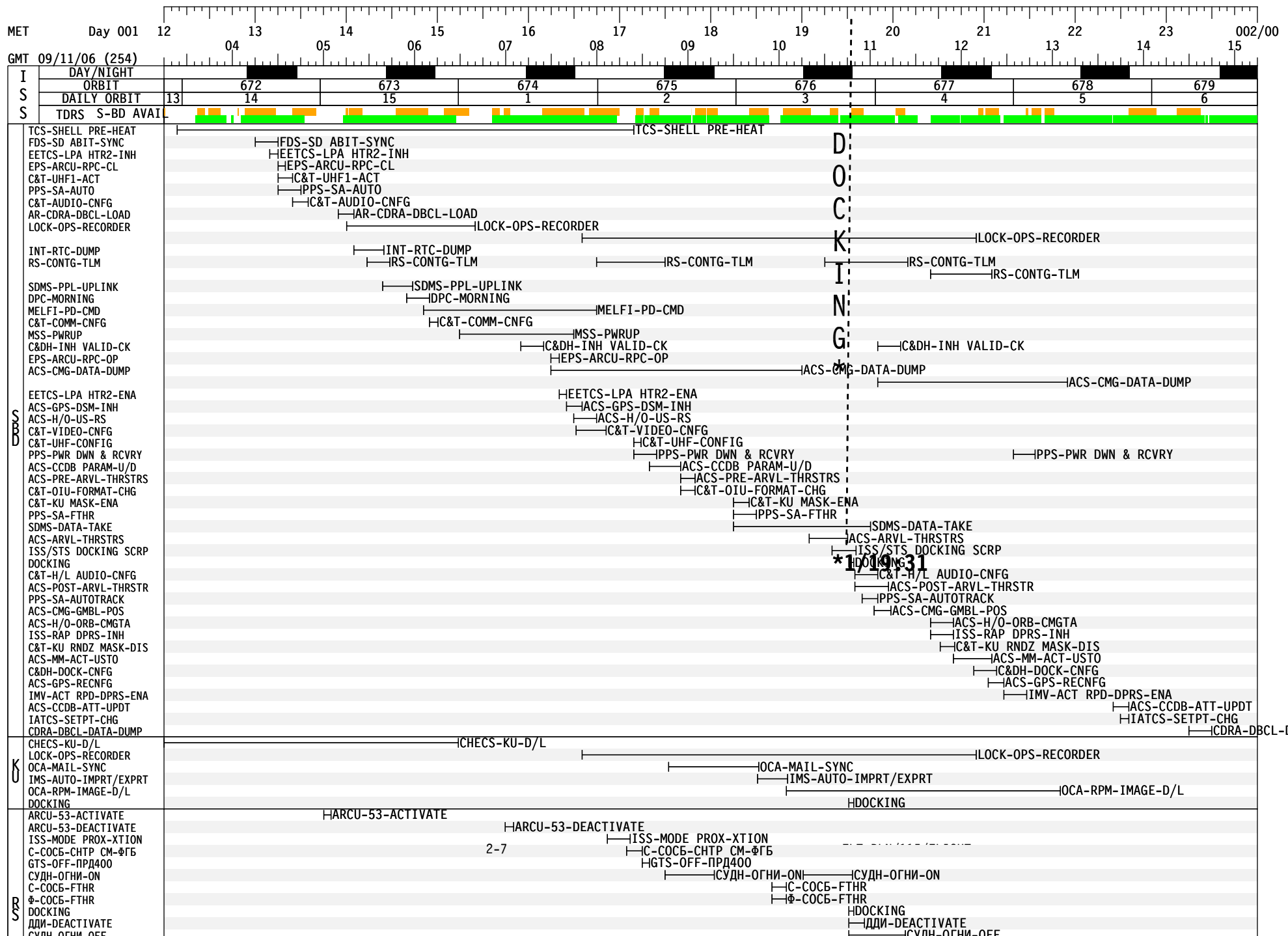
*1/19:31

09/10/06 22:23:34

REPLANNED

FD03

STS-115/12A JOINT MISSION STP



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MSG 018A - FD03 FLIGHT PLAN REVISION

MSG INDEX

<u>MSG NO.</u>	<u>TITLE</u>
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14	6.210 MT Generic Auto Translation Using String A(B) IMCAS (13-0555A)
15	6.113 CUP(LAB) Artificial Vision Unit (AVU) Hard Disk Drive (HDD)
	Changeout (13-0907A)
18	FD03 Flight Plan Revision
19	FD03 Mission Summary (13-1181)
20	FD03 Summary Timeline
21	FD03 Transfer Message (13-1182)
22	FD03 Water Activity Summary
23	EVA SAFER Latch Taping (13-1183)
24	EVA Procedure P&I Deltas (13-1184)
25	EVA Changeout Pages (13-1185)
26	OPCL and EPCL P&I Deltas
29	FD03 MMT Summary (13-1189)
30	RelMo Plots and Burn Pads

1. The FD3 post-sleep change out can be changed from dual can to single can. The table below reflects the new FD3 LiOH change outs.

FLIGHT DAY	POS A	POS B	CK CMPLT
POST FD03	STS-115 6	"	Docking
PRE FD03	"	STS-115 8	

Any further changes to the cue card will be uplinked as needed.

Rationale:

By changing the post-sleep change out from a dual can to a single can, a LiOH canister can be saved and possibly reduce the number of ISS stockpile cans used.

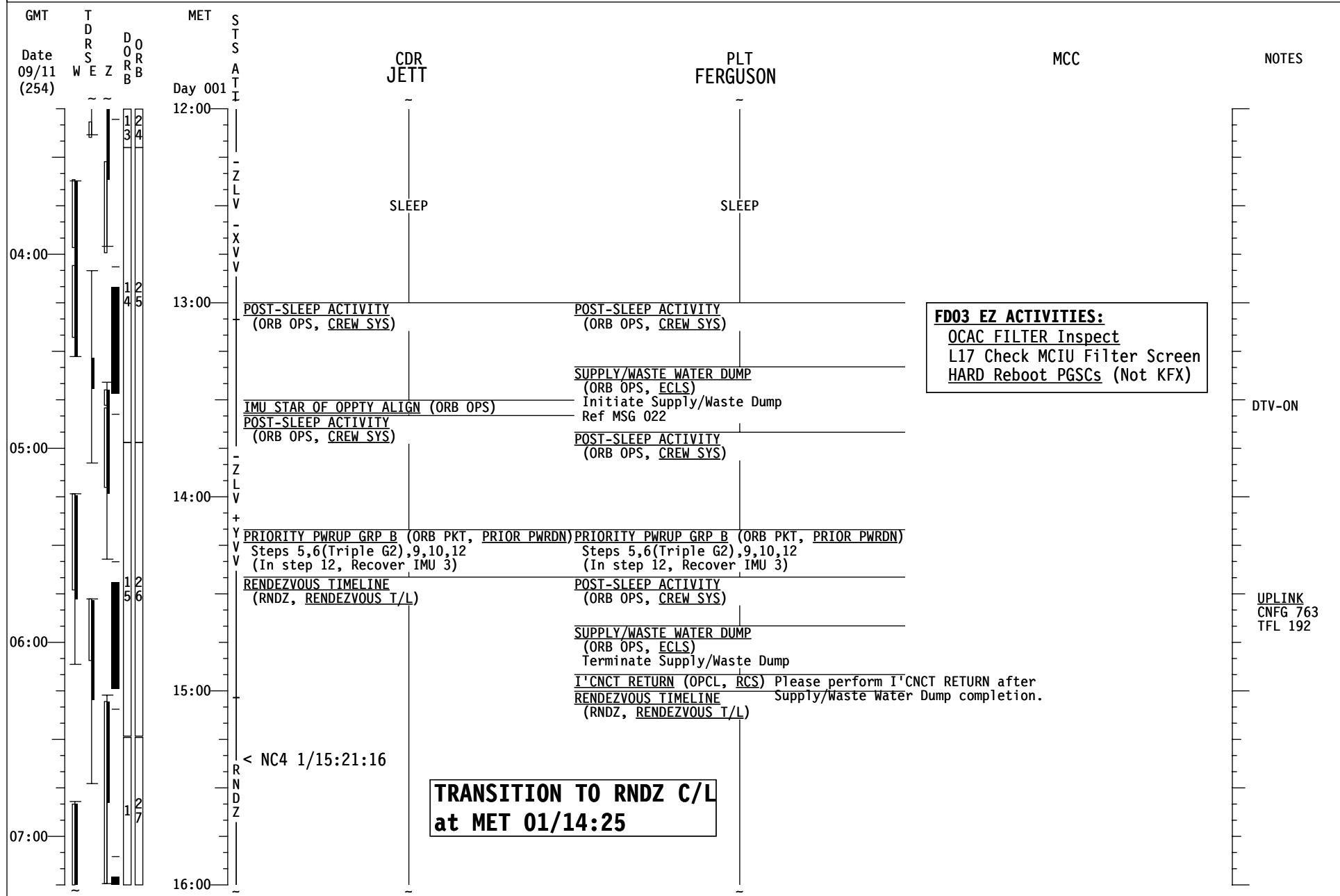
2. If you are having problems moving or deleting email messages from Work Related folders, perform the following steps. These steps will need to be performed by each crewmember for their own account.

1. Open Outlook.
2. On the Folder List, right-click the "Work Related" folder.
3. Select "Properties" from the popup menu.
4. Select the "Synchronization" tab.
5. Under "This folder is available", select the "When offline or online" option.
6. Click "OK".

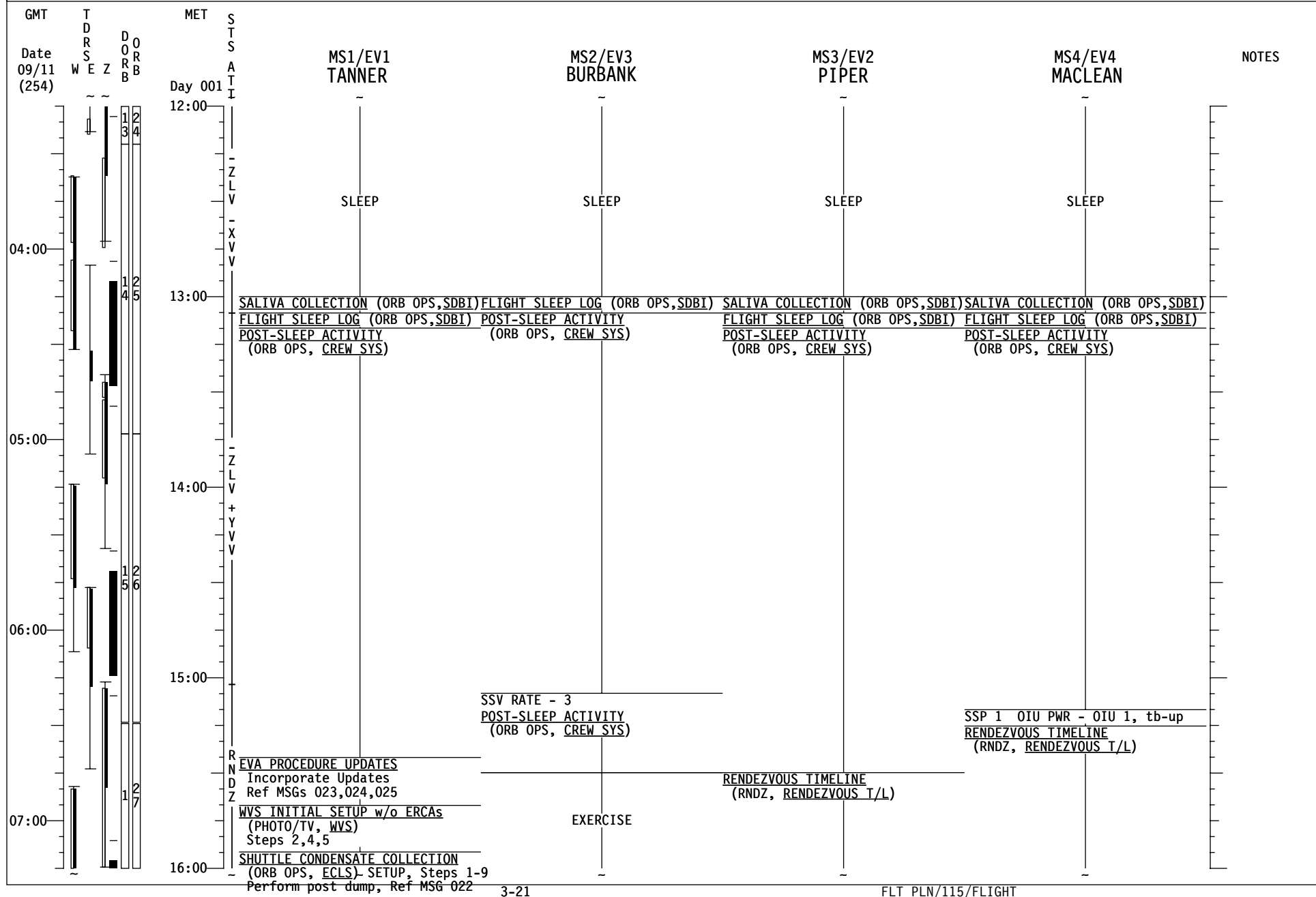
This problem occurred on STS-121, and the fix was not made before your flight load was developed.

3. REPLACE PAGES 3-20 THROUGH 3-29.

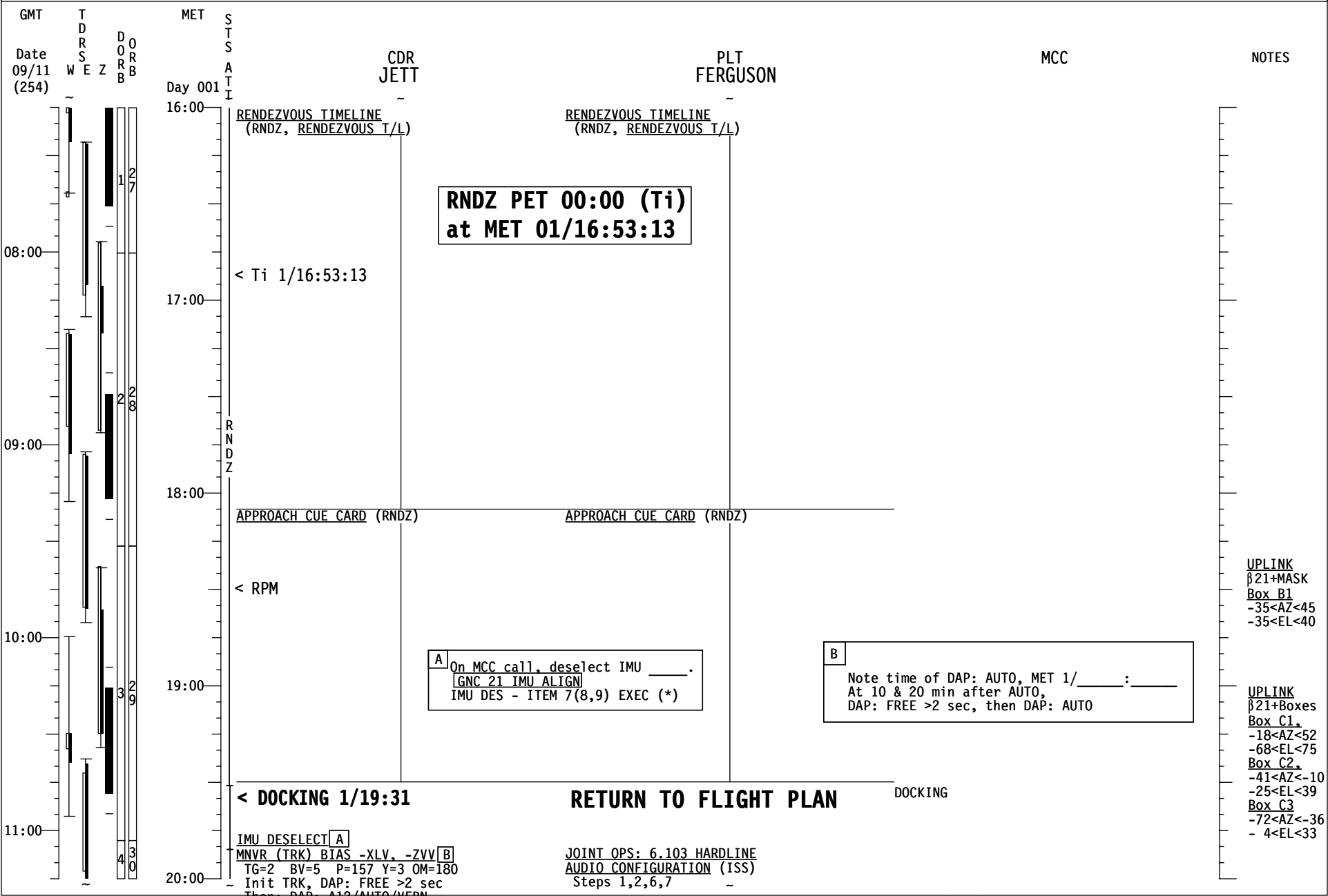
STS-115 (FD03)



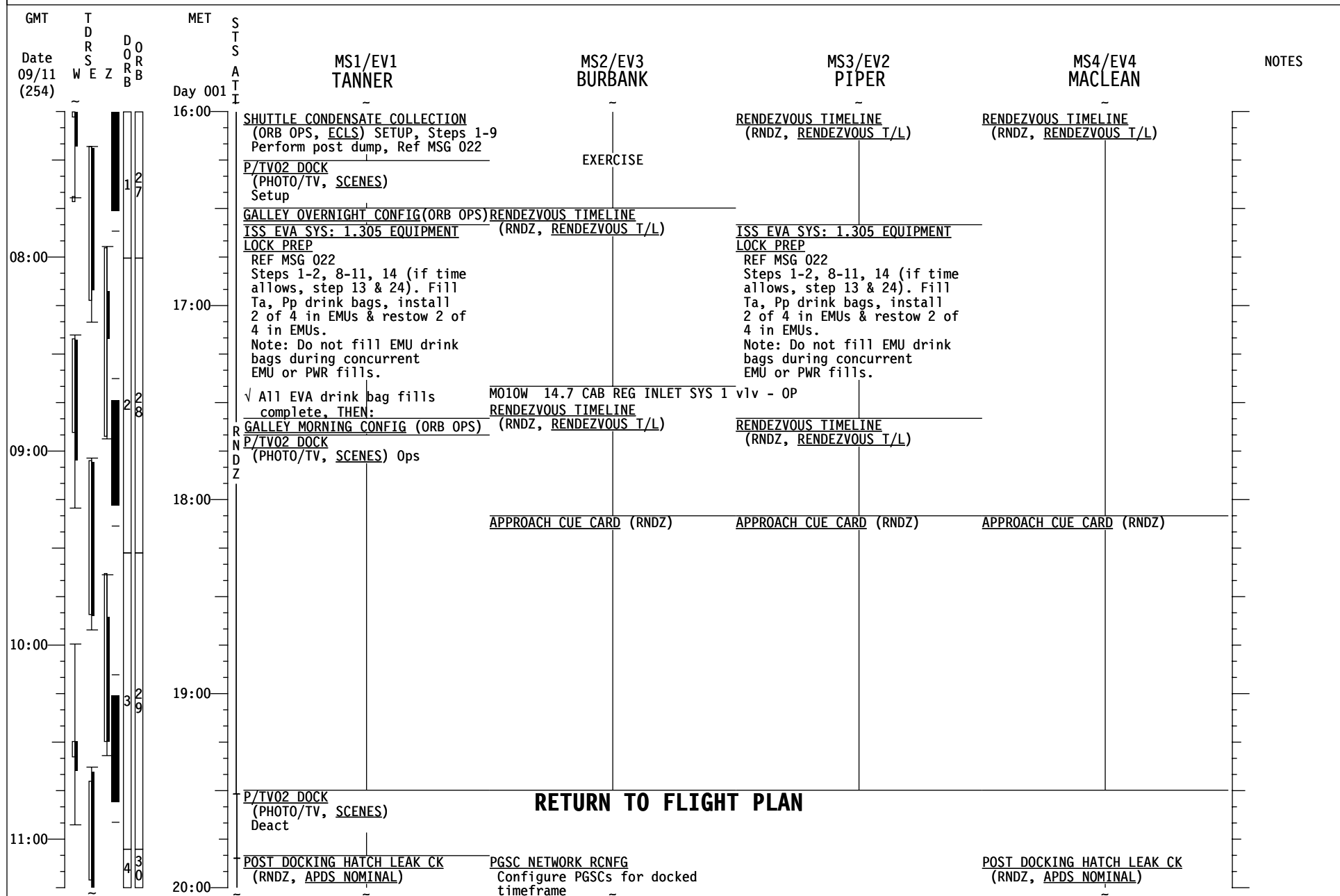
STS-115 (FD03)



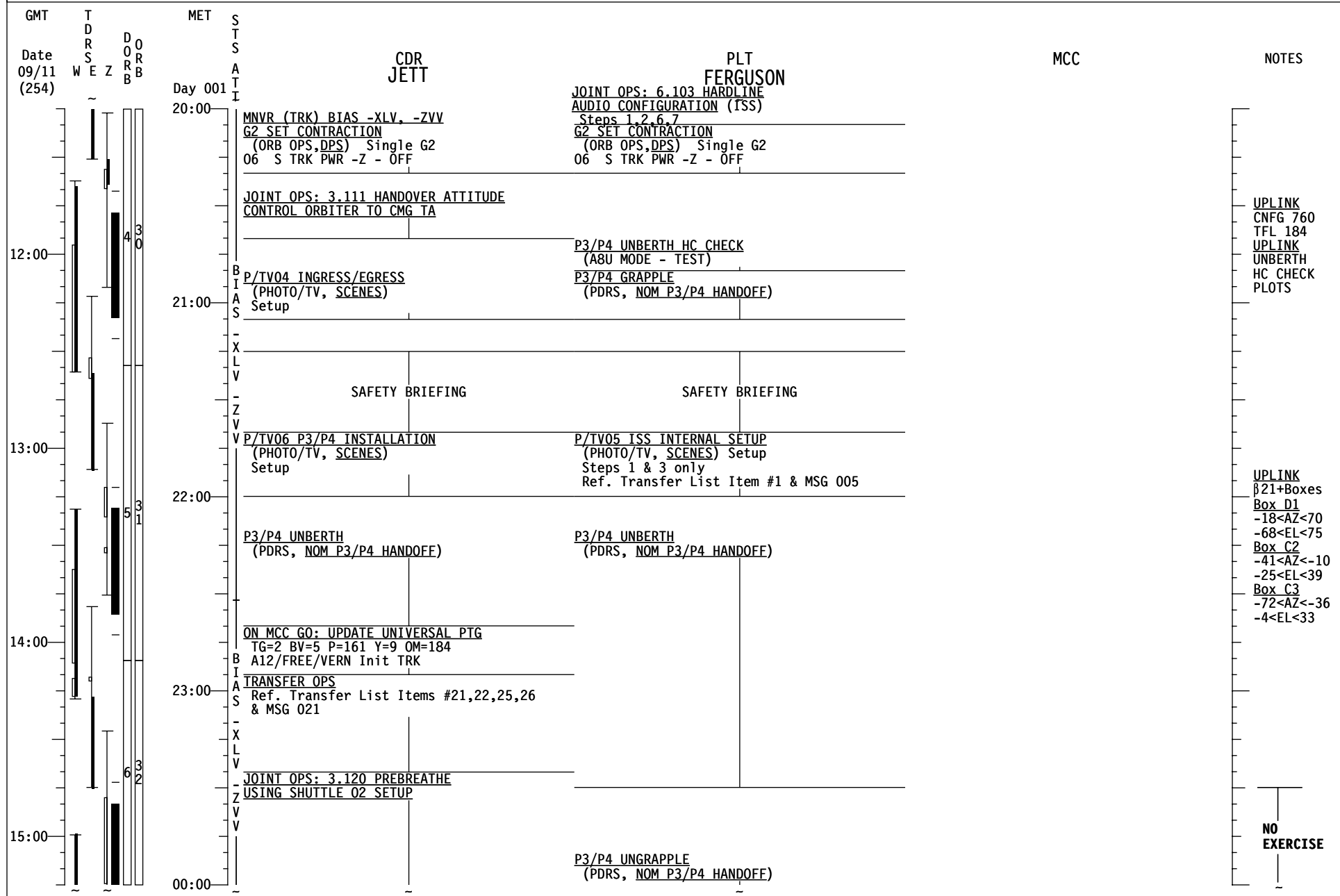
STS-115 (FD03)



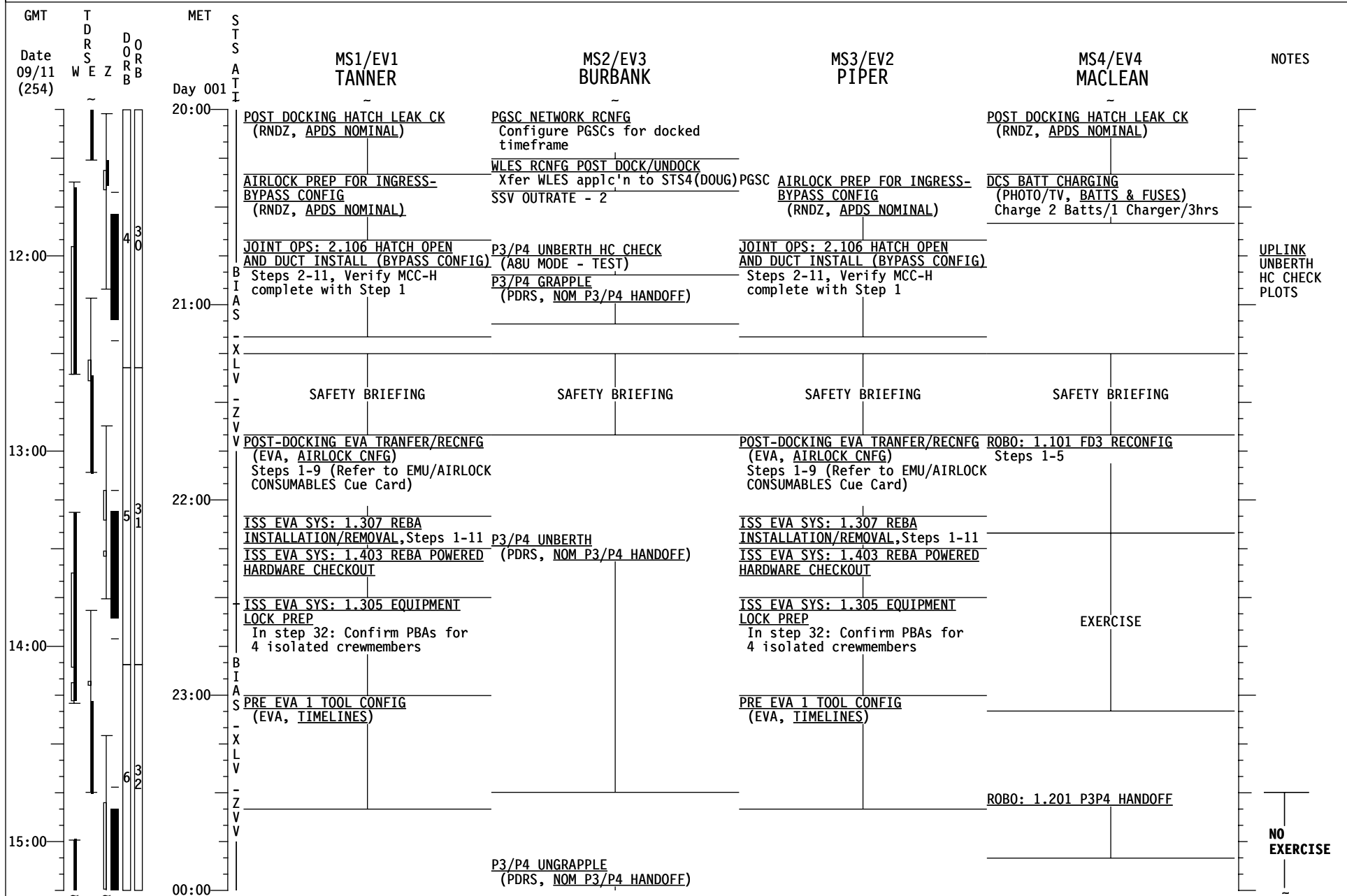
STS-115 (FD03)



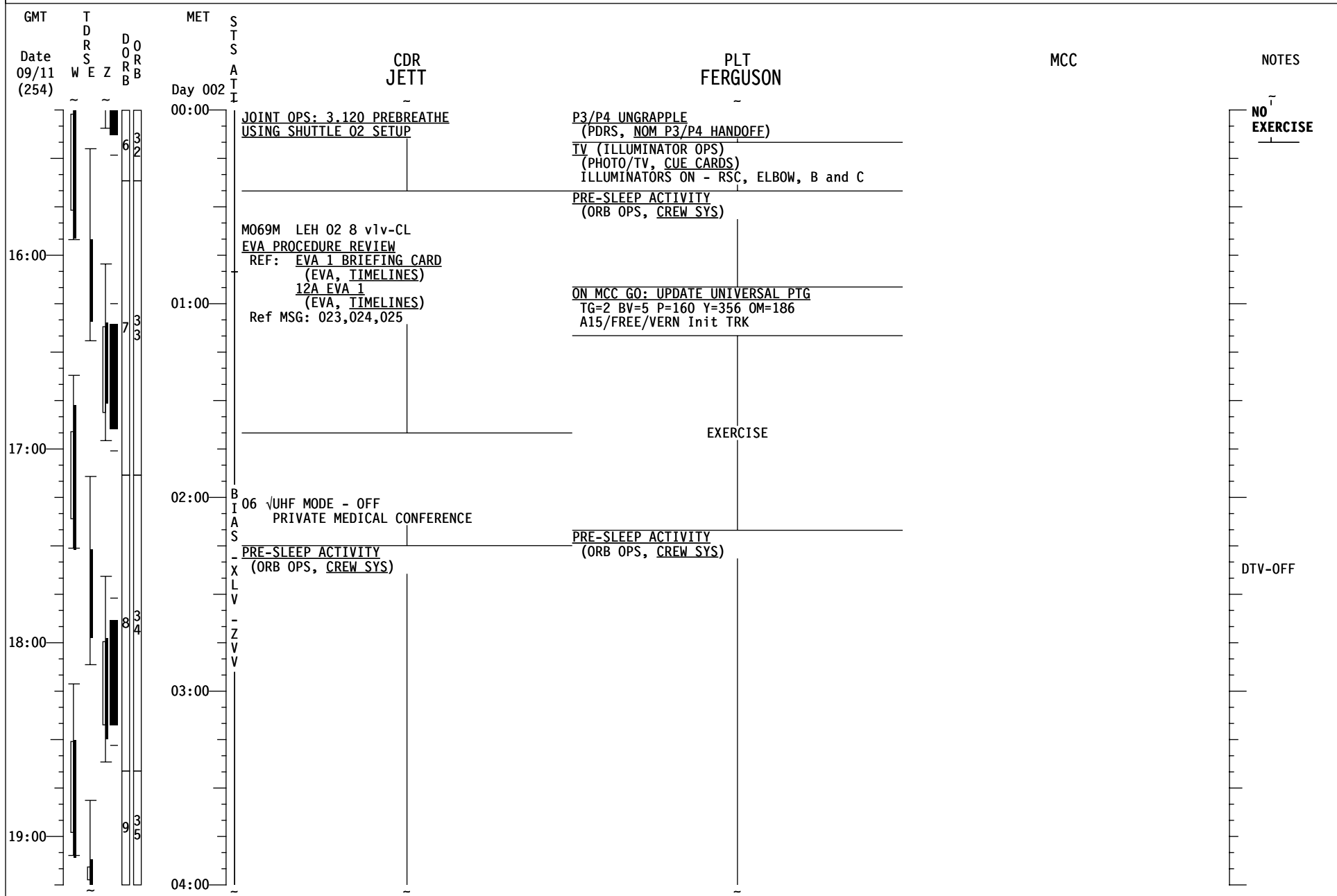
STS-115 (FD03)



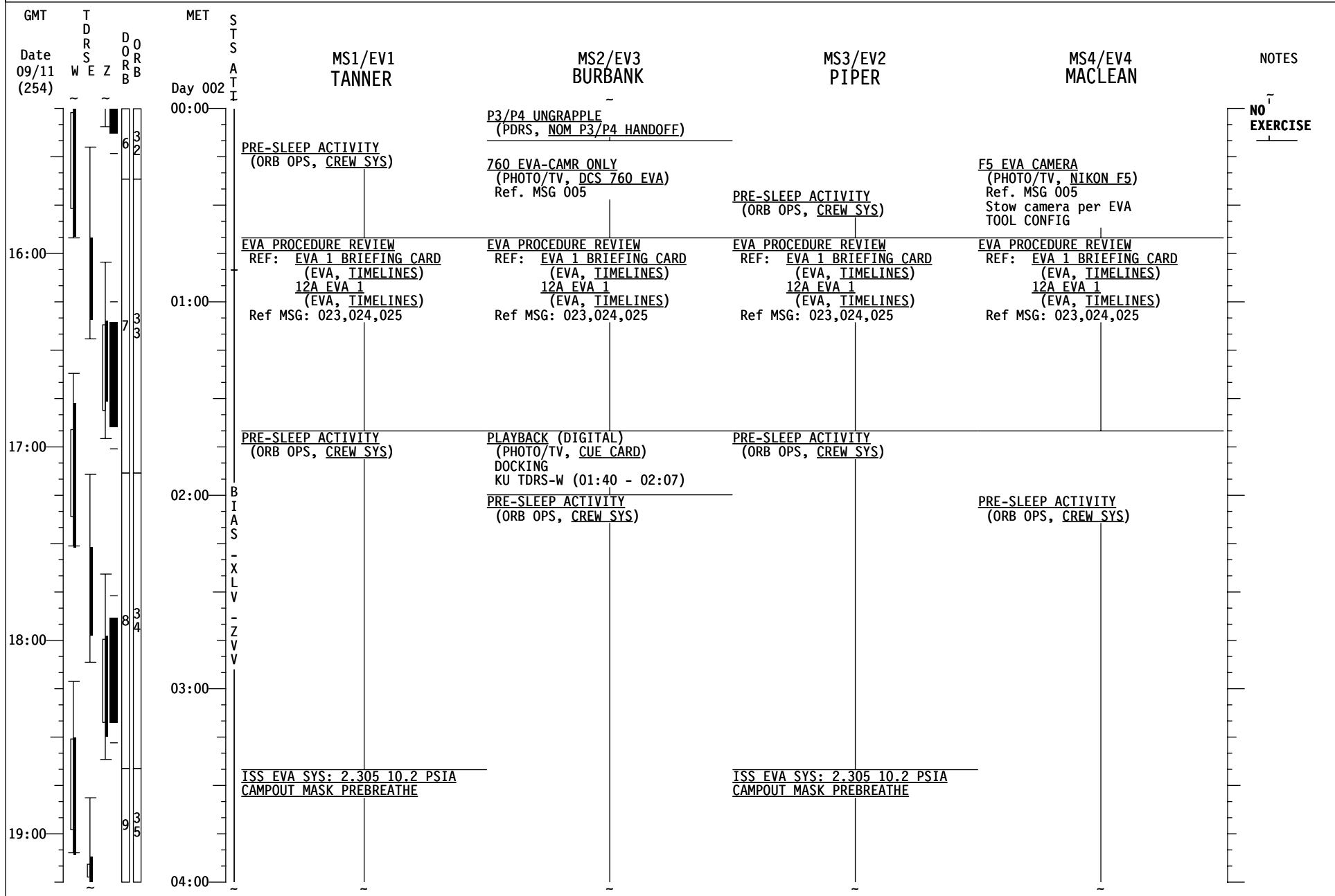
STS-115 (FD03)



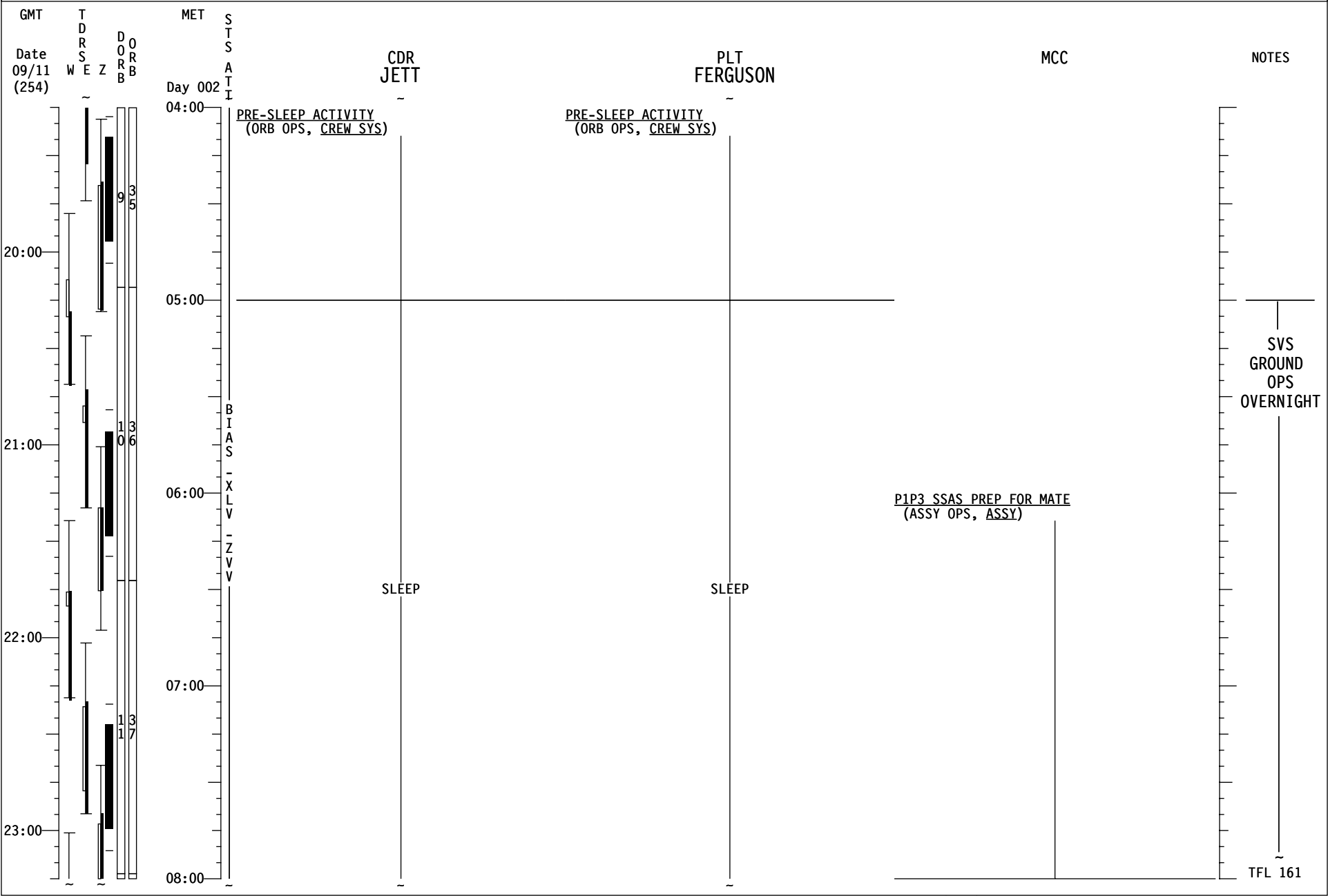
STS-115 (FD03)



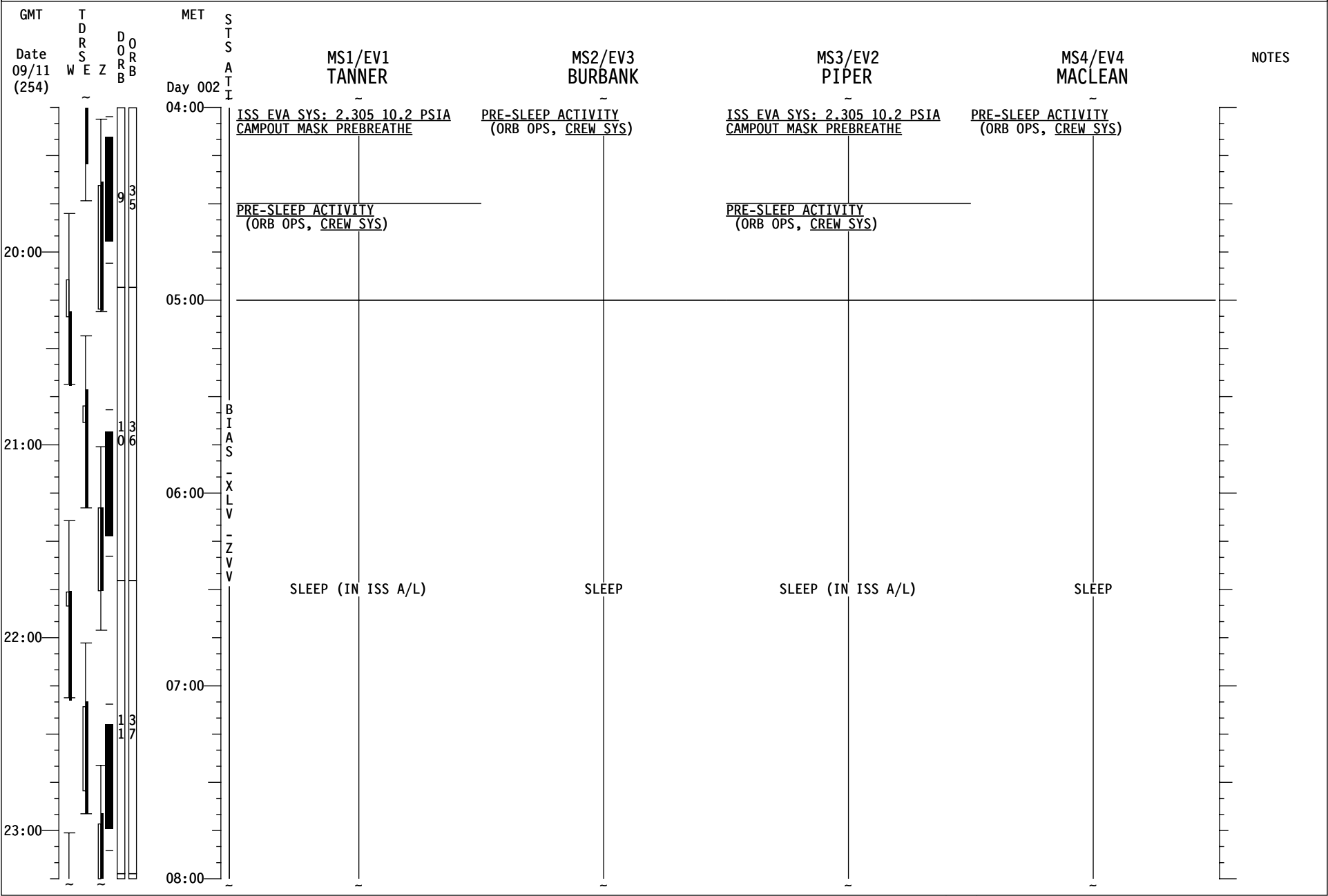
STS-115 (FD03)



STS-115 (FD03)



STS-115 (FD03)



MSG 019 - FD03 MISSION SUMMARY

Good morning Atlantis!

Welcome to a wonderful day in micro gravity and thanks for your excellent work! Today your extraterrestrial peers are looking forward to greeting you and to getting your help to upgrade their home! Have a smooth docking!

YOUR CURRENT ORBIT IS: 181 X 175 NM

NOTAMS:

AMBERLY (AMB) - CLOSED
ANDERSEN (GUA) - 06L/24R CLOSED, ALTERNATE 06R/24L
ANDERSON BACKUP VOR/DME UNZ100 CHANNEL CHANGED TO UNZ105
HALIFAX (YHZ) - CLOSED, ALTERNATE GREENWOOD (YZX)
ISTRES (FMI) - RUNWAY 33 DISTANCE MARKERS @ 300, 600, 900M
LAJES (LAJ) 15/33 - CLOSED
LAJES TACAN (LAJ) CH 45 OUT OF SERVICE
OCEANA (NTU) - PREFERRED RWY 32L FOR ISOLATION FROM AIR SHOW
ORMAND BEACH (OMN) CH 73 AZIMUTH OUT OF SERVICE
RIO GALLEGOS (AWG) - NOT APPROVED
SALISBURY (SBY) CH 49 AZIMUTH OUT OF SERVICE (PRIME TACAN FOR WALLOPS)
STEPHENVILLE (YJT78) OUT OF SERVICE
WAKE ISLAND (WAK) - CLOSED
WAKE ISLAND (AWK) CH 82 OUT OF SERVICE
WILMINGTON (ILM) - CLOSED

NEXT 2 PLS OPPORTUNITIES:

EDW22 ORB 33 – 2/01:15 (SKC, 090@05P10)
EDW22 ORB 48 – 3/00:03 (SKC, 040@05P10)

OMS TANK FAIL CAPABILITY:

L OMS FAILS: NO
R OMS FAILS: NO

LEAKING OMS PRPLT BURN:

L OMS LEAK: ALWAYS BURN RETRO
R OMS LEAK: ALWAYS BURN RETRO

PRE-DOCK OMS QUANTITIES(%)

POST DOCK OMS QUANTITIES(%)

L OMS	OX = 35.2	R OMS	OX = 33.1	L OMS	OX = 33.4	R OMS	OX = 33.1
	FU = 36.1		FU = 33.8		FU = 34.5		FU = 33.8

SUBTRACT I'CNCT COUNTER FOR CURRENT OMS QUANTITIES

MSG 019 - FD03 MISSION SUMMARY

DELTA V AVAILABLE:

PRE-DOCK

POST-DOCK

OMS 301 FPS
ARCS (TOTAL ABOVE QTY1) 47 FPS

OMS 343 FPS
ARCS (TOTAL ABOVE QTY1) 33 FPS

TOTAL IN THE AFT 348 FPS

TOTAL IN THE AFT 376 FPS

ARCS (TOTAL ABOVE QTY2) 76 FPS
 FRCS (ABOVE QTY 1) 63 FPS

ARCS (TOTAL ABOVE QTY2) 67 FPS
 FRCS (ABOVE QTY 1) 59 FPS

AFT QTY 1 97 %
 AFT QTY 2 59 %

AFT QTY 1 91 %
 AFT QTY 2 53 %

<u>SYSTEM</u>	<u>FAILURE</u>	<u>IMPACT</u>	<u>WORK AROUND</u>
PDRS	STBD AFT MRL LAT Sys 2 msw failed OFF.	None.	Disregard SPEC 94 indication of STBD AFT MRL LAT Sys 2 msw. tb not affected.

MSG 021 (13-1182) - FD03 TRANSFER MESSAGE

Page 1 of 2

Good Morning Heide and Steve!

Welcome to STS-115/12A Transfer! We've uplinked the return plan as well as changes to the resupply plan that have occurred since your book was published. You'll need to swap out the pages with these changes.

The Transfer List Excel file, FD03_TransferList_STS115.xls, is located on the KFX machine in **C:\OCA-upltransfer**.

For ISS, the Transfer List Excel file, FD03_TransferList_STS115.xls, is located in **K:\OCA-upltransfer**.

Transfer Choreography for FD3:

- Incorporate uplinked 'RETURN' pages in Transfer List book
- Incorporated uplinked 'change pages' into 'RESUPPLY' Tab of Transfer List book
- Transfer HDD Hard drives, ODF and CD Transfer Case (Item #'s 21, 22, and 25)
- Transfer Double Coldbag and install 'samples' (Item #'s 26 and 26.1)
- Transfer BPSMU and assorted cables from ISS to Middeck (Item #1)
- Transfer EMUs and required gear for EVA 1 (Item #'s 2 thru 4)

Transfer Choreography for FD4 (no Transfer Message on FD4):

- Transfer required gear for EVA 2 (Item #'s 5 and 6)
- Transfer Silver Biocide Kit to Middeck from ISS for CWC fills (Item #733 on 'RETURN' Tab).

Transfer Notes

- All remaining items from the 'Pre-pack List' have been incorporated into the Transfer List, therefore please execute only from the Transfer List from this point forward.
- Unfortunately the HMS Defibrillator (item #33) and the Defibrillator Resupply Kit (item #19.2) still have 'Yellow-tag' paperwork open on them. The transfer list has been updated to note this. These items are NO GO for use on ISS until the yellow-tag paperwork has been cleared up, however we expect this to happen prior to the FD8 Defibrillator Checkout.
- Middeck return layout drawings for the lockers (if required) and the MLE bags will be uplinked on or around FD5.

Please incorporate uplink pages as follows (call us with any questions):

In the MDDK Transfer List '**RESUPPLY**' tab
Replace Page(s): 3, 6, 7, 8, 9, 13, 14, and 17
Add Page(s): 18

In the MDDK Transfer List '**RETURN**' tab
Add Page(s): 1 thru 13

In the MDDK Transfer List '**TRASH**' tab
Replace Page(s): NONE

Changes to the Transfer List are detailed below.

MSG 021 (13-1182) - FD03 TRANSFER MESSAGE

Page 2 of 2

MIDDECK RESUPPLY

Item 8: Deleted 'Stowage at Undock', added 'Temp Stowage' location.

Item 17: Updated 'Stowage at Undock'

Item 19: Updated 'Stowage at Undock'

Item 19.1: Updated comments to provide back-up plan if drug subpack does not fit in the designated location within the ALSP

Item 19.2: Updated constraints to note the item is still 'yellow-tagged' and is NO GO for use on ISS until removed.

Item 20: Updated comments to note that this item is no longer a swap item. The returning RF Access Point has been pre-packed in Item #407 on the 'RETURN' Tab.

Item 22.1: New Item

Item 23: Added clarifying Notes to 'Item Name', updated 'Weight'

Item 26: Updated 'Stowage at Undock'

Item 26.1: Updated comments to note that the box modules to install the samples are 'crew choice' and that there should be qty 6 in each box module.

Item 33: Updated constraints to note the item is still 'yellow-tagged' and is NO GO for use on ISS until removed.

Item 35: Updated 'Stowage at Undock'

Item 36: Updated 'Stowage at Undock'

Item 37: Updated 'Stowage at Undock'

Item 38: Updated 'Stowage at Undock'

Item 201: New Item – NOTE this item does not transfer, but needs to be moved to a new location in the Middeck for return

Item 202: New Item

Item 203: New Item

Item 204: New Item

Item 205: New Item

Item 206: New Item

Item 207: New Item

MIDDECK RETURN

Incorporate all pages.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				7	ISS PHOTO TV RESUPPLY BAG	1 hlf	EXT A/L FLOOR BAG		LAB1D3	17.81	
x				8	ORCA O2 OUTLET LINE	1	EXT A/L FLOOR BAG	A/L1O1		10	Transfer prior to FD8 timed activity O2 RECONFIG TO XFER {3.123 O2 TRANSFER SETUP (POST PREBREATHE USING SHUTTLE O2)} (SODF: JOINT OPS: MATED OPERATIONS) **Does not have a yellow transfer label.
				9	BGA BOLT RETAINER [QTY 8]	2 ziplocks	EXT A/L FLOOR BAG	ISS A/L		13.36	Transfer prior to EVA 3. **Does not have a yellow transfer label.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				15	SSU SHUNT PLUG [QTY 2]	1 ziplock	EXT A/L FLOOR BAG		LAB1S5_D2	2.8	
				16	SSU SHUNT PLUG ADAPTER	1	EXT A/L FLOOR BAG		LAB1S5_D2	2.5	
x				17	STRAP ASSEMBLY, KEY, MMWS [p/n SEG33110812-301]	1	EXT A/L FLOOR BAG		A/L1O0 {1.0 CTB s/n 1013, b/c 002308J}	0.10	**Stow in 1.0 CTB: MUT AND MWS PARTS, s/n 1013, b/c 002308J.
				18	Wire Ties [QTY 42] [p/n SDG33108130-001]	1 ziplock	EXT A/L FLOOR BAG		A/L1O0 behind closeout {Mesh Bag}	4.50	Transferred per EVA PREP FOR ISS TRANSFER (EVA Checklist, <u>A/L</u> <u>CONFIG</u>). **Stow in Mesh bag with other Wire Ties.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
X				19	CHECS	1 sngl	MA9F		LAB1D1 Rack Front	24.85	**Remove and stow Item #'s 19.1 & 19.2. **Stow CTB with remaining items on Rack Front, near the top of the rack.
X				19.1	ALSP Drug Pack	1	MA9F		LAB1D4_D1 {ALSP, s/n 1001}	3.75 (part of above)	**Swap. Ref Item #702 on the 'Return' Tab. If item does not fit in the designated location, swap locations with the AIRWAY SUBPACK (within the ALSP). Notify MCC-H if locations were swapped.
X				19.2	Defibrillator Resupply Kit [s/n 1003]	1	MA9F	LAB1D4 Rack Front		6.7 (part of above)	This item is 'Yellow-tagged' and is currently not certified for use on ISS. Do Not Use. Transfer prior to DEFIB C/O on FD8 **Transfer contents to lid of new HMS Defibrillator (Ref. Item #33) **This item will return on Middeck empty. Ref. Item #705 on the 'Return' Tab.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
X				20	RF LAN Access Point [Shuttle Back-up] [p/n SEZ39129738-307, s/n 1024]	1	MA9G		NOD1S4_C1 {1.0 CTB s/n 1131, b/c 004125J}	2.64	Do not transfer until FD9. **Stow in 1.0 CTB: Spare A-31p Hardware, s/n 1131, b/c 004125J.
				21	HDD MODULE ASSEMBLY [s/n 055, 057]	2	MA9L		LAB1S5_A1	6.0	Transfer on FD3.
				22	CD LIBRARY	1	MA9L		LAB1S5_A1	4.0	Transfer on FD3.
X				22.1	3.0 GB HARD DRIVE [ePCS] [s/n's 6152, 6155]	2	MA9L		LAB1S5_A1	1.0 (part of above)	Needed for EPCS-LAPTOP-INSTALL on FD3.
X				23	3 Volt Lithium Coin Cell Battery Chest Strap/Monitor/Transmitter Assy [Heart Rate Monitor Assemblies]	1 ziplock	MA16G	MDDK {Exercise Mesh Bag}	LAB1D4_A1 {HRM Resupply Kit, s/n 1002}	0.44	**Remove Item #23.1.
				23.1	Heart Rate Watch	1	MA16G		Crew Pref	0.1 (part of above)	**Remove QTY 1 Heart Rate Watch for Reiter use prior to stowing ziplock in HRM Resupply Kit s/n 1002. Report s/n of selected Heart Rate Watch.
				24	Multimeter [new] [s/n 55460298]	1	MF28G {IFM Tools Stowage Tray}		NOD1O4_D1 {0.5 CTB s/n 1202, b/c 006651J}	3.10	**Swap with ISS Multimeter. Ref. Item #726 on the 'Return' Tab. **Remove Multimeter from Multimeter/Temp Probe Kit [p/n 10118-10018-04] and transfer. **Stow in 0.5 CTB: Scopemeter and Accessories, s/n 1202, b/c 006651J.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				25	OPERATIONS DATA FILE	1 hlf	MF43H	LAB1P5 Rack Front		26.01	Transfer on FD3.
X				26	DOUBLE COLDBAG [p/n SEG39136374-301]	1	MF71G	LAB1O4 rack front	LAB1O5_C1/D1	36.75	Transfer on FD3. Stage at MELFI for sample installation. Remove samples per Item #26.1. Once Samples are removed, complete the following: **Remove Icepac Belt -21° C (seven) and place in temporary stowage location (crew preference in location that will not permit inadvertent crew contact with cold surface). WARNING - these are cold!! be careful! Use White Gloves. **Secure lid of Double Coldbag open to allow contact with cabin air for 24-48 hours. Temp Stow in a location to avoid inadvertant contact. This item has kickload constraints. The bag will be stowed on FD5 per 12A-COLDBAG-CLN/STW.
X				26.1	SSTF - ICT Samples	24	MF71G		LAB1O4 {MELFI DEWAR #3, Tray A}	n/a	Samples are installed on FD3 per XFER-SAMPLE-INST using {2.014 MELFI INSERTION OF SAMPLE INTO BOX MODULE} (PODF: MELFI: Nominal) **Any Box Modules in Tray A may be used. Stow samples sideways as they fit (6 to a box module).

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				32	SILVER BIOCIDES SYRINGE KIT [s/n 1001]	1	MD FLOOR PORT 1 (Bag A)	MDDK deployed	NOD1D2 {M-02 bag s/n 1026}	1.34	Transfer with last CWC on FD9. **Half of these syringes are used for CWC fills.
X				33	HMS DEFIBRILLATOR [new] [s/n 1003]	1	MD FLOOR PORT 1 (Bag A)	LAB1D4 Rack Front	LAB1D4_J1	36.5	This item is 'Yellow-tagged' and is currently not certified for use on ISS. Do Not Use. Checked out FD8 per {13-0027 2.8.375 DEFIBRILLATOR - CHECKOUT} {SODF: Uplinked Procedures: Med Ops} **Ref. Item #19.2 for items to stow in lid of Defibrillator prior to C/O of this item. **Swap. Ref. Item #717 on the 'Return' Tab for return of the 'OLD' Defibrillator.
				34	MICROBIOLOGY WATER ANALYSIS KIT - 3 [s/n's: 1168, 1169, 1170]	1 ziplock	MD FLOOR PORT 1 (Bag A)		NOD1D4_D1	1.2	

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
x				35	3.0 CTB W/ WINDOW [empty]	1	MD FLOOR STBD 1 (Bag C)		NOD1S4_D2	6.20	
x				36	ROBOT LAPTOP SUPPORT	1	MD FLOOR STBD 1 (Bag C)		NOD1D2 {3.0 CTB s/n 1043, b/c 004228J}	19.00	**Stow in 3.0 CTB: ROBOT HARDWARE, s/n 1043, b/c 004228J.
x				37	ROBOT/SVG/Sorge Test Kit/KAZBEK	1 sngl	MD FLOOR STBD 1 (Bag C)		LAB1D1 Rack Front	40.00	
x				38	SPACE VIDEO GATEWAY	1	MD FLOOR STBD 1 (Bag C)		NOD1O4_C2	28.30	
				39	SONY 750 HDTV CAMCORDER	1	MD FLOOR STBD 1 (Bag C)		NOD1O4_C2	15.12	

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
Real Time Additions											
x				201	RTV 142 [Item does not transfer]	1	MD FLOOR STBD 1 (Bag C)		MF43G	0.45	**Item does not transfer, but needs to change location in the middeck for return.
x				202	433L TAPE	1	MD FLOOR STBD 1 (Bag C)		NOD1S4_B2 {0.5 CTB s/n 1195, b/c 006644J}	0.54	**Stow in 0.5 CTB: IMV/MPV/CDRA Parts, s/n 1195, b/c 006644J.
x				203	FOAM APPLICATOR ASSEMBLY	1	MF28O		NOD1P4_A1 {0.5 CTB s/n 1099, b/c 006548J}	0.54	**Stow in Leak Patch kit (p/n 10105-10002-01), which is located inside 0.5 CTB: ISS Leak Kit, s/n 1099, b/c 006548J.
x				204	CHEMICAL RESISTANT BAG ASSEMBLY	1	MF28O		NOD1P4_A1 {0.5 CTB s/n 1099, b/c 006548J}	0.05	**Stow in Leak Patch kit (p/n 10105-10002-01), which is located inside 0.5 CTB: ISS Leak Kit, s/n 1099, b/c 006548J.
x				205	RS422 PCMCIA Card/Cable Assembly (Quatech RS-422 Card)	1	ML60E		A/L1O1 {1.0 CTB s/n 1161, b/c 004155J}	0.23	**Stow in 1.0 CTB: PGT HARDWARE, s/n 1161, b/c 004155J.

STS-115/12A Resupply Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
X				206	RS-422 ISS Laptop Support Adapter (RS-422 Adapter)	2	ML60E		A/L1O1 {1.0 CTB s/n 1161, b/c 004155J}	0.26	**Stow in 1.0 CTB: PGT HARDWARE, s/n 1161, b/c 004155J.
X				207	CWC Water Sample [Water Sampling Kit Assembly] [Un-used]	6	MD FLOOR PORT 1 (Bag A)		LAB1O6 {ISS Sample/Purge Kit, s/n 1001, b/c 00015606J}	0.24	**Transfer 6 unused CWC Water Sample (Water Sampling Kit Assemblies) from Orbiter Sample/Purge Kit to ISS. **Stow in ISS Sample/Purge Kit, s/n 1001, b/c 00015606J.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
Middeck Return											
Prepacked Bags/Items											
				400	Return Bag 400 [CHeCS/MDDK Misc]	1 snl	LAB1D2		MF71G	14.50	
				401	Return Bag 401 [POIC/CHeCS/CSA-O2s]	1 snl	LAB1D2		MA9F	11.20	
				402	Return Bag 402 [GPS Antenna Assy, FPMU Bags]	1 snl	LAB1D2		MD CEIL STBD 1 (10 MLE)	22.25	
				403	Return Bag 403 [Vinogradov Clothing]	1 snl	LAB1D2		MD CEIL STBD 1 (10 MLE)	39.00	
				404	Return Bag 404 [Williams Clothing]	1 snl	LAB1D2		MA16D	39.00	Remove QTY 8 DIDBs from MA16D and stow in MD FLOOR PORT 2 (Bag C) before stowing this bag in the locker.
				405	Return Bag 405 [CWCS, EMU Micron Filters, EMU ION Filter]	1 snl	LAB1D2		MD FLOOR PORT 1 (Bag A)	20.26	

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				406	Return Bag 406 [CWCs]	1 snl	LAB1D2		MD FLOOR PORT 1 (Bag A)	25.00	
				407	Return Bag 407 [ISS PHOTO TV RESUPPLY BAG]	1 snl	LAB1D3		MD CEIL STBD 1 (10 MLE)	24.33	
				407.1	DCS 760 Camera [p/n SEZ33113001-302, s/n 1014]	1	LAB1D3		MD CEIL STBD 1 (10 MLE)	3.64 (part of above)	Pack this item into this bag prior to transferring the bag.
				407e	35MM FILM [P/N SED33101584-302]	11	LAB1D3 {1.0 ctb S/N 1083, B/C 004007J}		MD CEIL STBD 1 (10 MLE)	0.55 (part of above)	Pack remaining film into this bag prior to transferring the bag.
				407f	FILM CASSETTE CONTAINER [P/N SED33101586-302]	11	LAB1D3 {1.0 ctb S/N 1083, B/C 004007J}		MD CEIL STBD 1 (10 MLE)	N/A	Pack remaining film cassette containers (with film) into this bag prior to transferring the bag.
				409	Return Bag 409 [GAS TRAPS, FFA & METOX CAPS]	1 hlf	LAB1D2		MF43H	44.92	

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CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				500	Return Bag 500 [MBS CAMERA aka CAMERA LIGHT AND PAN/A ASSEMBLY]	1 tpl	LAB1D2		EXT A/L FLOOR BAG	93.90	Transfer prior to returning the EMUs to the EXT A/L on FD8.
				501	Return Item 501 [CD STOWAGE CASE ASSEMBLY] [ULF1.1 Transfer Case]	1	LAB1D2		MA9L	3.50	
				503	Return Item 503 [ETVCG DUMMY BOX]	1	LAB1D2 {0.5 CTB s/n 1329, b/c 010510J}		MD FLOOR PORT 2 (Bag C)	4.55	**Item is stowed in 0.5 CTB: EVA TOOLS BAG, s/n 1329, b/c 010510J.
				504	Return Item 504 [EVA IR CAMERA RCC TEST ARTICLE ASSEMBLY]	1	LAB1D2		MD FLOOR PORT 2 (Bag C)	6.00	
				505	Return Item 505 [TCCS CATALYTIC OXIDIZER]	1	LAB1D2		MD FLOOR PORT 2 (Bag C)	27.83	
				507	Return Item 507 [MDM-4E TYPE 13, Jettison Stowage Bag]	1 jettison stowage bag	LAB1D2		MD FLOOR PORT 2 (Bag C)	23.33	
				508	Return Item 508 [ISS MED ORU TRANSFER BAG]	1	LAB1D2		MD CEIL STBD 1 (10 MLE)	13.72	

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				510a	Return Item 510a [MWS T-Bar, p/n SEG33110493-305, s/n 1007, b/c 00008729J]	1	LAB1D2 {Mesh Bag}		MD FLOOR STBD 2 (Bag H)	9.00	Transfer post EVA 3 **Swap. Ref. Item #45 on the 'Resupply' Tab.
				510b	Return Item 510b [BRT, p/n SEG33110400-305, s/n 1002]	1	LAB1D2 {Mesh Bag}		MD CEIL PORT 1 (Bag E)	7.90	Transfer post EVA 3 **Swap. Ref. Item #43 on the 'Resupply' Tab.
				510c	Return Item 510c [Adjustable Fuse Tether, s/n 1028]	1	LAB1D2 {Mesh Bag}		MF71E	2.60	
				510.1	EVA Cuff Checklists	3	LAB1D2 {Mesh Bag}		MF43H {SODF Locker}	1.80	
				512	Return Bag 512 [Russian Items]	1 hlf	LAB1D2		MF71M	28.34	
				513	Return Item 513 [3 bundles of 6 Food Containers]	3	LAB1D2		EXT A/L FLOOR BAG	39.60	
				514	Return Item 514 [Russian Handcontrollers]	6	LAB1D2 {Mesh Bag}		EXT A/L FLOOR BAG	15.20	Use clothing to wrap and protect these items when packing into the EXT A/L FLOOR BAG.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
Non- Prepacked Bags/Items											
				701	Adjustable Fuse Tether [s/n 1008]	1	ISS A/L		MF71E	2.60	Transfer Post EVA 3
				702	ALSP Drug Subpack	1	LAB1D4_D1 {ALSP, s/n 1001}		MD FLOOR PORT 1 (Bag A)	7.94	**Swap. Ref. Item #19.1 on the 'Resupply' Tab.
				703	CHEMICAL SAMPLE, POST-FLIGHT ANALYSIS PACKET [p/n SEG46119988-309]	2	LAB1P1 {0.5 CTB s/n 1303, b/c 010484J}		MF57E In food tray	3.52	**Item is stowed in 0.5 CTB: CheCS RTH Water Samples and Hardware Bag, s/n 1303, b/c 010484J. **Sample dated 8/11/06 (GMT 223) **Item #'s 704 and 723 also located in this CTB for return.
				704	LARGE WASTE WATER BAG [p/n KLSK270288-303]	1	LAB1P1 {0.5 CTB s/n 1303, b/c 010484J}		MF57E In food tray	2.27	**Item is stowed in 0.5 CTB: CheCS RTH Water Samples and Hardware Bag, s/n 1303, b/c 010484J. **Sample dated 8/25/06 (GMT 237) **Item #'s 703 and 723 also located in this CTB for return.
				705	Defibrillator Resupply Kit [s/n 1003]	1	MA9F	LAB	MD FLOOR PORT 2 (Bag C)	2.2	**The contents of this kit were emptied into the lid of the 'New' Defibrillator per Item #19.2 on the 'Resupply Tab'. This kit will return empty.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				706	Mesh Bag (with ECOK (Mn))	1		ISS A/L	MD FLOOR STBD 1 (Bag G)	5.5	Transfer post EVA 3. Configured per EVA PREP FOR TRANSFER TO SHUTTLE (EVA Checklist, <u>A/L CONFIG</u>).
				707	Mesh Bag (with ECOK (Bb))	1		ISS A/L	MD FLOOR STBD 1 (Bag G)	5.36	Transfer post EVA 3. Configured per EVA PREP FOR TRANSFER TO SHUTTLE (EVA Checklist, <u>A/L CONFIG</u>).
				708	EMU [with ECOK (Ta), LCVG (3111)] [s/n 3004]	1		ISS A/L	EXT A/L	298.28	Item #s 500, 724, 725, (MISSE and CLPA) must transfer prior to returning EMUs to Ext A/L. Transfer post EVA 3. Configured per EVA PREP FOR TRANSFER TO SHUTTLE (EVA, <u>A/L CONFIG</u>).
				709	EMU [with ECOK (Pp), LCVG (3127)] [s/n 3017, w/ Helmet s/n 1070]	1		ISS A/L	EXT A/L	298.69	Item #s 500, 724, 725, (MISSE and CLPA) must transfer prior to returning EMUs to Ext A/L. Transfer post EVA 3. Configured per EVA PREP FOR TRANSFER TO SHUTTLE (EVA Checklist, <u>A/L CONFIG</u>).
				710	EMU RF Camera Assembly [ERCA] [SED33111710-307] [s/n 1011, ID #17]	1	NOD1S1 {0.5 CTB s/n 1125, b/c 006574J}		EXT A/L FLOOR BAG	9.00	Transfer post EVA 3.

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CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				711	EVA Systems Mesh Bag	1		ISS A/L	MD FLOOR STBD 1 (Bag G)	23.95	Transfer post EVA 3. Configured per EVA PREP FOR TRANSFER TO SHUTTLE (EVA Checklist, <u>A/L CONFIG</u>).
				712	Eq Hk RET [p/n SEG33106164-381] [s/n 4073]	1	A/L1D2 Tether Staging Area		MF71E	0.70	Transfer post EVA 3.
				713	Lg-Eq RET [p/n SEG33106164-385] [s/n 4257]	1	A/L1D2 Tether Staging Area		MF71E	1.1	Transfer post EVA 3.
				714	FOAM [EMCS 12 CTB foam]	2		LAB	MD CEIL STBD 1 (10 MLE)	2.0	**Foam removed from EMCS CTB. Ref. Item #30.3 on the 'Resupply' Tab.
				715	FOAM [EMCS and EMU Micron CTB foam]	2		LAB	MD CEIL STBD 1 (10 MLE)	2.0	**Foam removed from EMCS and EMU Micron Filter CTB. Ref. Item #31.3 on the 'Resupply' Tab.
				716	Item Deleted						
				717	HMS DEFIBRILLATOR [OLD] [s/n 1001]	1	LAB1D4_J1		MD FLOOR PORT 1 (Bag A)	36.5	Do Not Transfer until post DEFIB C/O on FD8. **Swap. The 'New' Defibrillator (Ref. Item #33 on the 'Resupply' Tab) must be checked out prior transfer of 'Old' Defibrillator.

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CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				718	Installable Handrail [p/n SEG33106351-301] [s/n's 1388, 1389]	2	EXT		EXT A/L FLOOR BAG	3.8	Transfer post EVA 3. **Will only transfer if EWIS is installed in EVA 3.
				719	LTA MLI BLANKET, ECU	1	P3/P4		MD FLOOR PORT 2 (Bag C)	2.66	Transfer Post EVA 2 **Folded dimensions: 16"x16"x3"
				720	LTA MLI BLANKET, ECU	1	P3/P4		MD FLOOR PORT 2 (Bag C)	2.66	Transfer Post EVA 2 **Folded dimensions: 16"x16"x3"
				721	LTA MLI BLANKET, SSU	1	P3/P4		MD FLOOR PORT 2 (Bag C)	4.41	Transfer Post EVA 2 **Folded dimensions: 24"x16"x3"
				722	LTA MLI BLANKET, SSU	1	P3/P4		MD FLOOR PORT 2 (Bag C)	4.41	Transfer Post EVA 2 **Folded dimensions: 24"x16"x3"
				723	LARGE STOWAGE BAG [Water Samples]	2	LAB1P1 {0.5 CTB s/n 1303, b/c 010484J}		MF57E In food tray	0.44	**Item is stowed in 0.5 CTB: CHeCS RTH Water Samples and Hardware Bag, s/n 1303, b/c 010484J. **Samples dated 8/11/06 (GMT 223) **Item #'s 703 and 704 also located in this CTB for return.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				724	MISSE PEC Inner Bag [aka 'MISSE Inner Flight Bag'] [1 of 2]	1	A/L100 {Mesh Bag}		MD CEIL STBD 1 (10 MLE)	80.53	Transfer prior to returning the EMUs to the Ext A/L on FD8. Configured and Transferred per timelined MISSE XFER on FD7. **Place both MISSE 5 and removed MEEP Experiment Probe (stem) in MISSE Inner Flight bag (loose is fine - do not tape down). Then fold over top of MISSE Inner Flight bag and tape shut with Kapton Tape.
				724.1	MISSE PEC 5	1	EXT		MD CEIL STBD 1 (10 MLE)	80.36 (part of above)	**Use Ratchet, 3/8" drive and 7/16" Socket, 3/8" Drive (both from Drawer 2 of ISS IVA Tool Box) to remove (2) bolts from the base of the stem. **Remove the MISSE CLAMP/POINTER ASSY (Reference Item #725.1, (remove by releasing the 2 pip-pins)) and stage for return. ** Remove stem from base PEC stem mounting plug and replace bolts and washers in their respective holes in the stem mounting plugbase for return.
				724.2	MEEP Experiment Probe [aka PEC STEM]	1	EXT {MISSE 5}		MD CEIL STBD 1 (10 MLE)	n/a (part of above)	**Place in a ziplock bag for return. Ziplock Bag can be found at NOD104_C1. Stow ziplock in MISSE Inner Flight Bag with MISSE 5, but Do Not Tape to MISSE - this can be free-floating in the bag with MISSE.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				725	MISSE PEC Inner Bag [aka 'MISSE Inner Flight Bag'] [2 of 2]	1	A/L100 {Mesh Bag}		MD CEIL STBD 1 (10 MLE)	12.57	Configured and Transferred per timelined MISSE XFER on FD7.
				725.1	MISSE CLAMP/POINTER ASSEMBLY	1	EXT {MISSE 5}		MD CEIL STBD 1 (10 MLE)	12.39 (part of above)	**Remove from MISSE 5 by releasing the 2 pip-pins. **Place in 2nd MISSE Inner Flight bag for return. Then fold over top of MISSE Inner Flight bag and tape shut with Kapton Tape.
				726	Multimeter [old] [Gertrude]	1	NOD1O4_D1 {0.5 CTB s/n 1202, b/c 006651J}		MF28G {IFM Tools Stowage Tray}	3.10	**Swap with Shuttle multimeter. Ref. Item #24 on 'Resupply' Tab. **Item is located in 0.5 CTB: Scopemeter and Accessories (s/n 1202, b/c 006651J) **Place old multimeter in STS Multimeter/Temp Probe Kit [p/n 10118- 10018-04] in IFM drawer.
				727	NH3 Vent Tool [p/n 1F98589-1]	1	EXT		EXT A/L FLOOR BAG	5.36	Transfer Post EVA 3. **This is a EVA 3 get-ahead task.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				728	POEMS FOAM CUSHION [p/n 1022-M-3001-00]	2	LAB1O4 {MELFI}		MA16G	2.82	Samples removed from MELFI on FD8 per {2.002 POEMS SAMPLE CANISTER REMOVAL FROM MELFI} (PODF: POEMS: Nominal). Do not stow near a heat source.
				729	Return Ziplock Bag [ITCS Sample] [p/n SEG46118278-702]	1	LAB1P5_A2 {inside CQMK (s/n 1002)}		MF57E In food tray	1.4	Sample taken on FD9 per {3.1.601 ITCS Fluid Sampling} (SODF: ISS In-Flight Maintenance: Lab: Preventive/TCS).
				730	Safety Tether 85ft [p/n SED33116109-301] [s/n 1002]	1	A/L1D2 Tether Staging Area		MD CEIL PORT 1 (Bag E)	12.00	Transfer post EVA 3 **Swap. Ref. Item #42 on the 'Resupply' Tab.
				731	S-BAND BASEBAND SIGNAL PROCESSOR (OLD) [p/n 10033177-1]	1 snl	EXT		MD FLOOR PORT 1 (Bag A)	47.82	Transfer Post EVA 3. **This is the CTB from the Resupply Transponder (Ref. Item #10 on the 'Resupply' Tab). Use this CTB and the foam to pack Item #731.1 for return. **Remove the 'yellow' transfer label from CTB to display 'green' return label.
				731.1	S-BAND BASEBAND SIGNAL PROCESSOR [OLD] [p/n 10033177-1]	1	EXT		MD FLOOR PORT 1 (Bag A)	42.82 (part of above)	Transfer Post EVA 3. Install protective caps on electrical connectors. Caps are located in the EMU Equipment Bag at A/L1A1. **Pack in CTB and foam from 'New' Transponder.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
				732	1.0 CTB: S-BAND TRANSPONDER [s/n 1376, b/c CTB00042J]	1 sngl	LAB1D5 Rack Front		MD CEIL STBD 1 (10 MLE)	48.04	Transfer Post EVA 3. **Use this CTB and the foam to pack Item #732.1 for return.
				732.1	S-BAND TRANSPONDER [OLD] [p/n 10039397-1]	1	EXT		MD CEIL STBD 1 (10 MLE)	42.76 (part of above)	Transfer Post EVA 3. Install protective covers on electrical connectors. Caps are located in the EMU Equipment Bag at A/L1A1. **Pack in CTB and foam from 'New' Transponder.
				733	SILVER BIOCID SYRINGE KIT (20 ML) [s/n 1005, b/c 00015599J]	1	LAB1D2	MDDK	MD FLOOR PORT 1 (Bag A)	1.34	Transfer prior to first docked CWC FILL INIT on FD4. **The syringes in this kit will be used for CWC fills, and then return empty.
				734	BPSMU	1	ISS	MDDK deployed	LAB FWD ENDCONE {behind closeout}	1.12	Return to ISS prior to hatch close. **Reference Item #1 on the 'Resupply' Tab. **Stow this item in the DOCKING MECHANISM ACCESSORY KIT, which is stowed in closeout above the LAB FWD Endcone.

STS-115/12A Return Transfer List

CHNG	☒	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
Return Realtime Additions											

MSG 022 - FD03 WATER ACTIVITY SUMMARY

Today, there will be a simo supply/waste H2O dump, the Condensate Collection CWC will be setup, and EMU drink bags will be filled.

Simo Dump Details

At MET 01/13:20 perform a simo supply/waste H2O dump with the following details:

Perform SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS) p 5-2, steps A, and C through J

Dump supply water for 60 minutes.

The waste tank will be dumped to 5%. Waste dump valve open duration will be ~24 minutes.

MCC will TMBU all limits.

Shuttle Condensation Collection Details

Post waste dump, perform SETUP of SHUTTLE CONDENSATE COLLECTION (ORB OPS, ECLS) p 5-36, steps 1-9. All hardware is stowed in MF71O. Report initiation time and CWC barcode and serial number to MCC.

EMU Drink Bag Fill Details

At MET 1/16:35 ISS EVA SYS: 1.305 EQUIPMENT LOCK PREP will be performed.

GALLEY OVERNIGHT CONFIG (ORB OPS, ECLS) p 5-48 must be performed prior to the fills to ensure iodinated H2O is in the bags. After fills are complete, perform GALLEY MORNING CONFIG (ORB OPS, ECLS) p 5-48.

MSG 023 (13-1183) - EVA SAFER LATCH TAPING

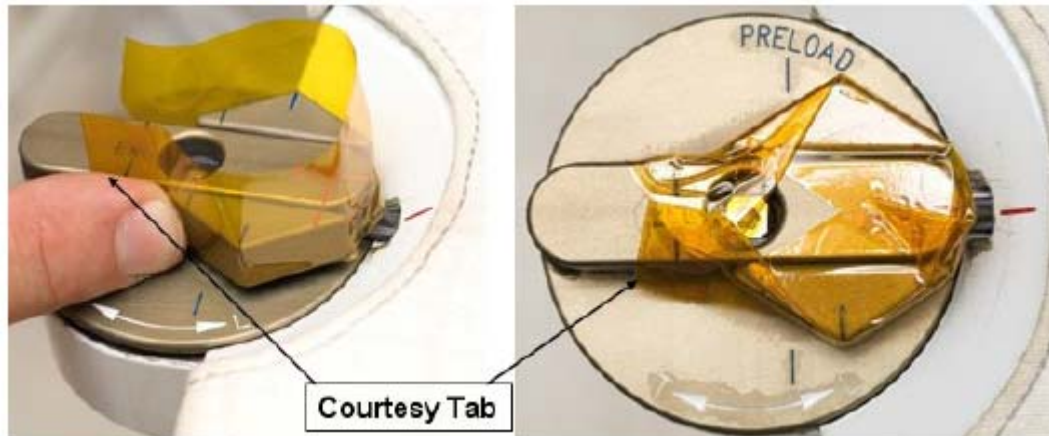
Page 1 of 4

Nominal SAFER Latch Taping:

This nominal procedure will be implemented by the IV crew member after step 37 of 1.225 EMU PREBREATHE (US_SODF: EVA-EXTRA VEHICULAR ACTIVITIES: ISS EVA SYS: EVA PREP/POST) prior to each 12A EVA.

Helpful Hints:

- We used one piece of 1" wide x 5" long (per latch) of Kapton tape in this photo.
 - If required/desired, apply more layers of tape for additional security.
 - Make sure that the tape has a tab available for quick release in case of an expedited suit doffing scenario.
1. Wipe the SAFER latches (4) with a clean cloth or lint free wipe (for better adhesion.)
 2. With Flashlight, √latch is properly engaged/locked in PLSS. (under EMU arm)
 3. Tape around each latch as shown, then fold the tape down.



Off-nominal attaching of SAFER with a Jammed Latch

Objective: To avoid having to go EVA without a SAFER due to multiple units having failures. SAFER sn1007 has a latch that only can only be placed in the "PRELOAD" position. With this method of attachment and taping, any latch with this condition can still be considered usable.

MSG 023 (13-1183) - EVA SAFER LATCH TAPING

Page 2 of 4

Preparation:

Obtain from the ISS-IVA toolbox:

- ❑ any one of the following wrenches
 - 1/8" L wrench (from drawer 4)
 - Folding L wrench set (0.05"-3/16", from drawer 4)
 - 1/8" Hex head driver (from drawer 3)
- ❑ 2" wide roll of Kapton tape
- ❑ 1" wide roll of Kapton tape
- ❑ Flashlight

Obtain from the EMU Servicing Kit

- ❑ Scissors
- ❑ Lint Free Wipes

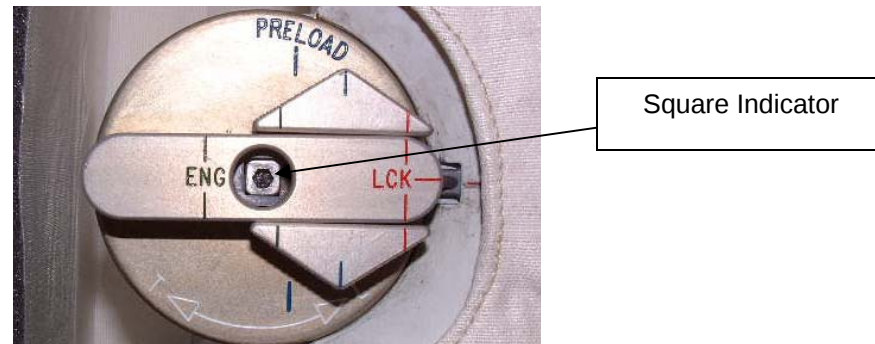
CAUTION

Rotating latch CCW hard against the softstop can bind the latch.

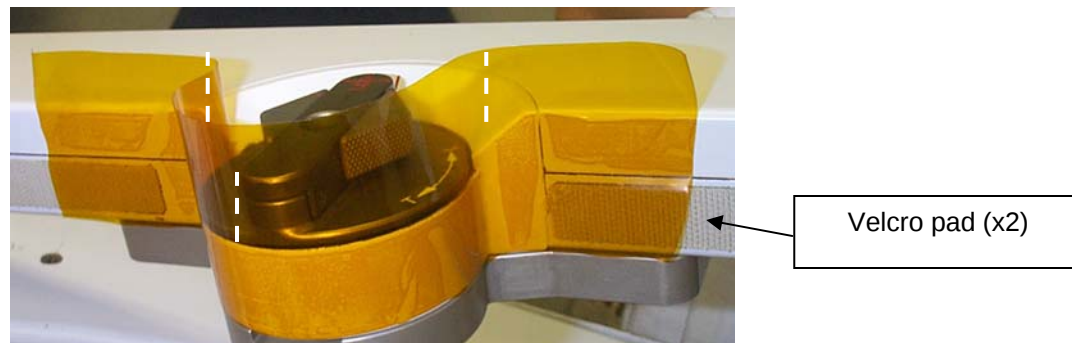
1. As required for nominally operating latch, attach / inspect / tape per original plan,
i.e.:
 - 1.1 Attach per ISS EVA SYSTEMS CHECKLIST procedure 1.225 EMU PREBREATHE steps 26-37.
 - 1.2 Inspect and tape latch per the above **Nominal SAFER Latch Taping**.
2. For jammed latch (stuck in "PRELOAD" position) :
 - 2.1 Turn latch CCW to softstop (toward 'L' = loosen)
 - 2.2 Insert a 1/8" L wrench into the square indicator in the central hole of the latch (See picture).
 - 2.3 Push latch toward PLSS and hold latch such that the 'butterfly / T' portion is recessed into the PLSS striker plate (NOTE: rotate wrench slightly as required to make "T" align with slot in PLSS.)
 - 2.4 While holding the latch in the recessed position, turn the wrench CW ~90 degrees until it stops. (NOTE: The latch assembly may turn along with the wrench; this is not a concern.)

MSG 023 (13-1183) - EVA SAFER LATCH TAPING

Page 3 of 4



- 2.5 Turn the latch assembly CW (toward 'T' = tighten) until ratcheting occurs.
 - 2.6 Continue CW rotation at least another 360 degrees, ending with latch aligned for locking as shown in previous picture.
 - 2.7 With Flashlight, √latch is properly engaged/locked in PLSS (under EMU arm.)
 - 2.8 Attempt to lock latch one last time (Note: proceed regardless of outcome.)
3. Tape the latch assembly to tower (to prevent rotation and release):
- 3.1 Pull open MLI cover around the latch (attached with velcro.)
 - 3.2 Clean surfaces to be taped using Lint free wipe.
 - 3.3 Tape around SAFER latch, as shown below, using a 2" wide by ~9" long piece of Kapton tape. (NOTE: velcro pads not completely covered.)

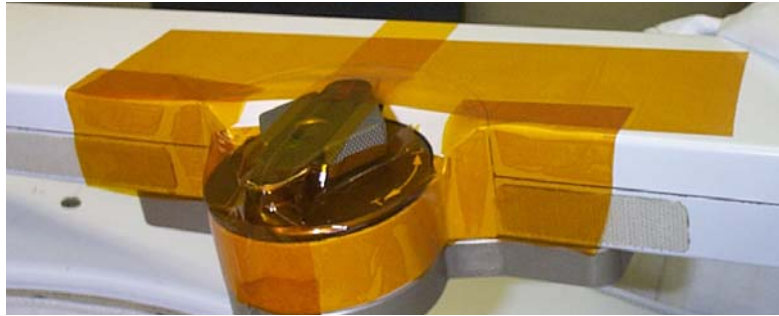


- 3.4 Cut the tape at the three locations, fold tape onto latch and tower surfaces as shown below.
- If additional security needed due to taping issues:
- 3.5 Place a 1" wide by ~8" long piece of Kapton tape across the center of the latch mechanism as shown below.

MSG 023 (13-1183) - EVA SAFER LATCH TAPING

Page 4 of 4

- 3.6 Place a second length of 2" wide Kapton tape along the SAFER tower to further secure both strips of tape to the tower.



4. Re-secure the MLI cover over the tower.
5. Continue EVA PREBREATHE.

MSG 024A (13-1184A) - EVA PROCEDURE P&I DELTAS

Page 1 of 2

FD03 EVA Checklist and Cue Card Updates

AIRLOCK CONFIG

Make the following Pen and Ink changes to the (EVA, AIRLOCK CONFIG)

1. On pg FS 2-8
 - Add "7a. Remove & install EMU Batteries per EMU/AIRLOCK CONSUMABLES Cue Card, stowing removed batteries for EVA 3 use."

EVA 1

Update FS 7-5 PRE EVA 1 TOOL CONFIG (EVA, EVA 1) to add a second GP caddy with SSAS Cont Bolts to contents of Staging Bag.

Add:

GP Caddy (RET if required)
SSAS Contingency Bolts (4)

Although only 4 SSAS bolts are required to support SSAS EVA contingencies, we thought it prudent to add a back up set to the staging bag for a total of 2 GP Caddies with 4 SSAS Contingency bolts each. These items have already been preconfigured by Inc13.

UNSCH/CONT EVA TASKS

Make the following changes to 12A WORKAROUND CRIBSHEET (EVA, UNSCHEDULED/CONTINGENCY EVA TASKS) to reflect late 1819 data updates:

FS 16-3 PAD, block B. step 3

- Was:
... PGT[B7 25.5 ft-lb, CCW2 30 RPM, MTL 30.5]...
- Is:
... PGT[A6 8.3 ft-lb, CCW2 30 RPM, MTL 30.5]...

FS 16-4 APFR/IAPFR, block C

- Was:
... PGT[B7 25.5 ft-lb, CCW2 30 RPM, MTL 30.5]...
- Is:
... PGT[B1 12.0 ft-lb, CCW2 30 RPM, MTL 30.5]...

FS 16-4 Torque Multiplier, block A, step 2

- Was:
... PGT[A1 2.5 ft-lb, CCW2 30 RPM, MTL 30.5]...
- Is:
... PGT[A5 7.0 ft-lb, CCW2 30 RPM, MTL 30.5]...

FS 16-4 Scoops, block A

- Was:
... PGT[B1 12.0 ft-lb, CCW2 30 RPM, MTL 30.5]...
- Is:
... PGT[A2 3.8 ft-lb, CCW2 30 RPM, MTL 30.5]...

MSG 024A (13-1184A) - EVA PROCEDURE P&I DELTAS

Page 2 of 2

12A EMU/AIRLOCK CONSUMABLES CUE CARD

Make the following Pen and Ink changes to the 12A EMU/ AIRLOCK CONSUMABLES CUE CARD:

- Note: in addition to the cue card itself, a reproduction is located on pg FS 10-13 and FS 10-14 (EVA, EMU MAINT/RECHARGE)
- 1. On front of Cue Card, "EMU Battery" column, "EVA 1" row,
 - ☐ was "Sn2031 in EMU1 (launched) Sn2036 in EMU2 (launched)"
 - ☐ is "Sn2057 in EMU1 (~~launched~~) Sn2058 in EMU2 (~~launched~~)"
- 2. On front of Cue Card, "EMU Battery" column, "EVA2" row,
 - ☐ was "... Recharge on ISS EMU Charger (PSA) Sn2031, Sn2036",
 - ☐ is "... Recharge on ISS EMU Charger (PSA) Sn2057, Sn2058"
- 3. On front of Cue Card, "EMU Battery" column, "EVA 3" row,
 - ☐ was "Sn2057 in EMU1 Sn2058 in EMU2"
 - ☐ is "Sn2031 in EMU1 Sn2036 in EMU2"
- 4. On front of Cue Card, "EMU Battery" column, "Pre-Undock Notes: (per Nominal Timeline)" row,
 - ☐ was "... (2) EVA1 batts (up/down) return in STS EMUs charged..."
 - ☐ is "... (2) EVA1 batts (ISS) return in STS EMUs charged..."
- 5. On Back of Cue Card, for "Post EVA 2" (i.e. upper graphic, REBA batteries on right),
 - ☐ was "1004"
 - ☐ is "1005"
 - ☐ Note: editorial correction only; batteries are installed this way per front side of Cue Card.
- 6. On Back of Cue Card, for "Post EVA 3" (i.e. lower graphic, REBA batteries on right),
 - ☐ was "1005"
 - ☐ is "1004"
 - ☐ Note: editorial correction only; batteries are installed this way per front side of Cue Card.

MSG 025A (13-1185A) - EVA CHANGEOUT PAGES

Page 1 of 10

EVA 2

Replace FS 7-41 EVA 2 Inhibit Pad (EVA, EVA2) with page 2 to add inhibit to lock P4 4A BGA. EV3 will remove the 4A SSU Shroud at approximately 0:45 PET. This task will put him in the 4A BGA rotation plane, requiring the BGA to be locked per flight rule B9-305_A. This is the nominal config for the BGA for EVA2. This is an MCC-H action only, no crew action is required.

Replace FS 16-10 with page 3, which moves S-band BSP or XDPR Box, block C to SASA R&R and re-letters subsequent block designations.

Add pages 4 and 5 after FS 16-10 to incorporate QD workarounds for vent tool on Z1-M5.

Replace FS 16-11 through FS 16-13 with pages 6 through 8. This changes the PGT speed for CLA manual override from 60RPM to 10RPM, adds cautions to maintain comm and halt ratcheting if SSRMS safes while ratcheting with PRDs, changes slack strap to pull from PRD from 3 to 6.5 inches and updates the CLA manual override speed in the Task Data from 60 to 10 RPM.

Replace FS 16-18 and FS 16-19 with pages 9 and 10 to change PGT settings and Task Data in P1-P3 MBA BOLT OVERRIDE (EVA, UNSCHEDULED/CONTINGENCY EVA TASKS).

EVA 2 INHIBIT PAD [MSG025 (13-1185) PAGE 2 OF 10]

ORBITER

RCS	
If EV crew < 27 ft from FRCS:	
IV	1. √DAP: FREE, LO Z
O14,15,16	2. √RJDF F1, F2, F3, F4 MANF DRIVER (four) – OFF LOGIC (four) – OFF
MCC-H	3. √Above RCS config
IV	4. √RCS F – ITEM 1 EXEC (*) √JET DES F1U – ITEM 17 (*) F3U – ITEM 19 (*) F2U – ITEM 21 (*)
TCS	
IV	L12 1. √TCS POWER – OFF
S-Band	
<u>NOTE</u> Possible loss of comm when forced to S-Band LL FWD antenna	
When EV crew on Lab forward area:	
If EV crew ≤ 1.6 ft from upper S-Band antenna:	
IV	1. S-BAND FM ANT – XMTR LOWER/RCVR UPPER
A1R	2. √MCC, lower antenna selected
If no comm, or on MCC call:	
C3	3. S-BAND PM ANT – LL FWD
When EV crewmember at least 1.6 ft away from all S-band upper antennas:	
C3	4. S-BAND ANT – GPC
KU-Band	
MCC-H	1. √KU-BAND EVA Mask – active 2. √KU-BAND EVA Protect Box – active

RSOS

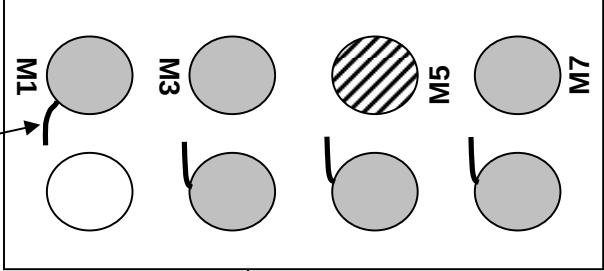
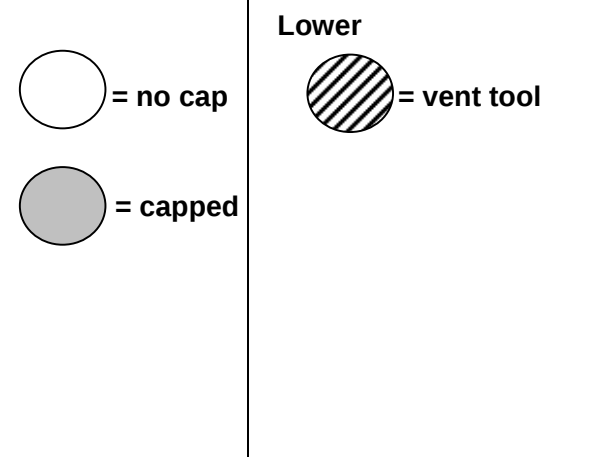
FGB Antennas	
MCC-M	1. √FGB KURS P [Kurs] – Deactivate
	2. ARISS – Deactivate
Soyuz Antennas	
MCC-M	3. √Soyuz KURS A [Kurs] – Deactivate
SM Antennas	
MCC-M	4. Global Timing Sys 1 (400.1MHz) [GTS] – Deactivate
	5. ARISS – Deactivate

USOS

PCU	
<u>NOTE</u> PCUs may require up to 1 hr warm-up period before they are operational. No further action is reqd in the event of one or two PCU failures	
MCC-H	1. √PCUs (two) operational in discharge mode
Lab Window	
IV	1. Close window shutter if EV crew less than 10 ft/3.5m from window
MISSE PEC 5	
MCC-H	1. √MISSE PEC 5 – RESET, record timer information
Ground Radar	
MCC-H	1. √TOPO/RIO & FDO console, ground radar restrictions in place for EVA
<u>P4 4A BGA</u> MCC-H 1. √BGA - LOCKED	

SASA R&R	A. Spare SASA mast fasteners do not release from Z1 truss	PGT[RCCW, MTL 30.5]-6 ext 7/16: Re-attempt fastener release
	B. SASA mast fasteners do not engage Z1 truss	Secure SASA to Z1 truss with tethers, contact MCC for tie down information
	C. Stanchion bolt does not release	1. PGT[RCCW, MTL 30.5] Drive bolt 1 turn 2. If NO JOY, retrieve manual ratchet, re-attempt ccw rotation
	D. Spare SASA stanchion bolt does not engage truss at least 7 turns	1. PGT[B7 25.5, CW2 30 RPM, MTL 30.5] 2. PGT[RCW, MTL 30.5]-6 ext 7/16: Re-attempt fastener engagement to 7 turns (4 turns minimum required)
	E. Spare SASA gimbal bolts do not release	1. PGT[B7 25.5 ft-lb, CCW2 30 RPM, MTL 30.5]-6 ext 7/16: Drive fastener 1 turn 2. Release all other gimbal bolts, reattempt stuck bolt 3. On MCC GO – PGT[RCCW, MTL 30.5]-6 ext 7/16: Drive fastener 1 turn
	F. Gimbal bolts do not pivot	Verify that all gimbal bolts have been released and check for FOD
	G. Spare SASA gimbal bolts do not stay in place after rotation	PGT[A4 6.3 ft-lb, CW2 30 RPM, MTL 30.5]- 6 ext 7/16: Secure fastener
S-band BSP or XDPR Box	A. Outer or center jack bolt fails to break initial torque	1. For center jack bolt, reattempt with same setting while pulling box out 2. PGT[B7 25.5 ft-lb, CCW2 30 RPM, MTL 30.5]-6 ext 7/16: Drive fastener 1 turn 3. PGT[RCCW, MTL 30.5]-6 ext 7/16: Apply manual torque 4. On MCC GO, retrieve manual ratchet, re-attempt
	B. Center jack bolt and outer bolt fails to engage/install	1. Remove box, inspect rail and bolt interface for debris. Check box co-therm layer for damage 2. Attempt to reinstall 3. PGT[A7 9.2 ft-lb, CW2 30 RPM, MTL 30.5]-6 ext 7/16: Re-attempt fastener release 4. Incrementally increase torque up to B2 16.0 ft-lb
	C. High running torque on center jack bolt or outer bolts	Incrementally increase torque up to B2 16.0 ft-lb, ccw direction

Z1-M5 Vent Tool Retrieval	A. Unable to close vent tool QD valve	1. Use bail lever (boomerang) tool in QD crewlock bag. 2. If QD stuck in intermediate position, attempt to cycle back to open position, then closed 3. Use bail drive (jackscrew) tool a. Retrieve bail drive tool from Z1 stbd tool box, slot #2 b. Install bail drive tool on vent tool QD c. Verify button pressed and apply force to QD bail by turning bail drive tool CW by hand - stop if deformation of the QD bail is observed d. If bail not deformed, PGT[A1 2.5 ft-lb, CW1 10 RPM, MTL 30.5]- 6 ext 7/16: Verify button pressed and drive bail drive tool until QD valve closed or bail deforms e. Incrementally increase PGT torque until QD valve closed or bail deforms f. If no joy, leave QD in open or intermediate position
	B. QD valve closed, but cannot be demated	1. Verify button up 2. Retrieve QD release tool from crewlock bag and use tool to demate QD

		C. Unable to remove cap from M5 lower Upper  Lower 	- Remove cap from M3 lower - if no joy go to step 2 - Install cap from M3 lower on M5 upper. - If M3 lower lanyard will not reach M5 upper: - Remove cap from M3 upper - if no joy reinstall M3 lower cap and proceed to step 2 - Install cap from M3 upper on M5, install cap from M3 lower on M3 upper - Remove cap from M7 lower - if no joy go to step 3 - Install cap from M7 lower on M5 upper. - If M7 lower lanyard will not reach M5 upper: - Remove cap from M7 upper - if no joy reinstall M7 lower cap and proceed to step 3 - Install cap from M7 upper on M5, install cap from M7 lower on M7 upper - Retrieve QD cap tool (QD crewlock bag) and ratchet wrench (P3 ORU bag), use to remove M5 lower cap - Retrieve RPDA shroud from P3 ORU bag, secure over Z1 QD tray with wire ties - verify M5 completely covered - Mate vent tool to M5, leave valve closed
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P1-P3 CAPTURE LATCH OVERRIDE [MSG025 (13-1185) PAGE 6 OF 10]

IV/RMS	EV1	EV2
<u>CAPTURE LATCH MANUAL DRIVE FOR FAILED OPEN CLA</u> IV 1. First stage capture complete, GO to limp SSRMS MCC-H 2. Inhibit mechanism autosafing <u>CAUTION</u> Verify and maintain good communication with EV crew during manual override drive 3. Give EV GO to continue latch closure <u>NOTE</u> If less than 63.3 turns additional turns (105 total turns) before hard stop, capture latch closure not complete, go to <u>CAPTURE LATCH OVERRIDE WITH PRDs</u> MCC-H 4. On EV GO, perform nominal MBA bolting <u>CAPTURE LATCH OVERRIDE WITH PRDs</u> <u>CAUTION</u> Do not exceed 200 lbf on EVA handrails while ratcheting with PRDs. When the PRD actuating force increases sharply during bail throw, stop actuating. Verify and maintain good communication with EV crew during PRD ratcheting. IV 1. First stage capture complete, GO to limp SSRMS 2. Give EV GO to continue ratcheting PRDs	<u>CAPTURE LATCH MANUAL DRIVE FOR FAILED OPEN CLA</u> 1. PGT[A6 8.3 ft-lb, CW1 10RPM, MTL 30.5]-6 ext 7/16: Drive manual override up to 41.7 turns to topological capture <u>CAUTION</u> If SSRMS safing occurs during EVA manual drive of CLA, IV must notify EV crew to stop driving the manual override immediately to prevent SSRMS damage 2. On IV GO, rotate drive to hard stop (approx 84.6 turns,126.3 total turns) 3. PGT[A6 8.3 ft-lb, CCW2 30RPM, MTL 30.5]-6 ext 7/16: Drive manual override 5 turns to final close position 4. Give IV GO for nominal MBA bolting 5. If NO JOY closing capture latch, continue with <u>CAPTURE LATCH OVERRIDE WITH PRDs</u> <u>CAPTURE LATCH OVERRIDE WITH PRDs</u> <u>CAUTION</u> If SSRMS safing occurs during ratcheting of PRDs, IV must notify EV crew to stop ratcheting the PRD bail drive immediately to prevent SSRMS damage. 1. Install PRD on zenith longeron between handrails P1-3685 and P3 – 3813 with inboard stand-off on P1 handrail 2. Pull minimum 6.5 inches slack in strap. Ratchet PRD snug (14 full strokes reqd) 3. Verify SSAS coarse pin engages cone	<u>CAPTURE LATCH OVERRIDE WITH PRDs</u> 1. Install PRD between handrails P1-3604 and P3 – 3800 (nadir CETA rail handrails) with fixed end on P1 handrail 2. Pull minimum 6.5 inches slack in strap. Ratchet PRD snug (14 full strokes reqd) 3. Verify SSAS coarse pin engages cone

P1-P3 CAPTURE LATCH OVERRIDE (Cont) [MSG025 (13-1185) PAGE 7 OF 10]

IV/RMS	EV1	EV2
MCC-H 3. On EV GO, perform nominal MBA bolting <u>CONTINGENCY BOLT REMOVE</u> IV 1. When MBA bolting complete and as assembly time permits, perform <u>CONTINGENCY BOLT REMOVE</u>	- On IV GO, ratchet PRD until trusses fully seated (0.5 inch bulkhead clearance) or PRD actuating force increases sharply during PRD bail throw - After PRDs are installed, Install contingency bolt 4B, DO NOT PRELOAD PGT[A7 9.2 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 4B (zenith trunnion) until bolt head seated - DO NOT PRELOAD. Install and drive contingency bolt 3B (zenith CETA rail) until bolt head seated - Release PRD and temp stow PGT[B7 25.5 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 4B to torque stall PGT[RCW MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt 4B to torque (x4) - Install locking cap onto bolt head PGT[B7 25.5 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8: Drive contingency bolt 3B to torque stall PGT[RCW MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt 3B to torque - Install locking cap onto bolt head - Give GO for nominal MBA bolting <u>CONTINGENCY BOLT REMOVE</u> - Remove locking cap from 4B bolt head PGT[B7 25.5 ft-lb, CCW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 4B, remove and stow - Remove locking cap from 3B bolt head - Drive contingency bolt 3B, remove and stow	- On IV GO, ratchet PRD until trusses fully seated (0.5 inch bulkhead clearance) or PRD actuating force increases sharply during PRD bail throw - After PRDs are installed, install contingency bolt 2B, DO NOT PRELOAD PGT[A7 9.2 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 2B (nadir CETA rail)) until bolt head seated - DO NOT PRELOAD. Install and drive contingency bolt 1B (nadir trunnion) until bolt head seated - Release PRD and temp stow PGT[B7 25.5 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 2B to torque stall PGT[RCW MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt 2B to torque - Install locking cap onto bolt head PGT[B7 25.5 ft-lb, CW2 30RPM, MTL 30.5]-7.8 ext 5/8: Drive contingency bolt 1B to torque stall PGT[RCW MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt 1B to torque - Install locking cap onto bolt head - Give GO for nominal MBA bolting <u>CONTINGENCY BOLT REMOVE</u> - Remove locking cap from 2B bolt head PGT[B7 25.5 ft-lb, CCW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt 2B, remove and stow - Remove locking cap from 1B bolt head - Drive contingency bolt 1B, remove and stow

P1-P3 CAPTURE LATCH OVERRIDE – TASK DATA [MSG025 (13-1185) PAGE 8 OF 10]

Tools:

EV1	EV2
PGT	PGT
6 Ext 7/16	6 Ext 7/16
7.8 Ext 5/8	7.8 Ext 5/8
RAD	RAD
PRD	PRD

EVA Fasteners:

Fastener Name	Label	Head Size	Qty	Install Torque (ft-lb)	Release Torque (ft-lb)	Failure Torque (ft-lb)	Turns	RPM
Manual Capture Latch Override bolt	NA	7/16	1	8.3	NA	14.6	126.3	10
Contingency Bolt at Trunnion Longeron	NA	5/8	4	47.9	NA	60.8	43	30
Contingency Bolt at Zenith MT rail	NA	5/8	4	47.9	NA	83.3	43	30
Contingency Bolt at Nadir MT rail	NA	5/8	4	55.8	NA	145.8	43	30

EVA Connectors:

Harness	From	To	Clamps (#)	Conn Size	Function
NA					

Mass: NA

Notes:

- During the Capture Latch Override steps, the "B" bolts are used to avoid having to remove thermal covers. The "A" bolts are acceptable if the crewmember believes they have better access to them
- Due to mis-labeling on the P1 flight hardware, the SSAS contingency bolt labels do not correspond to their respective MBA corner. The 1A and 1B labels are on MBA corner #4 (nadir trunnion). The 4A and 4B labels are on MBA corner #1 (zenith trunnion). The 2A and 2B labels are on MBA corner #3 (nadir MT rail). The 3A and 3B labels are on MBA corner #2 (zenith MT rail). The procedure is written to position EV1 on MBA corners 1 and 2 and EV2 on MBA corners 3 and 4. The EVA labels for the MBA are correct, this error affects the EVA Contingency Bolt labels only

Cautions:

- Structural damage may occur if PRD tension is not released prior to preloading EVA contingency bolts

Warnings:

None

P1-P3 MBA BOLT OVERRIDE [MSG025 (13-1185) PAGE 9 OF 10]

IV/RMS	EV1	EV2
Record final MBA torque and turns: MBA 3 _____ ft-lb _____ turns MBA 1 _____ ft-lb _____ turns MBA 2 _____ ft-lb _____ turns MBA 4 _____ ft-lb _____ turns	3. PGT[RCW, MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt to torque (x4) 4. Install locking cap on contingency bolt 5. PGT[B1 12.0 ft-lb, CW3 60RPM, MTL 30.5]-6 ext 7/16: Drive MBA #3 override bolt approx 460 turns 6. PGT[A7 9.2 ft-lb, CCW3 60RPM, MTL 30.5]-6 ext 7/16: Drive MBA #1 override bolt approx 460 turns 7. PGT[B1 12.0 ft-lb, CCW3 60RPM, MTL 30.5]-6 ext 7/16: Drive MBA #2 override bolt approx 460 turns 8. PGT[A7 9.2 ft-lb, CW3 60RPM, MTL 30.5]-6 ext 7/16: Drive MBA #4 override bolt approx 460 turns 9. Remove locking cap on contingency bolt 10. PGT[RCCW, MTL 30.5]-7.8 ext 5/8: Ratchet contingency bolt to break torque 11. PGT[B7 25.5 ft-lb, CCW2 30RPM, MTL 30.5]-7.8 ext 5/8. If required, use RAD: Drive contingency bolt and remove bolt	

P1-P3 MBA BOLT OVERRIDE – TASK DATA [MSG025 (13-1185) PAGE 10 OF 10]

Tools:

EV1	EV2
PGT	PGT
6 Ext 7/16	6 Ext 7/16
7.8 Ext 5/8	7.8 Ext 5/8

EVA Fasteners:

Fastener Name	Label	Head Size	Qty	Install Torque (ft-lb)	Release Torque (ft-lb)	Failure Torque (ft-lb)	Turns	RPM
P1 MBA 1 Override bolt	MOTORIZED BOLT 1 EVA OVERRIDE	7/16	1	9.2	N/A	16.7	460	60
P1 MBA 2 Override bolt	MOTORIZED BOLT 2 EVA OVERRIDE	7/16	1	12.0	N/A	21.5	460	60
P1 MBA 3 Override bolt	MOTORIZED BOLT 3 EVA OVERRIDE	7/16	1	12.0	N/A	25.1	460	60
P1 MBA 4 Override bolt	MOTORIZED BOLT 4 EVA OVERRIDE	7/16	1	9.2	N/A	18.2	460	60
Contingency Bolt at Trunnion Longeron	1A, 1B, 4A, 4B	5/8	4	47.9	N/A	60.8	43	30
Contingency Bolt at Zenith MT rail	3A, 3B	5/8	4	47.9	N/A	83.3	43	30
Contingency Bolt at Nadir MT rail	2A, 2B	5/8	4	55.8	N/A	145.8	43	30

EVA Connectors:

Harness	From	To	Clamps (#)	Conn Size	Function
NA					

Mass: NA

Notes:

- For the P1 MBAs: MBA 1 and 2 override bolts are driven ccw MBA 3 and 4 override bolts are driven cw
- For a MBA motor failure, it is assumed that the bolt tight switches will provide an indication. If the max torque is reached without a bolt tight switch, the MBA can be declared failed. Consequently, the EVA crewmember will need to install two contingency bolts
- For the Dual BBC failure case, a contingency bolt is used to seat the cup/cone. The Dual BBC failure case is treated as a non-instrumented bolt and installation is defined by torque and use turns as a secondary indicator
- Due to mis-labeling on the P1 flight hardware, the SSAS contingency bolt labels do not correspond to their respective MBA corner. The 1A and 1B labels are on MBA corner #4. The 4A and 4B labels are on MBA corner #1. The 2A and 2B labels are on MBA corner #3. The 3A and 3B labels are on MBA corner #2. The procedure is written to position EV1 on MBA corners 1 and 2 and EV2 on MBA corners 3 and 4. The EVA labels for the MBA are correct, this error affects the EVA Contingency Bolt labels only
- There is no APFR worksite for MBA corner 3 (nadir CETA rail corner)

Cautions:

-

Warnings:

None

MSG 026 - OPCL AND EPCL P&I DELTAS

Please make the following pen and ink changes to the OPCL to account for loss of AC1 phase A for Fuel Cell 1:

OPCL, 3 ϕ AC MOTORS STOPPED, p. 5-5

Replace step 12 with:

12. (Aff) INV PWR - OFF (tb - OFF)

cb AC CONTR - op

If AC1 ϕ B or ϕ C is the bad phase:

perform FC1 SHUTDN (Cue Card)

Go to aff MAL, EPS, SSR BUS LOSS ACTION>>

FC - START (10 sec or Δ P tb-gray)

OPCL, AC VOLTS, p 5-6

Replace step 5 with:

5. If AC1 ϕ B or ϕ C aff perform FC1 SHUTDN (Cue Card)

Go to aff MAL, EPS, SSR BUS LOSS ACTION>>

OPCL, AC OVERLOAD, p 5-8

Replace step 4 with:

4. If AC1 ϕ B or ϕ C aff perform FC1 SHUTDN (Cue Card)

Go to aff MAL, EPS, SSR BUS LOSS ACTION>>

Please make the following pen and ink changes to the EPCL to account for loss of AC1 phase A for Fuel Cell 1:

EPCL, AC VOLTS (LOW or HIGH), p 5-5

Replace step 5 with:

5. If AC1 ϕ B or ϕ C aff perform FC1 SHUTDN (Cue Card)

Go to aff BUS LOSS ACTION>>

EPCL, AC OVERLOAD, p 5-7

Replace step 4 with:

4. If AC1 ϕ B or ϕ C aff perform FC1 SHUTDN (Cue Card)

Go to aff BUS LOSS ACTION>>

EPCL, 3 ϕ AC MOTORS STOPPED, p 5-9

Replace step 12 with:

12. (Aff) INV PWR - OFF (tb - OFF)

cb AC CONTR - op

If AC1 ϕ B or ϕ C is the bad phase:

perform FC1 SHUTDN (Cue Card)

Go to aff BUS LOSS ACTION>>

FC - START (10 sec or Δ P tb-gray)

FLIGHT NOTE

TO: FD, CAPCOM, FA0, RENDEZVOUS, PROP, GC
FROM: FDO
SUBJECT: NOMINAL MANEUVER TIGS

COPIES: 1

MET

NC4	001:15:21:16.400	
NCC	001:15:55:31.000	
TI	001:16:53:13.000	PET = 0:0 ; SS - 36 MIN
MC1	001:17:13:13.000	
MC2	001:17:43:07.000	ET = 0:0
MC3	001:18:00:07.000	MC2 + 17 MIN
MC4	001:18:10:07.000	MC2 + 27 MIN
Docking	001:19:31:20.000	

MSG 030 - RELMO PLOTS AND BURN PADS

PRELIMINARY ORBIT MANEUVER PAD FOR NC-4 (RNDZ C/L PG. 3-2)

OMS BOTH 1 ☐ L 2 ☐ R 3 ☒ RCS SEL 4 ☐ +X -X MULTI-AXIS TV ROLL 5 0 0 0 TRIM LOAD P 6 <table border="1" style="display: inline-table;"><tr><td>(+)</td><td>0</td><td>.</td><td>8</td></tr><tr><td>(+)</td><td>4</td><td>.</td><td>6</td></tr><tr><td>(-)</td><td>4</td><td>.</td><td>7</td></tr></table> LY 7 RY 8 WT 9 <table border="1" style="display: inline-table;"><tr><td>2</td><td>4</td><td>8</td><td>4</td><td>3</td><td>8</td></tr></table> TIG 10 <table border="1" style="display: inline-table;"><tr><td>0</td><td>1</td><td>/</td><td>1</td><td>5</td><td>:</td><td>2</td><td>1</td><td>:</td><td>1</td><td>6</td><td>.</td><td>4</td></tr></table> TGT PEG 7 ΔVX 19 <table border="1" style="display: inline-table;"><tr><td>(+)</td><td>0</td><td>1</td><td>1</td><td>.</td><td>4</td></tr><tr><td>(+)</td><td>0</td><td>0</td><td>0</td><td>.</td><td>0</td></tr><tr><td>(+)</td><td>0</td><td>0</td><td>0</td><td>.</td><td>1</td></tr></table> ΔVY 20 ΔVZ 21	(+)	0	.	8	(+)	4	.	6	(-)	4	.	7	2	4	8	4	3	8	0	1	/	1	5	:	2	1	:	1	6	.	4	(+)	0	1	1	.	4	(+)	0	0	0	.	0	(+)	0	0	0	.	1	BURN ATT R 24 <table border="1" style="display: inline-table;"><tr><td>0</td><td>9</td><td>4</td></tr><tr><td>2</td><td>2</td><td>4</td></tr><tr><td>3</td><td>3</td><td>8</td></tr></table> P 25 Y 26	0	9	4	2	2	4	3	3	8	ΔVTOT <table border="1" style="display: inline-table;"><tr><td>0</td><td>1</td><td>1</td><td>.</td><td>4</td></tr><tr><td>0</td><td>0</td><td>:</td><td>1</td><td>5</td></tr></table> TGO VGO X <table border="1" style="display: inline-table;"><tr><td>(+)</td><td>0</td><td>1</td><td>0</td><td>.</td><td>8</td></tr><tr><td>(-)</td><td>0</td><td>0</td><td>2</td><td>.</td><td>2</td></tr><tr><td>(+)</td><td>0</td><td>0</td><td>2</td><td>.</td><td>9</td></tr></table> VGO Y VGO Z TGT <table border="1" style="display: inline-table;"><tr><td colspan="3">HA</td><td colspan="3">HP</td></tr><tr><td>1</td><td>8</td><td>2</td><td>(+)</td><td>1</td><td>8</td><td>1</td></tr></table>	0	1	1	.	4	0	0	:	1	5	(+)	0	1	0	.	8	(-)	0	0	2	.	2	(+)	0	0	2	.	9	HA			HP			1	8	2	(+)	1	8	1
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NOTES: Treat loss of GPC3 as second gimbal fail on right.

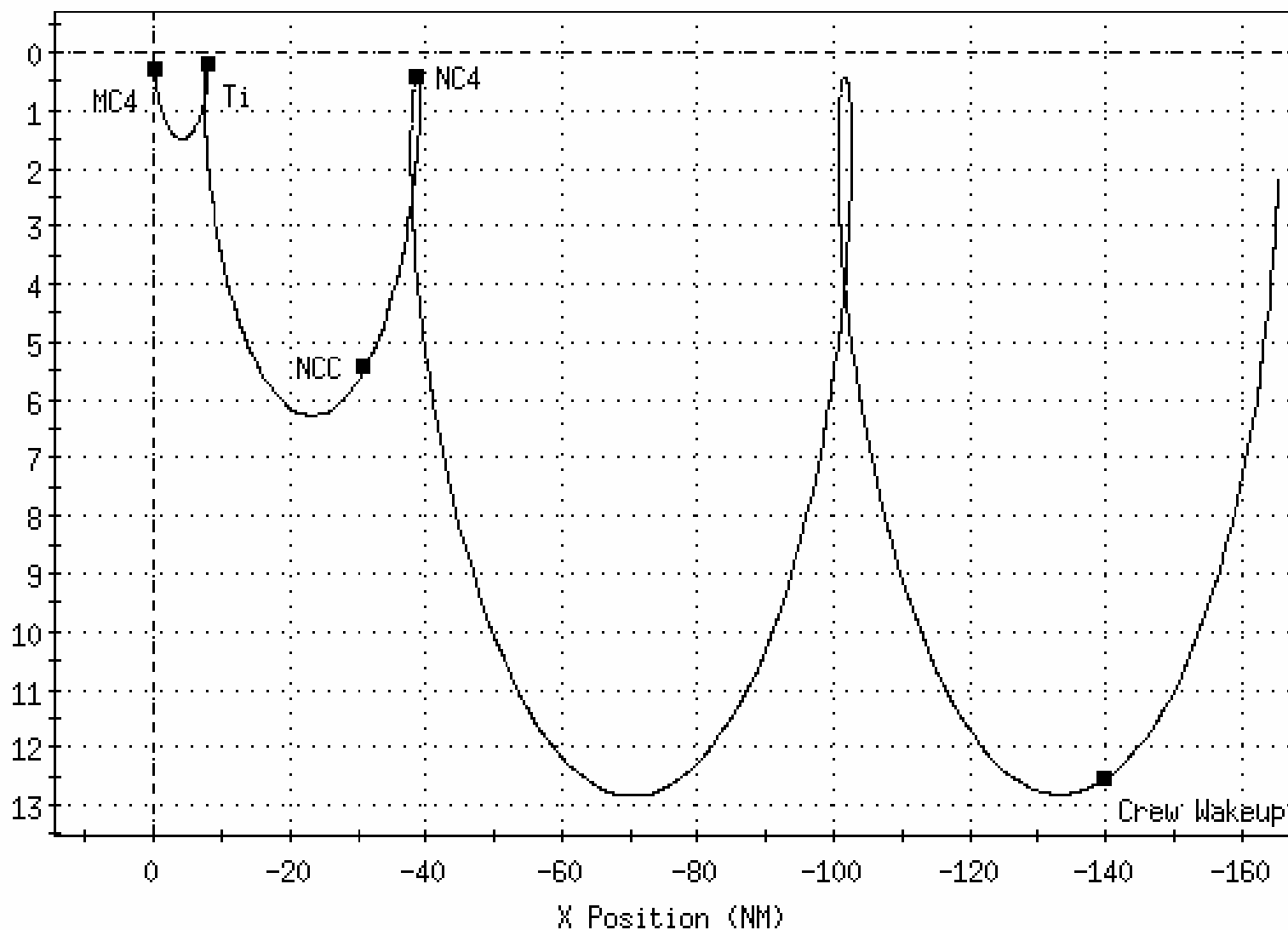
MSG 030 - RELMO PLOTS AND BURN PADS

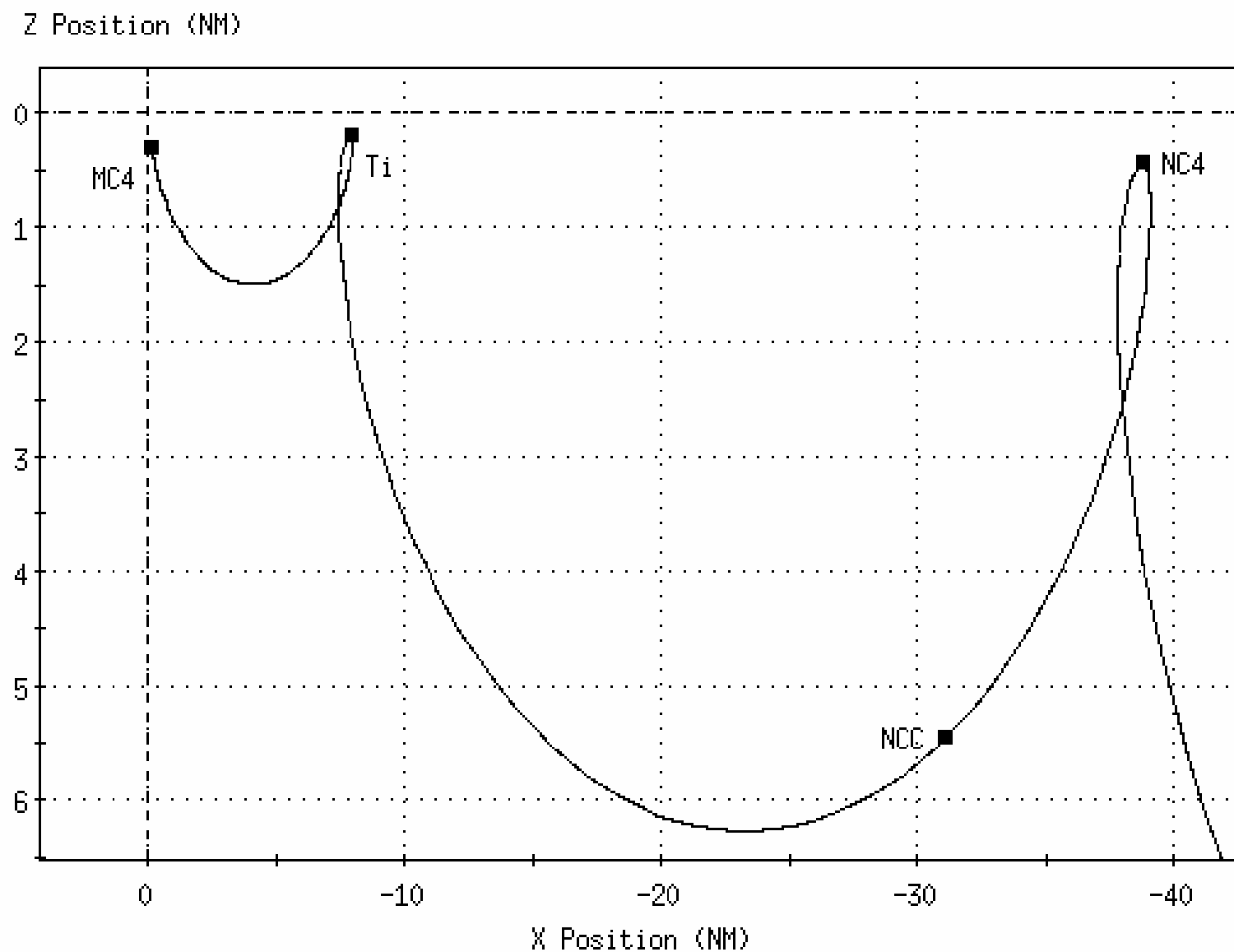
PRELIMINARY ORBIT MANEUVER PAD FOR Ti (RNDZ C/L PG. 3-6)

OMS BOTH 1 ☐ L 2 ☒ R 3 ☐ RCS SEL 4 ☐ ☐ +X ☐ -X ☐ MULTI-AXIS TV ROLL 5 0 0 0 TRIM LOAD P 6 <input "="" type="text" value="("/> +) 0 . 8 LY 7 <input "="" type="text" value="("/> +) 4 . 6 RY 8 <input "="" type="text" value="("/> -) 4 . 7 WT 9 2 4 8 1 4 3 TIG 10 0 1 / 1 6 : 5 3 : 1 3 . 0 TGT PEG 7 ΔVX 19 <input "="" type="text" value="("/> +) 0 0 8 . 4 ΔVY 20 <input "="" type="text" value="("/> -) 0 0 0 . 6 ΔVZ 21 <input "="" type="text" value="("/> +) 0 0 0 . 1	BURN ATT R 24 1 1 1 P 25 2 5 1 Y 26 3 4 0	ΔVTOT 0 0 8 . 4 TGO 0 0 : 1 1 VGO X <input "="" type="text" value="("/> +) 0 0 8 . 0 VGO Y <input "="" type="text" value="("/> +) 0 0 1 . 6 VGO Z <input "="" type="text" value="("/> +) 0 0 2 . 1 TGT HA 1 8 7 HP <input "="" type="text" value="("/> +) 1 8 1																										
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BURN ATT	LVLH ATT																											
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TIG SLIP: If Ti not started by nominal TIG + ___ min (G34 as reqd), reload original TIG and go to Ti DELAY, 5-27 Max Ti DELAY TIG slip ___ min. ☐ DO NOT UPDATE TIG UPDATE TIG AFTER ___ MIN.																												

NOTES:

Z Position (NM)





MSS

C&W
ROBOTICS

C&W Messages with 'R1E - MSS ... SRT COMM' in the Text

Nominal Config:
RWS is Active.

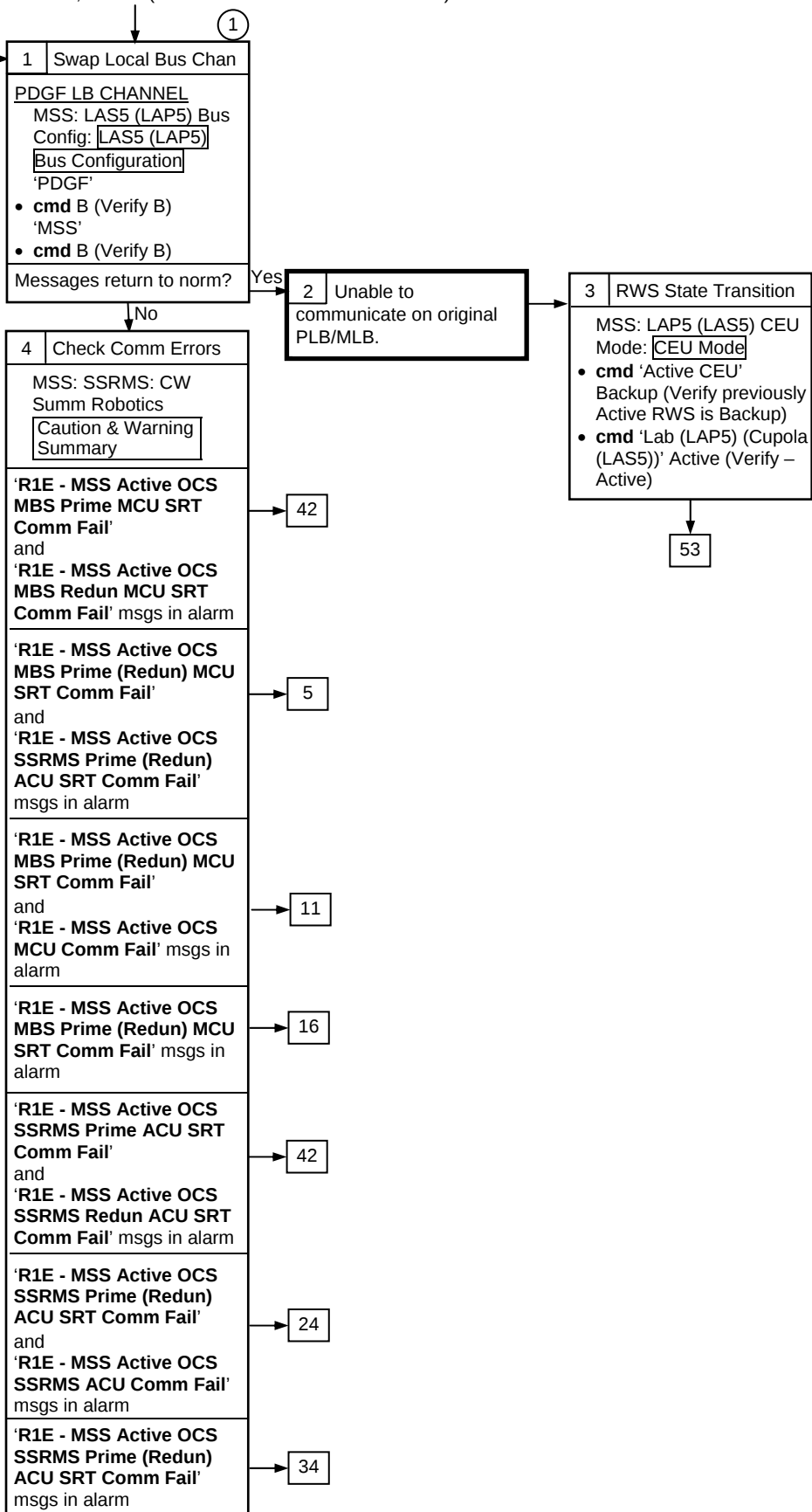
EXT, S0(S1,P1)
MDMs configured
for SEPS control.

MT SSBAs powered.

13-1103 (MSG 012) 7.201 MSS COMM FAILURE

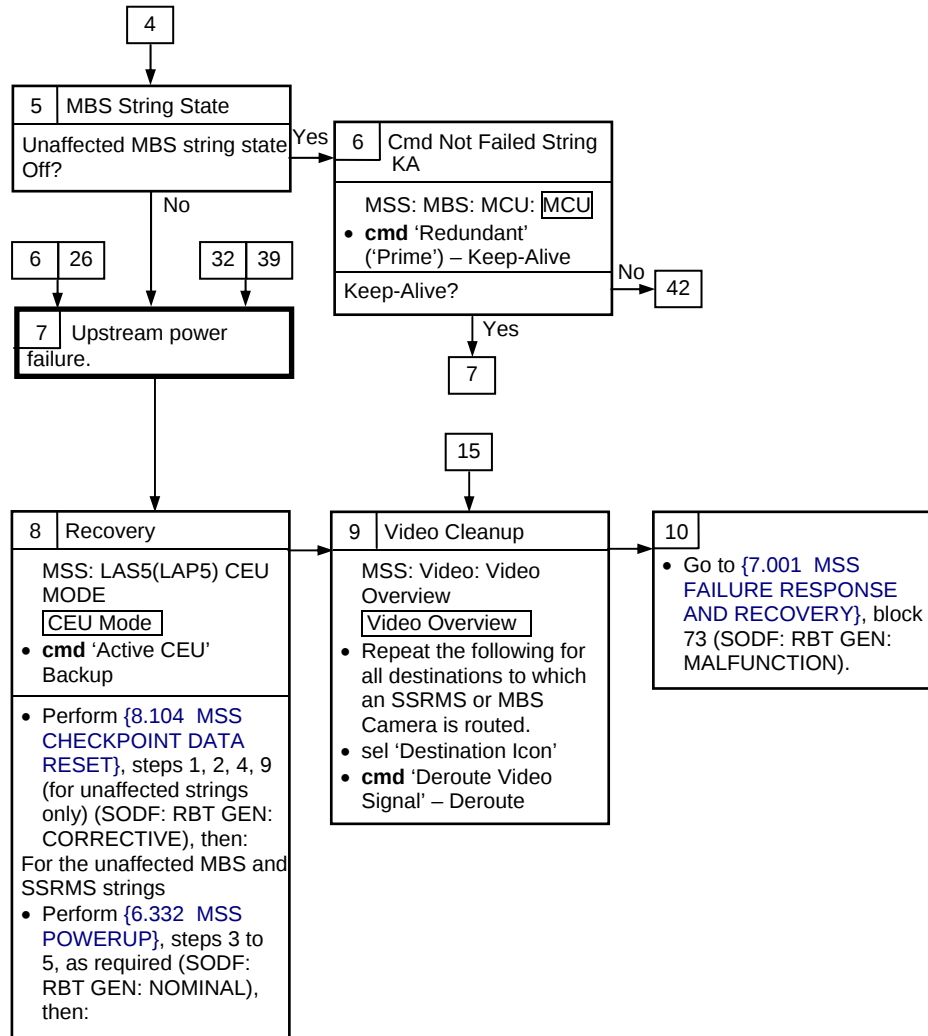
(RBT GEN/X2R4 - ALL/FIN 1/SPN/REAL-TIME) Page 1 of 8 pages

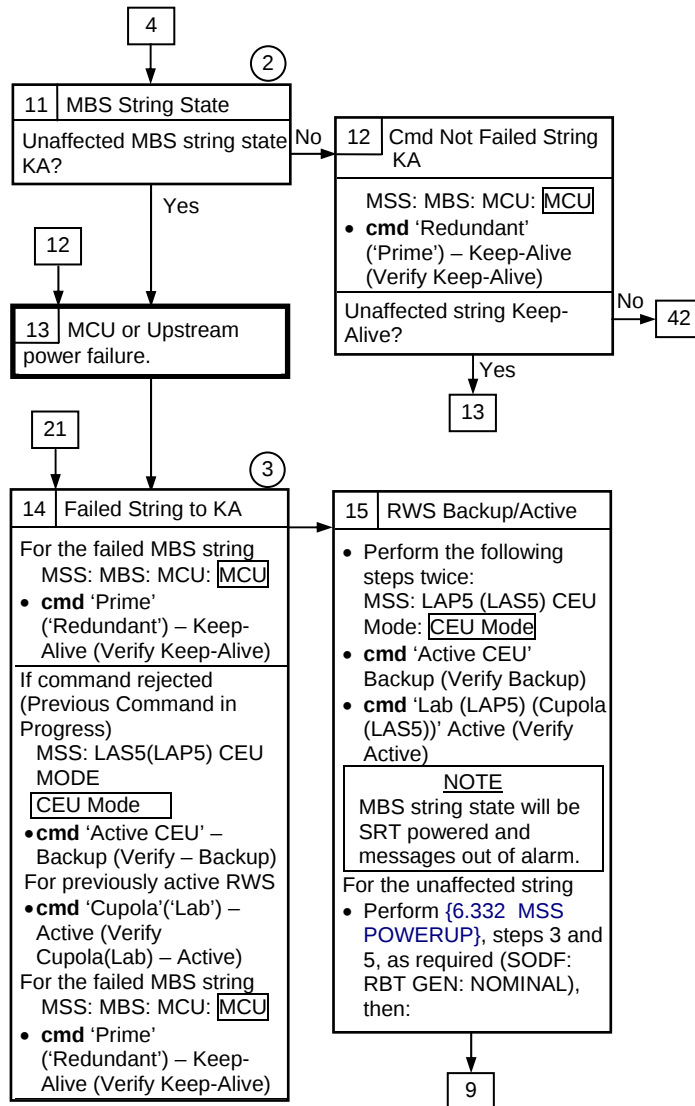
{7.001 MSS FAILURE RESPONSE AND RECOVERY}, block 75, and 88 (SODF: RBT GEN: MALFUNCTION).



①

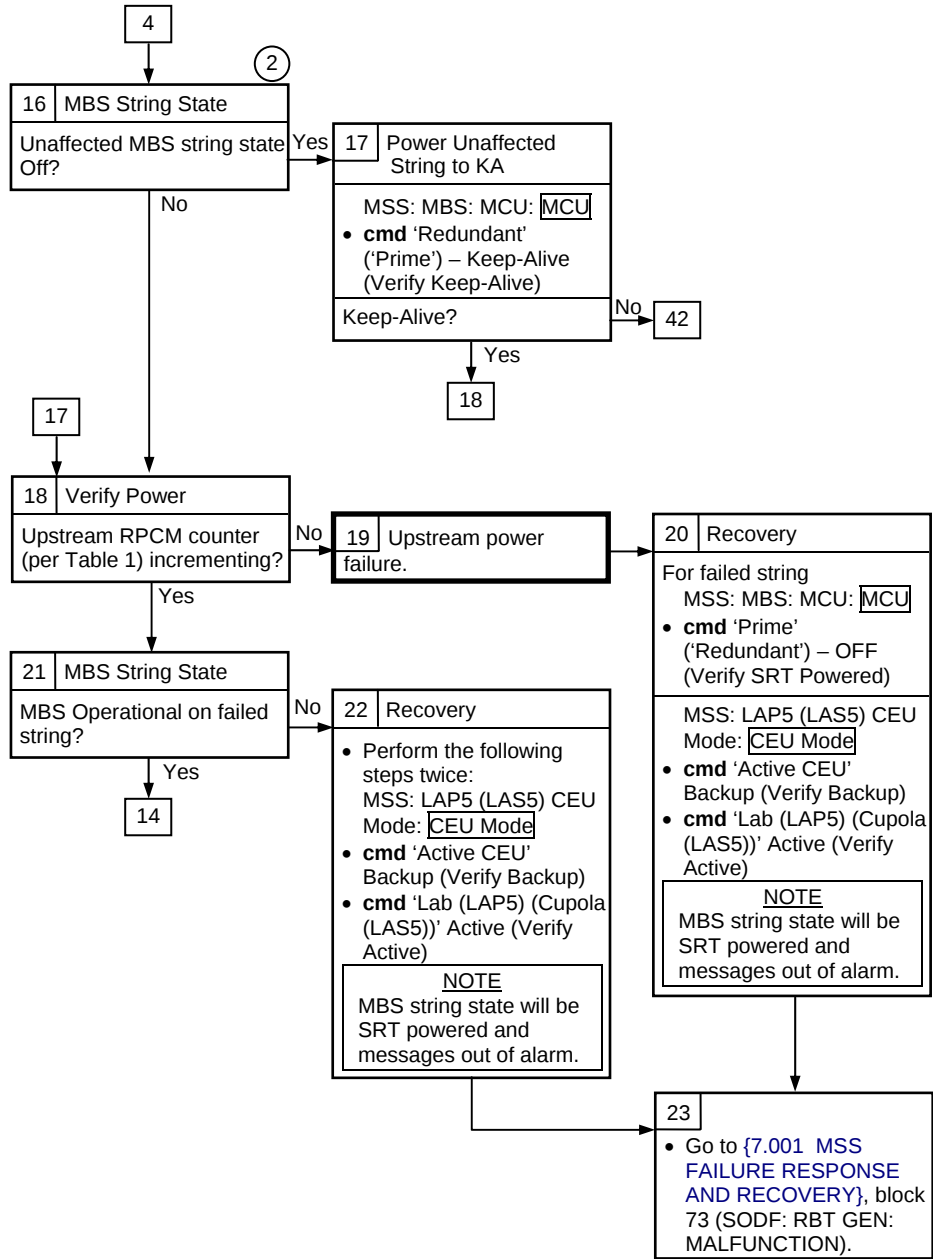
Unless otherwise noted, all displays in the procedures are on the PCS.





② SSRMS safing can be cancelled and SSRMS recovery operations can resume in the presence of an MBS CAT-1 error.

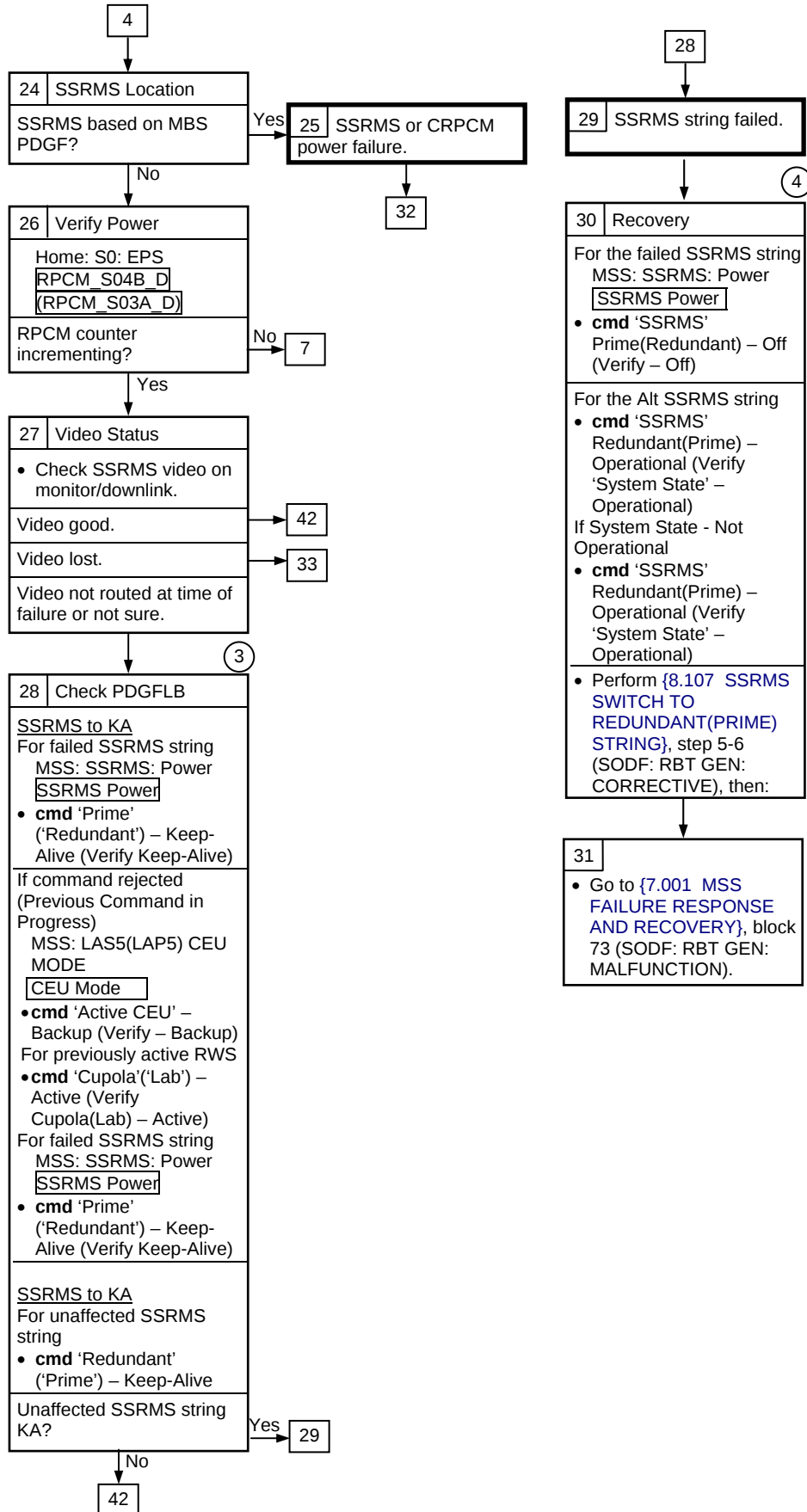
③ SCR 35020 – Command may be rejected if a command was executing when comm. was lost



② SSRMS safing can be cancelled and SSRMS recovery operations can resume in the presence of an MBS CAT-1 error.

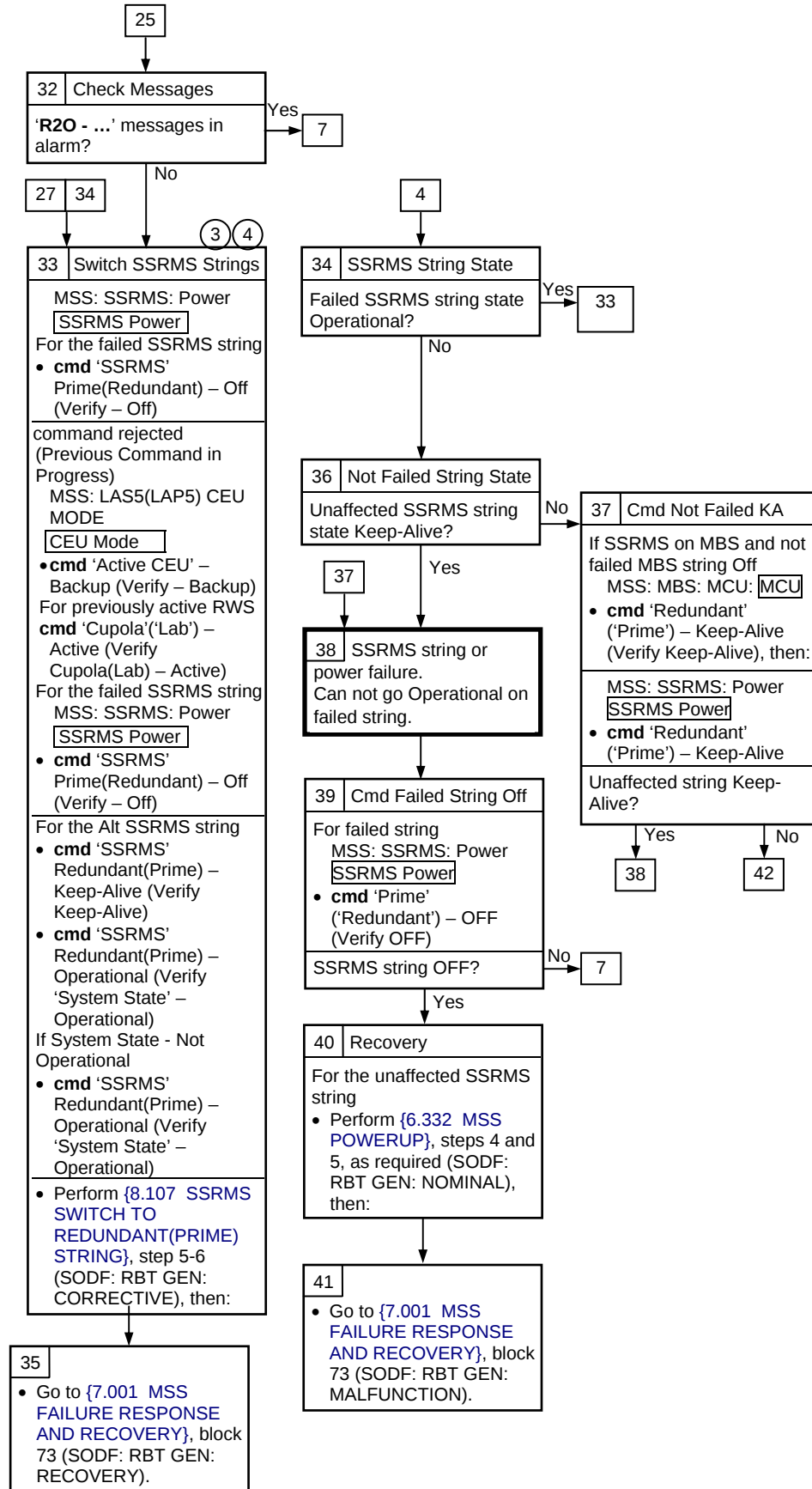
Table 1. Upstream RPCM Checks

MT Worksite	Prime	Redundant
1	RPCM S34B F	RPCM S33A F
2	RPCM S14B E	RPCM S13A E
3	RPCM S14B F	RPCM S13A F
4	RPCM S04B A	RPCM S03A A
5	RPCMS04B B	RPCM S03A B
6	RPCM P14B F	RPCM P13A F
7	RPCM P14B E	RPCM P13A E
8	RPCM P34B F	RPCM P33A F
9	RPCM S43A B	RPCM S41A B
10	RPCM P44A B	RPCM P42A B



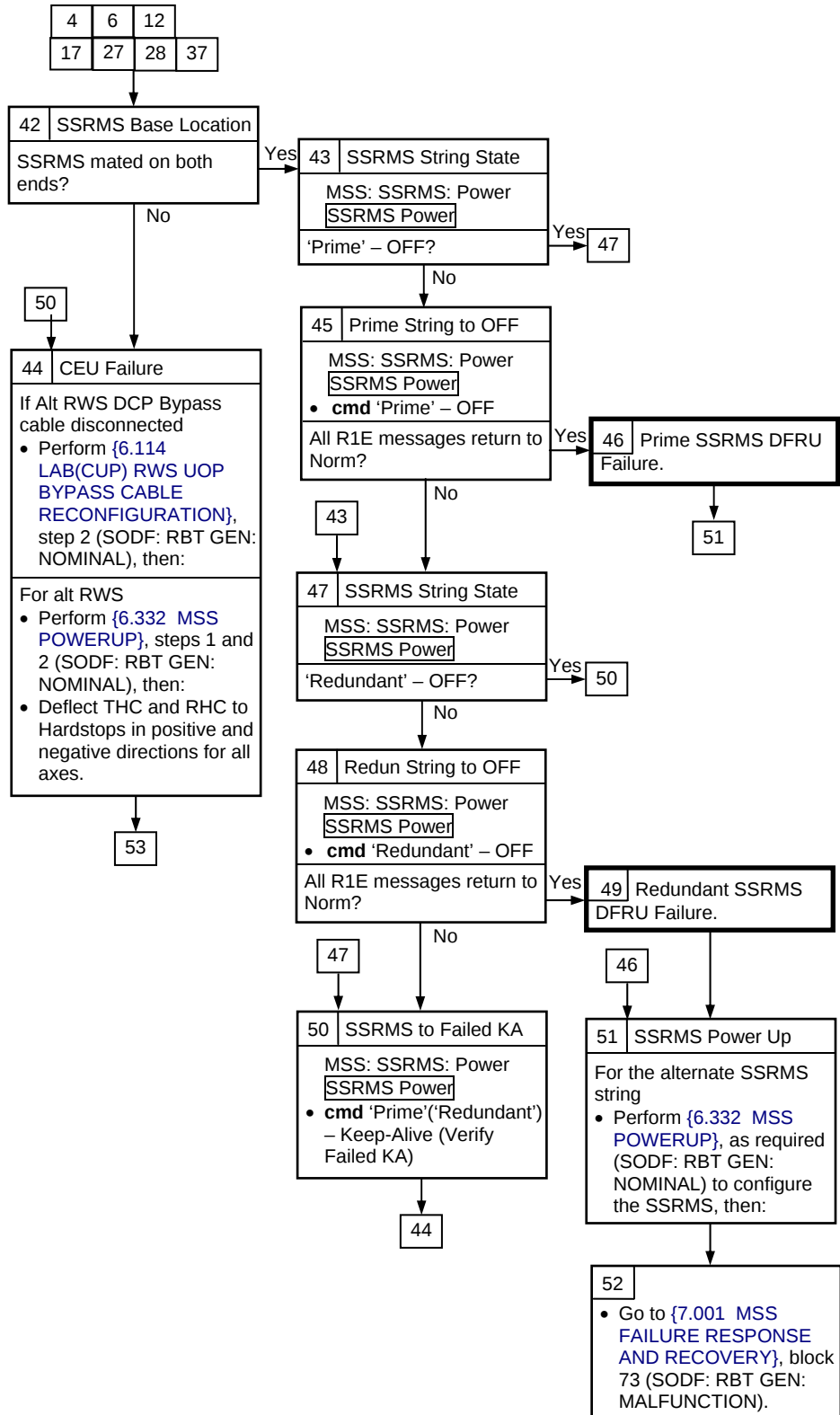
③
SCR 35020 – Command may be rejected if a command was executing when comm. was lost

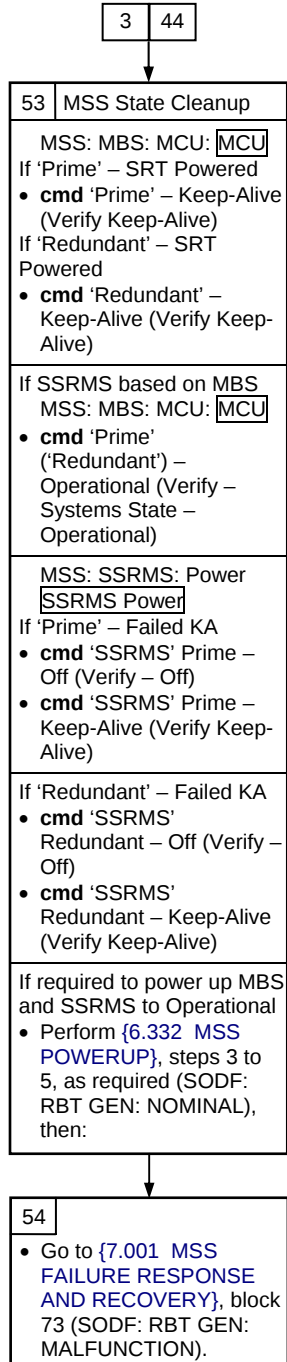
④
SCR 20380 - the power to operational commands may not complete after the first attempt.



③
 SCR 35020 – Command may be rejected if a command was executing when comm. was lost

④
 SCR 20380 – the power to operational commands may not complete after the first attempt.





MSS

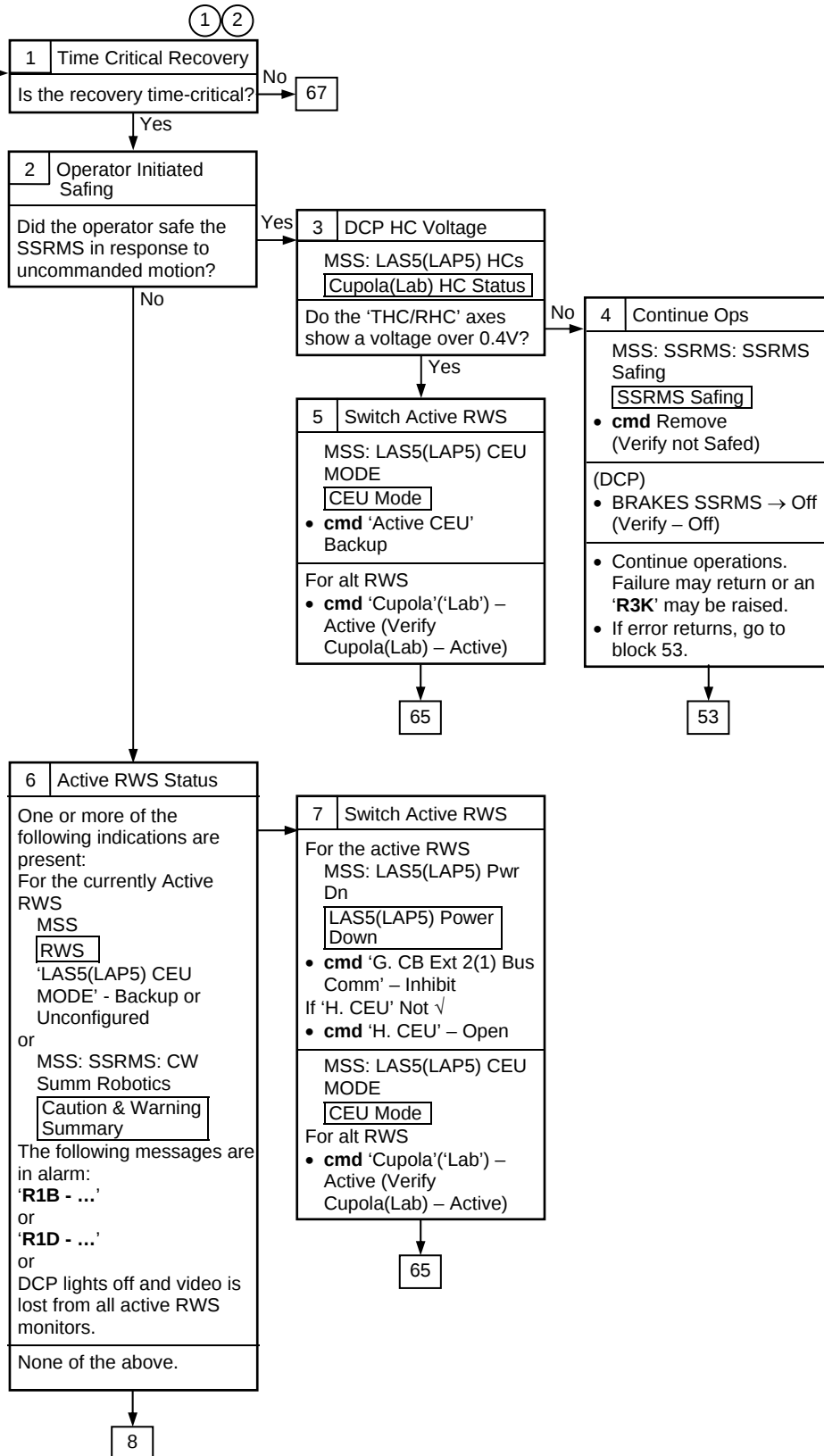
13-1104 (MSG 013) 7.001 MSS FAILURE RESPONSE AND RECOVERY

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C&W
ROBOTICS

C&W Messages
Starting with
'Rxx - ...'

MSS or ISS
Failure Causing
Robotics C&W
Messages or
Interruption to
Robotics
Operations

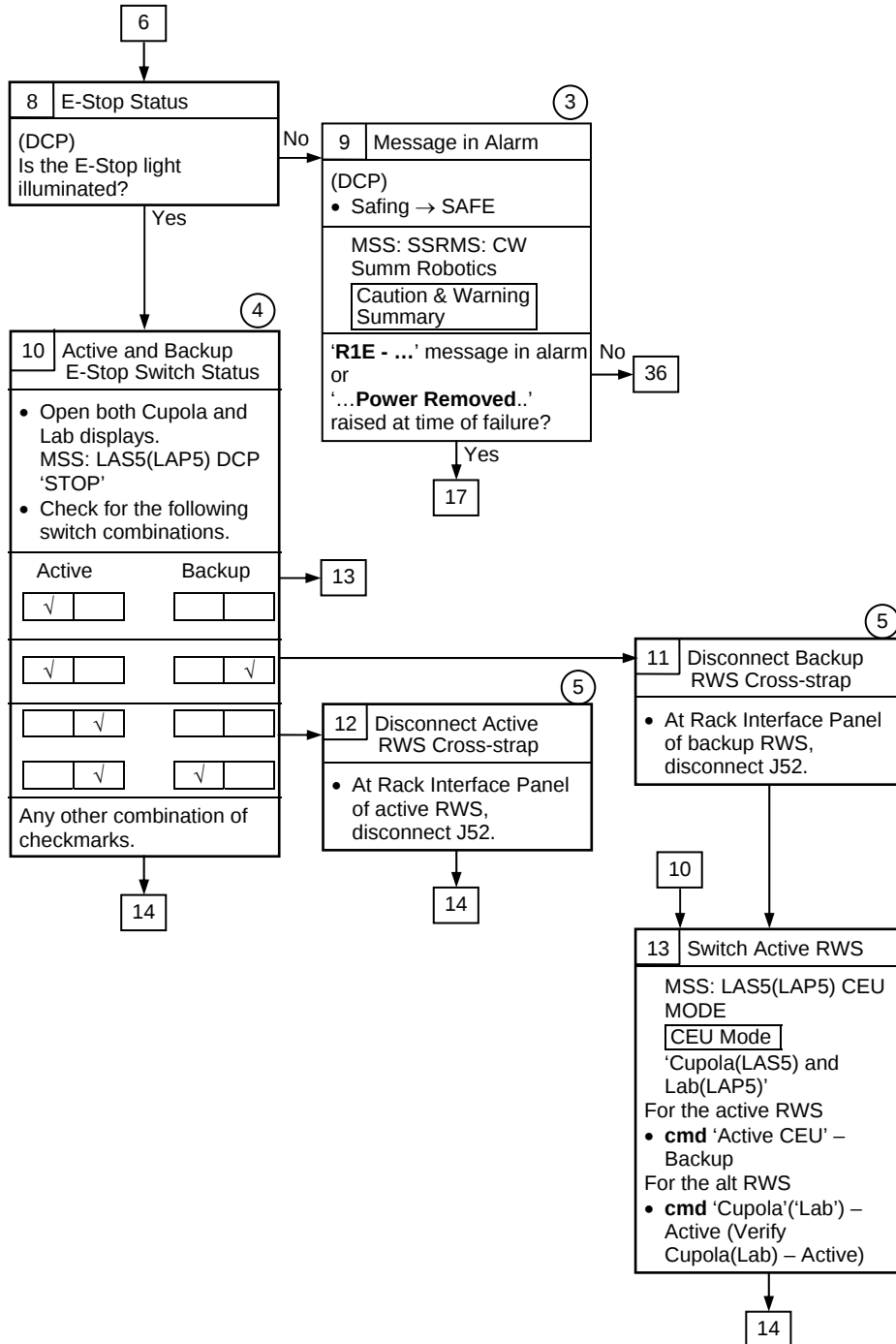


①
Unless otherwise indicated, all displays in the procedures are on the PCS.

②
Time-critical recovery is intended to regain MSS functionality (SSRMS motion capability) in situations where immediate operator response is required to ensure the safety of the crew, ISS, or a visiting vehicle. Time-critical recovery can be performed by the on-orbit crew without assistance from the ground.
Time-critical recovery steps do not account for MT, LEE or any MBS mechanism failures.

Time-critical recovery assumes the MSS is configured as follows:

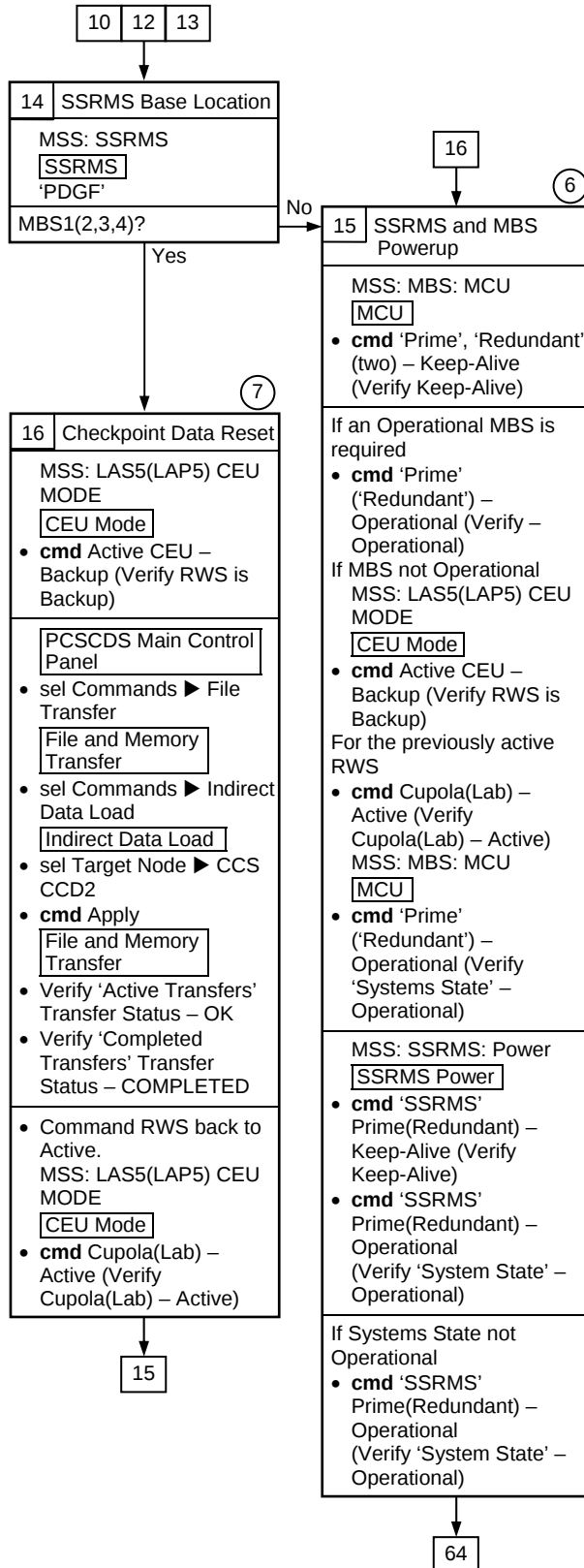
One RWS Backup
One RWS Active
SSRMS Operational with video system powered
MBS Operational on one string with video system powered, Keep-Alive on the other.



(3)
SCR 19378 - LEU Receive Message Err.
SCR 21737– EDCD not saved after loss of MBS power,
SCR 22615– Cancel safing aborted,
SCR 23233 - CRPCM output port 8 inadvertent power off.

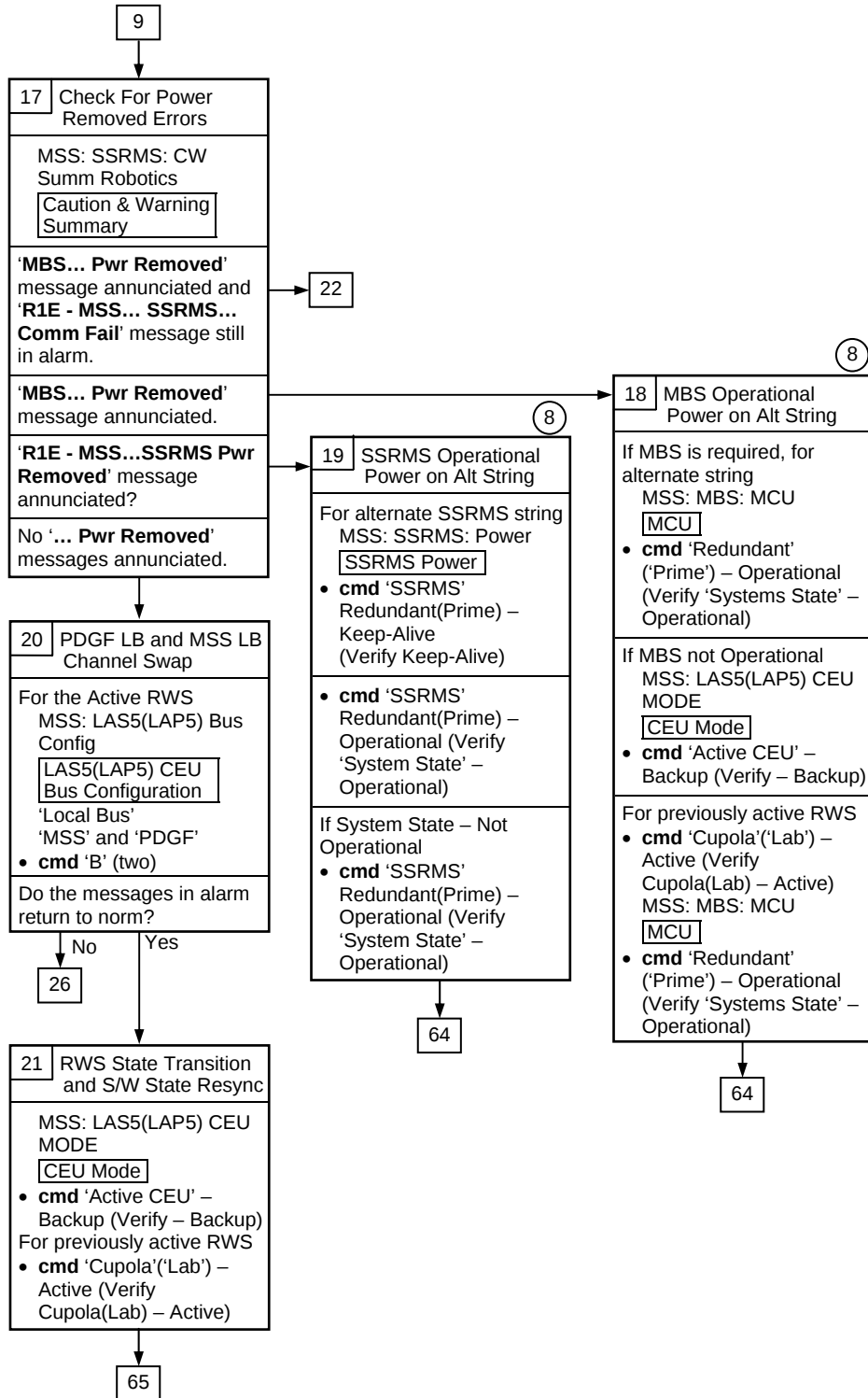
(4)
The E-Stop Reset command is not issued in this procedure to prevent removal of power in case of failed E-stop switch contact on either the Active or Backup RWS.

(5)
Cross-strap disconnect inhibits ability of backup RWS to safe system via backup RWS safing switch. E-stop still functional at failed RWS.



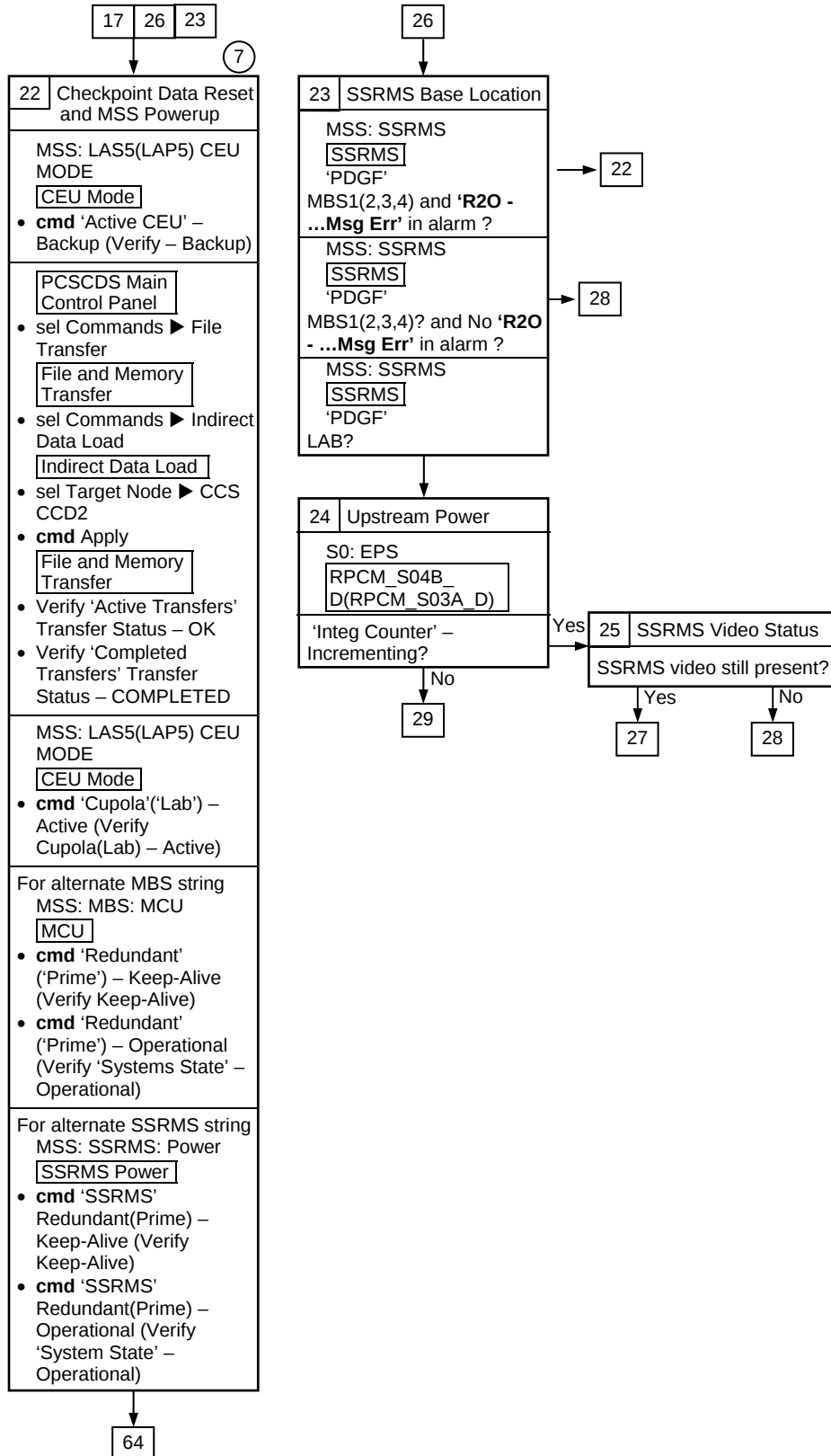
⑥
Power up the previously operational strings. Due to a known SPN condition (SCR 20380), the MBS and SSRMS power to operational commands may not complete after the first attempt.

⑦
SCR 21749 - OCS does not reset SSRMS FST_State when MBS power is removed with SRMS on an MBS PDGF.

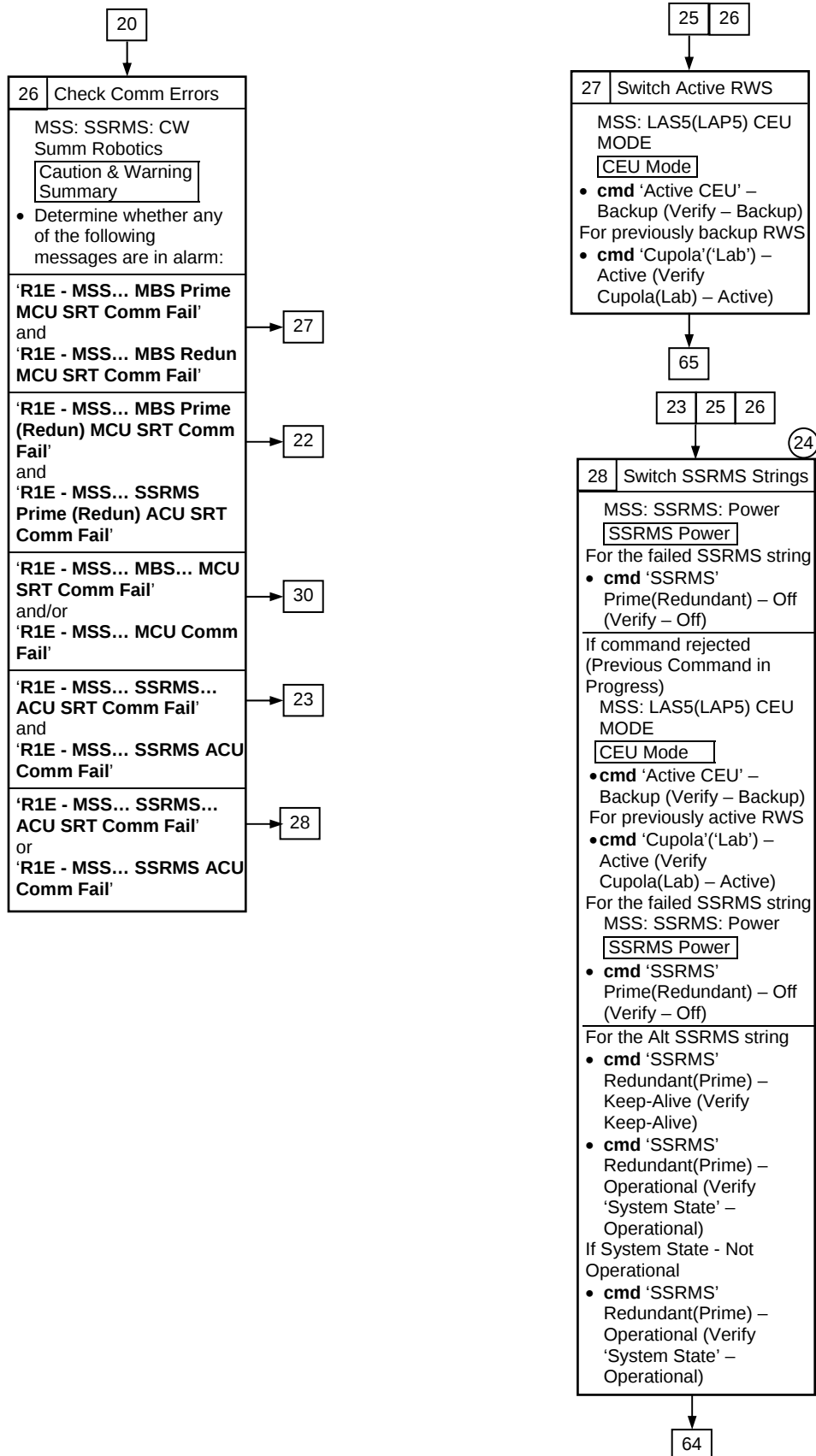


8

Due to a known SPN condition (SCR 20380), the MBS and SSRMS power to operational commands may not complete after the first attempt.



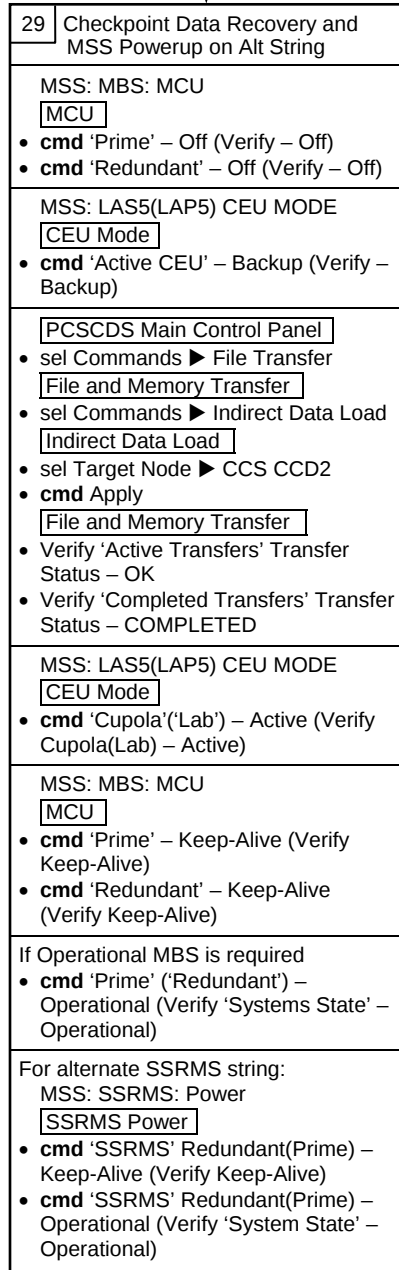
7
SCR 21749 - OCS does not reset SSRMS FST_State when MBS power Is removed with SSRMS on an MBS PDGF.



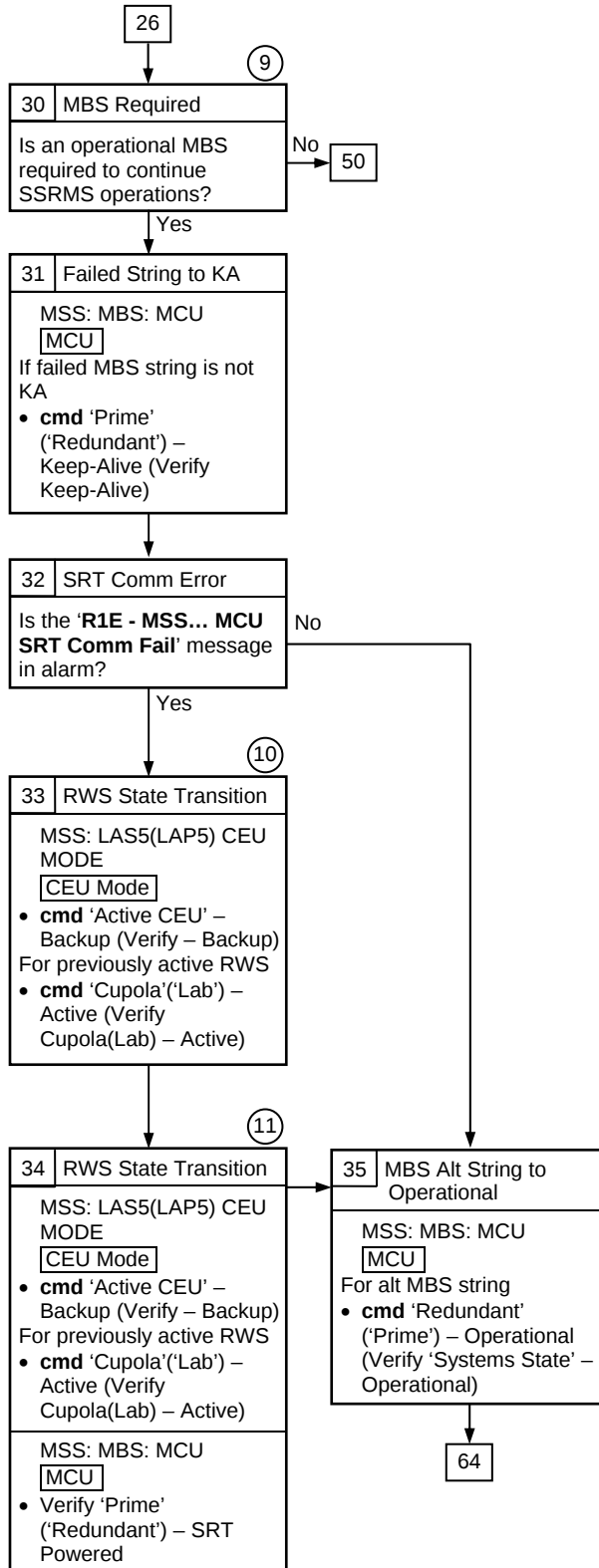
(24) SCR 35020 – Power-off command may be rejected if a command was executing when comm. was lost

SCR 20380 - the power to operational commands may not complete after the first attempt.

24



64



⑨

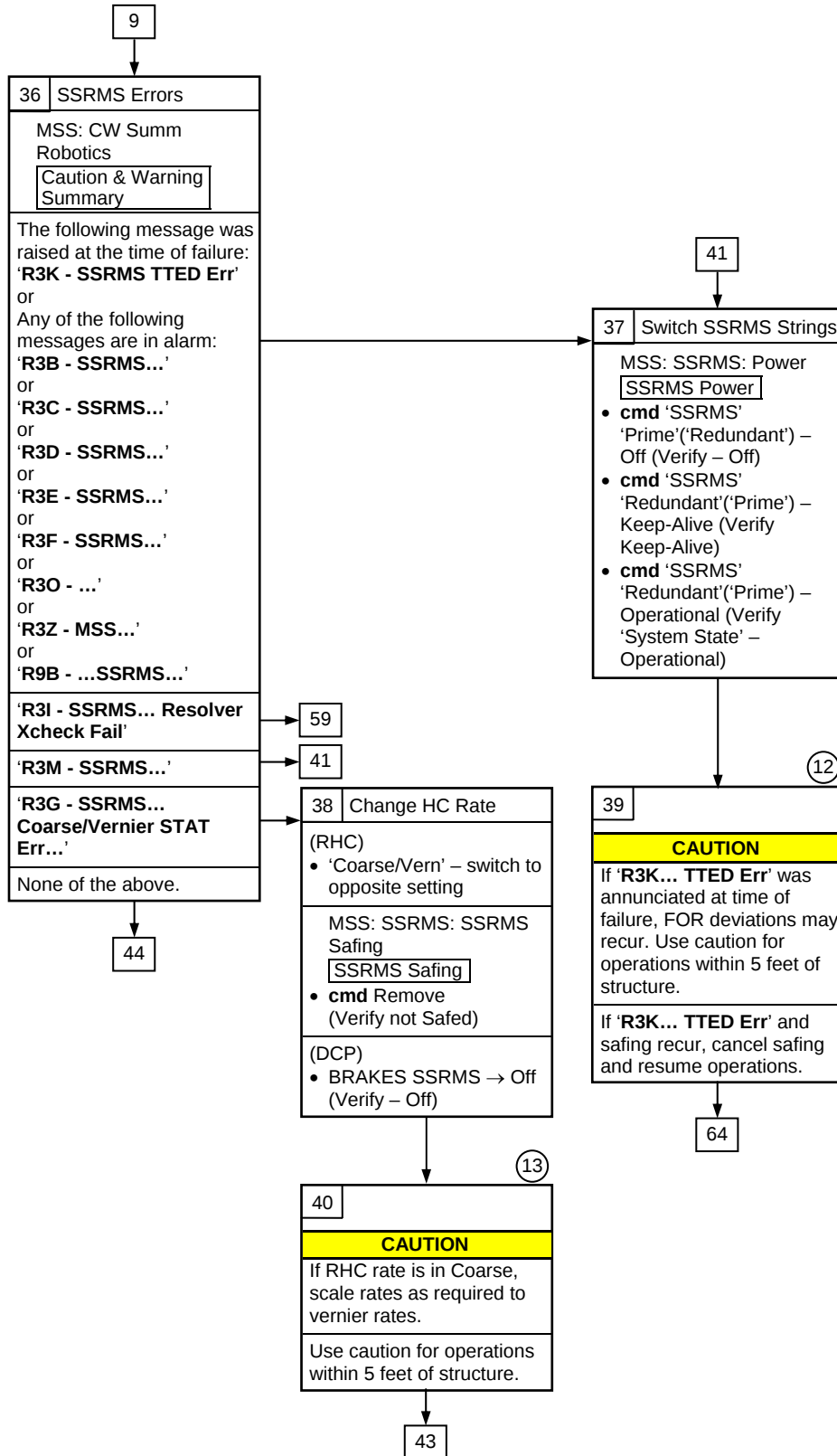
An operational MBS is required to power the MBS Mast Camera and light, as well as route and deroute its view. An operational MBS is not required to control pan, tilt, zoom, and focus if the camera has already been routed.

⑩

Expect 'R1E - MSS... MCU SRT Comm Fail' to return into alarm and the MCU state to become SRT Powered.

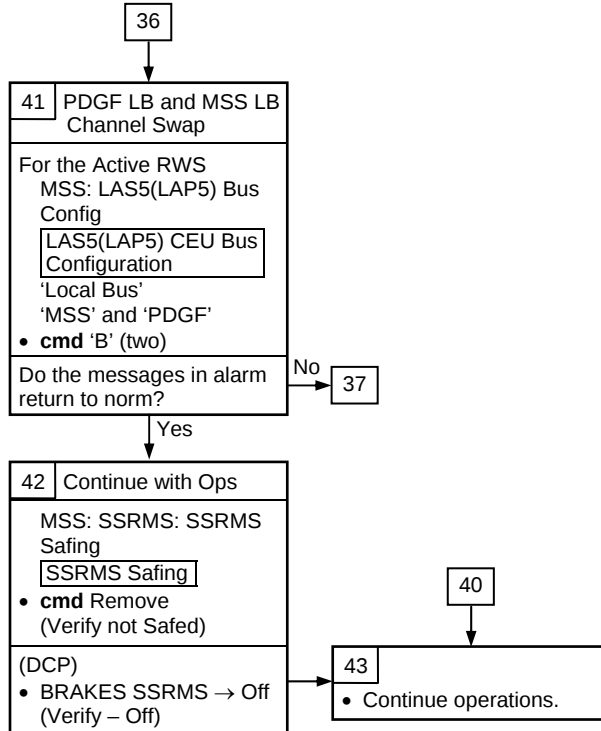
⑪

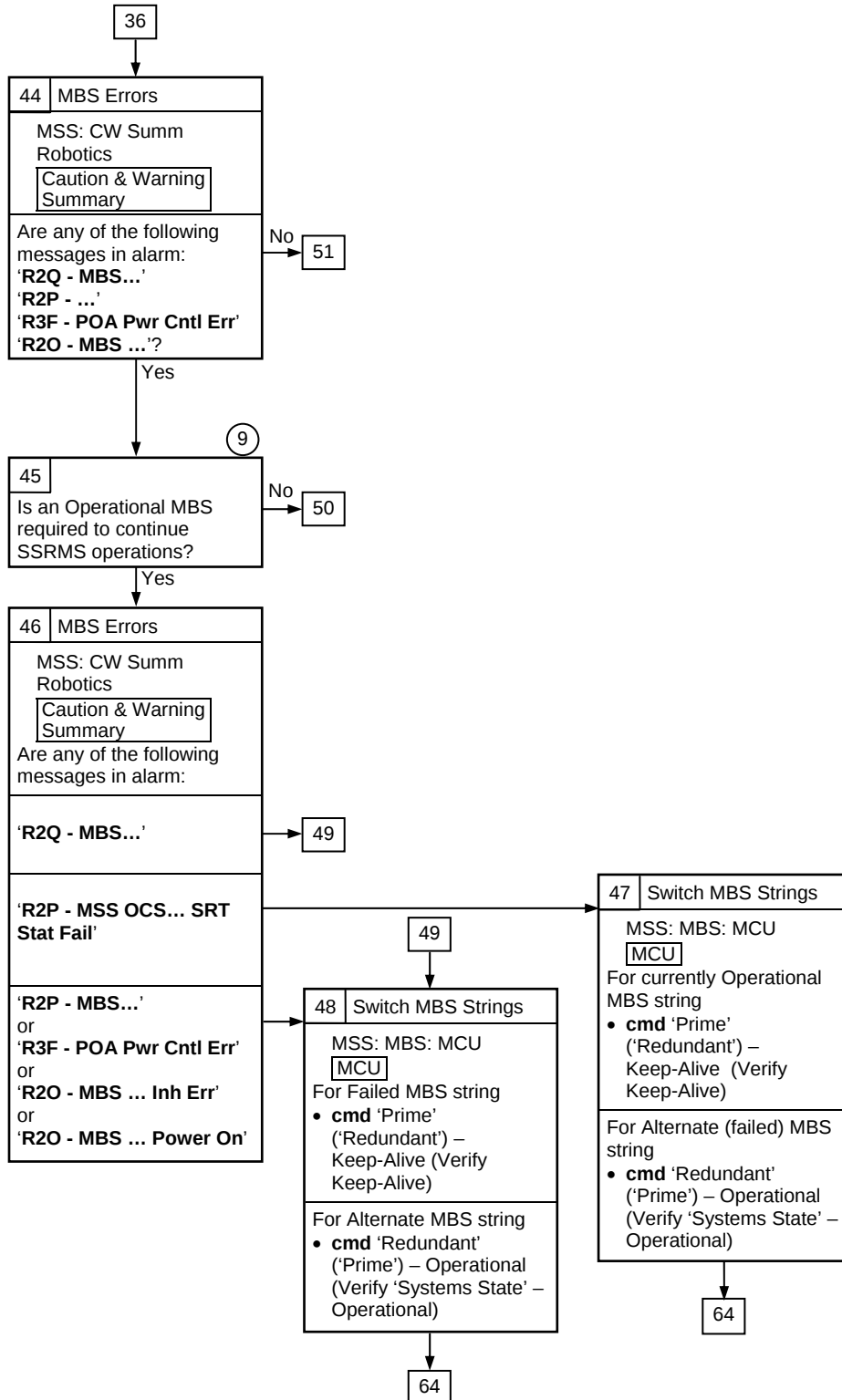
The RWS state transition in the block is required even if it has been executed once already in block 33.



12
Single joint mode can be used to avoid R3K errors.

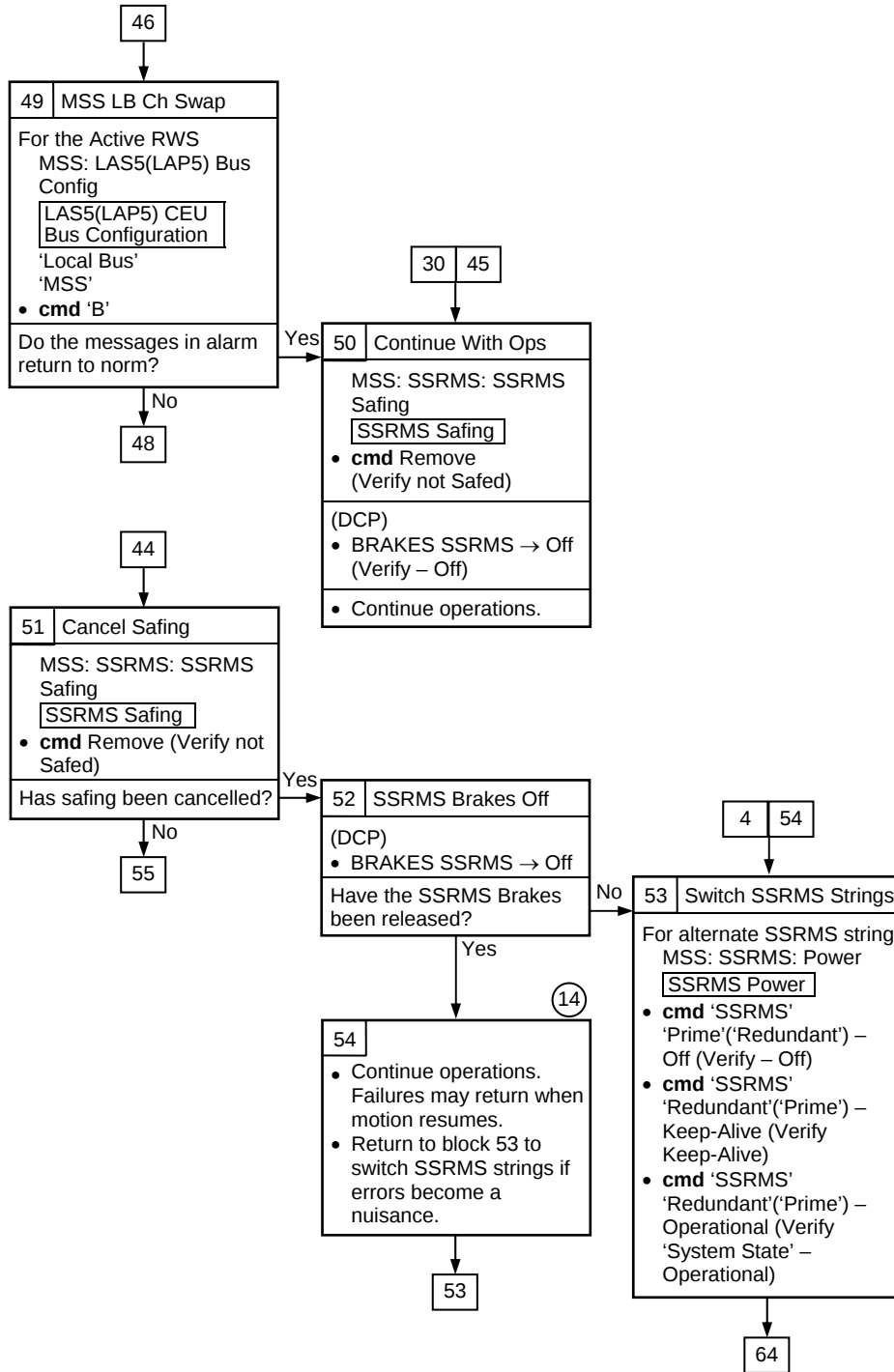
13
If failure is 'R3G - SSRMS ACU Coarse/Vernier Stat ERR' and RHC rate is in Coarse, MSS powerdown or RWS state transition removes string functionality.
If failure is 'R3G - SSRMS SR (SY, SP, EP, WP, WY, WR) Coarse/Vernier Stat ERR' and RHC rate is in Coarse, DJOPS is available to recover current string functionality in the case of a MSS Powerdown or RWS state transition.





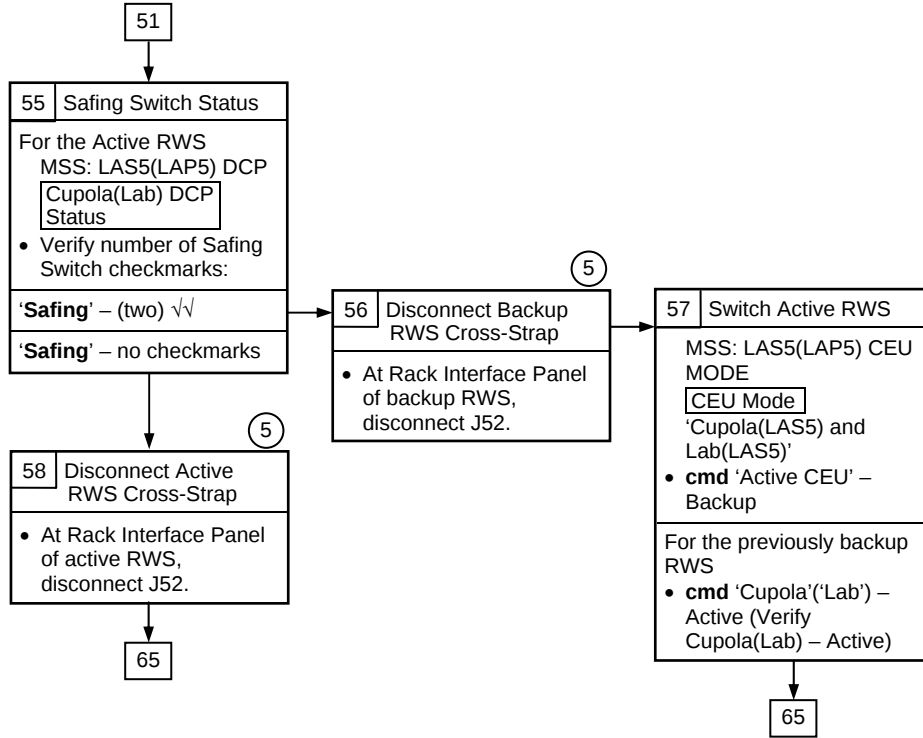
⑨

An operational MBS is required to power the MBS Mast Camera and light, as well as route and deroute its view. An operational MBS is not required to control pan, tilt, zoom, and focus if the camera has already been routed.

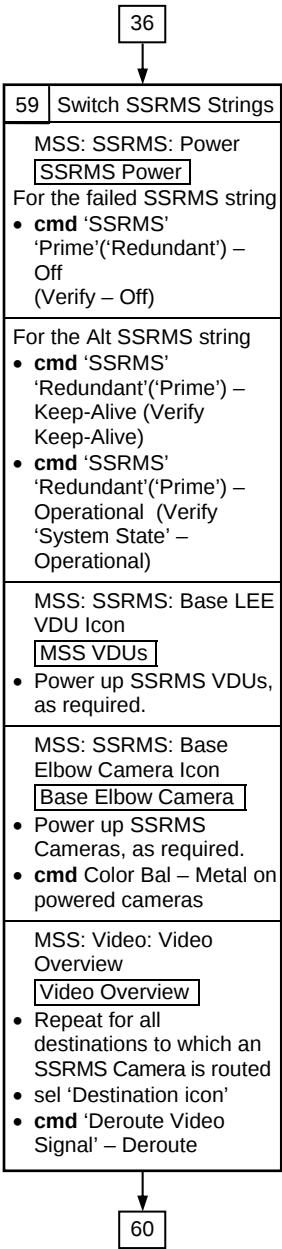


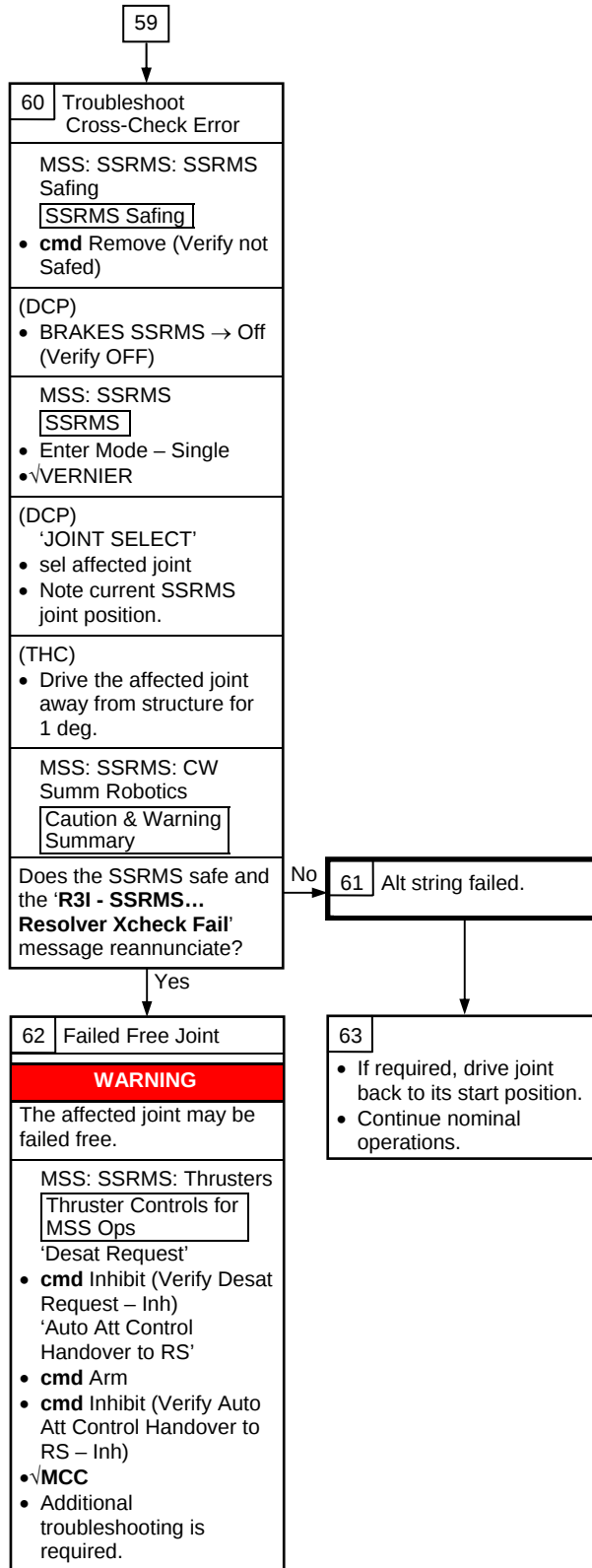
(14)

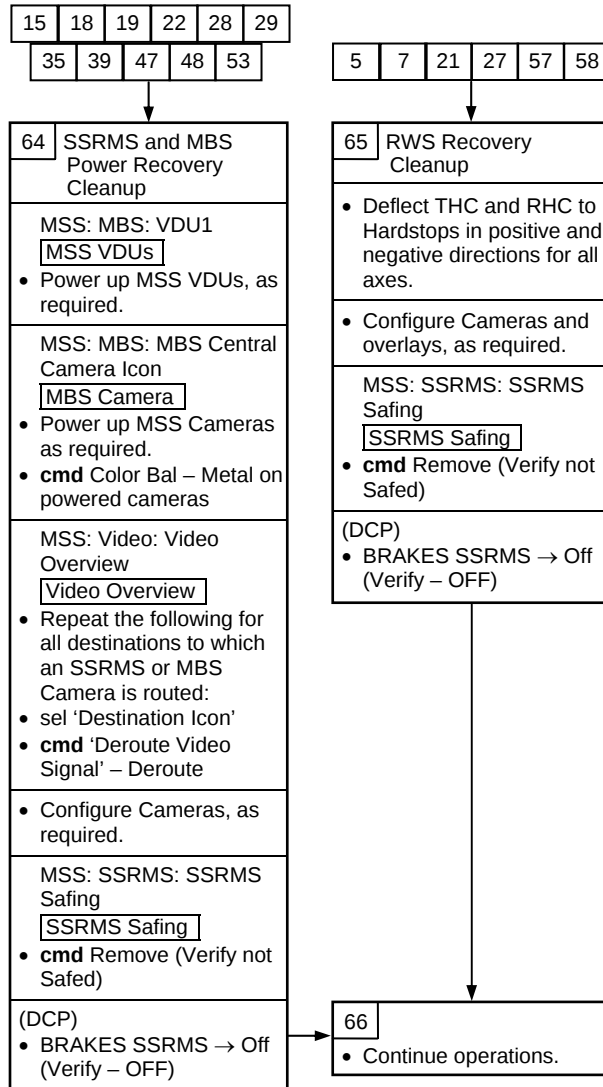
If 'R3H - SSRMS Mtr Current Consistency Ck Fail' errors recur, changing the SSRMS rate setting on the RHC may reduce the likelihood of recurrence.

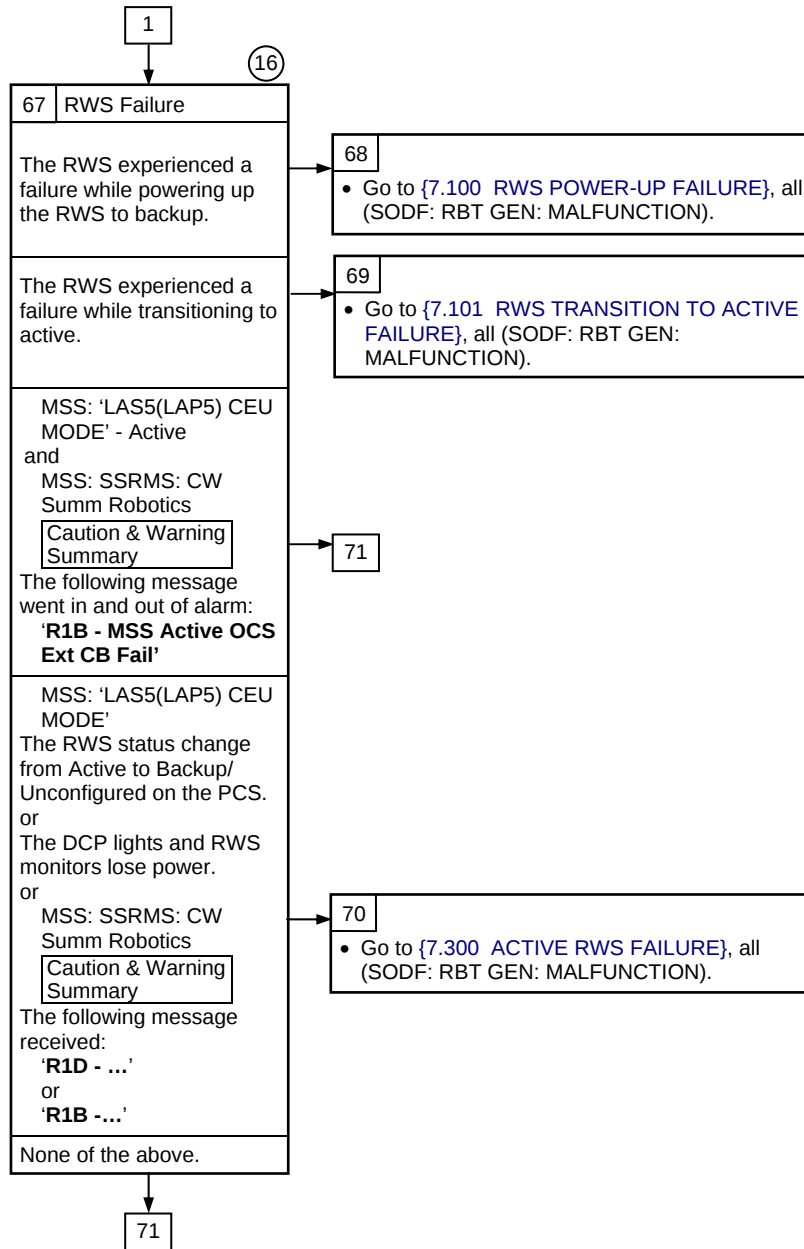


5 Cross-strap disconnect inhibits ability of backup RWS to safe system via backup RWS safing switch. E-stop still functional at failed RWS.



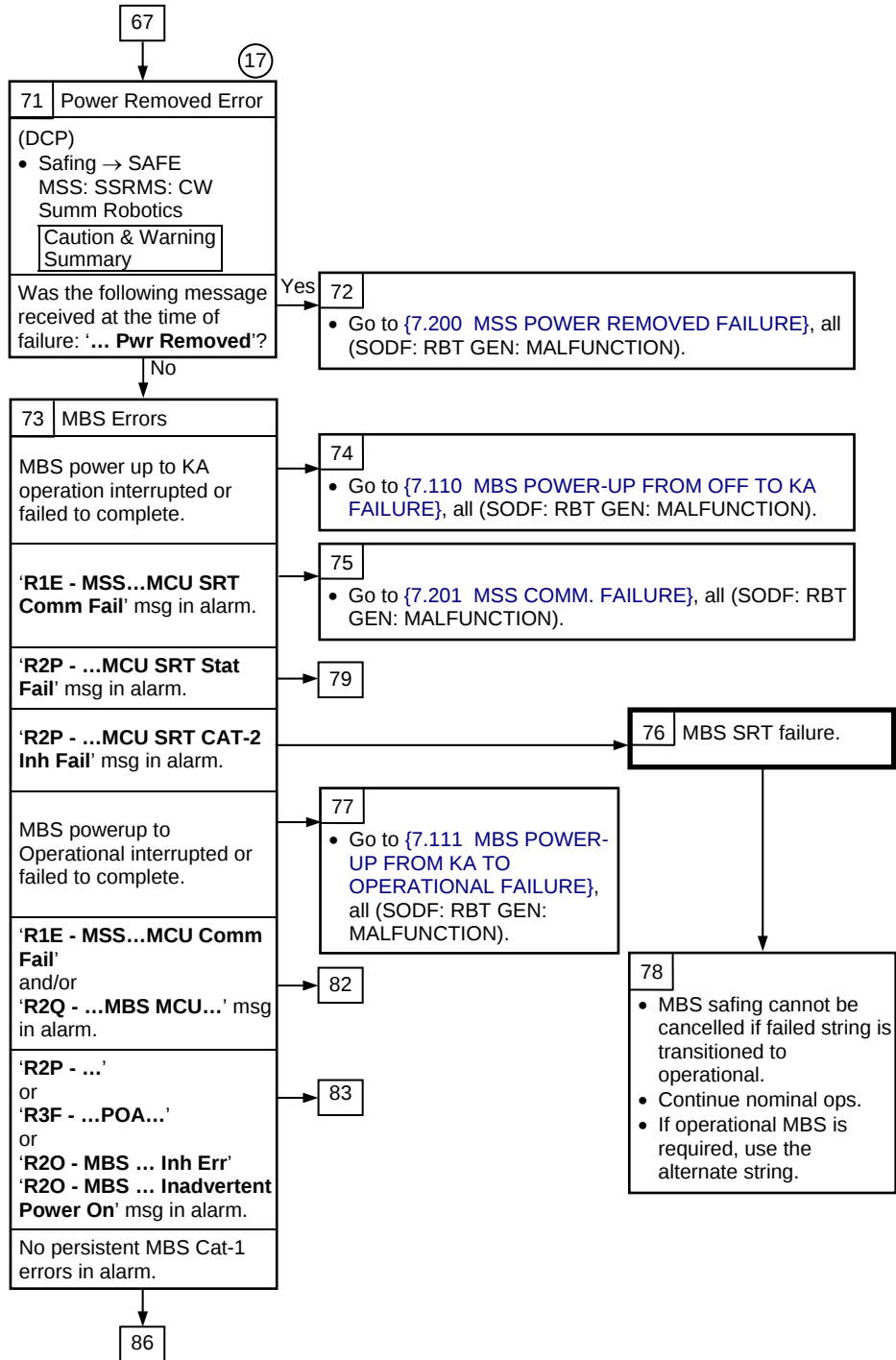






15
Non time-critical recovery is lead by MCC-H. √MCC-H before executing procedures.

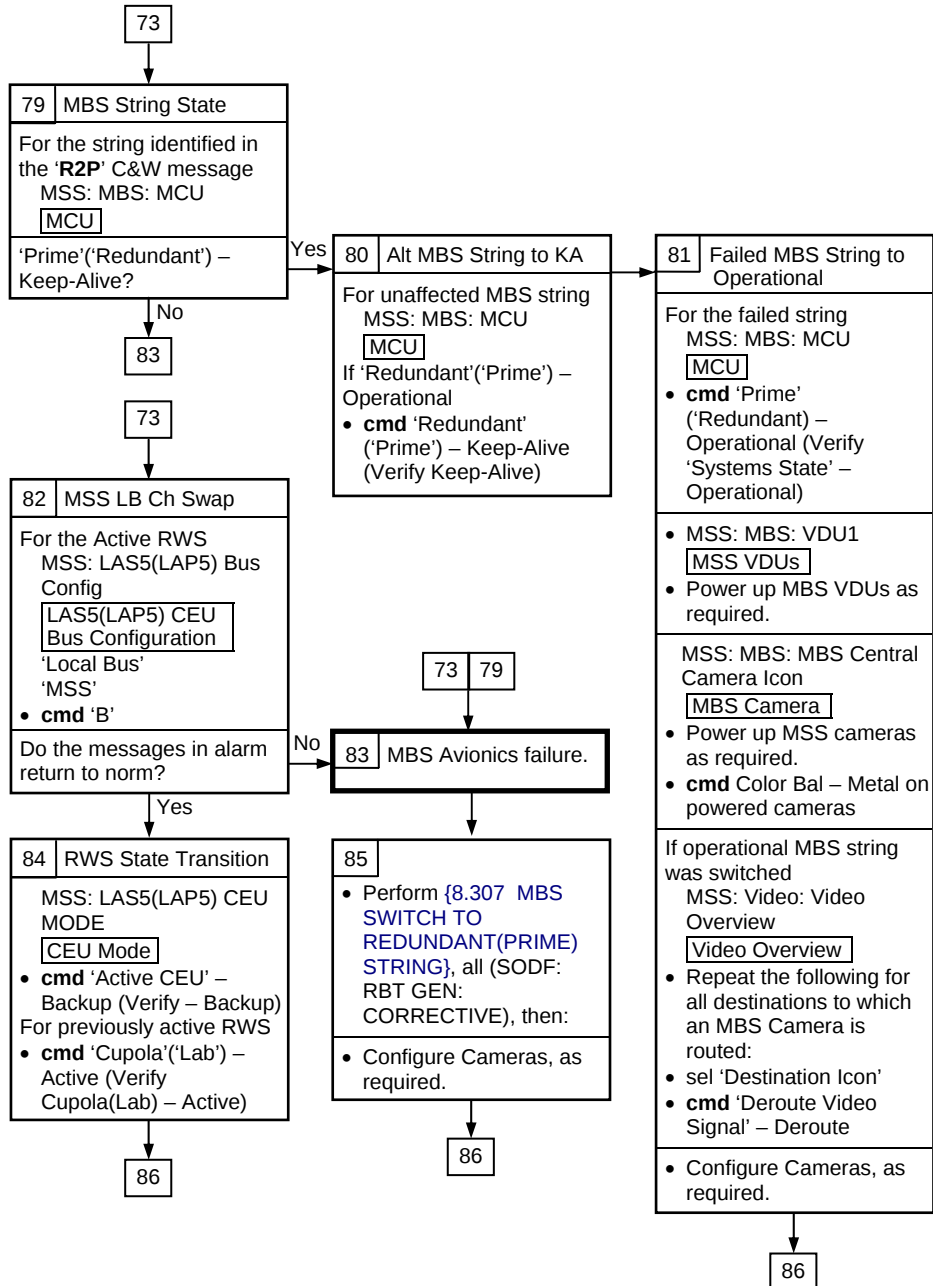
16
SCR 17606 - Transient disruption in timing of camera command poll causes MSS to safe.

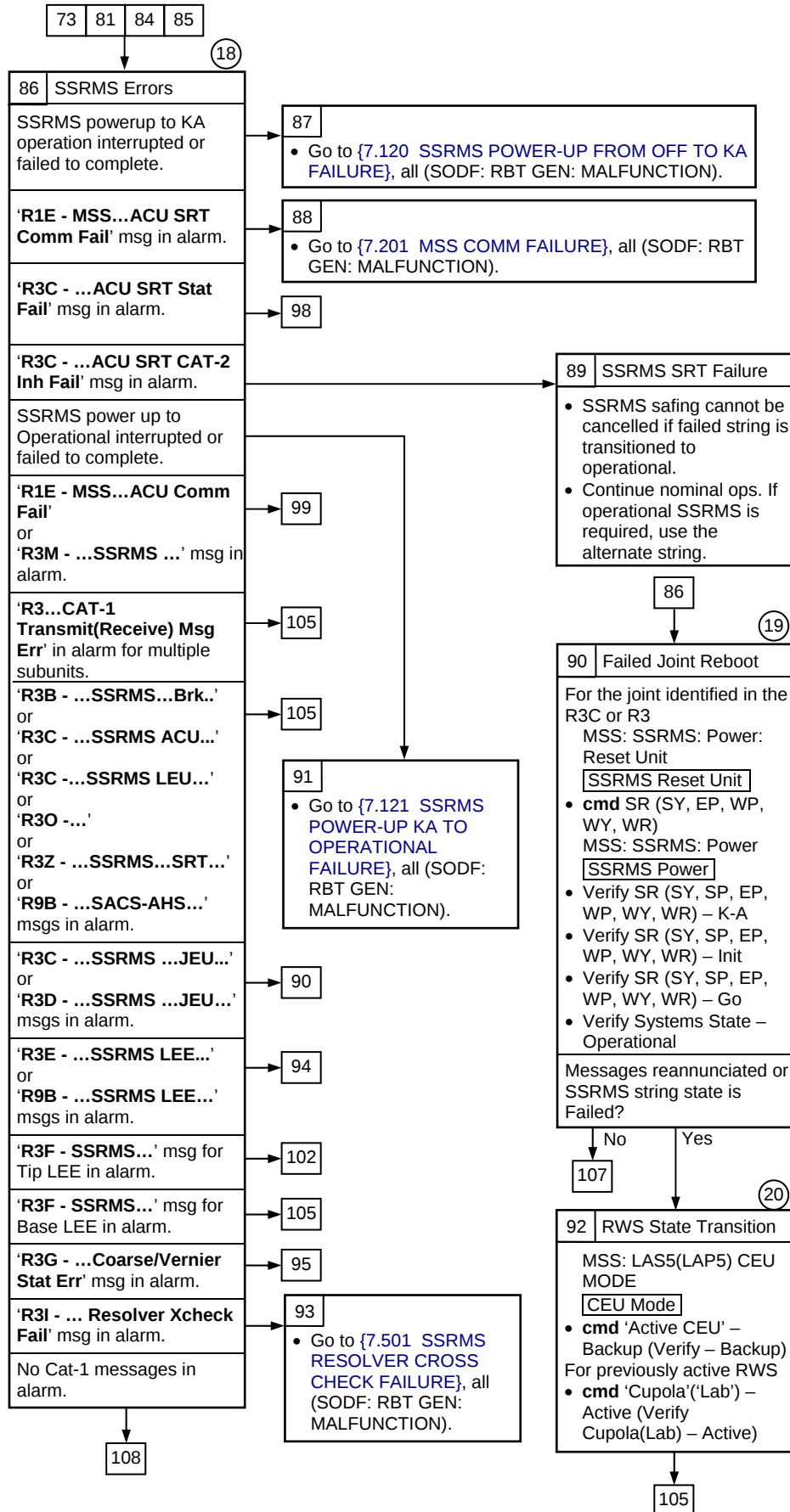


(17)

SSRMS safing can be cancelled and SSRMS recovery operations can resume in the presence of an MBS CAT-1 error.

SCR 22615 - Cancel safing aborted,
SCR 23233 - CRPCM output port 8 inadvertent power off,
SCR 21737- EDCD not saved after loss of MBS power,
SCR 19378 - LEU Receive Message Err.





(18)

If SSRMS is based on end A, Tip LEE is LEU2.

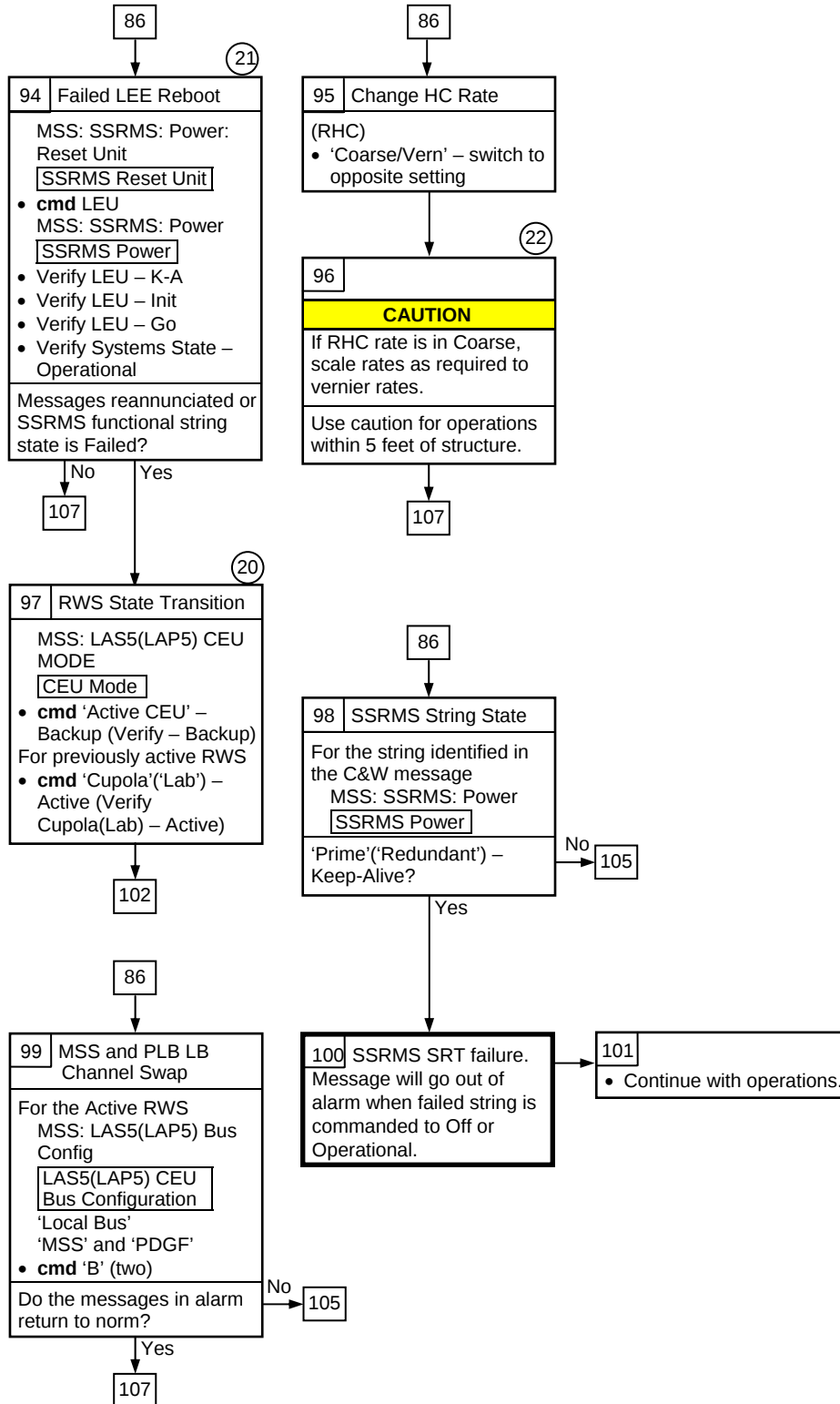
If SSRMS is based on end B, Tip LEE is LEU1.

(19)

If joint has previously failed on, reboot entire string per {8.106 SSRMS REBOOT PRIME (REDUNDANT) STRING}, all (SODF: RBT: GEN: CORRECTIVE). (SCR 26261)

(20)

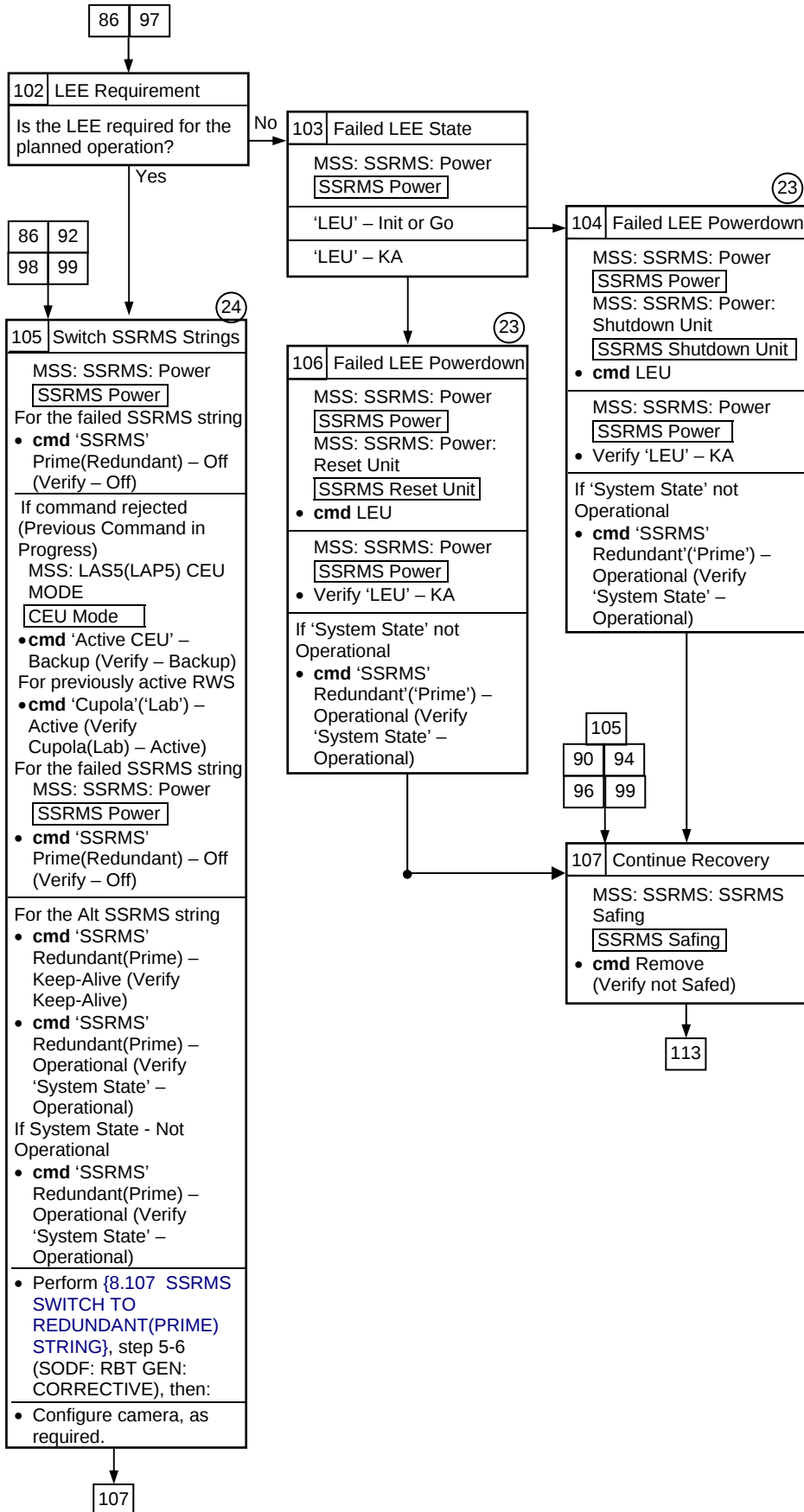
SCR 28722 - OCS may reject commands if a problem occurs during subunit initialization.



(20)
 SCR 28722 - OCS may reject commands if a problem occurs during Subunit Initialization

(21)
 If LEE has previously failed on, reboot entire string per {8.106 SSRMS REBOOT PRIME (REDUNDANT) STRING}, all (SODF: RBT: GEN: CORRECTIVE). (SCR 26261)

(22)
 If failure is 'R3G - SSRMS ACU Coarse/Vernier Stat ERR' and RHC rate is in coarse, MSS powerdown or RWS state transition removes string functionality.

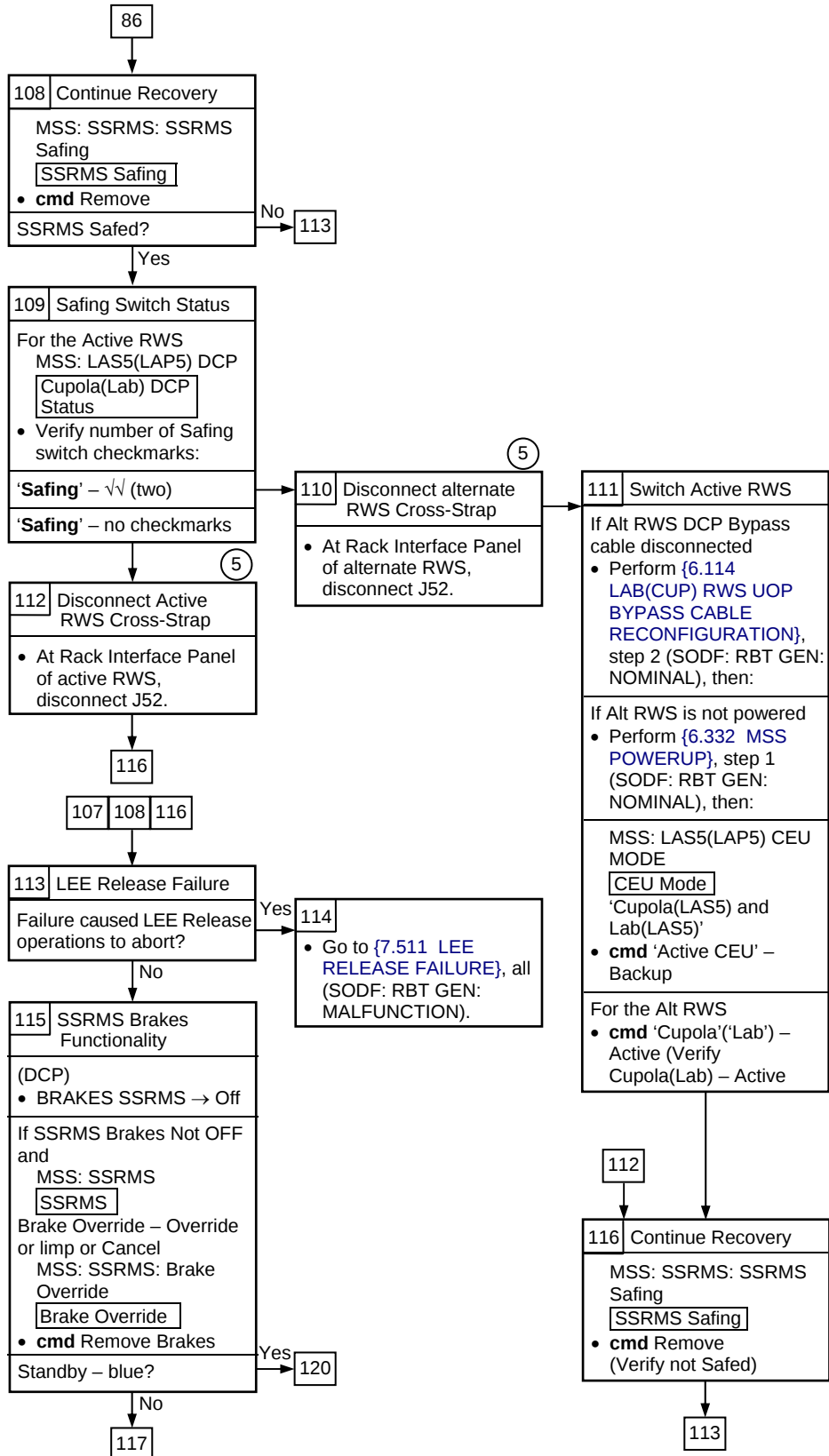


(23)

SCR 28418 - Shutdown_Subunit command may not work on a partially initialized subunit

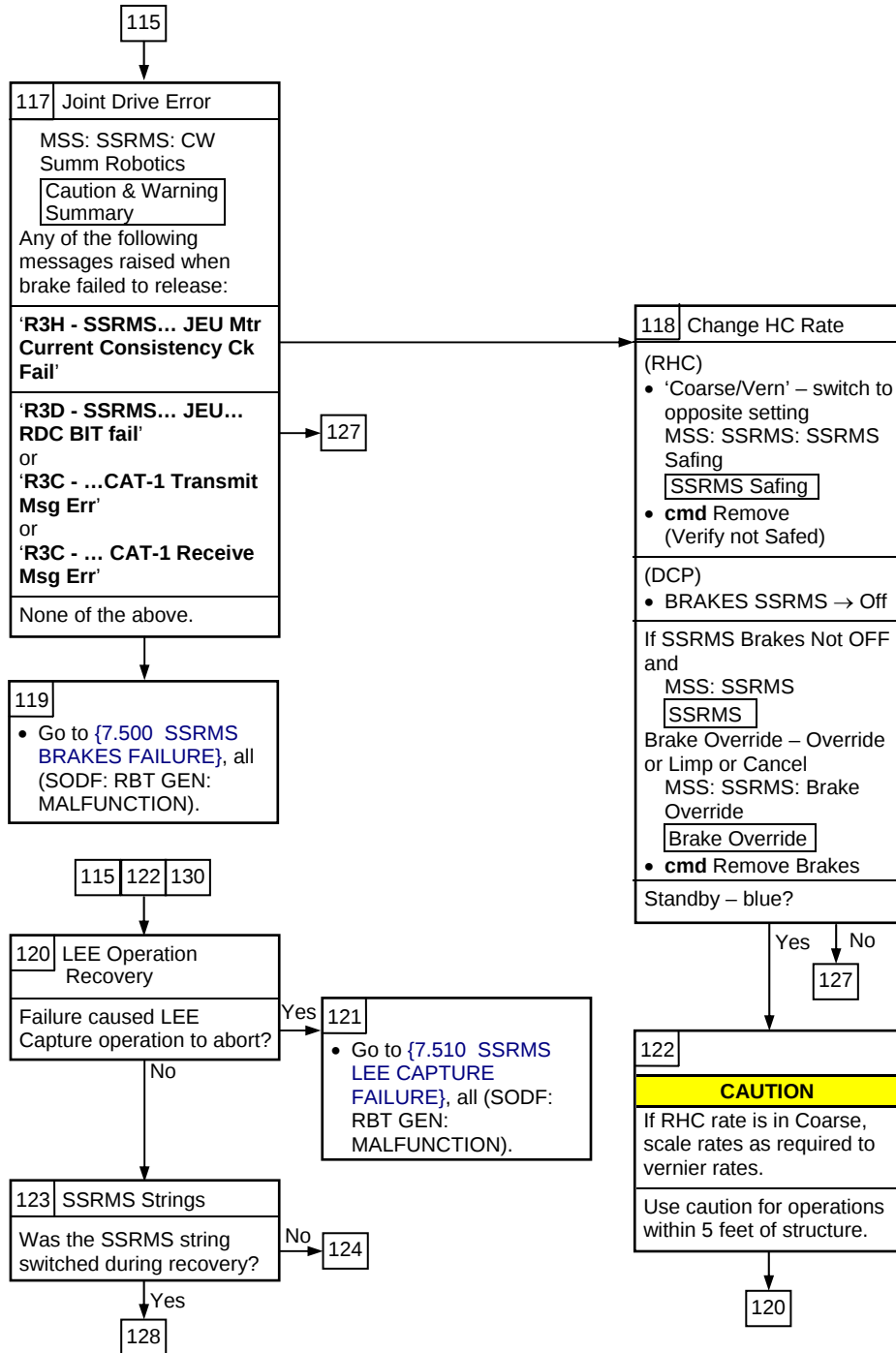
(24)

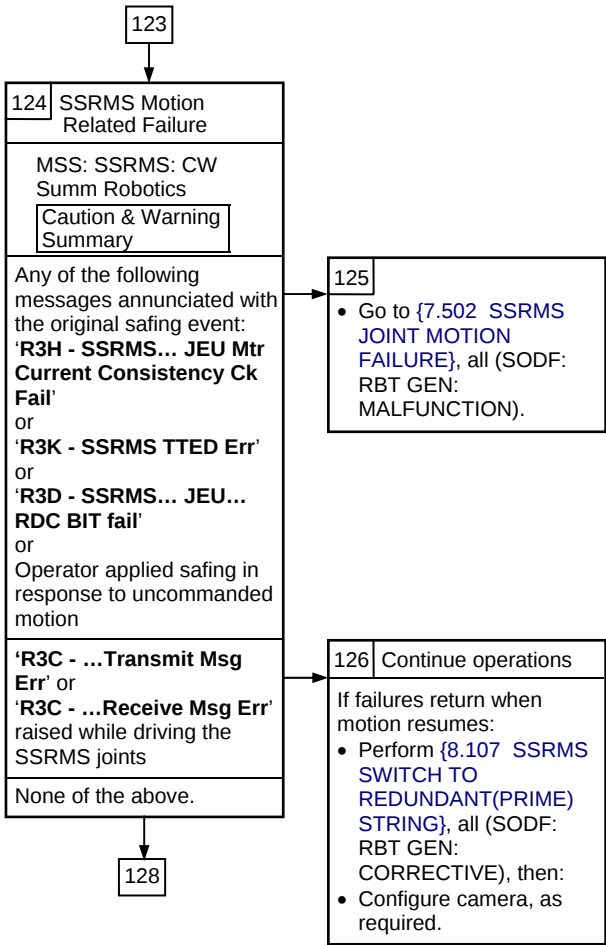
SCR 35020 – Power-off command may be rejected if a command was executing when comm. was lost
SCR 20380 - the power to operational commands may not complete after the first attempt.

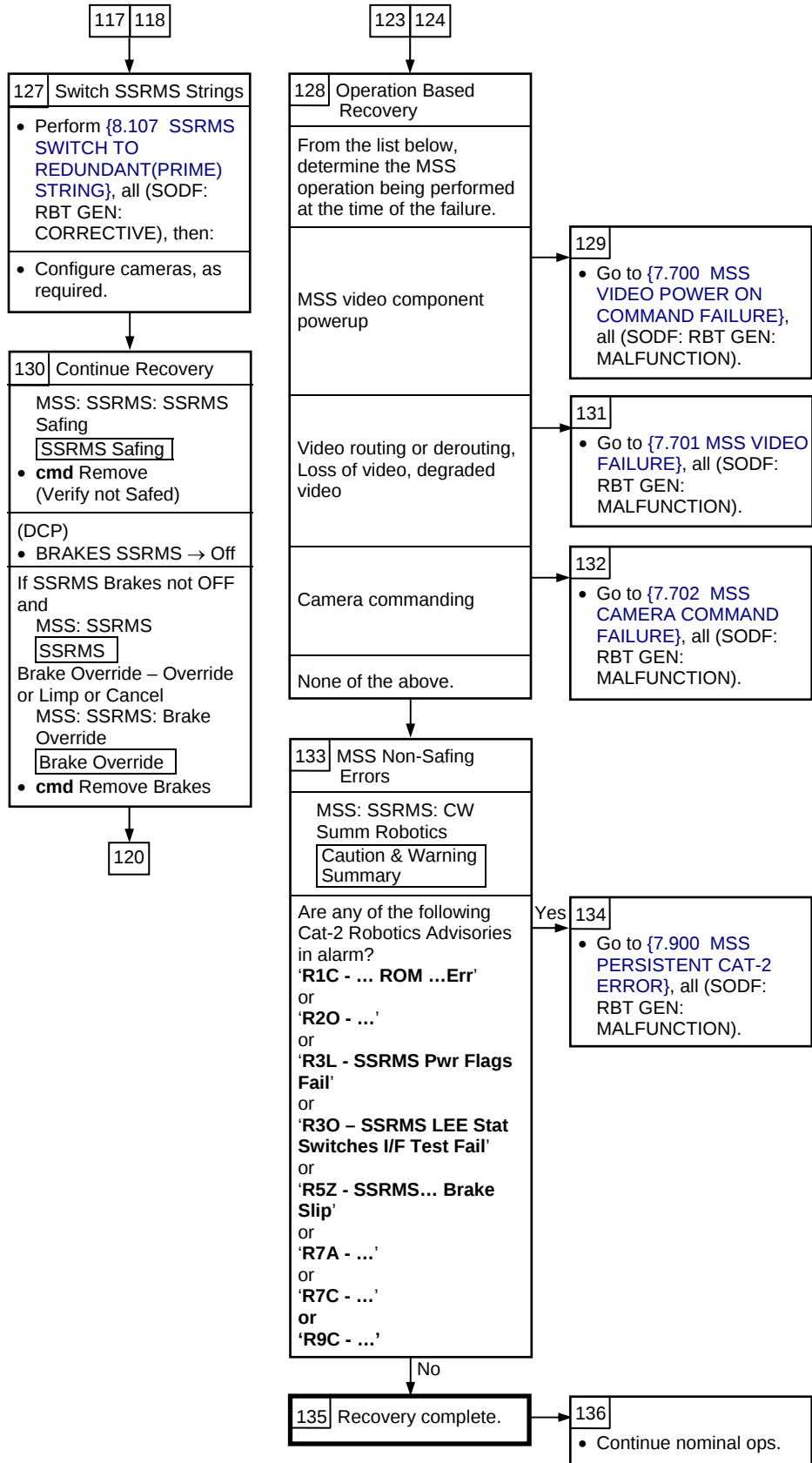


5

Cross-strap disconnect inhibits ability of backup RWS to safe system via backup RWS safing switch. E-stop still functional at failed RWS.







13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

(RBT GEN/X2R4 - ALL/FIN 2/REAL-TIME) Page 1 of 23 pages

NOTE

1. Items highlighted in gray are for **MCC** info only.
2. MT IMCA RT FDIR is enabled to the TUS and TD IMCAS during the translation (step 17). This allows the software in the EXT MDM to halt MT motion in the case of a TUS or TD IMCA failure. Enabling TUS and TD IMCA FDIR only during the translation limits annunciation of nuisance IMCA Comm Fail Robotics Advisories and MT Local Bus channel switching. The nuisance messages and channel switching only occur when all of the following are true: IO and FDIR are Enabled, EXT MDM detects RPC closed, and EXT MDM detects loss of comm with the IMCA. (SCR 28581)
3. The following type A commands should be unsafed prior to starting this procedure:

Ops Name	CIPUI
MSS_MT_Execute_Demate_UMAs	S0RM96IM0014K
MSS_MT_Prepare_to_Translate_Inboard	S0RM96IM0012K

4. One of the following type A commands should be built and unsafed prior to starting this procedure:

Ops Name	CIPUI
MSS_MT_Execute_Translate_Inboard_Tmplt	S0RM96IM0030K
MSS_MT_Execute_Translate_SARJ_Tmplt	S0RM96IM0031K

1. IMCA RT I/O ENABLE

Coordinate with ODIN/RAVEN to enable IMCA RT I/O.

PCS

MSS: MT: Auto Translate

MT Auto Translate

Verify SEPS Process State – Initiated

Verify IMCA Process State – Initiated

MSS: MT: 'MT' 'Amp1' MT LB A: RT Status

LB MT 1 RT Status

cmd 'RT Status' '00 LTU 1P' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '01 LTU 2P' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '02 LTU 3P' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '03 LTU 1S' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '04 LTU 4P' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '05 LTU 3S' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '06 LTU 2S' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '07 LTU 4S' Enable **Execute** (Verify – Ena)
cmd 'RT Status' '08 ED P' Enable **Execute** (Verify – Ena)

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

(RBT GEN/X2R4 - ALL/FIN 2/REAL-TIME) Page 2 of 23 pages

cmd 'RT Status' '09 TD P' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '11 ED S' Enable **Execute** (Verify – Ena)

Ops Name	CIPUI	Owner
Prim_EXT_Ena_RT_0	S0DD96IM0120K: 188	ODIN
Prim_EXT_Ena_RT_1	S0DD96IM0120K: 186	ODIN
Prim_EXT_Ena_RT_2	S0DD96IM0120K: 184	ODIN
Prim_EXT_Ena_RT_3	S0DD96IM0120K: 187	ODIN
Prim_EXT_Ena_RT_4	S0DD96IM0120K: 182	ODIN
Prim_EXT_Ena_RT_5	S0DD96IM0120K: 183	ODIN
Prim_EXT_Ena_RT_6	S0DD96IM0120K: 185	ODIN
Prim_EXT_Ena_RT_7	S0DD96IM0120K: 181	ODIN
Prim_EXT_Ena_RT_8	S0DD96IM0120K: 190	ODIN
Prim_EXT_Ena_RT_9	S0DD96IM0120K: 192	ODIN
Prim_EXT_Ena_RT_11	S0DD96IM0120K: 189	ODIN

sel RT Status Cont. RT#16-25

LB MT 1 RT Status Cont

cmd 'RT Status' '14 TD S' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '16 TUS 1S' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '17 TUS 2P' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '18 TUS 2S' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '19 UMA 1P' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '20 UMA 1S' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '21 UMA 2P' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '22 UMA 2S' Enable **Execute** (Verify – Ena)

cmd 'RT Status' '24 TUS 1P' Enable **Execute** (Verify – Ena)

Ops Name	CIPUI	Owner
Prim_EXT_Ena_RT_14	S0DD96IM0120K: 191	ODIN
Prim_EXT_Ena_RT_16	S0DD96IM0120K: 199	ODIN
Prim_EXT_Ena_RT_17	S0DD96IM0120K: 198	ODIN
Prim_EXT_Ena_RT_18	S0DD96IM0120K: 197	ODIN
Prim_EXT_Ena_RT_19	S0DD96IM0120K: 196	ODIN
Prim_EXT_Ena_RT_20	S0DD96IM0120K: 195	ODIN
Prim_EXT_Ena_RT_21	S0DD96IM0120K: 194	ODIN
Prim_EXT_Ena_RT_22	S0DD96IM0120K: 193	ODIN
Prim_EXT_Ena_RT_24	S0DD96IM0120K: 200	ODIN

2. [MT POWER VERIFICATION](#)

MSS: MT: Power

MT Power

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

(RBT GEN/X2R4 - ALL/FIN 2/REAL-TIME) Page 3 of 23 pages

Verify 'TUS1' 'RPCM S04B F' 17 – CI
Verify 'MT' 'RPCM MT4B' 13,14 (two) – CI
Verify 'TUS2' 'RPCM S03A E' 18 – CI
Verify 'MT' 'RPCM MT3A' 13,14 (two) – CI

3. MT ORU TEMPERATURE VERIFICATION

CAUTION

Damage or reduced lifetime to MT components may result if the startup temperatures within this step are equal to or higher than the value shown. The IMCAs should not exceed 71.4 deg C in operation.

3.1 Non-IMCA Temperature Verification

MSS: MT: Thermal

MT Thermal

Verify 'TUS1' to 'TUS2' Gearbox (two) < 47.8 deg C
Verify 'MT' 'RPCM MT4B' RPCM Bracket Temp < 48.9 deg C
Verify 'MT' 'RPCM MT3A' RPCM Bracket Temp < 48.9 deg C

3.2 IMCA Power Application

sel RPCM [X] where [X] = 3A F 4B F 3A E 4B E

MSS: MT: Power: 'RPCM S0[X]' 1

RPCM S0[X] RPC 01

cmd 'RPC Position' Close (Verify – CI)

Repeat

RPCM	Ops Name	CIPUI
3A F	RPCM_S03A_F_RPC_01_MSS _MT_TUS_1_IMCA_2_CI	S0PR96IM0258K
4B F	RPCM_S04B_F_RPC_01_MSS _MT_TUS_1_IMCA_1_CI	S0PR96IM0304K
3A E	RPCM_S03A_E_RPC_01_MSS _MT_TUS_2_IMCA_2_CI	S0PR96IM0240K
4B E	RPCM_S04B_E_RPC_01_MSS _MT_TUS_2_IMCA_1_CI	S0PR96IM0286K

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

(RBT GEN/X2R4 - ALL/FIN 2/REAL-TIME) Page 4 of 23 pages

sel RPC [X] where [X] =

7	2	10	9	5	1	4	11
---	---	----	---	---	---	---	----

MSS: MT: Power: 'MT' 'RPCM MT4B' [X]

RPCM MT4B A RPC [X]

cmd 'RPC Position' Close (Verify – CI)

MSS: MT: Power: 'MT' 'RPCM MT3A' [X]

RPCM MT3A A RPC [X]

cmd 'RPC Position' Close (Verify – CI)

Repeat

RPC	Ops Name	CIPUI
07	RPCM_MT4B_A_RPC_07_MSS_MT _UMA_1_IMCA_1_CI	S0PR96IM0328K
02	RPCM_MT4B_A_RPC_02_MSS_MT _UMA_2_IMCA_1_CI	S0PR96IM0323K
10	RPCM_MT4B_A_RPC_10_MSS_MT _LTU_1_IMCA_1_CI	S0PR96IM0331K
09	RPCM_MT4B_A_RPC_09_MSS_MT _LTU_2_IMCA_1_CI	S0PR96IM0330K
05	RPCM_MT4B_A_RPC_05_MSS_MT _LTU_3_IMCA_1_CI	S0PR96IM0326K
01	RPCM_MT4B_A_RPC_01_MSS_MT _LTU_4_IMCA_1_CI	S0PR96IM0322K
04	RPCM_MT4B_A_RPC_04_MSS_MT _TD_1_IMCA_CI	S0PR96IM0325K
11	RPCM_MT4B_A_RPC_11_MSS_MT _ED_1_IMCA_CI	S0PR96IM0332K

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

(RBT GEN/X2R4 - ALL/FIN 2/REAL-TIME) Page 5 of 23 pages

RPC	Ops Name	CIPUI
07	RPCM_MT3A_A_RPC_07_MSS_MT _UMA_1_IMCA_2_CI	S0PR96IM0346K
02	RPCM_MT3A_A_RPC_02_MSS_MT _UMA_2_IMCA_2_CI	S0PR96IM0341K
10	RPCM_MT3A_A_RPC_10_MSS_MT _LTU_1_IMCA_2_CI	S0PR96IM0349K
09	RPCM_MT3A_A_RPC_09_MSS_MT _LTU_2_IMCA_2_CI	S0PR96IM0348K
05	RPCM_MT3A_A_RPC_05_MSS_MT _LTU_3_IMCA_2_CI	S0PR96IM0344K
01	RPCM_MT3A_A_RPC_01_MSS_MT _LTU_4_IMCA_2_CI	S0PR96IM0340K
04	RPCM_MT3A_A_RPC_04_MSS_MT _TD_2_IMCA_CI	S0PR96IM0343K
11	RPCM_MT3A_A_RPC_11_MSS_MT _ED_2_IMCA_CI	S0PR96IM0350K

3.3 IMCA Power Verification

MSS: MT: IMCA Data Stale State

MT IMCA Data Stale State

Verify 'Status Measurements' 'TUS1' to 'TUS2' 'IMCA' 'A' (two) – blank
Verify 'Status Measurements' 'TUS1' to 'TUS2' 'IMCA' 'B' (two) – blank
Verify 'Status Measurements' 'UMA1' to 'UMA2' 'IMCA' 'A' (two) – blank
Verify 'Status Measurements' 'UMA1' to 'UMA2' 'IMCA' 'B' (two) – blank
Verify 'Status Measurements' 'LTU1' to 'LTU4' 'IMCA' 'A' (four) – blank
Verify 'Status Measurements' 'LTU1' to 'LTU4' 'IMCA' 'B' (four) – blank
Verify 'Status Measurements' 'TD' 'IMCA' 'A' – blank
Verify 'Status Measurements' 'TD' 'IMCA' 'B' – blank
Verify 'Status Measurements' 'ED' 'IMCA' 'A' – blank
Verify 'Status Measurements' 'ED' 'IMCA' 'B' – blank

MSS: MT: Power

MT Power

Verify 'TUS1' 'RPCM S03A F' 'Mode' – Standby
Verify 'TUS1' 'RPCM S04B F' 'Mode' – Standby
Verify 'TUS2' 'RPCM S03A E' 'Mode' – Standby
Verify 'TUS2' 'RPCM S04B E' 'Mode' – Standby
Verify 'TUS1' 'RPCM S03A F' 'Fault' – blank
Verify 'TUS1' 'RPCM S04B F' 'Fault' – blank
Verify 'TUS2' 'RPCM S03A E' 'Fault' – blank
Verify 'TUS2' 'RPCM S04B E' 'Fault' – blank

Verify 'MT' 'RPCM MT4B' 'UMA1' to 'UMA2' 'Mode' (two) – Standby
Verify 'MT' 'RPCM MT4B' 'LTU1' to 'LTU4' 'Mode' (four) – Standby

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Verify 'MT' 'RPCM MT4B' 'TD' 'Mode'	– Standby
Verify 'MT' 'RPCM MT4B' 'ED' 'Mode'	– Standby
Verify 'MT' 'RPCM MT4B' 'UMA1' to 'UMA2' 'Fault' (two)	– blank
Verify 'MT' 'RPCM MT4B' 'LTU1' to 'LTU4' 'Fault' (four)	– blank
Verify 'MT' 'RPCM MT4B' 'TD' 'Fault'	– blank
Verify 'MT' 'RPCM MT4B' 'ED' 'Fault'	– blank
Verify 'MT' 'RPCM MT3A' 'UMA1' to 'UMA2' 'Mode' (two)	– Standby
Verify 'MT' 'RPCM MT3A' 'LTU1' to 'LTU4' 'Mode' (four)	– Standby
Verify 'MT' 'RPCM MT3A' 'TD' 'Mode'	– Standby
Verify 'MT' 'RPCM MT3A' 'ED' 'Mode'	– Standby
Verify 'MT' 'RPCM MT3A' 'UMA1' to 'UMA2' 'Fault' (two)	– blank
Verify 'MT' 'RPCM MT3A' 'LTU1' to 'LTU4' 'Fault' (four)	– blank
Verify 'MT' 'RPCM MT3A' 'TD' 'Fault'	– blank
Verify 'MT' 'RPCM MT3A' 'ED' 'Fault'	– blank

3.4 IMCA Temperature Verification

MSS: MT: Thermal

MT Thermal

Verify 'TUS1' S0 3AF IMCA < 49.4 deg C

Verify 'TUS1' S0 4BF IMCA < 49.4 deg C

Verify 'TUS2' S0 3AE IMCA < 49.4 deg C

Verify 'TUS2' S0 4BE IMCA < 49.4 deg C

Verify 'MT' 'RPCM MT4B' LTU1 to LTU4 (four) < 60.0 deg C

Verify 'MT' 'RPCM MT4B' TD1 < 50.0 deg C

Verify 'MT' 'RPCM MT4B' ED1 < 58.9 deg C

Verify 'MT' 'RPCM MT4B' UMA1 to UMA2 (two) < 57.8 deg C
(< 51.1 deg C when translating from another segment to WS4)

Verify 'MT' 'RPCM MT3A' LTU1 to LTU4 (four) < 60.0 deg C

Verify 'MT' 'RPCM MT3A' TD2 < 50.0 deg C

Verify 'MT' 'RPCM MT3A' ED2 < 58.9 deg C

Verify 'MT' 'RPCM MT3A' UMA1 to UMA2 (two) < 57.8 deg C
(< 51.1 deg C when translating from another segment to WS4)

3.5 IMCA Power Removal

sel RPCM [X] where [X] = 3A F 4B F 3A E 4B E

MSS: MT: Power: 'RPCM S0[X]' 1

RPCM S0[X] RPC 01

cmd 'RPC Position' Open (Verify – Op)

Repeat

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RPCM	Ops Name	CIPUI
3A F	RPCM_S03A_F_RPC_01_MSS _MT_TUS_1_IMCA_2_Op	S0PR96IM0638K
4B F	RPCM_S04B_F_RPC_01_MSS _MT_TUS_1_IMCA_1_Op	S0PR96IM0684K
3A E	RPCM_S03A_E_RPC_01_MSS _MT_TUS_2_IMCA_2_Op	S0PR96IM0620K
4B E	RPCM_S04B_E_RPC_01_MSS _MT_TUS_2_IMCA_1_Op	S0PR96IM0666K

sel RPC [X] where [X] =

7	2	10	9	5	1	4	11
---	---	----	---	---	---	---	----

MSS: MT: Power: 'MT' 'RPCM MT4B' [X]

RPCM MT4B A RPC [X]

cmd 'RPC Position' Open (Verify – Op)

MSS: MT: Power: 'MT' 'RPCM MT3A' [X]

RPCM MT3A A RPC [X]

cmd 'RPC Position' Open (Verify – Op)

Repeat

RPC	Ops Name	CIPUI
07	RPCM_MT4B_A_RPC_07_MSS_MT _UMA_1_IMCA_1_Op	S0PR96IM0708K
02	RPCM_MT4B_A_RPC_02_MSS_MT _UMA_2_IMCA_1_Op	S0PR96IM0703K
10	RPCM_MT4B_A_RPC_10_MSS_MT _LTU_1_IMCA_1_Op	S0PR96IM0711K
09	RPCM_MT4B_A_RPC_09_MSS_MT _LTU_2_IMCA_1_Op	S0PR96IM0710K
05	RPCM_MT4B_A_RPC_05_MSS_MT _LTU_3_IMCA_1_Op	S0PR96IM0706K
01	RPCM_MT4B_A_RPC_01_MSS_MT _LTU_4_IMCA_1_Op	S0PR96IM0702K
04	RPCM_MT4B_A_RPC_04_MSS_MT _TD_1_IMCA_Op	S0PR96IM0705K
11	RPCM_MT4B_A_RPC_11_MSS_MT _ED_1_IMCA_Op	S0PR96IM0712K

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RPC	Ops Name	CIPUI
07	RPCM_MT3A_A_RPC_07_MSS_MT _UMA_1_IMCA_2_Op	S0PR96IM0726K
02	RPCM_MT3A_A_RPC_02_MSS_MT _UMA_2_IMCA_2_Op	S0PR96IM0721K
10	RPCM_MT3A_A_RPC_10_MSS_MT _LTU_1_IMCA_2_Op	S0PR96IM0729K
09	RPCM_MT3A_A_RPC_09_MSS_MT _LTU_2_IMCA_2_Op	S0PR96IM0728K
05	RPCM_MT3A_A_RPC_05_MSS_MT _LTU_3_IMCA_2_Op	S0PR96IM0724K
01	RPCM_MT3A_A_RPC_01_MSS_MT _LTU_4_IMCA_2_Op	S0PR96IM0720K
04	RPCM_MT3A_A_RPC_04_MSS_MT _TD_2_IMCA_Op	S0PR96IM0723K
11	RPCM_MT3A_A_RPC_11_MSS_MT _ED_2_IMCA_Op	S0PR96IM0730K

4. VERIFYING STATION CONFIGURED FOR MT TRANSLATION

Verify any payloads or SSRMS attached to the MBS positioned within the translation corridor.

Verify translation path is clear of obstacles.

5. MT AUTOSAFING ENABLED VERIFICATION

MSS: MT: Auto Safing

MT Autosafing

√MT Autosafing State – ENA

6. MT POSITION CHECK

MSS: MT: MT Mode

MT Mode

√MT Process State – Disabled

MSS: MT

Mobile Transporter

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√MT Position matches value shown in Table 1 to within ± 12 cm

Table 1. MT Positions

Location	MT Position (cm)
WS9	3672.8
WS1	2169.2
WS2	1653.5
WS3	795.0
WS4	287.0
Launch Site	-254.0
WS5	-525.8
WS6	-795.0
WS7	-1653.5
WS8	-2169.2
WS10	-3672.8

Ops Name	CIPUI
MSS_MT_Reset_Position_WS9	S0RM96IM0044K: 009
MSS_MT_Reset_Position_WS1	S0RM96IM0044K: 001
MSS_MT_Reset_Position_WS2	S0RM96IM0044K: 002
MSS_MT_Reset_Position_WS3	S0RM96IM0044K: 003
MSS_MT_Reset_Position_WS4	S0RM96IM0044K: 004
MSS_MT_Reset_Position_Launchsite	S0RM96IM0044K: 011
MSS_MT_Reset_Position_WS5	S0RM96IM0044K: 005
MSS_MT_Reset_Position_WS6	S0RM96IM0044K: 006
MSS_MT_Reset_Position_WS7	S0RM96IM0044K: 007
MSS_MT_Reset_Position_WS8	S0RM96IM0044K: 008
MSS_MT_Reset_Position_WS10	S0RM96IM0044K: 010

7. MT SOFTWARE PROCESS INITIATION AND MODE TO AUTO

7.1 Verify Predictor Configuration

NOTE

At high beta angles the combination of MT Operations and Predictor Software operations causes the EXT MDM to have excessive CPU usage and can cause the MDM to fail over to a Diagnostic State. At Beta angles with magnitude greater than 40°, Predictor must be inhibited prior to beginning MT operations in the EXT MDM (SCR 34357/ SPN 4427).

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MCC-H

If |Beta| > 40

Coordinate with THOR for Predictor inhibit.

S1: TCS: Loop A Software: Loop A RGAC Loop A RGAC
'Commands' 'RGAC' **cmd** Predictor – Inh (√ - Inh)

P1: TCS: Loop B Software: Loop B RGAC Loop B RGAC
'Commands' 'RGAC' **cmd** Predictor – Inh (√ - Inh)

PCS

7.2 Auto Translate

MSS: MT: Auto Translate

MT Auto Translate

cmd Initiate MT Process **Execute** (Verify MT Process State – Initiated)

cmd Mode MT to Standby **Execute** (Verify MT Software Mode – Standby)

cmd Mode MT to Auto **Execute** (Verify MT Software Mode – Auto)

Ops Name	CIPUI
DSM_Enable_Logical_Thread_MSS_MT	S0DD96IM0383K
MSS_MT_Mode_to_Standby	S0RM96IM0005K
MSS_MT_Mode_to_Auto	S0RM96IM0006K

8. [HARDWARE CONFIGURATION SELECTION](#)

NOTE

If HW Config C1 is selected, apply power to only RPCM MT4B IMCAs in the following procedures. Likewise, if HW Config C2 is selected, apply power to only RPCM MT3A IMCAs.

cmd 'HW Config' 1(2) **Execute** [Verify – C1(C2)]

Unit	Ops Name	CIPUI
1	MSS_MT_HW_Config_Auto_1	S0RM96IM0020K
2	MSS_MT_HW_Config_Auto_2	S0RM96IM0021K

9. [MBS/SSRMS POWER REMOVAL](#)

MSS: LAS5 CEU Mode

CEU Mode

√'Cupola (LAS5)' or 'LAB (LAP5)' – Active

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STRING A(B) IMCAS**

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If SSRMS attached to MBS

MSS: MBS: MBS

√'MCU' – Operational

For both SSRMS strings

Perform {6.434 SSRMS POWERDOWN TO OFF ON BOTH
STRINGS}, all (SODF: RBT GEN: NOMINAL), then:

For Operational MBS string

Perform {6.334 MSS POWERDOWN FROM OPERATIONAL TO
KEEP-ALIVE}, step 3 (SODF: RBT GEN: NOMINAL), then:

NOTE

Expect '**R1E - MSS Active OCS MBS Prime(Redun) MCU SRT
Comm Fail**' Caution and Warning messages (SCR 17730).

MSS: MBS: MCU: MCU

cmd 'Prime' Off (Verify – Off) (30 s max)

cmd 'Redundant' Off (Verify – Off) (30 s max)

Record GMT.

Notify **MCC-H** at next opportunity.

To powerdown prime and redundant strings, perform {8.291 MBS &
SSRMS POWERDOWN TO OFF AND POWERUP FROM OFF}, steps 1
to 3 (SODF: GND SUPPORT: ROBOTICS: NOMINAL), then:

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MSS: MT: Worksite Power: Work Site Power

√Utility Port power is off for Current Worksite by examining the appropriate RPCM(s) in Table 2

Table 2. Current Worksite Utility Port Power

Utility Port	Service	
	Primary	Secondary
1	RPCM S34B F	RPCM S33A F
2	RPCM S14B E	RPCM S13A E
3	RPCM S14B F	RPCM S13A F
4	RPCM S04B A	RPCM S03A A
5	RPCM S04B B	RPCM S03A B
6	RPCM P14B F	RPCM P13A F
7	RPCM P14B E	RPCM P13A E
8	RPCM P34B F	RPCM P33A F
9	RPCM S43A B	RPCM S41A B
10	RPCM P44A B	RPCM P42A B

10. UMA IMCA POWER APPLICATION AND VERIFICATION

10.1 UMA IMCA Power Application

sel RPC [X] where [X] = 7 2

MSS: MT: Power: 'MT' 'RPCM MT4B(3A)' [X]
RPCM MT4B(3A) A RPC [X]

cmd 'RPC Position' Close (Verify – CI)

Repeat

RPC	Ops Name	CIPUI
07	RPCM_MT4B_A_RPC_07_MSS_MT_UMA_1_IMCA_1_CI	S0PR96IM0328K
02	RPCM_MT4B_A_RPC_02_MSS_MT_UMA_2_IMCA_1_CI	S0PR96IM0323K
07	RPCM_MT3A_A_RPC_07_MSS_MT_UMA_1_IMCA_2_CI	S0PR96IM0346K
02	RPCM_MT3A_A_RPC_02_MSS_MT_UMA_2_IMCA_2_CI	S0PR96IM0341K

10.2 UMA IMCA Power Verification

MSS: MT: IMCA Data Stale State

MT IMCA Data Stale State

Verify 'Status Measurements' 'UMA1' to 'UMA2' 'IMCA' 'A(B)' (two) – blank

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MSS: MT: Power

MT Power

Verify 'MT' 'RPCM MT4B(3A)' 'UMA1' to 'UMA2' 'Mode' (two) – Standby

Verify 'MT' 'RPCM MT4B(3A)' 'UMA1' to 'UMA2' 'Fault' (two) – blank

11. UMA DEMATE PREPARATION

MSS: MT: Auto Translate

MT Auto Translate

Verify Prepare to Demate UMAs – Ready

cmd Prepare to Demate UMAs **Execute** (Verify – Complete)

Ops Name	CIPUI
MSS_MT_Ready_Demate_UMAs	S0RM96IM0013K

12. THRUSTER INHIBIT

Coordinate with ADCO for Thruster Inhibit.

If ISS/orbiter mated

MSS: MT: Thruster

Thruster Controls for MSS Ops

Verify 'Desat Request' Inhibit (Verify – Inh)

✓ 'Auto Att Control Handover to RS' – Inh

If ISS is not mated to orbiter

✓ **MCC-H/ADCO** for proper thruster configuration before proceeding

13. UMA DEMATE EXECUTION

MSS: MT: Auto Translate

MT Auto Translate

Verify Demate UMAs – Ready

cmd Demate UMAs **Execute** (Verify – Complete)

Ops Name	CIPUI
MSS_MT_Execute_Demate_UMAs	S0RM96IM0014K

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

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14. LTU AND TD IMCA POWER APPLICATION AND VERIFICATION

14.1 LTU and TD IMCA Power Application

sel RPC [X] where [X] =

10	9	5	1	4
----	---	---	---	---

MSS: MT: Power: 'MT' 'RPCM MT4B(3A)' [X]

RPCM MT4B(3A) A RPC [X]

cmd 'RPC Position' Close (Verify – CI)

Repeat

RPC	Ops Name	CIPUI
10	RPCM_MT4B_A_RPC_10_MSS_MT_LTU_1_IMCA_1_CI	S0PR96IM0331K
09	RPCM_MT4B_A_RPC_09_MSS_MT_LTU_2_IMCA_1_CI	S0PR96IM0330K
05	RPCM_MT4B_A_RPC_05_MSS_MT_LTU_3_IMCA_1_CI	S0PR96IM0326K
01	RPCM_MT4B_A_RPC_01_MSS_MT_LTU_4_IMCA_1_CI	S0PR96IM0322K
04	RPCM_MT4B_A_RPC_04_MSS_MT_TD_1_IMCA_CI	S0PR96IM0325K
10	RPCM_MT3A_A_RPC_10_MSS_MT_LTU_1_IMCA_2_CI	S0PR96IM0349K
09	RPCM_MT3A_A_RPC_09_MSS_MT_LTU_2_IMCA_2_CI	S0PR96IM0348K
05	RPCM_MT3A_A_RPC_05_MSS_MT_LTU_3_IMCA_2_CI	S0PR96IM0344K
01	RPCM_MT3A_A_RPC_01_MSS_MT_LTU_4_IMCA_2_CI	S0PR96IM0340K
04	RPCM_MT3A_A_RPC_04_MSS_MT_TD_2_IMCA_CI	S0PR96IM0343K

14.2 LTU and TD IMCA Power Verification

MSS: MT: IMCA Data Stale State

MT IMCA Data Stale State

Verify 'Status Measurements' 'LTU1' to 'LTU4' 'IMCA' 'A(B)' (four) – blank

Verify 'Status Measurements' 'TD' 'IMCA' 'A(B)' – blank

MSS: MT: Power

MT Power

Verify 'MT' 'RPCM MT4B(3A)' 'LTU1' to 'LTU4' 'Mode' (four) – Standby

Verify 'MT' 'RPCM MT4B(3A)' 'TD' 'Mode' – Standby

Verify 'MT' 'RPCM MT4B(3A)' 'LTU1' to 'LTU4' 'Fault' (four) – blank

Verify 'MT' 'RPCM MT4B(3A)' 'TD' 'Fault' – blank

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

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15. PREPARING TD IMCA

MSS: MT: Auto Translate

MT Auto Translate

Verify Ready TD – Ready

cmd Ready TD **Execute** (Verify – Complete)

Ops Name	CIPUI
MSS_MT_Ready_Translation_Drive	S0RM96IM0019K

16. MT TRANSLATION PREPARATION

Verify Prepare to Translate – Ready

cmd Prepare to Translate **Execute**

Ops Name	CIPUI
MSS_MT_Prepere_to_Translate_Inboard	S0RM96IM0012K

When motion is complete (~7.5 minutes), verify the following.

sel RPC [X] where [X] =

10	9	5	1	11
----	---	---	---	----

MSS: MT: Power: 'MT' 'RPCM MT4B(3A)' [X]

RPCM MT4B(3A) A RPC [X]

Verify RPC Position – Op

Repeat

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17. TUS AND TD IMCA RT FDIR ENABLE

Coordinate with ODIN/RAVEN to enable TUS and TD IMCA RT FDIR.

If HW Config C1 selected in step 8

MSS: MT: 'MT' 'Amp1' MT LB A: RT Status

LB MT 1 RT Status

cmd 'RT FDIR Status' '09 TD P' Enable FDIR **Execute** (Verify – Ena)

MSS: MT: 'MT' 'Amp1' MT LB A: RT Status: RT Status Cont. RT#16-25

LB MT 1 RT Status Cont

cmd 'RT FDIR Status' '24 TUS 1P' Enable FDIR **Execute** (Verify – Ena)

cmd 'RT FDIR Status' '17 TUS 2P' Enable FDIR **Execute** (Verify – Ena)

Ops Name	CIPUI	Owner
Prim_EXT_Ena_RT_FDIR_RT_09	S0DD96IM0096K: 007	ODIN
Prim_EXT_Ena_RT_FDIR_RT_24	S0DD96IM0096K: 006	ODIN
Prim_EXT_Ena_RT_FDIR_RT_17	S0DD96IM0096K: 004	ODIN

If HW Config C2 selected in step 8

MSS: MT: 'MT' 'Amp1' MT LB A: RT Status: RT Status Cont. RT#16-25

LB MT 1 RT Status Cont

cmd 'RT FDIR Status' '14 TD S' Enable FDIR **Execute** (Verify – Ena)

cmd 'RT FDIR Status' '16 TUS 1S' Enable FDIR **Execute** (Verify – Ena)

cmd 'RT FDIR Status' '18 TUS 2S' Enable FDIR **Execute** (Verify – Ena)

Ops Name	CIPUI	Owner
Prim_EXT_Ena_RT_FDIR_RT_14	S0DD96IM0096K: 014	ODIN
Prim_EXT_Ena_RT_FDIR_RT_16	S0DD96IM0096K: 003	ODIN
Prim_EXT_Ena_RT_FDIR_RT_18	S0DD96IM0096K: 005	ODIN

18. MT TRANSLATION AND LATCH/MATE EXECUTION

NOTE

Pause function is only available during the following:
“Translate Phase 1” portion of Translate Inboard of SARJ.

“Translate Phase 1” and “Translate Phase 3” portion of Translate across SARJ.

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STRING A(B) IMCAS**

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If Current and Destination Worksite ≤ 8

MSS: MT: Auto Translate: Translate Inboard of SARJ

MT Translate Inboard of SARJ

Verify 'Event in progress' – Ready

sel Current Worksite – as desired

sel Destination Worksite – as desired

sel Payload Mass – as desired

cmd Translate Inboard of SARJ Execute

Ops Name	CIPUI
MSS_MT_Execute_Translate_Inboard_Tmpl	S0RM96IM0030K

If Current or Destination Worksite ≥ 9

MSS: MT: Auto Translate: Translate across SARJ

MT Translate across SARJ

Verify Event in progress – Ready

sel Current Worksite – as desired

sel Destination Worksite – as desired

cmd Translate across SARJ Execute

Ops Name	CIPUI
MSS_MT_Execute_Translate_SARJ_Tmpl	S0RM96IM0031K

MSS: MT

Mobile Transporter

Verify Destination WS – as chosen

Verify MT Position – changing

Verify MT Velocity: -3.0 to 3.0

Verify MT bug is moving from Current to Destination Worksite.

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STRING A(B) IMCAS**

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NOTE

1. FDIR is Enabled to the TUS and TD IMCAs; therefore, expect the following messages to annunciate and return to Norm twice: once during the IMCA Built In Test (communication is interrupted for several seconds during the BIT) and again when IMCA power is removed (SCR 28581).
2. If HW Config C1 is selected
 - 'R9Z - MSS MT TUS 1 IMCA 1 Comm or Device Fail'
 - 'R9Z - MSS MT TUS 2 IMCA 1 Comm or Device Fail'
 - 'R9Z - MSS MT TD IMCA 1 Comm or Device Fail'
3. If HW Config C2 is selected
 - 'R9Z - MSS MT TUS 1 IMCA 2 Comm or Device Fail'
 - 'R9Z - MSS MT TUS 2 IMCA 2 Comm or Device Fail'
 - 'R9Z - MSS MT TD IMCA 2 Comm or Device Fail'

When MT is latched and mated at the destination worksite,
MSS: MT: Auto Translate: Translate Inboard of SARJ (Translate
across SARJ)

MT Translate Inboard of SARJ (MT Translate across SARJ)

Verify Event in progress – Complete

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19. THRUSTER ENABLE

Notify **MCC-H**/ADCO Thruster Inhibit no longer required.

20. TUS AND MT IMCA POWER REMOVAL VERIFICATION

20.1 TUS IMCA Power Removal Verification

sel RPCM [X] where [X] =

3A F	4B F	3A E	4B E
------	------	------	------

MSS: MT: Power: 'RPCM S0[X]' 1

RPCM S0[X]	RPC 01
------------	--------

Verify RPC Position – Op

Repeat

20.2 MT IMCA Power Removal Verification

sel RPC [X] where [X] =

7	2	10	9	5	1	4	11
---	---	----	---	---	---	---	----

MSS: MT: Power: 'MT' 'RPCM MT4B(3A)' [X]

RPCM MT4B(3A) A	RPC [X]
-----------------	---------

Verify RPC Position – Op

Repeat

21. MT SOFTWARE SHUTDOWN

MSS: MT: Auto Translate

MT Auto Translate

cmd Mode MT to Standby **Execute** (Verify MT Software Mode – Standby)

cmd Mode MT to Idle **Execute** (Verify MT Software Mode – Idle)

cmd Disable MT Process **Execute** (Verify MT Process State – Disabled)

Ops Name	CIPUI
MSS_MT_Mode_to_Standby	S0RM96IM0005K
MSS_MT_Mode_to_Idle	S0RM96IM0016K
DSM_Disable_Logical_Thread_MSS_MT	S0DD96IM0445K

22. MT POSITION RESET

MSS: MT: MT Mode

MT Mode

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input MT Position per Table 3

Table 3. MT Positions

LOCATION	MT POSITION (CM)
WS9	3672.8
WS1	2169.2
WS2	1653.5
WS3	795.0
WS4	287.0
Launch Site	-254.0
WS5	-525.8
WS6	-795.0
WS7	-1653.5
WS8	-2169.2
WS10	-3672.8

cmd Load New MT Position **Execute**

Ops Name	CIPUI
MSS_MT_Reset_Position_WS9	S0RM96IM0044K: 009
MSS_MT_Reset_Position_WS1	S0RM96IM0044K: 001
MSS_MT_Reset_Position_WS2	S0RM96IM0044K: 002
MSS_MT_Reset_Position_WS3	S0RM96IM0044K: 003
MSS_MT_Reset_Position_WS4	S0RM96IM0044K: 004
MSS_MT_Reset_Position_Launchsite	S0RM96IM0044K: 011
MSS_MT_Reset_Position_WS5	S0RM96IM0044K: 005
MSS_MT_Reset_Position_WS6	S0RM96IM0044K: 006
MSS_MT_Reset_Position_WS7	S0RM96IM0044K: 007
MSS_MT_Reset_Position_WS8	S0RM96IM0044K: 008
MSS_MT_Reset_Position_WS10	S0RM96IM0044K: 010

cmd Initiate MT Process **Execute** (Verify MT Process State – Initiated)

Ops Name	CIPUI
DSM_Enable_Logical_Thread_MSS_MT	S0DD96IM0383K

MSS: MT

Mobile Transporter

Verify MT Position Data Valid – ✓

MSS: MT: MT Mode

MT Mode

13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING STRING A(B) IMCAS

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cmd Disable MT Process **Execute** (Verify MT Process State – Disabled)

Ops Name	CIPUI
DSM_Disable_Logical_Thread_MSS_MT	S0DD96IM0445K

Notify **MCC-H**/THOR that Predictor inhibit is no longer required.

23. MBS/SSRMS POWER APPLICATION

Notify **MCC-H**, go for MSS Powerup.

To repower prime and redundant strings, perform {8.291 MBS & SSRMS POWERDOWN TO OFF AND POWERUP FROM OFF}, steps 4, 5.1, 5.3, 5.4, and 5.6 (SODF: GND SUPPORT: ROBOTICS: NOMINAL), then:

24. IMCA RT I/O AND FDIR INHIBIT

Coordinate with ODIN/RAVEN to Inhibit IMCA RT I/O and FDIR.

MSS: MT: 'MT' 'Amp1' MT LB A: RT Status

LB MT 1 RT Status

cmd 'RT Status' '00 LTU 1P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '01 LTU 2P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '02 LTU 3P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '03 LTU 1S' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '04 LTU 4P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '05 LTU 3S' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '06 LTU 2S' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '07 LTU 4S' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '08 ED P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '09 TD P' Inhibit **Execute** (Verify – Inh)
cmd 'RT Status' '11 ED S' Inhibit **Execute** (Verify – Inh)

Ops Name	CIPUI	Owner
Prim_EXT_Inh_RT_0	S0DD96IM0122K: 100	ODIN
Prim_EXT_Inh_RT_1	S0DD96IM0122K: 101	ODIN
Prim_EXT_Inh_RT_2	S0DD96IM0122K: 102	ODIN
Prim_EXT_Inh_RT_3	S0DD96IM0122K: 103	ODIN
Prim_EXT_Inh_RT_4	S0DD96IM0122K: 104	ODIN
Prim_EXT_Inh_RT_5	S0DD96IM0122K: 105	ODIN
Prim_EXT_Inh_RT_6	S0DD96IM0122K: 106	ODIN
Prim_EXT_Inh_RT_7	S0DD96IM0122K: 107	ODIN
Prim_EXT_Inh_RT_8	S0DD96IM0122K: 108	ODIN
Prim_EXT_Inh_RT_9	S0DD96IM0122K: 109	ODIN
Prim_EXT_Inh_RT_11	S0DD96IM0122K: 111	ODIN

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If HW Config C1 selected in step 8

cmd 'RT FDIR Status' '09 TD P' Inhibit FDIR **Execute** (Verify – Inh)

Ops Name	CIPUI	Owner
Prim_EXT_Inh_RT_FDIR_RT_09	S0DD96IM0097K: 007	ODIN

sel RT Status Cont. RT#16-25

LB MT 1 RT Status Cont

cmd 'RT Status' '14 TD S' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '16 TUS 1S' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '17 TUS 2P' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '18 TUS 2S' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '19 UMA 1P' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '20 UMA 1S' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '21 UMA 2P' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '22 UMA 2S' Inhibit **Execute** (Verify – Inh)

cmd 'RT Status' '24 TUS 1P' Inhibit **Execute** (Verify – Inh)

Ops Name	CIPUI	Owner
Prim_EXT_Inh_RT_14	S0DD96IM0122K: 112	ODIN
Prim_EXT_Inh_RT_16	S0DD96IM0122K: 110	ODIN
Prim_EXT_Inh_RT_17	S0DD96IM0122K: 113	ODIN
Prim_EXT_Inh_RT_18	S0DD96IM0122K: 114	ODIN
Prim_EXT_Inh_RT_19	S0DD96IM0122K: 115	ODIN
Prim_EXT_Inh_RT_20	S0DD96IM0122K: 116	ODIN
Prim_EXT_Inh_RT_21	S0DD96IM0122K: 117	ODIN
Prim_EXT_Inh_RT_22	S0DD96IM0122K: 118	ODIN
Prim_EXT_Inh_RT_24	S0DD96IM0122K: 119	ODIN

If HW Config C1 selected in step 8

cmd 'RT FDIR Status' '24 TUS 1P' Inhibit FDIR **Execute** (Verify – Inh)

cmd 'RT FDIR Status' '17 TUS 2P' Inhibit FDIR **Execute** (Verify – Inh)

Ops Name	CIPUI	Owner
Prim_EXT_Inh_RT_FDIR_RT_24	S0DD96IM0097K: 006	ODIN
Prim_EXT_Inh_RT_FDIR_RT_17	S0DD96IM0097K: 004	ODIN

**13-0555A (MSG 014A) 6.210 MT GENERIC AUTO TRANSLATION USING
STRING A(B) IMCAS**

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If HW Config C2 selected in step 8

cmd 'RT FDIR Status' '16 TUS 1S' Inhibit FDIR **Execute** (Verify – Inh)

cmd 'RT FDIR Status' '18 TUS 2S' Inhibit FDIR **Execute** (Verify – Inh)

cmd 'RT FDIR Status' '14 TD S' Inhibit FDIR **Execute** (Verify – Inh)

Ops Name	CIPUI	Owner
Prim_EXT_Inh_RT_FDIR_RT_16	S0DD96IM0097K: 003	ODIN
Prim_EXT_Inh_RT_FDIR_RT_18	S0DD96IM0097K: 005	ODIN
Prim_EXT_Inh_RT_FDIR_RT_14	S0DD96IM0097K: 014	ODIN

13-0907A (MSG 015A) 6.113 CUP(LAB) ARTIFICIAL VISION UNIT (AVU) HARD DISK DRIVE (HDD) CHANGEOUT

(RBT GEN/ULF1 - ALL/FIN 1/REAL-TIME) Page 1 of 2 page

1. [DCP POWERDOWN AND RACK REMOVAL](#)

WARNING

Failure to remove power and apply close inhibit could result in electrical shock hazard.

1.1 Open and Close – Inhibit LAS52A3B-A (LAP51A4A-A) RPC 18

PCS

LAB: EPS: LAB1S5(LAB1P5): RPCM LAS52A3B (RPCM
LAP51A4A): 'RPC' 18

`RPCM_LAS52A3B_A_RPC_18(RPCM_LAP51A4A_A_RPC_18)`

cmd 'RPC Position' Open (Verify – Op)

cmd 'Close Cmd' Inhibit (Verify – Inh)

1.2 Disconnect DCP Cables (if required)

NOTE

Cables should remain connected if the external equipment is being relocated to an adjacent rack. Otherwise, only cables routed from the external RWS rack to the internal rack must be disconnected. Do not disconnect cabling exclusive to external rack.

At Rack Interface Panel, disconnect

J53 ←|→ W1193-P1(W1293-P1)

J54 ←|→ W1193-P2(W1293-P2)

J55 ←|→ W1193-P3(W1293-P3)

At UOP opening, disconnect

J8(J7) ←|→ J00137 (UOP Bypass Pwr Cable)

J2 ←|→ J00138 (UOP Data Cable)

Secure loose cables to External Rack with Velcro Ties.

1.2 Release seat track locks (four) on Rack Adapter.

Relocate External Rack and Rack Adapter to desired location.

2. [AVU HARD DRIVE REMOVAL](#)

LAS5

(LAP5)

Open access panel and secure.

AVU

Loosen thumbscrews on AVU HDD.

Remove AVU HDD.

Notify **MCC-H** of serial number on HDD removed.

Stow AVU HDD.

**13-0907A (MSG 015A) 6.113 CUP(LAB) ARTIFICIAL VISION UNIT (AVU)
HARD DISK DRIVE (HDD) CHANGEOUT**

(RBT GEN/ULF1 - ALL/FIN 1/REAL-TIME) Page 2 of 2 page

3. AVU HARD DRIVE INSTALLATION

Notify **MCC-H** of serial number on HDD being installed.

AVU Install new AVU HDD.

Tighten thumbscrews.

LAS5 Close access panel and secure.
(LAP5)

4. RACK RELOCATION AND DCP POWERUP

4.1 Place Rack Adapter against Lab Rack and relatch seat track locks (four).

4.2 Connect DCP Cables (if required)

At Rack Interface Panel, connect
J53 →|← W1193-P1(W1293-P1)
J54 →|← W1193-P2(W1293-P2)
J55 →|← W1193-P3(W1293-P3)

At UOP opening, connect
J8(J7) →|← J00137 (UOP Bypass Pwr Cable)
J2 →|← J00138 (UOP Data Cable)

4.2 Close – Enable and Close LAS52A3B-A(LAP51A4A-A) RPC 18

PCS

LAB: EPS: LAB1S5(LAB1P5): RPCM LAS52A3B (RPCM
LAP51A4A): 'RPC' 18

RPCM LAS52A3B A RPC 18(RPCM LAP51A4A A RPC 18)

cmd 'Close Cmd' Enable (Verify – Ena)

cmd 'RPC Position' Close (Verify – Cl)

FD2 MMT Crew Summary

The MMT met to review the mission progress. There were only a few items of significant discussion including a preliminary review of the ascent imagery and WLE data. Several orbiter systems and MCC failures that occurred during ascent and post insertion were also reviewed. These items are in no particular order:

Cryo margins- Although no mission extensions are currently planned, current cryo margins support the ability to extend the mission by two days should that be required.

Edwards Runway- The F-22 aircraft is now off the Edwards 22/04 runway so the runway is now back into normal operations for the rest of the mission.

FES Pri A - As you know we recovered FES PRI A by activating both high load duct heaters and cycling the controller. Upon review of the data, FES PRI A is operating nominally both for ascent and orbit heat loads. It can be used as required during the mission. The cause of the shutdown is the significant amount of pre-evap cooling caused by a large amount of condensate and rain water in the FES high load core that accumulated pre-launch. The large amount of condensate led to excessive carryover during ascent such that cooling became unstable when the FES was in the middle of startup. This FES behavior has been seen on past flights. The MMT does not plan to discuss this subject unless there are any additional unusual signatures, which is unlikely.

Fuel Cell 1- The pumps continue to operate within limits on the remaining two phases (B&C). Obviously, there are no mission impacts as long as this performance continues. There is no plan to push in the phase A circuit breaker unless the H2 motor is struggling, the fuel cell is flooding, or the pH sensor is needed to troubleshoot an issue with the fuel cell. The cb retention device was installed as a precaution. You can expect no additional discussion of this item in the MMT summaries unless the situation changes.

Payload Bay Door Microswitches - During payload bay door opening, the Port Door Closed A microswitch indicated OFF at the port bulkhead latch drive initiation. This resulted in the auto opening sequence failing and led to the use of the manual open procedures. There is no impact to payload bay door closure as a result of this failure and this microswitch is expected to work nominally during deorbit prep. Additionally, the Starboard PLBD Closed B microswitch failed ON during the opening. This was no impact to door opening, but since the microswitch indication remains latched ON, the STBD door will be single motor in the close direction. Redundancy can be regained by disabling the failed microswitch if required per Malfunction procedure Mech SSR-6. There is no impact to mission duration as a result of these failures. Additional details for actual payload bay door close procedures will be provide for your review later in the mission.

1 **Speedbrake FCS Channel 3-** Intermittent driver errors were observed on
2 Speedbrake Channel 3 during three separate periods in OPS 1 on Flight Day 1. The
3 first period was during powered flight and resulted in very short duration spikes in
4 secondary delta pressure, slightly over 2000 psi. A bypass of that channel did not
5 occur since the spikes did not meet the time constraints for a bypass. The latter two
6 periods were after APU/HYD shutdown, so no force fight was observed which helps
7 to confirm the problem as electrical. For launch, the speedbrake is closed and held
8 there with "overdriven" commands that result in current limited driver commands
9 from the ASA's on the order of 9+ milliamps. Because this constant driver command
10 was present, it was possible to see the error when it occurred (the current dropped
11 towards zero to approximately 4-5 milliamps). The elevons, bodyflap, and rudder
12 behaved normally during ascent load relief so the theory is that this problem is
13 currently isolated to speedbrake channel 3. The use of ASA 3 for elevon park
14 allowed the MCC to have ASA 3 powered for the orbit phase of flight. It will be
15 monitored during crew sleep by swapping to TFL 161 in an attempt to see if the
16 intermittent problems repeat.

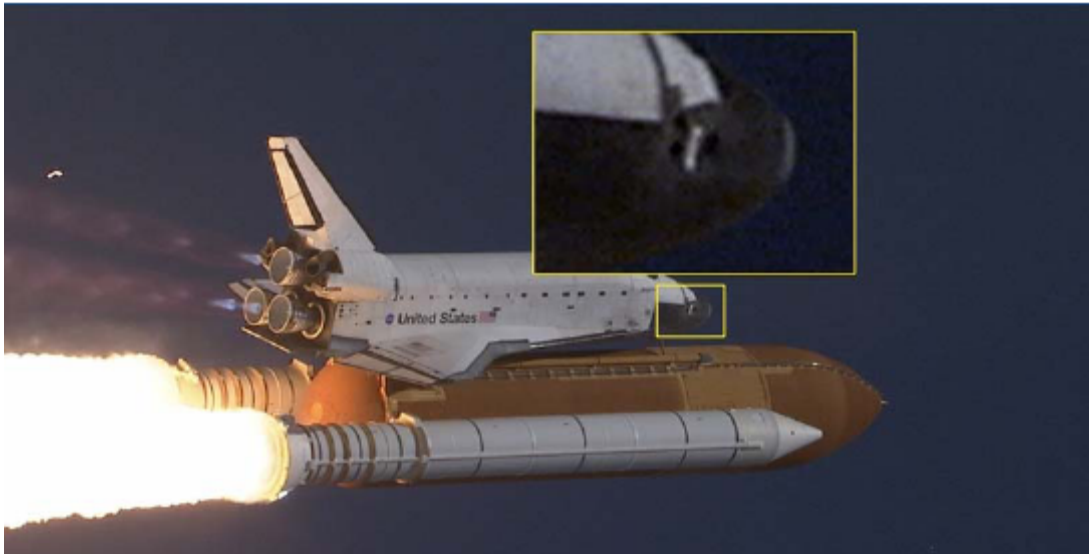
17
18 Elevon park was executed nominally using ASA 3, which helps to provide
19 confidence in the rest of the ASA. The plan at this time is to continue to monitor it's
20 performance, and verify the health of the rest of ASA 3 during FCS checkout. We
21 will likely bypass Speedbrake Channel 3 after FCS checkout. There are no mission
22 duration impacts at this time and no issues with FCS Channels 1, 2, or 4. More
23 details on this subject will be provided as they become available.

24
25 **MCC Abort Region Determinator (ARD)-** The MCC Abort Region Determinator
26 (ARD) indicated erroneous RTLS abort at 18 seconds MET during ascent due to
27 ratty downlist data. Once ARD executes a particular abort it is unrecoverable and
28 computations for uphill and TAL aborts are unavailable. Tracking data and no comm
29 abort boundaries were used to make the abort boundary calls during ascent. This is
30 no issue for the remainder of this mission. As a precaution, a review of all the entry
31 trajectory tools will be performed to insure that there is no susceptibility to ratty data
32 for deorbit/entry.

33
34 **Wing Leading Edge Sensors -** All the WLEIDS data has been downlinked and the
35 preliminary assessment is that the system detected 6 sensor indications during
36 ascent (tripped the 1.0 Grms sensor limit). Five of these were on the port wing and
37 one was on the starboard wing. This is very similar to the number of sensor
38 indications that were observed on STS-114 and STS-121.

Imagery - The teams continue to review the ascent imagery data (ET LOX feedline camera, ground cameras, WAVE aircraft video, and debris radar). The preliminary characterization is the debris environment was minimal, which is consistent with the preliminary debris report that you received yesterday during the post insertion timeframe. There was only one event occurring inside the debris sensitive timeframe. That event was a late release of an F4D Tyvek Cover at ~16 secs MET at a velocity of 230 mph. Figure 1 below clearly shows no contact with Orbiter so this is no issue for the mission.

Description: Tyvek on jet F4D separated late, approx L+ 16 sec.



The other debris events beyond the debris critical time of interest are as follows:

- 2:50 MET- Debris from ET ice Frost ramp at Xt 1270 (Figure 2)
- 4:05 MET- Possible Orbiter debris impacts to belly and RCC glove areas, but no damage visible. (Q-bar is 0.04 psf- See Figure 3)
- 4:07 MET Debris outboard of LO2 feedline that did not impact Orbiter
- 5:27 MET Potential debris impact on starboard wing, but no visible damage, WLEIDS did not detect anything
- 5:30 MET RADAR Event with no corroboration from WLEIDS sensors or imagery
- 7:32 MET Debris seen with possible Orbiter impact
- 8:44 MET Suspected ice impacts Orbiter near NLGD

Of course we'll have a better assessment of the TPS (wing leading edge RCC and tile) after the FD 3 and FD 4 MMTs when the FD2 TPS inspection and RPM data will be reviewed. A few sample ascent imagery photos are included for your review.

1 Figure 2 Debris from ET ice Frost ramp at Xt 1270

2

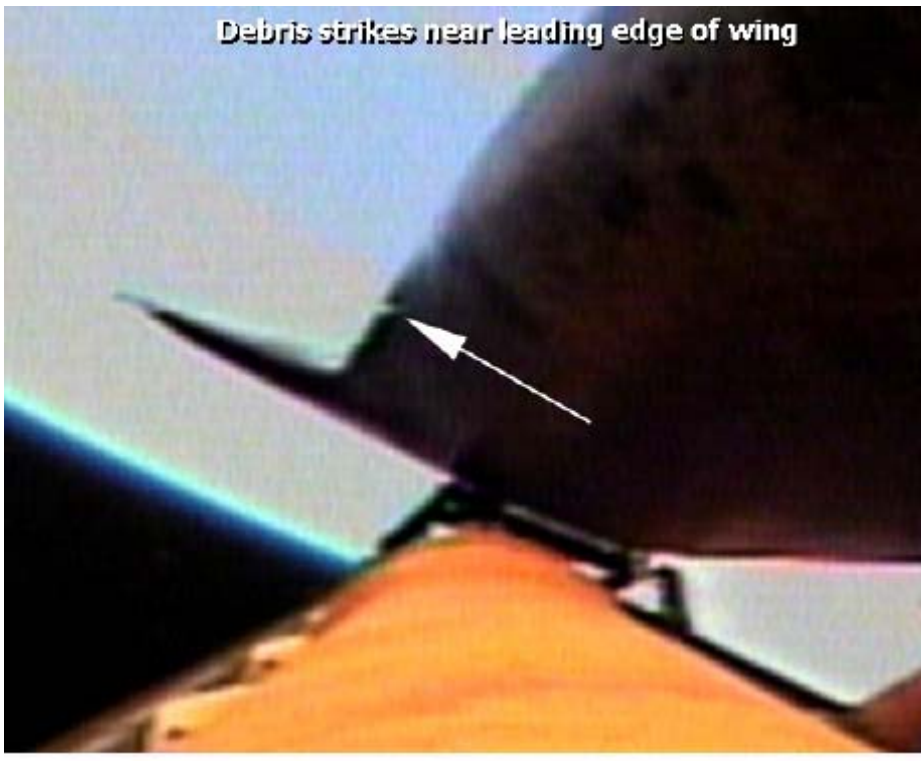


3

4

5 Figure 3 at 4:05 MET- Potential RCC glove areas impact

6



7