Space Shuttle Program
FLIGHT DATA FILE

JSC-48001

Ascent/Entry Systems Procedures

Mission Operations Directorate
Operations Division

Generic, Rev O
June 1, 2007

NOTE
For STS-118 and subsequent flights

AESP:	MM101
APCL:	MM104
OPCL:	MM106
EPCL:	MM301
AESP:	MM304

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

United Space Alliance

Verify this is the correct version for the pending operation (training, simulation or flight).
Electronic copies of FDF books are available. URL: http://mod.jsc.nasa.gov/do3/FDF/index.html

ASC/ENT SYSTEMS PROCEDURES	GENERIC, Rev O (June 1, 2007)

PCN-4 (Oct 22, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):

AESP-0719 MULTI-1829
AESP-0721
AESP-0725

NOTE
For STS-126 and subsequent flights

Incorporate the following:

1. Replace v thru xiv
2. Replace MS A3-3 & MS A3-4
3. Replace MS A8-1 thru MS A8-4
4. Replace MS E3-1 & MS E3-2
5. Replace CC 10-1 & CC 10-2
6. Replace FB A12-5 & FB A12-6
7. Replace FB E12-9 & FB E12-10
8. Replace FB A13-3 & FB A13-4
9. Replace (OV103,104) FB E13-3 thru (OV105) FB E13-4 (4 pages)

Prepared by: _____
Publication Manager

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Accepted by: _____
FDF Manager

Encl: 30 pages

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SSP Flight Data File **PAGE CHANGE NOTICE** JSC-48001

ASC/ENT SYSTEMS PROCEDURES	GENERIC, Rev O (June 1, 2007)

PCN-3 (Oct 9, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

AESP-0713 MULTI-1808

NOTE
For STS-120 and subsequent flights

Incorporate the following:

1. Replace v thru xii
2. Replace MS E3-1 & MS E3-2
3. Replace FB E11-5 & FB E11-6
4. Replace FB E12-9 & FB E12-10
5. Replace (OV103,104) FB E13-3 thru (OV105) FB E13-4 (4 pages)

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Encl: 18 pages

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ASC/ENT SYSTEMS PROCEDURES	GENERIC, Rev O (June 1, 2007)

PCN-2 (Oct 1, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

AESP-0710
MULTI-1784
MULTI-1803
MULTI-1805

NOTE
For STS-120 and subsequent flights

Incorporate the following:

1. Replace v thru xiv
2. Replace (OV103,104) MS A4-3 thru (OV105) MS A4-4 (6 pages)
   Delete TEMP MS A4-3 & TEMP MS A4-4
   Replace (OV105) MS A4-5 & (OV105) MS A4-6
3. Replace MS A8-1 & MS A8-2
4. Replace MS E3-1 & MS E3-2
5. Replace (OV103,104) MS E4-5 & (OV103,104) MS E4-6
   Replace (OV105) MS E4-5 & (OV105) E4-6
   Delete TEMP MS E4-5 & TEMP MS E4-6
6. Replace CC 10-1 & CC 10-2
   Replace (OV103,104) CC 10-9 thru (OV105) CC 10-10 (4 pages)
7. Replace FB E12-9 & FB E12-10
8. Replace (OV103,104) FB A13-9 thru (OV105) FB A13-10 (4 pages)
   Delete TEMP FB A13-9 & TEMP FB A13-10
   Replace (OV103,104) FB E13-3 thru (OV105) FB E13-4 (4 pages)
   Replace FB E13-13 & FB E13-14
   Delete TEMP FB E13-13 & TEMP FB E13-14

Prepared by: _____
Publication Manager

Approved by: _____
Manager, Shuttle Procedures Management

Accepted by: _____
FDF Manager

Encl: 44 pages

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ASC/ENT SYSTEMS PROCEDURES	GENERIC, Rev O (June 1, 2007)

PCN-1 (July 18, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

AESP-0709

NOTE
For STS-118 and subsequent flights

Incorporate the following:

1. Replace v thru xii (8 pages), xix thru xxii (4 pages)
2. Replace MS E7-3 & MS E7-4
3. Replace FB E11-3 thru FB E11-6

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Encl: 18 pages

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JSC-48001

MISSION OPERATIONS DIRECTORATE

ASCENT/ENTRY SYSTEMS PROCEDURES

GENERIC, REVISION O
June 1, 2007

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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted via FDF Workflow Crew Procedure Change Request (CR) to DO3/FDF Manager.

Additional distribution of this book, for official use only, may be requested in writing to DO3/PMO Administrator. The request must include justification and requester's name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184.

AESP/ALL/GEN O

Incorporates the following:			
482#:	AESP-0704	AESP-0706	AESP-0707

AREAS OF TECHNICAL RESPONSIBILITY

Publication Manager	DO35/M. Crisp	281-483-5975
Alternate	DO35/T. Vaughan	281-483-4180
APU/HYD (MMACS)	DF5/K. McCluney	281-483-0867
COMM (INCO)	DF2/G. Horlacher	281-483-3878
DPS	DF3/B. Schwank	281-244-0004
ECLS (EECOM)	DF8/D. Fasbender	281-483-7857
EPS (EGIL)	DF7/M. Friant	281-483-0682
GNC	DF6/D. Gruber	281-483-0709
OMS/RCS (PROP)	DF63/J. Campa	281-244-1002
MPS (BOOSTER)	DF5/M. Patel	281-483-0083
PWRDN	DF7/M. Friant	281-483-0682

NOTES

1. Sections 1 through 8 of this book are inserted in the front of the Mission Specialist copies of the Ascent and/or Entry Pocket Checklists.

2. Sections 10 thru 13 are the Multiphase Cue Cards, the Pilot's Overhead Flip Book, the Pilot's Window Flip Book, and the Commander's Window Flip Book which are printed in this book for documentation and control purposes only. They will be removed from Simulator and Flight copies.

3. The Mission Specialist book and all flip books will each be separated into two divisions, Powered Flight (A) and Glided Flight (E).

4. Icons will be used in the following manner:

   '⇒' At the end of a procedure line indicates a choice to continue to either the Glided Flight division of the AESP and/or to the ASC PKT C/L as dictated by the prevailing flight phase.

   '⇒G' At the end of a procedure line indicates one should continue to the Glided Flight division of the AESP.

   '⇒A' At the end of a procedure line indicates one should continue to the ASC PKT C/L.

   '⇒' Preceding a line indicates the starting point of the procedure if coming from a procedure with a continue (⇒) icon.

   '♦' Indicates one should √MCC and if no comm continue with the procedure.

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ASCENT/ENTRY SYSTEMS PROCEDURES

LIST OF EFFECTIVE PAGES

GENERIC	07/02/87
REV O	06/01/07
PCN-1	07/18/07
PCN-2	10/01/07
PCN-3	10/09/07
PCN-4	10/22/08

***** – Omit from MS flight book

***** – Omit from MS flight book
⊗ – Highlights reqd

(OV103,104) MS A5-11		3,4/A/GEN O
(OV103,104) MS A5-12		ALL/A/GEN O
(OV105) MS A5-11		5/A/GEN O
(OV105) MS A5-12		ALL/A/GEN O
MS A6-1		ALL/A/GEN O
MS A6-2	☒	ALL/A/GEN O
MS A6-3	☒	ALL/A/GEN O
MS A6-4	☒	ALL/A/GEN O
MS A7-1		ALL/A/GEN O
MS A7-2		ALL/A/GEN O
MS A7-3		ALL/A/GEN O
MS A7-4		ALL/A/GEN O
MS A8-1		ALL/A/GEN O
MS A8-2		ALL/A/GEN O,4
MS A8-3	⊗	ALL/A/GEN O,4
MS A8-4		ALL/A/GEN O
MS A9-1	*	ALL/A/GEN O
MS A9-2	*	ALL/A/GEN O
MS E-i		ALL/E/GEN O
MS E-ii		ALL/E/GEN O
MS E1-1		ALL/E/GEN O
MS E1-2		ALL/E/GEN O
MS E1-3		ALL/E/GEN O
MS E1-4		ALL/E/GEN O
MS E1-5		ALL/E/GEN O
MS E1-6		ALL/E/GEN O
MS E2-1		ALL/E/GEN O
MS E2-2		ALL/E/GEN O
(OV103,104) MS E2-3		ALL/E/GEN O
(OV103,104) MS E2-4		3,4/E/GEN O
(OV105) MS E2-3		ALL/E/GEN O
(OV105) MS E2-4		5/E/GEN O
MS E3-1		ALL/E/GEN O
MS E3-2		ALL/E/GEN O,4
MS E3-3		ALL/E/GEN O
MS E3-4		ALL/E/GEN O

☒ – Prelift-off information reqd
⊗ – Highlights reqd
***** – Omit from MS flight book

MS E5-17		ALL/E/GEN O
MS E5-18		ALL/E/GEN O
MS E6-1		ALL/E/GEN O
MS E6-2	☒	ALL/E/GEN O
MS E6-3		ALL/E/GEN O
MS E6-4		ALL/E/GEN O
MS E7-1		ALL/E/GEN O
MS E7-2		ALL/E/GEN O
MS E7-3		ALL/E/GEN O,1
MS E7-4		ALL/E/GEN O,1
MS E7-5		ALL/E/GEN O
MS E7-6		ALL/E/GEN O
MS E8-1		ALL/E/GEN O
MS E8-2		ALL/E/GEN O
MS E9-1	*	ALL/E/GEN O
MS E9-2	*	ALL/E/GEN O
CC 10-i	*	ALL/A,E/GEN O
CC 10-ii	*	ALL/A,E/GEN O
CC 10-1	*	ALL/A,E/GEN O
CC 10-2	*⊗	ALL/A/GEN O,4
CC 10-3	*	ALL/A/GEN O
CC 10-4	*	ALL/A/GEN O
CC 10-5	*	ALL/A/GEN O
CC 10-6	*	ALL/E/GEN O
CC 10-7	*	ALL/A/GEN O
CC 10-8	*	ALL/A/GEN O
(OV103,104) CC 10-9	*	3,4/A,E/GEN O,2
(OV103,104) CC 10-10	*	ALL/A,E/GEN O
(OV105) CC 10-9	*	5/A,E/GEN O,2
(OV105) CC 10-10	*	ALL/A,E/GEN O
FB A11-i	*	ALL/A/GEN O
FB A11-ii	*	ALL/A/GEN O
FB A11-1	*☒	ALL/A/GEN O
FB A11-2	*☒	ALL/A/GEN O
FB A11-3	*☒	ALL/A/GEN O
FB A11-4	*	ALL/A/GEN O

☒ – Prelift-off information reqd
***** – Omit from MS flight book
⊗ – Highlights reqd

FB A11-5	*	ALL/A/GEN O
FB A11-6	*	ALL/A/GEN O
FB E11-i	*	ALL/E/GEN O
FB E11-ii	*	ALL/E/GEN O
FB E11-1	*☒	ALL/E/GEN O
FB E11-2	*	ALL/E/GEN O
FB E11-3	*	ALL/E/GEN O
FB E11-4	*	ALL/E/GEN O,1
FB E11-5	*	ALL/E/GEN O,1
FB E11-6	*	ALL/E/GEN O,3
FB A12-i	*	ALL/A/GEN O
FB A12-ii	*	ALL/A/GEN O
FB A12-1	*	ALL/A/GEN O
FB A12-2	*	ALL/A/GEN O
FB A12-3	*	ALL/A/GEN O
FB A12-4	*	ALL/A/GEN O
FB A12-5	*	ALL/A/GEN O,4
FB A12-6	*	ALL/A/GEN O
FB A12-7	*	ALL/A/GEN O
FB A12-8	*	ALL/A/GEN O
FB A12-9	*⊗	ALL/A/GEN O
FB A12-10	*	ALL/A/GEN O
FB A12-11	*	ALL/A/GEN O
FB A12-12	*	ALL/A/GEN O
FB A12-13	*	ALL/A/GEN O
FB A12-14	*	ALL/A/GEN O
FB A12-15	*	ALL/A/GEN O
FB A12-16	*	ALL/A/GEN O
(OV103,104) FB A12-17	*	3,4/A/GEN O
(OV103,104) FB A12-18	*	ALL/A/GEN O
(OV105) FB A12-17	*	5/A/GEN O
(OV105) FB A12-18	*	ALL/A/GEN O
FB E12-i	*	ALL/E/GEN O
FB E12-ii	*	ALL/E/GEN O
FB E12-1	*	ALL/E/GEN O
FB E12-2	*	ALL/E/GEN O

***** – Omit from MS flight book
☒ – Prelift-off information reqd
⊗ – Highlights reqd

FB E12-3	*	ALL/E/GEN O
FB E12-4	*	ALL/E/GEN O
FB E12-5	*	ALL/E/GEN O
FB E12-6	*	ALL/E/GEN O
(OV103,104) FB E12-7.....	*	3,4/E/GEN O
(OV103,104) FB E12-8.....	*	3,4/E/GEN O
(OV105) FB E12-7.....	*	5/E/GEN O
(OV105) FB E12-8.....	*	5/E/GEN O
FB E12-9	*	ALL/E/GEN O,4
FB E12-10	*	ALL/E/GEN O
FB E12-11	*	ALL/E/GEN O
FB E12-12	*	ALL/E/GEN O
FB E12-13	*	ALL/E/GEN O
FB E12-14	*	ALL/E/GEN O
FB E12-15	*	ALL/E/GEN O
FB E12-16	*	ALL/E/GEN O
FB E12-17	*	ALL/E/GEN O
FB E12-18	*	ALL/E/GEN O
FB E12-19	*	ALL/E/GEN O
FB E12-20	*	ALL/E/GEN O
FB E12-21	*	ALL/E/GEN O
FB E12-22	*	ALL/E/GEN O
(OV103,104) FB E12-23.....	*	ALL/E/GEN O
(OV103,104) FB E12-24.....	*	3,4/E/GEN O
(OV105) FB E12-23.....	*	ALL/E/GEN O
(OV105) FB E12-24.....	*	5/E/GEN O
FB E12-25	*	ALL/E/GEN O
FB E12-26	*	ALL/E/GEN O
FB A13-i.....	*	ALL/A/GEN O
FB A13-ii.....	*	ALL/A/GEN O
FB A13-1	*	ALL/A/GEN O
FB A13-2	*	ALL/A/GEN O
FB A13-3	*	ALL/A/GEN O,4
FB A13-4	*	ALL/A/GEN O
FB A13-5	*	ALL/A/GEN O
FB A13-6	*	ALL/A/GEN O
FB A13-7	*⊗	ALL/A/GEN O
FB A13-8	*	ALL/A/GEN O

***** – Omit from flight book
⊗ – Highlights reqd

(OV103,104) FB A13-9	*	3,4/A/GEN O
(OV103,104) FB A13-10	*	ALL/A/GEN O,2
(OV105) FB A13-9	*	5/A/GEN O
(OV105) FB A13-10	*	ALL/A/GEN O,2
FB A13-11	*	ALL/A/GEN O
FB A13-12	*	ALL/A/GEN O
FB A13-13	*	ALL/A/GEN O
FB A13-14	*	ALL/A/GEN O
FB E13-i	*	ALL/E/GEN O
FB E13-ii	*	ALL/E/GEN O
FB E13-1	*	ALL/E/GEN O
FB E13-2	*	ALL/E/GEN O
(OV103,104) FB E13-3	*	3,4/E/GEN O
(OV103,104) FB E13-4	*	ALL/E/GEN O,4
(OV105) FB E13-3	*	5/E/GEN O
(OV105) FB E13-4	*	ALL/E/GEN O,4
FB E13-5	*	ALL/E/GEN O
FB E13-6	*	ALL/E/GEN O
FB E13-7	*	ALL/E/GEN O
FB E13-8	*	ALL/E/GEN O
FB E13-9	*	ALL/E/GEN O
FB E13-10	*	ALL/E/GEN O
(OV103,104) FB E13-11	*	ALL/E/GEN O
(OV103,104) FB E13-12	*	3,4/E/GEN O
(OV105) FB E13-11	*	ALL/E/GEN O
(OV105) FB E13-12	*	5/E/GEN O
FB E13-13	*	ALL/E/GEN O
FB E13-14	*	ALL/E/GEN O,2
FB E13-15	*	ALL/E/GEN O
FB E13-16	*	ALL/E/GEN O
FB E13-17	*	ALL/E/GEN O
FB E13-18	*	ALL/E/GEN O

***** – Omit from MS flight book

MULTIPHASE SYSTEMS CUE CARDS

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CONTENTS PAGE

SECTION RESERVED

PLT WINDOW FLIP BOOK - GLIDED FLIGHT ..... FB E12-i

CDR WINDOW FLIP BOOK - GLIDED FLIGHT ..... FB E13-i

MS POWERED FLIGHT

– – – – – MS POWERED FLIGHT, SECTIONS 1 thru 9 – – – – –

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APU/HYDRAULICS

APU SHUTDN
APU OPER – OFF
FU TK VLV – CL
√Shutdn (HYD PRESS < 200)
Report APU F7 lts
APU CNTLR PWR – OFF
AUTO SHTDN (two) – INH
SPEED SEL (two) – HI ⇒

APU SPD HI
If SPEED % exceeds 111:
APU SPEED SEL – HI ⇒

APU OVERSPEED
If SPEED % exceeds 129:
Go to APU SHUTDN

APU UNDERSPEED G51
If 'PRL SYS X ↓' or if APU has shut dn:
Perform APU SHUTDN, then: ⇒G

APU OIL OVERTEMP
♦BLR CNTLR/HTR – B
√N2 SPLY – ON ⇒

HYD PRESS (LOW) G51
If 'PRL SYS X ↓' and APU still oper:
1. APU AUTO SHTDN (two) – INH
2. SPEED SEL (two) – HI ⇒

HYD RSVR QTY (LOW)
Post MECO:
(Aff) HYD MPS/TVC ISOL VLV SYS – CL
(hold 5 sec, tb-CL) ⇒

W/B QTY (LOW)
1. If W/B QTY = 0 >>
2. BLR N2 SPLY – OFF
3. CNTLR/HTR – OFF ⇒

COMM/GNC

COMM/ GNC

COMM LOST (mult pnls)
1. AUD CTR – 2
2. No joy, S-BD PM CNTL – PNL,CMD
3. Config per COMM COVER (ASC) BFS G51:
   TDRS – ITEM 46 EXEC (*)
   STDN-HI – ITEM 47 EXEC (*)
   SGLS – ITEM 49 EXEC (*)
4. No joy, sel best S-BD PM ANT; else GPC ⇒

ICOM LOST
1. AUD CNTL sel – sel alt
2. No joy, AUD CTR – 2

FCS CH 1(2,3,4) (2nd FAIL) G53
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL)
(Aff) FLT CNTLR PWR – OFF

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA BFS G51
Aff LRU – desel

RM DLMA IMU G51 BFS G51
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

DPS

PASS GPC FAIL
1. (Aff) FCS CH – OFF

If two GPC/FA/FCS CHs ↓:
2. (Good) FCS CHs – ORIDE
3. √MPS CMD
4. G53 aff SURF FDBK – desel
5. If FTS, ASAP, GPC MODE – STBY,HALT
6. √BIG 'X', then assign IDPs as reqd
7. √MULT DATA PATH LOSS

Post MECO:
8. ASAP, GPC MODE – STBY,HALT ⇒

BFS GPC FAIL
1. Post SRB SEP: FLASH EVAP CNTLR PRI A – ON

Post MECO:
2. GPC MODE – STBY,HALT
♦ OUTPUT – TERM
3. If no comm: sel best S-BD PM ANT ⇒

FF(FA) MDM OUTPUT FAULT

♦ (Take action only if annun by entire set)

If single 'MDM OUTPUT':
1. Go to FA/FF MDM I/O ERROR >>

If both FF and FA annun:
2. I/O RESET; if reqd, BFS I/O RESET
3. If msgs repeat: Go to PASS GPC FAIL >>
4. If reqd, (aff) FCS CH – ORIDE,AUTO

PL MDM I/O ERROR
1. BFS I/O RESET; if recovered >>
♦ 2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL2 down:
   Post SRB SEP: FLASH EVAP CNTLR PRI A – ON
   If no comm: sel best S-BD PM ANT ⇒

PCM I/O ERROR
OI PCMMU PWR – 2

SUMWORD ICC
If TAL:
Go to OPS 1/6/TAL TRANSITION RESTRING (Cue Card) for aff GPC >>

If AOA/Uphill: ⇒A

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
		4. BFS I/O RESET >>
NOT RECOV	FA	5. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE
		6. G53 aff SURF FDBK – desel
		7. √MULT DATA PATH LOSS
		♦ 8. Go to FA/FF MDM PORT MODE ⇒

FA/FF MDM PORT MODE

NOTE

If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF	5. >>
	NOT RECOV	FA	6. BFS G51 aff SURF FDBK, RGA – desel
		FF	7. BFS G51 aff AA – desel
			8. √MULT DATA PATH LOSS ⇒
@GPC	FA RECOV (FF Give Up)		9. (Aff) FCS CH – AUTO 10. G51 aff IMU – desel 11. G53 aff SURF FDBK – resel 12. √MULT DATA PATH LOSS ⇒A
	FF RECOV (FA Give Up)		13. (Aff) FCS CH – OFF 14. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 15. G53 aff SURF FDBK – desel 16. √MULT DATA PATH LOSS ⇒A

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU	1. G51 IMU – desel
		2. I/O RESET
RECOV	IMU	3. >>
		4. >>
NOT RECOV	NSP	5. And no comm: PNL,CMD 6. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) >>
		♦ 7. G01 aff String – port mode 8. BFS I/O RESET 9. If recov, go to RECOV steps >>
	B	10. BFS G51 aff AA – desel
	D	11. BFS G51 aff SURF FDBK,RGA – desel
	B/D	12. If RTLS: G23 OVRD aff MANF(s) – OP 13. √MULT DATA PATH LOSS ⇒

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config
11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

FLT INST DISPLAY ANOMALY

1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY

1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

BFS INADVERTENT DISENGAGE/UNSUCCESSFUL ENGAGE (Lightning Strike)

1. CDR and PLT RHC BFS engage pb – push

If no response:

2. BFS OUTPUT – NORM,B/U
3. CDR,PLT RHC BFS engage pb – push

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC prob and not MDM,
BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FA any combo	D	√BFS MM at each transition Expect 'SEP INH' (FDLN Fail) combos 2&3,2&4
	I/O	√OMS MAN SHUTDOWN Post MECO: Before MECO + 25 sec: •• 1. MPS FDLN RLF ISOL (two) – OP 2. MPS PREVLVs (six) – OP RTLS/TAL: MPS FILL/DRAIN LH2 INBD, OUTBD – OP
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA SWs
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA SWs

OPS 1/6/TAL TRANSITION RESTRING

		1. Config MC1(3) NBAT as reqd 2. √G53 aff SURF FDBK – desel (*)
Post MECO		3. ASAP, (aff) GPC(s) – STBY,HALT
	ASC/RTLS	4. OPS Mode Recall: OPS XXX PRO 5. BFS I/O RESET ⇒G
	TAL	6. OPS 301 PRO 7. BFS, OPS 301 PRO ⇒G

POST BFS ENGAGE

If PASS GPCs running:

1. (Aff) GPC MODE – STBY/HALT
2. BFS I/O RESET
3. √FCS CHs, IMU config

If Pre MECO:

4. If SSME failed: MN ENG LIMIT SHUTDN – INH
5. G51 DES failed(commfaulted) RGA,AA,SURF ⇒G

ECLS

ECLS

CAB PRESS LEAK

1. CAB RELIEF A – CL,pause,
   B – CL
2. Check tabs, visors – CL, LES O2 – ON
3. If RTLS/TAL: O2/N2 CNTLR VLV SYS 2 – OP
4. O2 TK1,TK2 HTRS A,B (four) – AUTO ⇒

CAB PRESS HIGH

1. If incr: LES O2 – OFF, visors – OP

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL
3. O2 SYS 1,2 SPLY (two) – CL ⇒A

PPO2 ABNORMAL ⇒A

H2O LOOP PRESS HIGH

♦ Deact pump ⇒

H2O LOOP PRESS LOW ⇒

AV BAY FAN ΔP

♦ Deact fan ⇒

AV BAY TEMP HIGH ⇒

CABIN FAN FAIL ⇒

IMU FAN FAIL ⇒

FREON FLOW LOW

♦ 1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)

If flow still low:

3. Perform LOSS OF FREON LOOP(s), then ⇒A

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH

4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF
   A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT

Post MECO:

If RTLS:

8. TACAN (three) – OFF
9. RDR ALTM 1 – OFF ⇒G

If TAL:

10. All TACAN/RA – OFF
11. Use one FLT CNTLR PWR ⇒G

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
- ♦ 9. FREON PUMP LOOP 1,2 (two) – B
  NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. FLASH EVAP CNTLR PRI B – ON
12. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
13. NH3 CNTLR A,B (two) – OFF

FREON LEAK

- ♦ 1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop ⇒

If (aff) FREON LOOP 1(2) ACCUM QTY not decr, ⇒A

EVAP OUT TEMP HIGH

If temp high in only one loop (snsr failed) >>

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)

   If T decr >>

2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena) (wait 30 sec)

   If T decr:

   3. TOP EVAP HTR DUCT sel – A/B >>

4. HI LOAD EVAP – OFF (wait 30 sec)

   If T decr (HI LOAD EVAP only lost):

   5. HI LOAD DUCT HTR sel – A/B ⇒A

6. RAD BYP VLV (four) – MAN, RAD FLOW (total FES lost) ⇒A

FIRE/SMOKE

SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
two SMOKE DETN lt on, or
two CONC > 2, or
one SMOKE DETN lt on and
other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lt and assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)

If SMOKE DETN B(A) test good (lt on):
3. SMOKE DETN CKT TEST – OFF
4. SNSR – RESET >>

If SMOKE DETN B(A) test bad (no lt):
5. Go to step 6

If none of above >>
6. Check tabs, visors – CL
LES O2 – ON

If **AV BAY FIRE**:
7. FIRE SUPPR – ARM
pb – DISCH (push until lit)
8. If Ascent: AV BAY FAN (two) – OFF
9. If FIRE in Bay:
1: TACAN 1, MLS 1 – OFF
2: TACAN 2, MLS 2,3 – OFF
3: TACAN 3 – OFF

If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, facing page)
12. Unpwr source of smoke

If smoke persists or source cannot be unpwrd:

> WARNING
> Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>

If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

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FREON FLOW LOW

♦ 1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)

If flow still low:

3. Perform LOSS OF FREON LOOP(s), then ⇒A

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH

4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF
   A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT

Post MECO:

8. GPS 1,3 – OFF

If RTLS:

9. RDR ALTM 1 – OFF ⇒G

If TAL:

10. RA 1,2 – OFF
11. Use one FLT CNTLR PWR ⇒G

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
- ♦ 9. FREON PUMP LOOP 1,2 (two) – B
  NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. FLASH EVAP CNTLR PRI B – ON
12. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
13. NH3 CNTLR A,B (two) – OFF

FREON LEAK

- ♦ 1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop ⇒

If (aff) FREON LOOP 1(2) ACCUM QTY not decr, ⇒A

EVAP OUT TEMP HIGH

If temp high in only one loop (snsr failed) >>

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)

   If T decr >>

2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena) (wait 30 sec)

   If T decr:

   3. TOP EVAP HTR DUCT sel – A/B >>

4. HI LOAD EVAP – OFF (wait 30 sec)

   If T decr (HI LOAD EVAP only lost):

   5. HI LOAD DUCT HTR sel – A/B ⇒A

6. RAD BYP VLV (four) – MAN, RAD FLOW (total FES lost) ⇒A

FIRE/SMOKE

SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
two SMOKE DETN lt on, or
two CONC > 2, or
one SMOKE DETN lt on and
other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lt and assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)

If SMOKE DETN B(A) test good (lt on):
3. SMOKE DETN CKT TEST – OFF
4. SNSR – RESET >>

If SMOKE DETN B(A) test bad (no lt):
5. Go to step 6

If none of above >>
6. Check tabs, visors – CL
LES O2 – ON

If **AV BAY FIRE**:
7. FIRE SUPPR – ARM
pb – DISCH (push until lit)
8. If Ascent: AV BAY FAN (two) – OFF
9. If FIRE in Bay:
1: GPS 1, MLS 1 – OFF
2: MLS 2,3 – OFF
3: GPS 3 – OFF

If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, facing page)
12. Unpwr source of smoke

If smoke persists or source cannot be unpwrd:

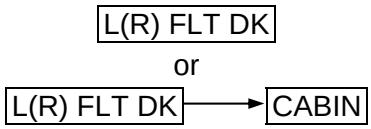
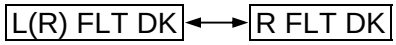
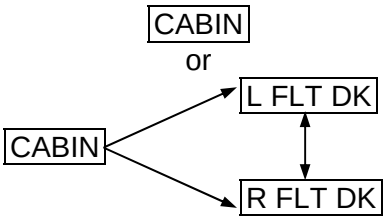
WARNING
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>

If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

Cont next page

ALARM SEQUENCE	SOURCE AREA
	PS(MS), L(R) CONSOLE
	AFT FLT DK, MIDDECK
	FWD FLT DK, WCS, LEB

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EPS

EPS

MN BUS UNDERVOLTS/FC VOLTS **PLT**

If MN V < 26.4, FC V < 26.6, FC A > 480 (2 of 3)
(SHORT or degraded FC):
1. MSTR MADS PWR – OFF
2. If aff BUS tied – untie
3. PL PRI (three) – OFF

If AC VOLTS < 95, or STACK T > 243 and incr:
4. (Aff) ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF

If FC VOLTS < 32 (FC SHORT)
5. (Aff) FC REAC VLV – CL
6. Perform BUS LOSS ACTION (do not perform FC SHUTDN)

Post MECO:
7. ⇒ FC SHUTDN (do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (BUS SHORT)
8. Go to BUS LOSS ACTION >>

9. ⇒

If MN V < 26.4 and FC V > 32 and FC A < 20
(FC disconnect, check APUs):
10. AC BUS SNSR (three) – OFF
11. MSTR MADS PWR – OFF
12. PL PRI (three) – OFF
13. FC/MN BUS – ON

If FC3 aff:
14. PL PRI MNC – ON
    FC3 – ON
15. If MNC V < 26.4: PL PRI (three) – OFF

If MN BUS recovered (FC VOLTS < 32):
16. GNC I/O RESET
17. ⇒ BUS TIE >>

If MN BUS not recovered (FC VOLTS > 32):
18. Perform BUS LOSS ACTION (do not perform FC SHUTDN)

Post MECO:
19. ⇒ FC SHUTDN

EPS

AC VOLT HIGH

If AC V > 123 and F7 “AC VOLTAGE”:
1. (Unaff) AC BUS SNSRS (two) – OFF

If AC V ≥ 130:
2. (Aff) AC BUS SNSR – AUTO TRIP

If AC V < 130 and AC3 aff:
3. H2O PUMP LOOP 2 – OFF

If RTLS/TAL:
4. AC VOLTS HIGH ⇒G
5. ⇒ AC VOLTS (LOW or HIGH)

AC VOLT LOW or OVERLOAD **PLT**

MN
SUB

1. AC BUS SNSR (three) – OFF

If amps > 14 and V < 95:

If single Φ amps > 14:

2. cb AC CONTR – cl
   INV/AC BUS – OFF
   INV PWR – OFF
   cb AC CONTR – op
3. If other Φ amps > 14:
   Go to step 6

If RTLS/TAL:

4. Go to aff BUS LOSS ⇒ G
5. Go to AC OVERLOAD ⇒ A

If multi Φ (bus short):

6. (Aff) cb AC CONTR (three) – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR (three) – op
7. Go to aff BUS LOSS >>
8. ⇒ AC VOLTS (LOW or HIGH)

3Φ AC MOTORS STOPPED

1. AC BUS SNSR (three) – OFF
2. Determine AC BUS:
   FC1 and FREON PUMP 2B: AC1
   FC2 and FREON PUMP 1B: AC2
   FC3 and CAB FAN A: AC3
3. (Aff) FC – STOP

If AC3 aff:

4. AV BAY 3 FAN B – OFF, A – ON
5. CAB FAN A – OFF

Isolate aff ΦB(ΦC,ΦA):

6. (Aff) cb AC CONTR – cl
7. INV/AC BUS – OFF

If AC1(2,3) aff and AV BAY 3(2,3) FAN ΔP ≥ 0.5:

8. Go to step 16 (bad Φ isolated)
9. (Aff) INV/AC BUS – ON
10. cb AC CONTR – op
11. Repeat from step 6 to isolate aff ΦC(ΦA), then:

Drop aff AC bus (three Φs):

12. (Aff) cb AC CONTR (three) – cl
13. INV/AC BUS – OFF
14. INV PWR – OFF
15. Go to aff BUS LOSS >>

Bad Φ isolated:

16. (Aff) FC – START (10 sec or ΔP tb-gray)
17. Perform aff BUS LOSS and if AC1(AC2) aff >>
18. If AC3 aff:
    Post MECO:
    CAB FAN B – ON

MN 3Φ

BUS TIE (do not tie bus short, check APUs)
If MN Volts > 20: Bus Tie >>
If MN Volts < 20 (do not BUS TIE Pre MECO for 1st FC):

1. (Aff) AC BUS SNSR – OFF
2. cb AC CONTR (three) – cl
3. INV/AC BUS – OFF (tb-OFF)
4. INV PWR – OFF (tb-OFF)
5. If MNC(B) dn, CAB FAN A(B) – OFF
6. Bus Tie
7. INV PWR – ON (tb-ON)
8. INV/AC BUS – ON (tb-ON)
9. cb AC CONTR (three) – op
10. GNC I/O RESET
11. Post MECO: (Aff) AC BUS SNSR – AUTO TRIP
12. Post PWRDN: √CAB FAN A(B) – ON

MNA **CDR**
Post SRB SEP:

1. TOP EVAP HTR DUCT sel – B
2. HI LOAD DUCT HTR sel – B
3. BFS G51 AA1 – desel ⇒
4. MS AUD CNTL – PS (MS can't talk)

FAILED: UHF HI PWR XMIT

MNB
Post SRB SEP:
BFS G51 AA2, RGA 2 – desel ⇒
FAILED: S-BD PM 1 (NO PNL,CMD)

MNC
Post SRB SEP:

1. FLASH EVAP CNTLR PRI A – OFF, B – GPC
2. BFS G51 RGA 3 – desel ⇒

ANY AC BUS LOSS ⇒

SUBBUS [MNA O14] ⇒G

SUBBUS [APC6 or ALC3]

1. FLASH EVAP CNTLR PRI A – OFF, B – GPC

MNA or AC1 Multi Φ **PLT**

1. Do not isolate MPS He C
2. MSTR MADS PWR – OFF
3. AC BUS SNSR (three) – OFF
4. Perform FC SHUTDN (within 9 min), then:

Post MECO:

5. L OMS – sel SEC ⇒

MNB or AC2 Multi Φ **ESS CNTL**

1. Do not isolate MPS He L
2. MSTR MADS PWR – OFF
3. AC BUS SNSR (three) – OFF
4. Perform FC SHUTDN (within 9 min), then: ⇒

FAILED: S-BD PM 1 (NO PNL,CMD)

MNC or AC3 Multi Φ

1. Do not isolate MPS He R
2. S-BD PM CNTL – PNL,CMD
3. Config per COMM COVER (ASC) BFS G51:
   - TDRS – ITEM 46 EXEC (**)
   - STDN-HI – ITEM 47 EXEC (**)
   - SGLS – ITEM 49 EXEC (**)
4. MSTR MADS PWR – OFF
5. AC BUS SNSR (three) – OFF
6. Perform FC SHUTDN (within 9 min), then:

Post MECO:

7. R OMS – sel SEC ⇒

AC SINGLE Φ ⇒

SUBBUS [APC4(5,6) or ALC1(2,3)]

Do not isolate MPS He C(L,R) ⇒

MN
SUB

ESS BUS V LOW **PLT**

If verified by F9 voltmeter:

1. Perform FC SHUTDN (< 9 min), then:
2. Go to aff ESS BUS LOSS

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost ⇒A
		3. ⇒A
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk) ⇒A
		3. ⇒A
ESS 3AB	**O13**	1. GPC CAM Lights lost
		2. Do not engage BFS ⇒

CNTL BUS LOSS **CDR**

AB1	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B ⇒
AB2	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B ⇒
AB3	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B If BFS engage reqd: 3. Use PLT's RHC, then GPCs 1,2,4 - STBY,HALT 4. BFS I/O RESET 5. ⇒
BC1	BFS G51 RGA 2 – desel ⇒
BC2	⇒
BC3	⇒
CA1	1. No BFS engage Post SRB SEP: 2. FLASH EVAP CNTLR PRI A – ON 3. BFS G51 RGA 3 – desel ⇒
CA2	⇒

CNTL BUS V LOW/CNTL BUS RPC PLT

WARNING
If VISIBLE FIRE/SMOKE AT ANY TIME, cb CNTL BUS AB1/2/3(BC1/2/3,CA1/2/3) – op (pnl R14:B)

1. Identify BUS (√BUS LOSS ID)

If bus critical (per MCC):

♦ 2. ⇒

♦ If one CNTL BUS RPC tripped (*****):

Aff CNTL BUS:

AB1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
3.	**A**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS AB1/2/3 – op
4.	**B**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS AB1/2/3 – op

BC1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
5.	**B**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS BC1/2/3 – op
6.	**C**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS BC1/2/3 – op

CA1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
7.	**C**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS CA1/2/3 – op
8.	**A**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS CA1/2/3 – op

♦ If no CNTL BUS RPC tripped (no *****):

	aff CNTL BUS	Panel R1 action (RESET, hold w/sw reten device)
9.	**AB1(2,3)**	CNTL BUS PWR MNA,MNB (two) – RESET
10.	**BC1(2,3)**	CNTL BUS PWR MNB,MNC (two) – RESET
11.	**CA1(2,3)**	CNTL BUS PWR MNA,MNC (two) – RESET

Cont next page

♦ 12. Perform aff CNTL BUS LOSS, then:

If pwr reqd (< 3 sec) for crit function:
13. Hold crit function sw
For tripped RPC:
14. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn
15. ⇒

ESS/ CNTL

CNTL BUS LOSS **PLT**

AB1	⇒
AB2	G23 RCS FWD MANF VLVS 1 OVRD – ITEM 40 EXEC (CL) ⇒
AB3	1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC If BFS engage reqd: 2. Use PLT's RHC, then GPCs 1,2,4 – STBY,HALT 3. BFS I/O RESET 4. ⇒
BC1	Failed: S-BD PM 1 (NO PNL,CMD) ⇒
BC2	1. S-BD PM CNTL – PNL,CMD 2. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) 3. G23 RCS FWD MANF VLVS 2 OVRD – ITEM 41 EXEC (CL) 4. PLT disp sws – green dot ⇒
BC3	G51 RCS RM MANF CL OVRD – ITEM 41 EXEC ⇒
CA1	No BFS engage ⇒
CA2	G23 RCS FWD MANF VLVS 3 OVRD – ITEM 42 EXEC (CL)
CA3	⇒

FC REAC VLV CLOSED **PLT**

1. FC REAC VLV (three) – OP
2. Perform BUS TIE, then:

If FC COOL P < 50:

3. Go to FC SHUTDN

FC pH ↓ 1(2,3) or FC DELTA V 1(2,3)

If pH ↓ and FC SS 1(2,3) ΔV > 150
or FC SS ΔV > 150 and incr:

1. Perform BUS TIE, then:
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

If pH ↓ only and Post SRB SEP:

♦ 5. Perform BUS TIE, then:

6. ⇒A FC pH 1(2,3)

FC STACK T

1. MSTR MADS PWR – OFF

If STACK T > 243 and incr:

2. If 2nd FC: Go to 2nd FC SHUTDN >>
3. PL PRI (three) – OFF

If aff FC amps < 190 or > 360:

4. Go to MN BUS UNDERVOLTS/FC VOLTS, step 4 >>

♦ 5. Perform BUS TIE, then:

6. ESS BUS SOURCE FC – OFF
7. FC/MN BUS – OFF

If aff FC VOLTS < 32 or STACK T not decr:

8. (Aff) FC REAC VLV – CL
9. FC – STOP after COOL P < 15 and STACK T < 243
10. Go to LOSS OF 1 FC PWRDN

FC EXIT T

1. MSTR MADS PWR – OFF
2. Perform LOSS OF 1 FC PWRDN
3. Post SRB SEP:

♦ Perform BUS TIE, then: ⇒

FC COOLANT PUMP ΔP LOW **PLT**

1. FC – START (10 sec or ΔP tb-gray)
♦ 2. MSTR MADS PWR – OFF
Perform LOSS OF 1 FC PWRDN, then:

If > 9 min since failure:

♦ If EXIT T > 164 and not decr or
RDY tb – bp or
FC PUMP cb(s) open (pnl L4:C):
3. Go to FC SHUTDN >>

4. If < 9 min since failure ⇒

FC COOL P

1. Perform BUS TIE, then:

If COOL P < 75: ⇒
If COOL P incr and not 100 (H),
or FC COOL PUMP = ΔP (intermittent),
or STACK/EXIT T unstable:

2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN

FC SHUTDN (1st) (< 9 min)

1. MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE, then:
If ORB (not deorb prep), kW > 18:
MN BUS TIE (three) – ON
3. ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF
FC – STOP (1 sec)
4. FC REAC VLV – CL
♦ Go to LOSS OF 1 FC PWRDN

LOSS OF 1 FC PWRDN

1. PRI PL (three) – OFF
AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
One MDU – OFF ⇒

2nd FC SHUTDN **PLT**

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA if RTLS or TAL)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. All TACAN/RA – OFF

Post MECO:

13. MPS PRPLT DUMP B/U LH2 VLV – OP
14. ⇒ LOSS OF 2nd FC PWRDN

LOSS OF 2nd FC PWRDN **CDR**

CRYO

1. LES O2 – OFF, visors – OP
2. L1: Select one FREON PUMP on good FC/MN BUS and place other pump to OFF
   Switch OFF all HUM SEPS, IMU FANS, H2O PUMPS, AV BAY FANS, CAB FANS, FES HTRS
3. Switch off all but one IDP/CRT with four MDUs

After BUS TIE, if MNC unpwrd:

4. FLASH EVAP CNTLR PRI A – OFF
   B – ON
5. ⇒ LOSS OF 2nd FC PWRDN

O2(H2) CRYO PRESS/TEMP HIGH **PLT**

O2(H2) TK HTR (two) – OFF ⇒A

CRYO O2(H2) LEAK (three or more tanks aff)

Use meter if CRT data OSL

1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

If TK1 and TK2 P decr slowly (HTR logic fail): ⇒

3. Perform aff MN BUS TIE, then:

If O2(H2) TK1(2) aff (open unaff manf):

4. O2(H2) MANF VLV TK2(1) – OP

If O2 TK1(2) aff:

5. O2 SYS 1(2) SPLY – CL
6. If O2 TK1(2) P now incr (PCS leak): >>

7. (Aff) TK HTR B – AUTO

If no aff FC COOL P alarm: ⇒

8. (Aff) TK HTRS A,B (two) – OFF
9. MSTR MADS PWR – OFF
10. Perform LOSS OF 1 FC PWRDN, then: ⇒

2nd FC SHUTDN **PLT**

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA if RTLS or TAL)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. All GPS/RA – OFF

Post MECO:

13. MPS PRPLT DUMP B/U LH2 VLV – OP
14. ⇒ LOSS OF 2nd FC PWRDN

LOSS OF 2nd FC PWRDN **CDR**

CRYO

1. LES O2 – OFF, visors – OP
2. L1: Select one FREON PUMP on good FC/MN BUS and place other pump to OFF
   Switch OFF all HUM SEPS, IMU FANS, H2O PUMPS, AV BAY FANS, CAB FANS, FES HTRS
3. Switch off all but one IDP/CRT with four MDUs

After BUS TIE, if MNC unpwrd:

4. FLASH EVAP CNTLR PRI A – OFF
   B – ON
5. ⇒ LOSS OF 2nd FC PWRDN

O2(H2) CRYO PRESS/TEMP HIGH **PLT**

O2(H2) TK HTR (two) – OFF ⇒A

CRYO O2(H2) LEAK (three or more tanks aff)

Use meter if CRT data OSL

1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

If TK1 and TK2 P decr slowly (HTR logic fail): ⇒

3. Perform aff MN BUS TIE, then:

If O2(H2) TK1(2) aff (open unaff manf):

4. O2(H2) MANF VLV TK2(1) – OP

If O2 TK1(2) aff:

5. O2 SYS 1(2) SPLY – CL
6. If O2 TK1(2) P now incr (PCS leak): >>

7. (Aff) TK HTR B – AUTO

If no aff FC COOL P alarm: ⇒

8. (Aff) TK HTRS A,B (two) – OFF
9. MSTR MADS PWR – OFF
10. Perform LOSS OF 1 FC PWRDN, then: ⇒

OMS

OMS

OMS He TK P LOW (√SPEC and [OMS/MPS])

Dumping RTLS/TAL/ [G51] DUMP	SERC	When leaking He P < 640: 1. [G51] DUMP STOP >>
	Not SERC	When leaking He P < 640: 2. [G51] INH ICNCT When aff OMS Pc < 72%: 3. (Aff) OMS ENG – OFF After 2:00 min: 4. (Good) OMS ENG – OFF >>
Dumping ASSIST/ATO Not Dumping ♦		5. (Good) OMS ENG – OFF When MET > 2:30 min: 6. [G51] ITEM 9 + [ ] [55] [ ] EXEC
Leaking He P < 640		7. [G51] ITEM 9 +0 EXEC ⇒A
Sub RTLS/TAL ♦		8. (Good) OMS ENG – ARM/PRESS 9. [G51] INH ICNCT 10. OMS XFEED (four) – OP 11. (Aff) OMS TK ISOL (two) – CL After 1:00 min: 12. OMS TK ISOL (four) – OP 13. OMS XFEED (four) – CL When aff OMS Pc < 72%: 14. (Both) OMS ENG (two) – OFF

OMS N2 TK P LOW
(N/A DURING ASSIST/RTLS/TAL/ATO DUMP)
1. √N2 TK P decr (meter and CRT)
2. OMS ENG – ARM
3. If OMS N2 REG P decr: OMS ENG – OFF >>

If OMS N2 REG P not decr and subs ASSIST/RTLS/TAL/ATO:
4. OMS ENG (two) – ARM/PRESS

OMS N2 REG P HIGH or LOW
OMS ENG – ARM

[P & I]

OMS TK P LOW (↓, OX or FU) NOT DUMPING (√ENG IN P)

1. (Good) OMS ENG – OFF
2. Monitor OMS Inlet Pressures
   If OX IN P < 151 or FU IN P < 216:
   (Aff) OMS ENG – OFF
   XFEED (two) – CL

Dumping Assist/ATO Not Dumping		When MET > 2:30 min: 3. G51 ITEM 9 +[83] EXEC
	OX IN P > 151 and FU IN P > 216	4. (Aff) OMS ENG – ARM/PRESS 5. If ATO: G51 √ICNCT = INH 6. (Aff) OMS XFEED (two) – CL When aff Pc < 80% (depletion cutoff): 7. (Aff) OMS ENG – OFF G51 ITEM 9 +0 EXEC >> If depletion cutoff does not occur ⇒A
	Repress NO JOY	8. G51 ITEM 9 +0 EXEC
Subs RTLS/TAL/G51		9. (Good) OMS ENG – ARM/PRESS
	OX IN P > 151 and FU IN P > 216	10. (Aff) OMS XFEED (two) – OP ENG – ARM/PRESS 11. G51 ENA ICNCT (N/A SERC)
	AFT QTY < 20% or He P < 2000	12. If SERC: G51 DUMP STOP If not SERC: G51 INH ICNCT 13. (Aff) OMS XFEED (two) – CL When aff Pc < 80% (depletion cutoff): 14. (Aff) OMS ENG – OFF 15. After 2:00 min: (Good) OMS ENG – OFF >>
	Repress NO JOY after 2:00 min	16. (Good) OMS ENG – OFF >>

P & I

OMS TEMP DURING DUMP

1. G51 INH ICNCT

	L	R
If aff OMS FU IN P ≥	230	230
2. Go to ENG FAIL >>	214	212
If aff OMS FU IN P ≤		

3. Go to PRPLT FAIL >>
4. Otherwise, snsr fail

Pc LOW DURING DUMP

1. ENG VLV < 70%: Go to ENG FAIL >>
2. ENG VLV > 70%: G51 INH ICNCT
   If aff OMS OX IN P > 227:
   3. Go to ENG FAIL >>
   If aff OMS OX IN P ≤ 136:
   4. Go to PRPLT FAIL >>
5. Otherwise, snsr fail

ENG FAIL (During Dump)

1. (Failed) OMS ENG – OFF
2. If RTLS/TAL/ATO/G51 DUMP:
   G51 ENA ICNCT ⇒G

PRPLT FAIL (During Dump)

1. ASSIST/ATO: (Both) OMS ENG (two) – OFF
   (Failed) OMS XFEED (two) – CL
2. Other: (Aff) OMS ENG – OFF
   (Failed) OMS XFEED (two) – CL
   After 2:00 min, (good) OMS ENG – OFF ⇒G

OMS TK P LOW (↓, OX and FU) DURING DUMP

(√ENG IN P)

1. (Aff) OMS He PRESS/VAP ISOL (two) – OP

If aff TK P not incr:

2. G51 √ICNCT = INH
3. OMS He PRESS/VAP ISOL (two) – CL

At Pc < 72% or OMS TEMP: Go to PRPLT FAIL

OMS TK P HIGH (↑, OX and FU) DURING DUMP

(√ENG IN P)

1. G51 √ICNCT = INH
2. (Aff) OMS He PRESS/VAP ISOL A – CL

If aff TK P not decr:

3. OMS He PRESS/VAP ISOL A – OP
   B – CL

P & I

RCS

RCS

RCS JET FAIL (LEAK)
If OX/FU Qty diverging:
(Aff) RCS MANF ISOL – CL

RCS JET FAIL (ON)
1. (Aff) RCS MANF ISOL – CL
If MANF P > 130 and stable (false alarm):
2. (Aff) RCS MANF ISOL – OP ⇒G

RM DLMA MANF
If (aff) MANF tb – OP or sw not thrown:
1. If FRCS: √MCC
2. If ARCS: G51 RCS RM MANF CL OVRD –
ITEM 41 EXEC
3. If (aff) MANF tb – bp: (aff) MANF – GPC

RCS JET FAIL (OFF)
If > one jet/pod/dir failed:
1. G23 resel jets
2. DES INH (*) (reprioritize)

RCS TK P HIGH (FU or OX) (√MANF P)
1. RCS He PRESS (two) – CL
2. A – OP
If He P decr:
3. RCS He PRESS A – CL
B – OP

XFEED: RCS to RCS
If AUTO XFEED:
1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. OMS XFEED (four) – CL
3. MSTR RCS XFEED – FEED FROM L(R) >>
If MANUAL XFEED:
4. L,R OMS XFEED (four) – CL
5. RCS XFEED (four) – OP
6. (Receiving) RCS TK ISOL (three) – CL
He PRESS (two) – CL
7. MSTR RCS XFEED – FEED FROM L(R)

RCS SECURE

RCS MANF ISOL (five) – CL
XFEED (two) – CL
TK ISOL (all) – CL
He PRESS (two) – CL

AFT RCS LK

N/A During Dump/SE Roll Cntl
(check He P decr: CRT and meter)

1. If TK P '↑': Go to TK P HIGH >>

TK P ≥ 254 and not decr (He Leak)	2. MSTR XFEED – feed from good side 3. (Aff) RCS He PRESS (two) – CL 4. G51 AFT RCS – INH (ITEM 13) >>
TK P < 254 or decr (prop leak)	5. (N/A RTLS) ET SEP – MAN 6. (N/A RTLS) MPS PRPLT DUMP SEQ – STOP 7. (Aff) MANFs (five) – CL 8. (Aff) TK ISOLs (three) – CL
Single MANF leak	9. TK ISOLs (three) – OP (tb-OP),GPC 10. (Good) MANFs (four) – OP
QTY < 75%	11. MSTR XFEED – feed from good side
Two MANF P decr (TK leg leak)	12. (Good leg) TK ISOL(s) – OP (tb-OP), GPC 13. (Good leg) Pri MANFs (two) – OP 14. (Leaking leg) XFEED (one) – CL
QTY < 75%	15. MSTR XFEED – feed from good side
No MANF P decr (Prplt TK or MANF 5 leak)	16. L,R RCS XFEED (four) – OP 17. (Aff) RCS MANF 1,2,3,4 (four) – OP 18. (Aff) RCS He PRESS (two) – CL 19. MSTR XFEED – feed from good side
	20. ET SEP – AUTO 21. G51 AFT RCS – INH (ITEM 13) 22. Post ET SEP -Z transl: MPS PRPLT DUMP SEQ – GPC

FWD RCS LK
(check He P decr: CRT and meter)
(check TK P; if '↑': Go to TK P HIGH >>)

RTLS	1. Perform RCS SECURE, then: 2. Post PPD – reopen RCS Post ET SEP -Z transl: 3. Go to RCS SECURE >>
Pre ET SEP (N/A RTLS)	4. ET SEP – MAN 5. MPS PRPLT DUMP SEQ – STOP 6. Perform RCS SECURE, then:
Single MANF leak	7. Reopen RCS, except bad MANF 8. ET SEP – AUTO Post ET SEP -Z transl: 9. MPS PRPLT DUMP SEQ – GPC >>
TK leg leak (two MANF P Low)	10. Reopen RCS, except bad leg 11. ET SEP – AUTO Post ET SEP -Z transl: 12. MPS PRPLT DUMP SEQ – GPC >>
PRPLT TK P decr	
Post MECO	13. RATE DAMP with ARCS 14. Reopen FRCS
TK P > 200 & QTY > 0%	15. ET SEP – AUTO
TK P < 200 or QTY = 0%	16. Perform RCS SECURE, then: 17. DAP – INRTL, PITCH – PULSE 18. ET SEP pb – SEP 19. THC -Z (UP) (2 sec; -1.25°/sec) 20. THC -X (OUT) and hold
At SEP (SEP init + approx 12 sec)	21. THC +Z (DOWN) (3 sec; +0.3°/sec) THC -Z (UP) (2 sec; -0.9°/sec) COAST (5 sec) THC +X (IN) (20 sec) After 10 sec of +X, then: PITCH – DISC RATE
	22. OPS 104 PRO, DAP – AUTO
Otherwise: (He TK or He leg)	Post MECO: 23. Reopen RCS 24. ET SEP – AUTO
Post ET SEP -Z transl	25. MPS PRPLT DUMP SEQ – GPC 26. Go to RCS SECURE

MPS

SSME FAIL/SHUTDN

AC BUS SNSR (three) – OFF
If two ENG remaining:
♦ MN ENG LIMIT SHUTDN – ENA,AUTO
If one ENG remaining: (N/A for TAL or OPS 6)
When MPS PRPLT = 5%
MAN THROT
When MPS PRPLT = 2%
MIN THROT (Pc → 67%)
AUTO THROT

MPS DATA

√MCC, accel, He dP/dT,
'MPS H2 OUT P',
'MPS O2 OUT T'
If SSME fail (MCC or three cues):
(Aff) MN ENG SHUTDN pb – push
If three ENG remaining:
♦ MN ENG LIMIT SHUTDN – ENA,AUTO
If no comm: Assume MPS CMD
If mult (no MECO confirm):
Post MECO:
MN ENG SHUTDN pb (three) – push (simo)

MPS LH2 ULL

♦ If two or three Ps < 28.0 or > 34.0:
MPS LH2 ULL PRESS – OP
When all Ps > 33.0:
MPS LH2 ULL PRESS – AUTO

MPS DUMP INHIBIT

Post MECO:
(Aff) MPS ENG PWR (two) – OFF
LO2(H2) PREVLV – CL

'ET SEP MAN' G51 **ET SEP**

Post MECO prior to MECO+1 min:
1. ET SEP AUTO – ITEM 38 (BFS 28)
2. If ET SEP pb reqd:
ET SEP SEP – ITEM 39 (BFS 29)

MPS CMD/HYD/ELEC

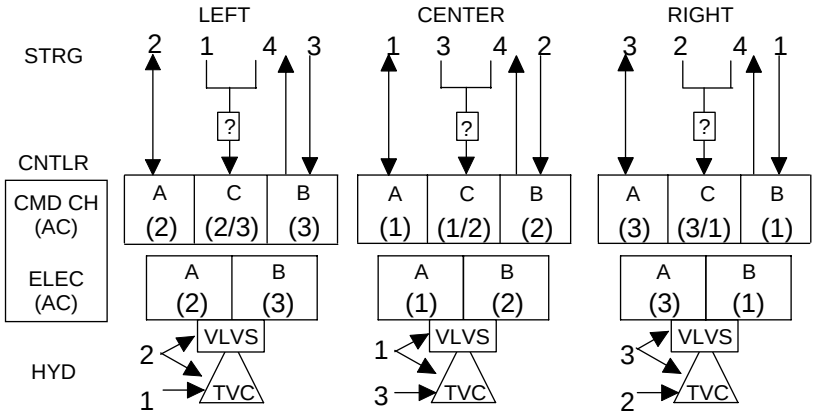
If two HYD SYS failed:

MN ENG LIMIT SHUTDN – INH

TRAJ disp – Cue SERC, ITEM 6

(EXEC if gimbaling eng fails)

If:	When:	Shut down:
2 Pcs stuck > 85% & 3-ENG RTLS	MECO -2:00	1 aff MN ENG: CMD: (AC/pb)•• HYD: (pb) ENG(HYD) | S/D C(1) & R(3) | C L(2) & C(1) | L L(2) & R(3) | R ELEC: (pb)
2 HYD SYS failed & Nom/ATO/TAL/ 2-ENG RTLS	Nom/ATO: SE PRESS TAL: SE TAL 2-ENG RTLS: 2 OUT RED	
He lk S/D reqd	Nom/ATO and: 3 ENG: V > 23K 2 ENG: V > 24.5K TAL: V > 22.5K RTLS: α = ~~+2~~ -1	Aff MN ENG (pb)
MPS CMD(s)••		Aff MN ENG (AC/pb)•• If 2 CMD: repeat
2 MPS HYD/ELEC & 3-ENG Nom/ATO/TAL		1 aff MN ENG: HYD: (pb) ELEC: (pb)
1 MPS HYD/ELEC & 3-ENG Nom/ATO	V > 23K	Aff MN ENG (pb)



P & I

MPS He P (Pre MECO)

1. Check dP/dT

If after MECO -60:
- 2. Shut dn MN ENG per MPS CMD/HYD/ELEC >>

If He REG P ↑ or ↓:
- 3. (Aff) He ISOL – CL

Otherwise:
- 4. (Aff) He ISOL A – CL

  If no decr in dP/dT:
  - 5. (Aff) He ISOL A – OP
    B – CL

    If no decr in dP/dT:
    - 6. (Aff) He ISOL B – OP

If any ENG failed:
- 7. (Failed) ENG He I'CNCT – OUT OP

If nonisolatable:
- 8. Shut dn MN ENG per MPS CMD/HYD/ELEC

  If/when TK P < 1150 or REG P < 679:
  - 9. (Aff) He I'CNCT – IN OP

If isolated:
- 10. (Aff) He I'CNCT – IN OP

  If TK P < 2200 @ MECO -60:
  - 11. Shut dn MN ENG per MPS CMD/HYD/ELEC

Post ET SEP:
- 12. He I'CNCT(s) – GPC

MPS PNEU TK(REG) P

If after MECO -60:
- At MECO -30:
  - 1. L ENG He XOVR – OP >>

2. PNEU He ISOL – CL

If PNEU ACUM P decr:
- At MECO -30:
  - 3. PNEU He ISOL – OP,

  Wait 5 sec, then:
  - 4. L ENG He XOVR – OP >>

If PNEU TK P decr:
- 5. PNEU He ISOL – OP

RESERVED

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GLIDED FLIGHT

MS GLIDED FLIGHT

– – – – – MS GLIDED FLIGHT, SECTIONS 1 thru 9 – – – – –

GLIDED FLIGHT

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APU/HYDRAULICS

APU SHUTDN

1. APU OPER – OFF
   FU TK VLV – CL
   √Shutdn (HYD PRESS < 200)
   Report APU F7 lts
   APU CNTLR PWR – OFF

If one APU failed:

⇒ 2. √APU AUTO SHTDN (three) – ENA
3. MM304: √APU SPEED SEL (two) – NORM
4. MM602/305: APU SPEED SEL (two) – HI

If two APUs failed:

5. APU SPEED SEL (one) – HI
6. AUTO SHTDN (one) – INH

APU SPD HI

If SPEED % exceeds 111:

1. APU SPEED SEL – HI

⇒ Pre-TAEM if two good APUs:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU OVERSPEED

If SPEED % exceeds 129:

Go to APU SHUTDN

APU UNDERSPEED G51

If 'PRL SYS X ↓' or if APU has shut dn:

1. Perform APU SHUTDN, then:

⇒ 2. Go to APU COOLDOWN

APU OIL OVERTEMP

1. BLR CNTLR/HTR – A(B)
   √N2 SPLY – ON

⇒ If M > 1:

If OIL IN T incr, and OUT T > 305:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU PUMP LEAK P

1. √MCC

Pre-TAEM if two good APUs:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU THERM (T HI)

If APU GG/FU PMP HTR or APU TK/FU LN HTR fail ON (↑):

(Aff) HTR – OFF

APU COOLDOWN

At M = 7:

1. HYD MN PUMP PRESS – LO
   APU CNTLR PWR – ON
   OPER – INJ COOL (start watch)

If APU not leaking:

2. APU FU TK VLV – OP

At Wheel Stop:

3. Go to APU SHUTDN

APU RESTART

♦ 1. √APU AUTO SHTDN – ENA
2. HYD MN PUMP PRESS – LO
3. APU CNTLR PWR – ON

If COOLDOWN for > 3.5 min or APU TEMP INJ < 380:

4. Go to step 7
5. APU OPER – INJ COOL (start watch)

If after 1.5 min, APU TEMP INJ not decr:

6. Go to APU SHUTDN >>

At 3.5 min:

7. √APU FU TK VLV – OP
   OPER – START/RUN

If restart unsuccessful:

8. Go to APU SHUTDN >>
9. HYD MN PUMP PRESS – NORM

HYD PRESS (LOW)

GNC 51 OVERRIDE
BFS, SM SYS SUMM 2

⇒ 1. Compare 'PRL SYS X' status and aff HYD PRESS (HYD/APU meter and CRT):

PRL SYS	HYD PRESS	ACTION
'↓'	both meter and CRT P < 300	Go to APU SHUTDN >>
blank	either meter or CRT P > 2600	No action reqd >>
'?'	ACUM P > 2800	No action reqd >>

2. (Aff) HYD MN PUMP PRESS – LO

If two good APU/HYD remain:

3. √APU AUTO SHTDN (three) – ENA
4. MM304: √APU SPEED SEL (two) – NORM
5. MM305/602: APU SPEED SEL (two) – HI >>

If only one good APU/HYD remains:

6. APU AUTO SHTDN (one) – INH
   SPEED SEL (one) – HI

On MCC call:

7. (Degraded) HYD MN PUMP PRESS – NORM

HYD RSVR QTY (LOW)

1. (Aff) √HYD MPS/TVC ISOL VLV SYS – CL
   (hold 5 sec, tb-CL)

⇒ √BK ISOL VLV – CL (hold 5 sec, tb-CL)

If HYD sys 1 leaking:
√LG EXTD ISO VLV – CL (hold 5 sec, tb-CL)

If qty still decr:
If two good Hyd sys:
2. (Aff) HYD MN PUMP PRESS – LO
If second sys fails:
3. At TAEM: (Leaking) HYD MN PUMP
   PRESS – NORM
4. At TAEM: (Good) APU SPEED SEL (two) – HI

If one good Hyd sys:
5. (Good) APU AUTO SHTDN – INH
6. (Good) APU SPEED SEL – HI
If prior to TAEM:
7. (Leaking) HYD MN PUMP PRESS – LO
8. At TAEM: (Leaking) HYD MN PUMP
   PRESS – NORM

HYD RSVR T

1. BLR CNTLR/HTR – A(B)

If HYD RSVR T > 250:
2. HYD MN PUMP PRESS – LO
If HYD RSVR T > 268 and incr:
3. Perform APU SHUTDN, then:
4. Go to APU COOLDOWN

W/B QTY (LOW)

1. BLR CNTLR/HTR – A(B)

⇒ 2. If BLR CNTLR/HTR – OFF:
3. BLR CNTLR/HTR – B
   N2 SPLY – ON
4. If W/B QTY = 0 or M ≤ 1 >>
5. Monitor W/B QTY for 2 min, then:
6. If W/B QTY change > 3:
7. Cycle BLR CNTLR/HTR to maintain:
   200 < LUBE OIL IN T < 290 (C&W)
When M ≤ 1:
8. BLR CNTLR/HTR – A(B)

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COMM/GNC

COMM LOST (mult pnls)
1. AUD CTR – 2

No comm (check UHF sites):
2. S-BD PM CNTL – PNL,CMD (pnl C3)
3. Config per COMM COVER (ASC) BFS G51:
   TDRS – ITEM 46 EXEC (*****)
   STDN-HI – ITEM 47 EXEC (*****)
   SGLS – ITEM 49 EXEC (*****)
   If ***** not next to selected config:
   4. Config pnl A1 per Comm Coverage
      (ASC/ENT PKT, COMM)
      S-BD PM CNTL – PNL,CMD (pnl C3)

No comm:
5. Sel best S-BD PM ANT

No comm:
6. S-BD PM ANT – GPC

ICOM LOST
1. AUD CNTL sel – sel alt

No ICOM:
2. AUD CTR – 2

FCS CH 1(2,3,4) (2nd FAIL) G53
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL) GNC SYS SUMM 1
(Aff) FLT CNTLR PWR – OFF

G51 ROLL MODE SW G51
If ROLL MODE ≠ sw pos:
AUTO SEL – ITEM 42 EXEC

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA BFS G51
Aff LRU – desel

RM DLMA IMU G51 BFS G51
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

RM FAIL ADTA G51

♦ 1. √BFS GNC SYS SUMM 1
2. If '↓' for aff ADTA >>
3. If accessible, (bad) ADTA cb – op >>
4. BFS, ADTA to G&C – INH

RM DLMA ADTA * G51

M < 2.0		1. Fly Theta limits
ADTA data agrees		2. Desel,resel one ADTA 3. If no '?' >>
Bad probe		4. Stow bad probe >>
Bad ADTA	ADTA cb accessible	♦ 5. (Bad) ADTA cb – op >>
	ADTA cb not accessible	♦ 6. DES bad ADTA 7. √BFS GNC SYS SUMM 1 8. If '↓' for aff ADTA >> 9. BFS, ADTA to G&C – INH
Dilemma not resolved		10. ADTA to G&C – INH (PASS & BFS)

***If three ADTAs failed:**
ADTA to G&C – INH (PASS)
Fly Theta limits

RM FAIL TAC G50
(RM LIMITS: 6 DEG, 0.5 NM)
1. If data good: desel,resel aff TACAN >>
2. If failure verified: desel failed TACAN in BFS

RM DLMA TAC G50
Do not desel or resel while in 'TEST'
1. If both data good: desel,resel one TACAN in DLMA >>
2. √TACAN MODE (three) – GPC
3. If 'RM FAIL TAC': desel failed TACAN in BFS >>
4. If continuous 'TEST': TACAN MODE (three) – T/R
If bad TACAN identified:
5. Desel bad TACAN (PASS,√BFS)

SPD BRK G51 BFS G51

M>5.0	♦ WRAP MODE – INH
M≤5.0	WRAP MODE – INH √MCC for energy mgmt procs

G55 GPS FAIL 2 G50 BFS G50
GPS to NAV INH – ITEM 43 EXEC (PASS, √BFS)

NO UPDATE GPS G55
√MCC
If ALT < 300kft and ALT > 180kft
    No Update due to plasma, reevaluate at ALT < 180kft
Else
    INIT – ITEM 15 EXEC
    NAV – ITEM 18 EXEC

RM FAIL ADTA G51

♦ 1. √BFS GNC SYS SUMM 1
2. If '↓' for aff ADTA >>
3. If accessible, (bad) ADTA cb – op >>
4. BFS, ADTA to G&C – INH

RM DLMA ADTA * G51

M < 2.0		1. Fly Theta limits
ADTA data agrees		2. Desel,resel one ADTA 3. If no '?' >>
Bad probe		4. Stow bad probe >>
Bad ADTA	ADTA cb accessible	♦ 5. (Bad) ADTA cb – op >>
	ADTA cb not accessible	♦ 6. DES bad ADTA 7. √BFS GNC SYS SUMM 1 8. If '↓' for aff ADTA >> 9. BFS, ADTA to G&C – INH
Dilemma not resolved		10. ADTA to G&C – INH (PASS & BFS)

***If three ADTAs failed:**
ADTA to G&C – INH (PASS)
Fly Theta limits

RM FAIL TAC G50
(RM LIMITS: 6 DEG, 0.5 NM)
1. If data good: desel,resel aff TACAN >>
2. If failure verified: desel failed TACAN in BFS

RM DLMA TAC G50
Do not desel or resel while in 'TEST'
1. If both data good: desel,resel one TACAN in DLMA >>
2. √TACAN MODE (three) – GPC
3. If 'RM FAIL TAC': desel failed TACAN in BFS >>
4. If continuous 'TEST': TACAN MODE (three) – T/R
If bad TACAN identified:
5. Desel bad TACAN (PASS,√BFS)

SPD BRK G51 BFS G51

M>5.0	♦ WRAP MODE – INH
M≤5.0	WRAP MODE – INH √MCC for energy mgmt procs

G55 GPS FAIL 1(2,3) G50 BFS G50
Aff LRU – desel (PASS, √BFS)

RM DLMA GPS G50 BFS G50
♦ 1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If 300kft > ALT > 180kft
DLMA due to plasma
Reevaluate when ALT < 180kft
Else
3. Desel GPS with highest P1σ
If P1σ values are equal, desel highest number LRU
If DLMA not resolved
4. Desel GPS with next highest P1σ

NO UPDATE GPS G55
1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If RM DLMA GPS message, see RM DLMA GPS >>
3. If 300kft > ALT > 180 kft
No Update due to plasma
Reevaluate when ALT < 180kft
Else
4. Initialize GPS with highest P1σ
INIT – ITEM 14(15,16) EXEC
NAV – ITEM 17(18,19) EXEC
May take up to 2 min for GPS to provide SV

DPS

PASS GPC FAIL

1. (Aff) FCS CH – OFF
2. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE
3. GPC MODE – STBY,HALT
4. G53 aff SURF FDBK – desel
5. ⇒ If String 1(2): CDR(PLT) disp sws – green dot
   NWS – 2
6. √MULT DATA PATH LOSS

BFS GPC FAIL

1. GPC MODE – STBY,HALT
2. ♦ OUTPUT – TERM
   ⇒ MODE – STBY
3. If BFS cannot drive an IDP:
   GPC MODE – HALT, then go to step 8
4. If BFS currently in OPS 3 or 6:
   Go to step 7
5. If BFS currently in OPS 1:
   PRO to OPS 106
   BFS, OPS 000 PRO
   PRO to OPS 304
6. If BFS in desired MM (304):
   BFS G50 √BFS R/W sel
   GPC MODE – RUN
   OUTPUT – B/U
   Advise MCC BFS in BACKUP >>
7. √GPC MODE – STBY (BFS is SM Only)
8. If no comm: sel best S-BD PM ANT
9. MPS He ISOL B (three) – CL
   PNEU He ISOL – CL
10. If AOA/GRTLS/TAL < 120K:
    NH3 CNTLR B – SEC/ON

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
	FF 1,2,3	♦ 4. G51 IMU – resel
		5. BFS I/O RESET >>
NOT RECOV	FA	6. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 7. G53 aff SURF FDBK – desel
		8. √MULT DATA PATH LOSS
		⇒ ♦ 9. Go to FA/FF MDM PORT MODE ⇒

FA/FF MDM PORT MODE

NOTE

If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF 1,2,3	♦ 5. G51 IMU – resel >>
	NOT RECOV		⇒ If MCC GO for pwr cycle: 6. (Aff) FA/FF MDM – OFF,ON 7. I/O RESET 8. If recov, go to @MDM RECOV >> 9. (Aff) MDM – OFF
		FA	10. BFS G51 aff SURF FDBK, RGA – desel
		FF	11. BFS G51 aff AA – desel 12. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2
			13. √MULT DATA PATH LOSS >>
@GPC	FA RECOV (FF Give Up)		14. (Aff) FCS CH – AUTO 15. G53 aff SURF FDBK – resel 16. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2 17. √MULT DATA PATH LOSS >>
	FF RECOV (FA Give Up)		18. (Aff) FCS CH – OFF 19. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 20. G53 aff SURF FDBK – desel
		FF 1,2,3	♦ 21. G51 IMU – resel
			22. √MULT DATA PATH LOSS >>

FF(FA) MDM OUTPUT FAULT

♦ (Take action only if annun by entire set)

If single 'MDM OUTPUT':

1. If 'FF MDM OUTPUT':
   G51 aff IMU – desel
2. Go to FA/FF MDM I/O ERROR >>

If both FF and FA annun:

3. G51 aff IMU – desel
4. I/O RESET; if reqd, BFS I/O RESET
5. If msgs repeat: Go to PASS GPC FAIL >>
6. If reqd, (aff) FCS CH – ORIDE,AUTO

♦ 7. G51 IMU – resel

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL1 ↓ and pre MM305: FLASH EVAP CNTLR PRI B – ON
4. If PL2 ↓ and no comm: sel best S-BD PM ANT
5. If PL2 ↓ and AOA/GRTLS/TAL < 120K:

⇒ NH3 CNTLR B – SEC/ON

PCM I/O ERROR

OI PCMMU PWR – 2(1)

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU		1.	G21 √IMU OPER, if STBY >>
			2.	I/O RESET
RECOV	IMU		3.	G21 √att ANG, if delta > 1° >>
		♦	4.	G51 IMU – resel >>
			5.	>>
NOT RECOV	NSP		6.	And no comm: PNL,CMD
			7.	BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) >>
			8.	G01 aff String – port mode
			9.	BFS I/O RESET
			10.	If recov, go to RECOV steps >>
	A(B,C,D, IMU)	⇒	11.	FF A(B,IMU) or FA C(D) MDM – OFF,ON
			12.	I/O RESET
			13.	If FA, (aff) FCS CH – ORIDE,AUTO
			14.	If recov, go to RECOV steps
	C(D)		15.	If < 3Y,2P jets/pod/dir: a. G23 aff jet DES INH (*) (reprioritize) b. Aff MANF VLVS STAT OP – OVRD
	1A(2A)		16.	CDR(PLT) disp sws – green dot
	B		17.	BFS G51 aff AA – desel
	D		18.	BFS G51 aff SURF FDBK,RGA – desel
			19.	√MULT DATA PATH LOSS >>

POST OPS 3/GRTLS TRANSITION RESTRING

1. (Aff) GPC(s) – STBY,HALT
2. √G53 aff SURF FDBK – desel (*****)
3. Config MC1(3) NBAT
4. OPS Mode Recall: OPS XXX PRO
5. BFS I/O RESET

If OPS 3 and String 1(2,3) recovered:

♦ 6. G51 IMU – resel

⇒ 7. Config FCS CH(s) (see Table):

8. G53 config SURF FDBK (see Table):

AVAILABLE		FCS CH CONFIG			SURF FDBK	
GPCs	FCS CHs	AUTO	ORIDE	OFF	SEL	DESEL
3	4	3		1	3	1*
	3	3		1	3	1*
	2		2	2	2	2
2	4		4		4	
	3		2	2	2	2
	2		2	2	2	2

***If CH 4 – OFF, DO NOT DESEL PASS SURF FDBK

POST BFS ENGAGE

If PASS GPCs running:

1. (Aff) GPC MODE – STBY/HALT

2. BFS I/O RESET
3. √FCS CHs, IMU config

⇒ If Air Data not analyzed:

4. G50 INH AD to G&C
5. M = 5: Deploy,evaluate probes one at a time
6. √AD to G&C by M = 1.5

If failed ADTA(s) in PASS:

7. cb(s) ADTA – op, or stow probe

8. G51 DES failed(commfaulted) RGA,AA,SURF
9. G50 DES failed TAC

At M ≤ 2.7:

10. CDR TRIM PNL – OFF
    RHC/PNL – ENA

At H = 3K:

11. SPDBK – MAN (check DEL PAD setting)

At MAIN GEAR TD:

12. SPDBK – 100%

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config
11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

FLT INST DISPLAY ANOMALY

1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY

1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

BFS INADVERTENT DISENGAGE/UNSUCCESSFUL ENGAGE (Lightning Strike)

1. CDR and PLT RHC BFS engage pb – push

If no response:

2. BFS OUTPUT – NORM, B/U
3. CDR,PLT RHC BFS engage pb – push

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC prob and not MDM, BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA sws
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA sws
GPC/FA any combo	I/O or D	No impact

ECLS

ECLS

CAB PRESS LEAK

1. CAB RELIEF A – CL,pause,
   B – CL
2. Check tabs, visors – CL, LES O2 – ON
3. If RTLS/TAL: O2/N2 CNTLR VLV SYS 2 – OP
4. O2 TK1,TK2 HTRS A,B (four) – AUTO

⇒ 5. TK3 HTRS A,B (two) – AUTO

If possible:

6. Remove INNER HATCH cap (two)
7. Equal vlv (two) – EMER

When CAB PRESS < 10 psia, if dP/dT EQ < 0.67:

8. √O2/N2 CNTLR VLV SYS 2 – OP >>

When CAB PRESS < 6.5 psia:

9. √O2/N2 CNTLR VLV SYS 2 – OP
10. CAB FAN (two) – ON

CAB PRESS HIGH

1. If incr: LES O2 – OFF, visors – OP

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL
3. O2 SYS 1,2 SPLY (two) – CL

H2O LOOP PRESS LOW(HIGH)

⇒ Switch Loops

AV BAY FAN ΔP

⇒ 1. If Av Bay 1 aff: FAN A – ON; FAN B – OFF
   If Av Bay 2 aff: FAN B – ON; FAN A – OFF
   If Av Bay 3 aff: FAN A – ON; FAN B – OFF
2. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

AV BAY TEMP HIGH

⇒ 1. (Aff) AV BAY FAN (two) – ON
2. If not decr: Switch H2O Loops
3. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

LOSS OF AV BAY COOLING PWRDN

Bay 1: MLS 1 – OFF
Bay 2: 2,3 – OFF
Bay 3: N/A

CABIN FAN FAIL

⇒ 1. Switch fans

If both fans lost:

2. Minimize use of IDPs/MDUs/FLT CNTLR PWR

IMU FAN FAIL

⇒ Switch fans

FREON FLOW LOW

1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MODE – AUTO
   CNTLR LOOP – AUTO A(B) (wait 90 sec)

If flow still low in both loops:

3. Go to LOSS OF FREON LOOP(s)

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH
4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF, A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT

If RTLS:

8. TACAN (three) – OFF
9. RDR ALTM 1 – OFF

If TAL/AOA/ENTRY and V > 15K:

10. All TACAN/RA/MLS – OFF
11. Use one FLT CNTLR PWR

⇒ 12. DC UTIL PWR – OFF

♦ 13. FCS CH 4 – OFF

14. GPC 4 – STBY,HALT,PWR – OFF
15. FF4,FA4 – OFF
16. ANNUN BUS SEL ACA 2/3 – OFF

♦ When MPS dump complete:

17. MPS ENG PWR (six) – OFF
18. EIU (three) – OFF
19. MEC 1 – OFF, wait 2 sec, then:
20. MEC 2 – OFF

♦ 21. G50 √GPS, INCORPORATE

22. At M = 2.9: √RA 2 – ON
23. If reqd: Use one MLS, GNC I/O RESET

OV103,104

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

EVAP OUT TEMP HIGH (Rads cold soaked)

If temp high in only one loop (snsr failed) >>

1. If V < 12K:
   RAD BYP VLV LOOP 1 – MAN,BYP
   NH3 CNTLR B – PRI/GPC >>
2. FLASH EVAP CNTLR PRI B(A) – OFF
   A(B) – ON (wait 30 sec)
   If T decr >>
3. FLASH EVAP CNTLR PRI A(B) – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr:
   TOP EVAP HTRS (three) – OFF >>
4. HI LOAD EVAP – OFF
   DUCT HTR sel – OFF (wait 30 sec)
   If T decr >>
5. TOP EVAP HTRS (three) – OFF
   RAD BYP VLV MODE (two) – AUTO
   CNTLR LOOP (two) – AUTO B(A) (wait 90 sec)

EVAP OUT TEMP HIGH (Rads *not* cold soaked)

If temp high in only one loop (snsr failed) >>

If V > 12K:

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)
   If T decr >>
2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr >>
3. HI LOAD EVAP – OFF
   If T decr >>
4. RAD BYP VLV (four) – MAN,RAD FLOW

⇒ 5. NH3 CNTLR B – SEC/ON (wait 60 sec)
6. If T decr >>
7. NH3 CNTLR B – OFF, A – SEC/ON

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. ♦ FREON PUMP LOOP 1,2 (two) – B
   NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
12. NH3 CNTLR A,B (two) – OFF

If V > 12K and FLASH EVAP CNTLR PRI A(B) previously selected:

13. FLASH EVAP CNTLR PRI B(A) – GPC >>

If V < 12K:

14. RAD BYP VLV MODE 1,2 (two) – AUTO
15. CNTLR LOOP 1,2 (two) – OFF
    AUTO A(B)

FREON LEAK

1. ♦ FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. ♦ (Aff) FREON ISOL LOOP 1(2) – RAD
   Hold for 5 sec
4. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop >>

If (aff) FREON LOOP 1(2) ACCUM QTY not decr:

When V<12K and rads cold soaked:

In good loop:

5. √RAD BYP VLV MODE 2(1) – AUTO
6. √RAD CNTLR LOOP 2(1) – AUTO B
7. NH3 CNTLR B(A) – PRI/GPC

FIRE/SMOKE

SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
two SMOKE DETN lt on, or
two CONC > 2, or
one SMOKE DETN lt on and
other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lt and assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)

If SMOKE DETN B(A) test good (lt on):
3. SMOKE DETN CKT TEST – OFF
4. SNSR – RESET >>

If SMOKE DETN B(A) test bad (no lt):
5. Go to step 6

If none of above >>
6. Check tabs, visors – CL
LES O2 – ON

If **AV BAY FIRE**:
7. FIRE SUPPR – ARM
pb – DISCH (push until lit)
8. If Ascent: AV BAY FAN (two) – OFF
9. If FIRE in Bay:
1: TACAN 1, MLS 1 – OFF
2: TACAN 2, MLS 2,3 – OFF
3: TACAN 3 – OFF

If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, facing page)
12. Unpwr source of smoke

If smoke persists or source cannot be unpwrd:

WARNING
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>

If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

Cont next page

OV103,104

FREON FLOW LOW

1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MODE – AUTO
   CNTLR LOOP – AUTO A(B) (wait 90 sec)

If flow still low in both loops:

3. Go to LOSS OF FREON LOOP(s)

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH
4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF, A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT
8. GPS 1,3 – OFF

If RTLS:

9. RDR ALTM 1 – OFF

If TAL/AOA/ENTRY and V > 15K:

10. All RA/MLS – OFF
11. Use one FLT CNTLR PWR

⇒ 12. DC UTIL PWR – OFF

♦ 13. FCS CH 4 – OFF

14. GPC 4 – STBY,HALT,PWR – OFF
15. FF4,FA4 – OFF
16. ANNUN BUS SEL ACA 2/3 – OFF

♦ When MPS dump complete:

17. MPS ENG PWR (six) – OFF
18. EIU (three) – OFF
19. MEC 1 – OFF, wait 2 sec, then:
20. MEC 2 – OFF

♦ 21. G50 √GPS, INCORPORATE

22. At M = 2.9: √RA 2 – ON
23. If reqd: Use one MLS, GNC I/O RESET

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

EVAP OUT TEMP HIGH (Rads cold soaked)

If temp high in only one loop (snsr failed) >>

1. If V < 12K:
   RAD BYP VLV LOOP 1 – MAN,BYP
   NH3 CNTLR B – PRI/GPC >>
2. FLASH EVAP CNTLR PRI B(A) – OFF
   A(B) – ON (wait 30 sec)
   If T decr >>
3. FLASH EVAP CNTLR PRI A(B) – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr:
   TOP EVAP HTRS (three) – OFF >>
4. HI LOAD EVAP – OFF
   DUCT HTR sel – OFF (wait 30 sec)
   If T decr >>
5. TOP EVAP HTRS (three) – OFF
   RAD BYP VLV MODE (two) – AUTO
   CNTLR LOOP (two) – AUTO B(A) (wait 90 sec)

EVAP OUT TEMP HIGH (Rads *not* cold soaked)

If temp high in only one loop (snsr failed) >>

If V > 12K:

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)
   If T decr >>
2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr >>
3. HI LOAD EVAP – OFF
   If T decr >>
4. RAD BYP VLV (four) – MAN,RAD FLOW

⇒ 5. NH3 CNTLR B – SEC/ON (wait 60 sec)
6. If T decr >>
7. NH3 CNTLR B – OFF, A – SEC/ON

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. ♦ FREON PUMP LOOP 1,2 (two) – B
   NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
12. NH3 CNTLR A,B (two) – OFF

If V > 12K and FLASH EVAP CNTLR PRI A(B) previously selected:

13. FLASH EVAP CNTLR PRI B(A) – GPC >>

If V < 12K:

14. RAD BYP VLV MODE 1,2 (two) – AUTO
15. CNTLR LOOP 1,2 (two) – OFF
    AUTO A(B)

FREON LEAK

1. ♦ FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. ♦ (Aff) FREON ISOL LOOP 1(2) – RAD
   Hold for 5 sec
4. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop >>

If (aff) FREON LOOP 1(2) ACCUM QTY not decr:

When V<12K and rads cold soaked:

In good loop:

5. √RAD BYP VLV MODE 2(1) – AUTO
6. √RAD CNTLR LOOP 2(1) – AUTO B
7. NH3 CNTLR B(A) – PRI/GPC

FIRE/SMOKE

SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
two SMOKE DETN lt on, or
two CONC > 2, or
one SMOKE DETN lt on and
other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lt and assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)

If SMOKE DETN B(A) test good (lt on):
3. SMOKE DETN CKT TEST – OFF
4. SNSR – RESET >>

If SMOKE DETN B(A) test bad (no lt):
5. Go to step 6

If none of above >>
6. Check tabs, visors – CL
LES O2 – ON

If **AV BAY FIRE**:
7. FIRE SUPPR – ARM
pb – DISCH (push until lit)
8. If Ascent: AV BAY FAN (two) – OFF
9. If FIRE in Bay:
1: GPS 1, MLS 1 – OFF
2: MLS 2,3 – OFF
3: GPS 3 – OFF

If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, facing page)
12. Unpwr source of smoke

If smoke persists or source cannot be unpwrd:

WARNING
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>

If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

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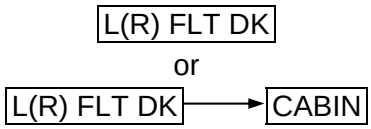
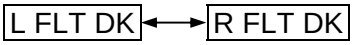
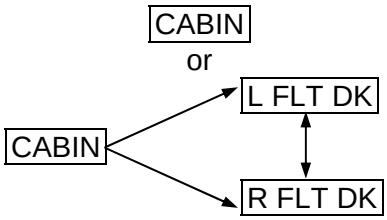
ALARM SEQUENCE	SOURCE AREA
	PS(MS), L(R) CONSOLE
	AFT FLT DK, MIDDECK
	FWD FLT DK, WCS, LEB

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EPS

EPS

MN BUS UNDERVOLTS/FC VOLTS PLT

If MN V < 26.4, FC V < 26.6, FC A > 480 (2 of 3)
(SHORT or degraded FC):
1. MSTR MADS PWR – OFF
2. If aff BUS tied – untie
3. PL PRI (three) – OFF
⇒ 4. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF

If FC VOLTS < 32 (FC SHORT)
5. (Aff) FC REAC VLV – CL
6. Go to FC SHUTDN (do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (BUS SHORT)
7. Go to BUS LOSS ACTION >>

If MN V < 26.4 and FC V > 32 and FC A < 20
(FC disconnect, check APUs):
8. MSTR MADS PWR – OFF
9. PL PRI (three) – OFF
10. FC/MN BUS – ON

If FC3 aff:
11. PL PRI MNC – ON
FC3 – ON
12. If MNC V < 26.4: PL PRI (three) – OFF

If 1st FC failure:
13. Perform BUS TIE, then:
If MN BUS recovered:
14. GNC I/O RESET

If aff FC VOLTS > 32:
15. Go to FC SHUTDN

EPS

AC VOLT HIGH

If AC V > 123 and F9 V > 123:
⇒ 1. (Aff) AC BUS SNSR – OFF
2. cb AC CONTR – cl
INV/AC BUS – OFF
INV PWR – OFF
cb AC CONTR – op
3. √H2O PUMP LOOP 2(1) – ON
4. Go to aff BUS LOSS

AC VOLT LOW or OVERLOAD **PLT**

3Φ/AC ESS

⇒ If amps > 14 or V < 110:

If single Φ amps > 14 or V > 10:

1. cb AC CONTR – cl
   INV/AC BUS – OFF
   INV PWR – OFF
   cb AC CONTR – op
2. If other Φ amps > 14:
   Go to step 3

If multi Φ (bus short):

3. (Aff) cb AC CONTR (three) – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR (three) – op
   AC BUS SNSR – OFF
4. Go to aff BUS LOSS

MN
AC

3Φ AC MOTORS STOPPED **PLT**

1. (Aff) AC BUS SNSR – OFF
2. Determine AC BUS:
   FC1 and FREON PUMP 2B: AC1
   FC2 and FREON PUMP 1B: AC2
   FC3 and CAB FAN A: AC3
3. (Aff) FC – STOP

If AC3 aff:

4. AV BAY 3 FAN B – OFF, A – ON
5. CAB FAN A – OFF

Isolate aff ΦB(ΦC,ΦA):

6. (Aff) cb AC CONTR – cl
7. INV/AC BUS – OFF

If AC1(2,3) aff and AV BAY 3(2,3) FAN $\Delta P \geq 0.5$:

8. Go to step 16 (bad Φ isolated)

9. (Aff) INV/AC BUS – ON
10. cb AC CONTR – op
11. Repeat from step 6 to isolate aff ΦC(ΦA), then:

Drop aff AC bus (three Φs):

12. (Aff) cb AC CONTR (three) – cl
13. INV/AC BUS – OFF
14. INV PWR – OFF
15. Go to aff BUS LOSS >>

Bad Φ isolated:

16. (Aff) FC – START (10 sec or ΔP tb-gray)
17. Perform aff BUS LOSS and if AC1(AC2) aff >>
18. If AC3 aff: CAB FAN B – ON

⇒ **AC SINGLE Φ**

AC1	**ΦA**	BLR CNTLR/HTR 1 – A When V = 12K: RAD CNTLR LOOP (two) – AUTO A
	ΦB	When V = 12K: RAD CNTLR LOOP (two) – AUTO A
	ΦC	BLR CNTLR/HTR 3 – B
AC2	**ΦA**	BLR CNTLR/HTR 1 – B
	ΦB	SIG CONDR FREON A – AC3
	ΦC	BLR CNTLR/HTR 2 – A
AC3	**ΦA**	BLR CNTLR/HTR 2 – B
	ΦB	SIG CONDR FREON B – AC2
	ΦC	BLR CNTLR/HTR 3 – A

ANY AC2 SINGLE Φ **CDR**

⇒ FREON PUMP LOOP 1 – A

BUS TIE (do not tie bus short, check APUs)
If MN Volts > 20: Bus Tie >>
If MN Volts < 20 (do not BUS TIE Pre MECO for 1st FC):

1. (Aff) AC BUS SNSR – OFF
2. cb AC CONTR (three) – cl
3. INV/AC BUS – OFF (tb-OFF)
4. INV PWR – OFF (tb-OFF)
5. If MNC(B) dn, CAB FAN A(B) – OFF
6. Bus Tie
7. INV PWR – ON (tb-ON)
8. ♦ INV/AC BUS – ON (tb-ON)
9. cb AC CONTR (three) – op
10. GNC I/O RESET
11. Post MECO: (Aff) AC BUS SNSR – AUTO TRIP
12. Post PWRDN: √CAB FAN A(B) – ON

MN SUB

ESS BUS V LOW **PLT**

If verified by F9 voltmeter:

1. Perform FC SHUTDN (< 9 min), then:
2. Go to aff ESS BUS LOSS

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk)
ESS 3AB	**O13**	1. GPC CAM Lights lost 2. Do not engage BFS ⇒ 3. BFS GPC OUTPUT – TERM

3Φ/AC ESS

MNA or AC1 Multi Φ **CDR**

1. FLASH EVAP CNTLR PRI B – OFF, A – GPC
2. TOP EVAP HTR DUCT sel – B
3. HI LOAD DUCT HTR sel – B

⇒ 4. FREON PUMP LOOP 2 – A

5. AV BAY 3 FAN A – ON, B – OFF

If rads cold soaked:

When V ≤ 12K:

6. RAD BYP VLV MODE 1,2 (two) – AUTO
7. RAD CNTLR LOOP 1,2 (two) – AUTO A
8. ANNUN BUS SEL ACA 1 – MNB
9. NWS – 2
10. BFS G51 AA1 – desel
11. MS AUD CNTL – PS (MS can't talk)

FAILED: NH3 A PRI, NWS 1,
UHF HI PWR XMIT, L HUD, AUTO B

MNB or AC2 Multi Φ

⇒ 1. AV BAY 1 FAN A – ON, B – OFF
2. FREON PUMP LOOP 1 – A
3. HUM SEP A – ON, B – OFF
4. IMU FAN A – ON, B – OFF
5. AV BAY 2 FAN B – ON, A – OFF
6. √cb AC3 ΦA LG SNSR 1 – cl
7. ANNUN BUS SEL ACA 2/3 – MNC
8. BFS G51 AA2, RGA 2 – desel

FAILED: NH3 B SEC, RA 2, NWS 2
PLT DRAG CHUTE ARM
S-BD PM 1 (NO PNL,CMD)

MNC or AC3 Multi Φ

1. FLASH EVAP CNTLR PRI A – OFF, B – GPC

⇒ 2. CAB FAN B – ON, A – OFF

3. √AV BAY 3 FAN B – ON
4. H2O PUMP LOOP 1 – ON, 2 – OFF
5. √cb AC2 ΦA LG SNSR 2 – cl
6. BFS G51 RGA 3 – desel

FAILED: NH3 A SEC, B PRI
CDR DRAG CHUTE ARM

SUBBUS [MNA O14]

1. NWS – 2

If rads cold soaked:

When V ≤ 12K:

2. RAD BYP VLV MODE 1,2 (two) – AUTO
3. RAD CNTLR LOOP 1,2 (two) – AUTO A

FAILED: AUTO B

SUBBUS [APC4(5,6) or ALC1(2,3)]

SUBBUS APC or ALC	4 1	5 2	6 3
1. FLASH EVAP CNTLR	PRI A – GPC		√PRI B – GPC

MNA or AC1 Multi Φ **PLT**

1. MSTR MADS PWR – OFF
2. Perform FC SHUTDN (within 9 min), then:

⇒ 3. BLR CNTLR/HTR 1 – A
3 – B

FAILED: TAC 1
MLS 1, RA 1, NWS 1, L HUD

MNB or AC2 Multi Φ

1. MSTR MADS PWR – OFF
2. Perform FC SHUTDN (within 9 min), then:

⇒ 3. BLR CNTLR/HTR 2 – A
1 – B

4. SIG CONDR FREON A – AC3

FAILED: TAC 2
MLS 2, RA 2, NWS 2
PLT DRAG CHUTE ARM
S-BD PM 1 (NO PNL,CMD)

CNTL

MNC or AC3 Multi Φ

1. S-BD PM CNTL – PNL,CMD
2. Config per COMM COVER (ASC) BFS G51:
   TDRS – ITEM 46 EXEC (*)
   STDN-HI – ITEM 47 EXEC (*)
   SGLS – ITEM 49 EXEC (*)
3. MSTR MADS PWR – OFF
4. Perform FC SHUTDN (within 9 min), then:

⇒ 5. BLR CNTLR/HTR 3 – A
2 – B

6. SIG CONDR FREON B – AC2

FAILED: TAC 3, MLS 3, R HUD
CDR DRAG CHUTE ARM

SUBBUS

SUBBUS APC or ALC	4 1	5 2	6 3
⇒ 1. BLR CNTLR/HTR	1 – A 3 – B	2 – A 1 – B	3 – A 2 – B

CNTL BUS V LOW/CNTL BUS RPC **PLT**

> WARNING
> If VISIBLE FIRE/SMOKE AT ANY TIME, cb CNTL BUS AB1/2/3(BC1/2/3,CA1/2/3) – op (pnl R14:B)

1. Identify BUS (√BUS LOSS ID)

⇒ If bus critical (per MCC):

♦ 2. >>

♦ If one CNTL BUS RPC tripped (*****):

Aff CNTL BUS:

AB1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
3.	**A**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS AB1/2/3 – op
4.	**B**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS AB1/2/3 – op

BC1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
5.	**B**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS BC1/2/3 – op
6.	**C**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS BC1/2/3 – op

CA1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
7.	**C**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS CA1/2/3 – op
8.	**A**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS CA1/2/3 – op

♦ If no CNTL BUS RPC tripped (no *****):

	aff CNTL BUS	Pnl R1 action (RESET, hold w/sw reten device)
9.	**AB1(2,3)**	CNTL BUS PWR MNA,MNB (two) – RESET
10.	**BC1(2,3)**	CNTL BUS PWR MNB,MNC (two) – RESET
11.	**CA1(2,3)**	CNTL BUS PWR MNA,MNC (two) – RESET

MN SUB

Cont next page

♦ 12. Perform aff CNTL BUS LOSS, then:

If pwr reqd (< 3 sec) for crit function:
13. Hold crit function sw
For tripped RPC:
14. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn
15. ⇒

CNTL BUS LOSS **CDR**

AB1	⇒ 1. Use R TRIM & BDY FLP sws FAILED: NH3 A SEC, FES PRI B GPC
AB2	⇒ 1. CDR disp sws – green dot FAILED: NH3 B SEC, L HUD, FES PRI B ON, H2O LOOP 1, A ON
AB3	⇒ If BFS engage reqd: 1. Use PLT's RHC, then GPCs 1,2,4 – STBY,HALT 2. BFS I/O RESET
BC1	⇒ 1. Use R TRIM & BDY FLP sws 2. BFS G51 RGA 2 – desel FAILED: R HUD, CDR DRAG CHUTE DPY/JETT
BC2	⇒ If TAL/AOA/RTLS: 1. NH3 CNTLR B – OFF A – PRI/GPC FAILED: NH3 B PRI, FES SEC GPC, H2O LOOP 1, B ON, CDR DRAG CHUTE DPY/JETT
BC3	⇒ FAILED: NH3 A PRI, FES SEC ON
CA1	1. No BFS engage GPC 3,5 ⇒ ♦ 2. BFS GPC OUTPUT – TERM 3. BFS G51 RGA 3 – desel FAILED: NH3 B SEC, FES PRI A GPC, H2O LOOP 2 GPC, PLT DRAG CHUTE DPY/JETT
CA2	⇒ FAILED: NH3 A SEC, FES PRI A ON, PLT DRAG CHUTE DPY/JETT

CNTL FC

CNTL BUS LOSS PLT

AB1	⇒	1. Use R TRIM & BDY FLP sws 2. BLR CNTLR/HTR 1 – A
AB2		1. G23 RCS FWD MANF VLVS 1 OVRD – ITEM 40 EXEC (CL) ⇒ 2. BLR CNTLR/HTR 1 – A FAILED: L HUD
AB3		1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC If BFS engage reqd: 2. Use PLT's RHC, then GPCs 1,2,4 – STBY, HALT 3. BFS I/O RESET ⇒ 4. BLR CNTLR/HTR 1,3 (two) – B
BC1	⇒	1. Use R TRIM & BDY FLP sws 2. BLR CNTLR/HTR 2 – A FAILED: R HUD, CDR DRAG CHUTE DPY/JETT S-BD PM 1 (NO PNL,CMD)
BC2		1. S-BD PM CNTL – PNL,CMD 2. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*****) STDN-HI – ITEM 47 EXEC (*****) SGLS – ITEM 49 EXEC (*****) 3. G23 RCS FWD MANF VLVS 2 OVRD – ITEM 41 EXEC (CL) 4. PLT disp sws – green dot ⇒ 5. Use L TRIM & BDY FLP sws 6. BLR CNTLR/HTR 2 – A FAILED: CDR DRAG CHUTE DPY/JETT
BC3		1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC ⇒ 2. BLR CNTLR/HTR 1, 2 (two) – B
CA1		1. No BFS engage GPC 3,5 ⇒ ♦ 2. BFS GPC OUTPUT – TERM 3. BLR CNTLR/HTR 3 – A FAILED: PLT DRAG CHUTE DPY/JETT
CA2		1. G23 RCS FWD MANF VLVS 3 OVRD – ITEM 42 EXEC (CL) ⇒ 2. Use L TRIM & BDY FLP sws 3. BLR CNTLR/HTR 3 – A FAILED: PLT DRAG CHUTE DPY/JETT
CA3	⇒	BLR CNTLR/HTR 2,3 (two) – B

Cont next page

FC REAC VLV CLOSED **PLT**

1. FC REAC VLV (three) – OP
2. Perform BUS TIE, then:

If FC COOL P < 50:

3. Go to FC SHUTDN

FC pH ↓ 1(2,3) or FC DELTA V 1(2,3)

If pH ↓ and FC SS 1(2,3) ΔV > 150
or FC SS ΔV > 150 and incr:

1. Perform BUS TIE, then:
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

If pH ↓ only:

♦ 5. Go to BUS TIE

FC STACK T

1. MSTR MADS PWR – OFF

If STACK T > 243 and incr:

2. If 2nd FC: Go to 2nd FC SHUTDN >>
3. PL PRI (three) – OFF

If aff FC amps < 170 or > 360:

4. Go to MN BUS UNDERVOLTS/FC VOLTS, step 4 >>

♦ 5. Perform BUS TIE, then:
6. ESS BUS SOURCE FC – OFF
7. FC/MN BUS – OFF

If aff FC VOLTS < 32 or STACK T not decr:

8. (Aff) FC REAC VLV – CL
9. FC – STOP after COOL P < 15 and STACK T < 243
10. Go to LOSS OF 1 FC PWRDN

FC EXIT T

1. MSTR MADS PWR – OFF
2. Perform BUS TIE, then:

⇒ If EXIT T > 164 and incr or < 131 and no comm:

3. Go to FC SHUTDN

FC EMER

FC COOLANT PUMP ΔP LOW **PLT**

1. FC – START (10 sec or ΔP tb-gray)

⇒ ♦ If EXIT T > 164 and not decr or
RDY tb – bp (30 sec after START) or
FC PUMP cb(s) – op (pnl L4:C):
2. Go to FC SHUTDN >>

If EXIT T norm, RDY tb – gray, and no comm:

3. Monitor AC amps
4. FC – STOP

If AMPS decr 0.7-0.9 AMP/Φ:

5. FC – START (hold 30 sec if ΔP tb-bp)
6. If AMPS incr 0.7-0.9 AMP/Φ >>

7. Go to FC SHUTDN

FC COOL P

1. Perform BUS TIE, then:

⇒ If COOL P < 75: >>

If COOL P incr and not 100 (H),
or FC COOL PUMP = ΔP (intermittent),
or STACK/EXIT T unstable,

2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN

CNTL FC

FC SHUTDN (1st) (< 9 min)

1. MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE, then:
   If ORB (not deorb prep), kW > 18:
   MN BUS TIE (three) – ON
3. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
4. FC REAC VLV – CL

♦ Go to LOSS OF 1 FC PWRDN

LOSS OF 1 FC PWRDN (GRTLS/TAL) PLT

1. PRI PL (three) – OFF
   AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
   One MDU – OFF

⇒ If TAL:
When V < 19K:
3. MPS ENG PWR (six) – OFF

LOSS OF 1 FC PWRDN (ENTRY)

1. If V < 15K >>
2. IDP/CRT4, one MDU,FLT CNTLR PWR – OFF
3. TACAN/RA/MLS – OFF

If middeck PL on:
4. cb MNB UTIL PWR – op (pnl O15:C)

♦ 5. PRI PL (three) – OFF
AFT PL (two) – OFF

EMER PWRDN

FC REAC (three) – CL

FC/MN BUS (BEST FC LAST) – OFF

ESS BUS SOURCE FC (three) – OFF

√TABS/VISOR/GREEN APPLE

FC

2nd FC SHUTDN (GRTLS/TAL) **PLT**

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN (GRTLS/TAL)

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. Go to LOSS OF 2nd FC PWRDN (GRTLS/TAL)

2nd FC SHUTDN (ENTRY)

1. Have CDR go to LOSS OF 2nd FC PWRDN (ENTRY)
2. O2/H2 HTRS (twelve) – OFF (pnl R1)
   PL pwr (seven) – OFF
3. √MSTR MADS PWR – OFF

If aff FC/MN BUS is tied:

4. MN BUS TIE (two) – OFF
5. If only MNA(B,C) pwrd: Secure APU 2(3,1)
6. Perform BUS TIE (good FC/BUS to another BUS), then:
7. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
   FC REAC VLV – CL

FC EMER

OV103,104

FC SHUTDN (1st) (< 9 min)

1. MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE, then:
   If ORB (not deorb prep), kW > 18:
   MN BUS TIE (three) – ON
3. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
4. FC REAC VLV – CL

♦ Go to LOSS OF 1 FC PWRDN

LOSS OF 1 FC PWRDN (GRTLS/TAL) PLT

1. PRI PL (three) – OFF
   AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
   One MDU – OFF

⇒ If TAL:
When V < 19K:
3. MPS ENG PWR (six) – OFF

LOSS OF 1 FC PWRDN (ENTRY)

1. If V < 15K >>
2. IDP/CRT4, one MDU,FLT CNTLR PWR – OFF
3. RA/MLS – OFF

If middeck PL on:
4. cb MNB UTIL PWR – op (pnl O15:C)

♦ 5. PRI PL (three) – OFF
AFT PL (two) – OFF

EMER PWRDN

FC REAC (three) – CL
FC/MN BUS (BEST FC LAST) – OFF
ESS BUS SOURCE FC (three) – OFF
√TABS/VISOR/GREEN APPLE

FC

2nd FC SHUTDN (GRTLS/TAL) **PLT**

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN (GRTLS/TAL)

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. Go to LOSS OF 2nd FC PWRDN (GRTLS/TAL)

2nd FC SHUTDN (ENTRY)

1. Have CDR go to LOSS OF 2nd FC PWRDN (ENTRY)
2. O2/H2 HTRS (twelve) – OFF (pnl R1)
   PL pwr (seven) – OFF
3. √MSTR MADS PWR – OFF

If aff FC/MN BUS is tied:

4. MN BUS TIE (two) – OFF
5. If only MNA(B,C) pwrd: Secure APU 2(3,1)
6. Perform BUS TIE (good FC/BUS to another BUS), then:
7. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
   FC REAC VLV – CL

FC EMER

LOSS OF 2nd FC PWRDN
(GRTLS/TAL) **CDR**

1. LES O2 – OFF, visors – OP
2. L1: Select one FREON PUMP on good FC/ MN BUS and place other pump to OFF
   Switch OFF all HUM SEPS, IMU FANS, H2O PUMPS, AV BAY FANS, CAB FANS, FES HTRS
3. Switch off all but one IDP/CRT with four MDUs

After BUS TIE, if MNC unpwrd:

4. FLASH EVAP CNTLR PRI A – OFF
   B – ON

⇒ 5. Assign all strings to GPC 1 OPS 30X(60X) PRO

6. Unassigned GPCs MODE – STBY (tb-bp),HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)
   GPC PWR – OFF
7. IMU (one) – OFF (choose previously failed IMU, if any)
8. IMU FAN (one) – ON
9. H2O PUMP (one) – ON
10. AV BAY 1,2 FAN (two) – ON (check fan ON in each bay with a pwrd GPC)

After MPS Pwrdn:

If MNA unpwrd:

11. FREON PUMP LOOP 1 – B
    2 – A
12. TOP EVAP HTR DUCT sel – B
    HI LOAD DUCT HTR sel – B

If MNB(C) unpwrd:

13. FREON PUMP LOOP 1,2 (two) – A(B)
14. TOP EVAP HTR DUCT sel – A
    HI LOAD DUCT HTR sel – A

If TAL:

15. HUM SEP (one) – ON
16. CAB FAN (one) – ON

2FC CRYO

LOSS OF 2nd FC PWRDN (GRTLS/TAL) **PLT**

⇒ ♦ When MPS Dump complete:
1. MPS ENG PWR (six) – OFF
   EIU (three) – OFF
2. MEC 1 – OFF, wait 2 sec, then
   2 – OFF

If MNA(MNB) unpwrd:
3. O2,H2 TK1 HTRS B (two) – AUTO

If MNC unpwrd:
4. O2,H2 TK2 HTRS B (two) – AUTO
5. Safe Payload, if reqd
6. Go to APU RESTART for secured APU

LOSS OF 2nd FC PWRDN (ENTRY) **CDR**

1. MDM PL1 – OFF
2. FCS CH 4 – OFF
   GPC MODE 4 – STBY,HALT
   PWR 4 – OFF
   MDM FF4,FA4 – OFF
3. HUM SEP (two) – OFF
4. FLASH EVAP FDLN HTR SPLY (two) – OFF
5. TOP EVAP HTR NOZ L,R (two) – OFF
   DUCT sel – OFF
   HI LOAD DUCT HTR sel – OFF
6. If V > 10K: √CAB FAN A(B) – ON
7. M = 2.9: CAB FAN (two) – OFF
   AV BAY FAN (six) – OFF

O2(H2) CRYO P/T HIGH **PLT**

O2(H2) TK HTRS (two) – OFF

CRYO O2(H2) LEAK (three or more tanks aff)

Use meter if CRT data OSL

1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

⇒ If TK1 and TK2 P decr slowly (HTR logic fail):

3. If QTY > 55%: TK3 HTRS B – AUTO
4. MANF VLV 1,2 (two) – OP >>
5. Perform aff MN BUS TIE, then:

If O2(H2) TK1(2) aff (open unaff manf):

6. O2(H2) TK2(1) – OP

If O2 TK1(2) aff:

7. O2 SYS 1(2) SPLY – CL
8. If O2 TK1(2) P now incr (PCS leak): >>
9. If O2 leak: (Aff) TK HTRS B – AUTO

If aff TK P not incr:

10. If TK3 aff: √HTRS A(&B if O2) – AUTO
11. Perform aff FC SHUTDN (post COOL P alarm if O2 leak), then:

If TK3 aff and P not decr within 2 min (FC leak):

12. MANF VLV 1,2 (two) – OP (ASAP) >>
13. (Aff) TK HTRS A,B (two) – OFF

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OMS

OMS

OMS TEMP DURING DUMP

1. G51 INH ICNCT
If aff OMS FU IN P ≥ L: 230 R: 230
| 2. Go to ENG FAIL >>
If aff OMS FU IN P ≤ L: 214 R: 212
3. Go to PRPLT FAIL >>
4. Otherwise, snsr fail

Pc LOW DURING DUMP

1. ENG VLV < 70%: Go to ENG FAIL >>
2. ENG VLV > 70%: G51 INH ICNCT
If aff OMS OX IN P > 227:
| 3. Go to ENG FAIL >>
If aff OMS OX IN P ≤ 136:
4. Go to PRPLT FAIL >>
5. Otherwise, snsr fail

ENG FAIL (DURING DUMP)

1. (Failed) OMS ENG – OFF
⇒ 2. √G51 INH ICNCT
3. Balance prop by XFEED

PRPLT FAIL (DURING DUMP)

⇒ (Both) OMS ENG (two) – OFF

OMS SECURE
If leak and
M > 24 or M < 3.5:
1. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
2. (Aff) OMS ENG – OFF
XFEED (two) – CL
TK ISOL (two) – CL
He PRESS (two) – CL

If leak isolated or
FU TK leak or
M < 24 & M > 3.5:
3. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

OMS XFEED: R to L
1. L,R OMS XFEED (four) – OP
2. L OMS TK ISOL (two) – CL
He PRESS/VAP ISOL (two) – CL

OMS XFEED: L to R
1. L,R OMS XFEED (four) – OP
2. R OMS TK ISOL (two) – CL
He PRESS/VAP ISOL (two) – CL

OMS XFEED RETURN: OMS to OMS
L,R OMS TK ISOL (four) – OP
XFEED (four) – CL

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RCS

RCS

RCS JET FAIL (LEAK)
If OX/FU Qty diverging:
(Aff) RCS MANF ISOL – CL

RCS JET FAIL (ON)
1. (Aff) RCS MANF ISOL – CL
If MANF P > 130 and stable (false alarm):
2. (Aff) RCS MANF ISOL – OP
⇒ 3. √AFT RCS RM LOSS

RM DLMA MANF
If (aff) MANF tb – OP or sw not thrown:
1. If FRCS: √MCC
2. If ARCS: G51 RCS RM MANF CL OVRD – ITEM 41 EXEC
3. If (aff) MANF tb – bp: (aff) MANF – GPC

RCS JET FAIL (OFF)
If > one jet/pod/dir failed:
1. G23 resel jets
2. DES INH (*) (reprioritize)

AFT RCS RM LOSS
If loss of jet RM and > 3Y,2P jets/pod/dir:
1. G23 aff jet DES INH (*) (reprioritize)
2. If yaw jet: desel >>
If total RM loss (BCE) and < 3Y,2P jets/pod/dir:
3. Aff jet DES INH (*) (reprioritize)
4. Aff MANF VLVS STAT OP – OVRD

LOW QBAR AFT RCS LK (GRTLS/304/305)

(√He P decr: CRT and meter)
(√$\bar{q}$ < 20: CRT)
1. If TK P '↑': Go to TK P HIGH >>

OX Leak & M > 24		2. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
RTLS/TAL		3. G51 AFT RCS – INH (ITEM 13)
		4. (Aff) 3/4/5 MANFs – CL 5. (Aff) 3/4/5 TK ISOLs – CL
	Single MANF leak	6. TK ISOL(s) – OP (tb-OP),GPC 7. (Good) Pri MANF (one) – OP
	Two MANF P decr (TK leg leak)	8. (Leaking leg) XFEED (one) – CL
	No MANF P decr	9. TK ISOL(s) – OP (tb-OP),GPC 10. Pri MANFs (two) – OP 11. Repeat steps 4-10 for 1/2 leg
Leak not found		12. (Aff) RCS He PRESS (two) – CL
	He P decr (He TK leak)	13. RCS He PRESS (two) – OP 14. When He P < 456: MSTR XFEED – feed from good side
	OX/FU TK P diverge (Prplt TK leak)	15. RCS He PRESS (two) – OP 16. When QTY = 0: MSTR XFEED – feed from good side and (aff) RCS He PRESS (two) – CL
	Leak not found	17. RCS He PRESS (two) – OP
		He P decr (He leg leak)	18. RCS He PRESS (two) – CL 19. Cycle He PRESS so 220 < TK P < 245 20. When He P < 456: MSTR XFEED – feed from good side
		Leak not found	21. Assume MANF 5 leak
3.5 < M < 24			22. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

AFT RCS LK (GRTLS/304/305)

(√He P decr: CRT and meter)

1. If TK P '↑': Go to TK P HIGH >>
2. If $\bar{q}$ < 20 or control problems:
   Go to LOW QBAR AFT RCS LK >>

		3. ENTRY MODE – NO Y JET (R/Y CSS; expect sluggish control)
RTLS/TAL		4. G51 AFT RCS – INH (ITEM 13)
		5. (Aff) RCS MANF ISOL (five) – CL XFEED (two) – CL TK ISOL (all) – CL HE PRESS (two) – CL
	(N/A RTLS)	6. G51 ELEVON FIXED – ITEM 18 EXEC (*)
	Single MANF leak	7. Return to normal config except bad MANF ENTRY MODE – AUTO >>
	Two MANF P decr (TK leg leak)	8. Return to normal config except bad leg ENTRY MODE – AUTO >>
	He P decr (He TK leak)	9. Return to normal config ENTRY MODE – AUTO 10. When He P < 456: MSTR XFEED – feed from good side >>
	OX/FU TK P diverge (Prplt TK leak)	11. Return to normal config ENTRY MODE – AUTO 12. When QTY = 0: MSTR XFEED – feed from good side and (aff) RCS He PRESS (two) – CL >>
	Leak not found	13. RCS He PRESS (two) – OP
	He P decr (He leg leak)	14. Return to normal config ENTRY MODE – AUTO 15. RCS He PRESS (two) – CL 16. Cycle He PRESS so 220 < TK P < 245 17. When He P < 456: MSTR XFEED – feed from good side >>
	Leak not found (Assume MANF 5 leak)	18. Return to normal config except MANF 5 ENTRY MODE – AUTO >>

RCS TK P HIGH (FU or OX) (√MANF P)
1. RCS He PRESS (two) – CL
2. A – OP

If He P decr:
3. RCS He PRESS A – CL
   B – OP

XFEED: RCS to RCS

If AUTO XFEED:
1. L,R RCS TK ISOL (six) – GPC
   XFEED (four) – GPC
2. OMS XFEED (four) – CL
3. MSTR RCS XFEED – FEED FROM L(R) >>

If MANUAL XFEED:
4. L,R OMS XFEED (four) – CL
5. RCS XFEED (four) – OP
6. (Receiving) RCS TK ISOL (three) – CL
   He PRESS (two) – CL
7. MSTR RCS XFEED – FEED FROM L(R)

RCS SECURE

If OX leak and
M > 24 or M < 3.5:
1. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
2. RCS MANF ISOL (five) – CL
   XFEED (two) – CL
   TK ISOL (all) – CL
   He PRESS (two) – CL

If leak isolated or
M < 24 & M > 3.5:
3. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

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MPS

MPS

MPS He P/MPS C&W LIGHT
PNEU REG

If M > 2.4: (Aff) MPS He ISOL – CL

RESERVED

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MULTIPHASE SYSTEMS CUE CARDS

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CC 10-1 AESP/ALL/A,E/GEN O

TOP

EMER PWRDN

FC REAC (three) – CL
FC/MN BUS
(BEST FC LAST) – OFF
ESS BUS SOURCE FC
(three) – OFF
√TABS/VISOR/GREEN APPLE

FC SHUTDN (1st) (< 9 min)

1. MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE, then:
   If ORB (not deorb prep), kW > 18:
   MN BUS TIE (three) – ON
3. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
4. FC REAC VLV – CL
   ♦ Go to LOSS OF 1 FC PWRDN

BUS TIE (do not tie bus short, check APUs)
If MN Volts > 20: Bus Tie **POWER**
If MN Volts < 20 (do not BUS TIE Pre MECO for 1st FC):

1. (Aff) AC BUS SNSR – OFF
2. cb AC CONTR (three) – cl
3. INV/AC BUS – OFF (tb-OFF)
4. INV PWR – OFF (tb-OFF)
5. If MNC(B) dn, CAB FAN A(B) – OFF
6. Bus Tie
7. INV PWR – ON (tb-ON)
♦ 8. INV/AC BUS – ON (tb-ON)
9. cb AC CONTR (three) – op
10. GNC I/O RESET
11. Post MECO: (Aff) AC BUS SNSR – AUTO TRIP
12. Post PWRDN: √CAB FAN A(B) – ON

AESP-5a/A,O,E/S

TOP
BACK OF 'POWER'

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

AESP-5b/A,O,E/F

TOP

SSME FAIL/SHUTDN

AC BUS SNSR (three) – OFF
If two ENG remaining:
♦ MN ENG LIMIT SHUTDN – ENA,AUTO
If one ENG remaining: (N/A for TAL or OPS 6)
When MPS PRPLT = 5%
MAN THROT
When MPS PRPLT = 2%
MIN THROT (Pc → 67%)
AUTO THROT

MPS DATA

√MCC, accel, He dP/dT,
'MPS H2 OUT P',
'MPS O2 OUT T'
If SSME fail (MCC or three cues):
(Aff) MN ENG SHUTDN pb – push
If three ENG remaining:
♦ MN ENG LIMIT SHUTDN – ENA,AUTO
If no comm:
Assume MPS CMD
If mult (no MECO confirm):
Post MECO:
MN ENG SHUTDN pb (three) – push (simo)

MPS LH2 ULL

♦ If two or three Ps < 28.0 or > 34.0:
MPS LH2 ULL PRESS – OP
When all Ps > 33.0:
MPS LH2 ULL PRESS – AUTO

MPS DUMP INHIBIT

Post MECO:
(Aff) MPS ENG PWR (two) – OFF
LO2(H2) PREVLV – CL

FIRE HOLE UNDER CARD

AESP-11a/A/N

MPS CMD/HYD/ELEC

MPS 1

If two HYD SYS failed:
MN ENG LIMIT SHUTDN – INH
TRAJ disp – Cue SERC, ITEM 6
(EXEC if gimbaling eng fails)

If:	When:	Shut down:
2 Pcs stuck > 85% & 3-ENG RTLS	MECO -2:00	1 aff MN ENG: CMD: (AC/pb)•• HYD: (pb)
2 HYD SYS failed & Nom/ATO/TAL/ 2-ENG RTLS	Nom/ATO: SE PRESS TAL: SE TAL 2-ENG RTLS: 2 OUT RED	ENG(HYD) / S/D C(1) & R(3) / C L(2) & C(1) / L L(2) & R(3) / R ELEC: (pb)
He lk S/D reqd		Aff MN ENG (pb)
MPS CMD(s)••	Nom/ATO and: 3 ENG: V > 23K 2 ENG: V > 24.5K	Aff MN ENG (AC/pb)•• If 2 CMD: repeat
2 MPS HYD/ELEC & 3-ENG Nom/ATO/TAL	TAL: V > 22.5K RTLS: α = ~~+2~~ -1	1 aff MN ENG: HYD: (pb) ELEC: (pb)
1 MPS HYD/ELEC & 3-ENG Nom/ATO	V > 23K	Aff MN ENG (pb)

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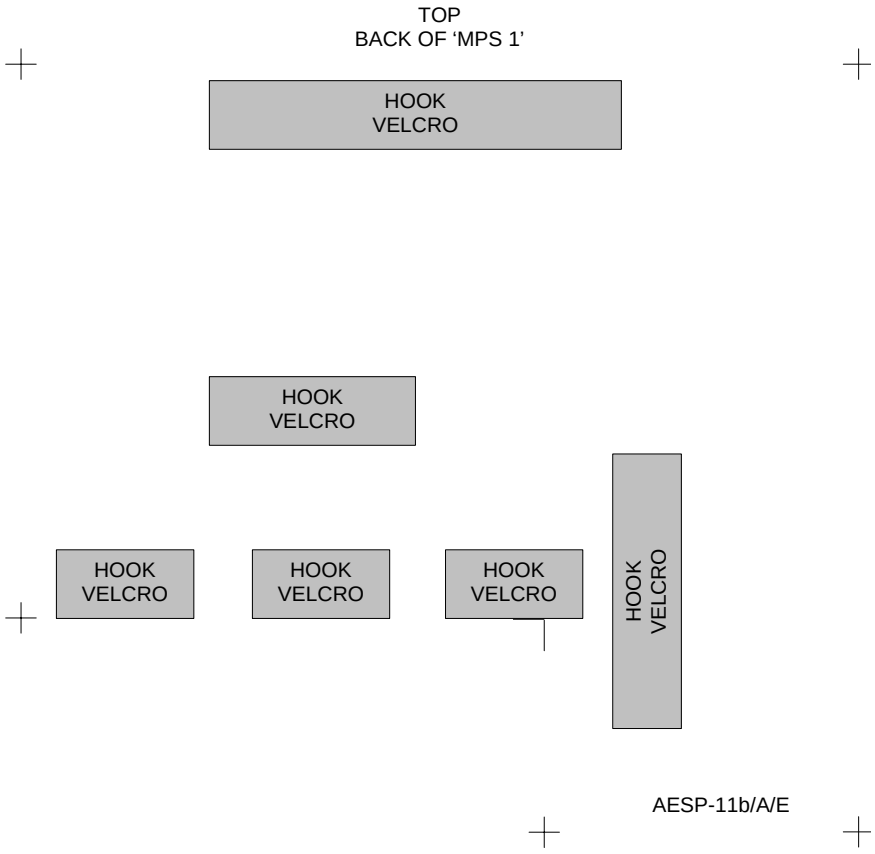
P & I



AESP-11b/A/E

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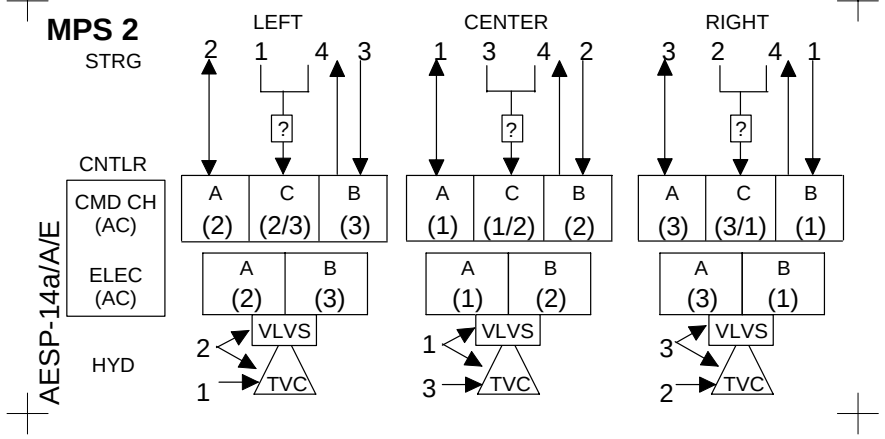
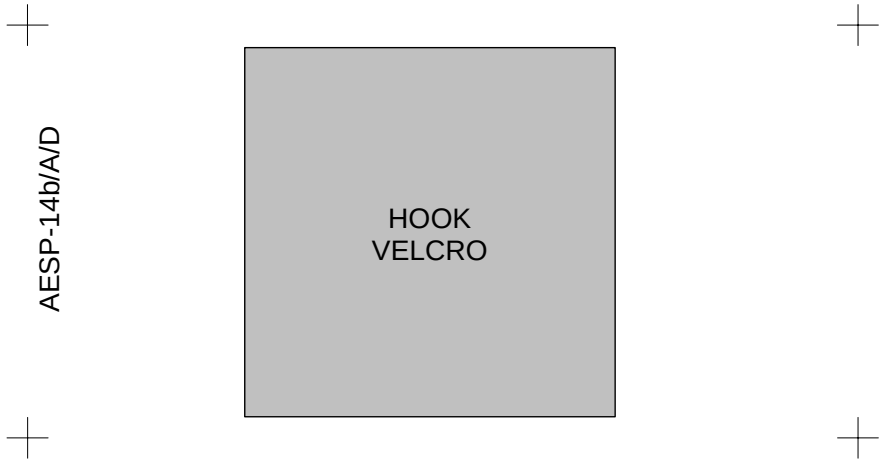
TOP



TOP
BACK OF 'MPS 2'



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TOP

OPS 1/6/TAL TRANSITION RESTRING

		1. Config MC1(3) NBAT as reqd 2. √ G53 aff SURF FDBK – desel (*)
Post MECO		3. ASAP, (aff) GPC(s) – STBY,HALT
	ASC/ RTLS	4. OPS Mode Recall: OPS XXX PRO 5. BFS I/O RESET ⇒G
	TAL	6. OPS 301 PRO 7. BFS, OPS 301 PRO ⇒G

HOOK
VELCRO

AESP-10a/A/G

TOP
BACK OF 'OPS 1/6/TAL TRANSITION RESTRING'

POST OPS 3/GRTLS TRANSITION RESTRING

1. (Aff) GPC(s) – STBY,HALT
2. √ G53 aff SURF FDBK – desel (*****)
3. Config MC1(3) NBAT
4. OPS Mode Recall: OPS XXX PRO
5. BFS I/O RESET

If OPS 3 and String 1(2,3) recovered:

♦ 6. G51 IMU – resel

⇒ 7. Config FCS CH(s) (see Table):

8. G53 config SURF FDBK (see Table):

AESP-10b/E/F

HOOK
VELCRO

AVAILABLE		FCS CH CONFIG			SURF FDBK	
GPCs	FCS CHs	AUTO	ORIDE	OFF	SEL	DESEL
3	4	3		1	3	1*
	3	3		1	3	1*
	2		2	2	2	2
2	4		4		4	
	3		2	2	2	2
	2		2	2	2	2

***If CH 4 – OFF, DO NOT DESEL PASS SURF FDBK**

TOP

MPS He P (Pre MECO)

1. Check dP/dT
If after MECO -60: 2. Shut dn MN ENG per MPS CMD/HYD/ELEC >>
If He REG P ↑ or ↓: 3. (Aff) He ISOL – CL Otherwise: 4. (Aff) He ISOL A – CL If no decr in dP/dT: 5. (Aff) He ISOL A – OP B – CL If no decr in dP/dT: 6. (Aff) He ISOL B – OP
If any ENG failed: 7. (Failed) ENG He I'CNCT – OUT OP
If nonisolatable: 8. Shut dn MN ENG per MPS CMD/HYD/ELEC If/when TK P < 1150 or REG P < 679: 9. (Aff) He I'CNCT – IN OP
If isolated: 10. (Aff) He I'CNCT – IN OP If TK P < 2200 @ MECO -60: 11. Shut dn MN ENG per MPS CMD/HYD/ELEC
Post ET SEP: 12. He I'CNCT(s) – GPC

MPS PNEU TK(REG) P

If after MECO -60: At MECO -30: 1. L ENG He XOVR – OP >>
2. PNEU He ISOL – CL
If PNEU ACUM P decr: At MECO -30: 3. PNEU He ISOL – OP, Wait 5 sec, then: 4. L ENG He XOVR – OP >>
If PNEU TK P decr: 5. PNEU He ISOL – OP

AESP-15a/A/B

TOP
BACK OF 'MPS He P'

HOOK
VELCRO

AESP-15b/A/C

Cont next page

TOP

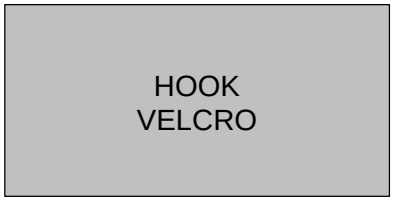
'ET SEP MAN' G51 **ET SEP**

Post MECO prior to MECO+1 min:

1. ET SEP AUTO – ITEM 38 (BFS 28)
2. If ET SEP pb reqd:
   ET SEP SEP – ITEM 39 (BFS 29)

AESP-13a/A/F

TOP
BACK OF 'ET SEP'



AESP-13b/A/F

TOP
MATE TOP-TO-BOTTOM;
FLIP VERTICALLY TO TURN

HOOK VELCRO

AESP-7a(OPCL-7a)/A,O,E/H

OV103,104

FIRE/SMOKE (ASCENT/ENTRY)
SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
| two SMOKE DETN lt on, or
| two CONC > 2, or
| one SMOKE DETN lt on and
| other CONC > 2:
| 1. Go to step 6
If single Av Bay SMOKE DETN A(B) lt and
| assoc CONC > 2:
| 2. SMOKE DETN CKT TEST – B(A) (25 sec)
| If SMOKE DETN B(A) test good (lt on):
| | 3. SMOKE DETN CKT TEST – OFF
| | 4. SMOKE DETN SNSR – RESET >>
| If SMOKE DETN B(A) test bad (no lt):
| 5. Go to step 6
If none of above >>
6. Check tabs, visors – CL
LES O2 – ON
If **AV BAY FIRE**:
| 7. FIRE SUPPR – ARM
| pb – DISCH
| (push until lit)
| 8. If Ascent:
| AV BAY FAN (two) – OFF
| 9. If Fire in Bay:
| 1: TACAN 1, MLS 1 – OFF
| 2: TACAN 2, MLS 2,3 – OFF
| 3: TACAN 3 – OFF
If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, below)
12. Unpwr source of smoke
If smoke persists or source cannot be unpwrd:

WARNING
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR
If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>
If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

ALARM SEQUENCE	SOURCE AREA
L(R) FLT DK or L(R) FLT DK → CABIN	PS(MS), L(R) CONSOLE
L FLT DK ↔ R FLT DK	AFT FLT DK, MIDDECK
CABIN or CABIN → L FLT DK, R FLT DK	FWD FLT DK, WCS, LEB

HOOK VELCRO

BOTTOM

FIRE/SMOKE (ORBIT) (OPCL-7b), back of FIRE/SMOKE (ASCENT/ENTRY) appears in the ORBIT POCKET C/L

replace side tab with clear tape and Hook Velcro

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TOP
MATE TOP-TO-BOTTOM;
FLIP VERTICALLY TO TURN

HOOK VELCRO

AESP-7a(OPCL-7a)/A,O,E/H

OV105

FIRE/SMOKE (ASCENT/ENTRY)

SM SYS SUMM 1

If **VISUAL SMOKE/FIRE**, or
two SMOKE DETN lt on, or
two CONC > 2, or
one SMOKE DETN lt on and
other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lt and
assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)

If SMOKE DETN B(A) test good (lt on):
3. SMOKE DETN CKT TEST – OFF
4. SMOKE DETN SNSR – RESET >>

If SMOKE DETN B(A) test bad (no lt):
5. Go to step 6

If none of above >>
6. Check tabs, visors – CL
LES O2 – ON

If **AV BAY FIRE**:
7. FIRE SUPPR – ARM
pb – DISCH
(push until lit)
8. If Ascent:
AV BAY FAN (two) – OFF
9. If Fire in Bay:
1: GPS 1, MLS 1 – OFF
2: MLS 2,3 – OFF
3: GPS 3 – OFF

If **CABIN FIRE**:
10. CAB FAN A,B (two) – OFF (max 20 min)
11. Locate source (see matrix, below)
12. Unpwr source of smoke
If smoke persists or source cannot be unpwrd:

WARNING
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

If Ascent:
14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>

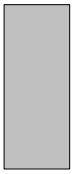
If Entry and prior to TIG:
15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

ALARM SEQUENCE	SOURCE AREA
L(R) FLT DK or L(R) FLT DK → CABIN	PS(MS), L(R) CONSOLE
L FLT DK ↔ R FLT DK	AFT FLT DK, MIDDECK
CABIN or CABIN → L FLT DK, R FLT DK	FWD FLT DK, WCS, LEB

HOOK VELCRO

BOTTOM

FIRE/SMOKE (ORBIT) (OPCL-7b), back of FIRE/SMOKE (ASCENT/ENTRY) appears in the ORBIT POCKET C/L



replace side tab with clear tape and Hook Velcro

(reduced copy) **OV105**

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POWERED FLIGHT

PLT OVERHEAD FLIP BOOK

POWERED FLIGHT

PLT OVERHEAD FLIP BOOK

FAB USE ONLY

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FAB USE ONLY

HOOK

OMS (OX/ FU) TK P LOW

OMS He TK P LOW (√SPEC and OMS/MPS)

Dumping RTLS/TAL/ G51 DUMP	SERC	When leaking He P < 640: 1. G51 DUMP STOP >>
	Not SERC	When leaking He P < 640: 2. G51 INH ICNCT When aft OMS Pc < 72%: 3. (Aff) OMS ENG – OFF After 2:00 min: 4. (Good) OMS ENG – OFF >>
Dumping ASSIST/ATO Not Dumping ♦		5. (Good) OMS ENG – OFF When MET > 2:30 min: 6. G51 ITEM 9 + 55 EXEC
Leaking He P < 640		7. G51 ITEM 9 +0 EXEC ⇒A
Sub RTLS/TAL ♦		8. (Good) OMS ENG – ARM/PRESS 9. G51 INH ICNCT 10. OMS XFEED (four) – OP 11. (Aff) OMS TK ISOL (two) – CL After 1:00 min: 12. OMS TK ISOL (four) – OP 13. OMS XFEED (four) – CL When aff OMS Pc < 72%: 14. (Both) OMS ENG (two) – OFF

OMS N2 TK P LOW
(N/A DURING ASSIST/RTLS/TAL/ATO DUMP)

1. √N2 TK P decr (meter and CRT)
2. OMS ENG – ARM
3. If OMS N2 REG P decr: OMS ENG – OFF >>

If OMS N2 REG P not decr and subs ASSIST/RTLS/TAL/ATO:

4. OMS ENG (two) – ARM/PRESS

OMS N2 REG P HIGH or LOW

OMS ENG – ARM

P & I

PILE

OMS He/ N2 TK P LOW

OMS TK P LOW (↓, OX or FU) NOT DUMPING (√ENG IN P)

1. (Good) OMS ENG – OFF
2. Monitor OMS Inlet Pressures
   If OX IN P < 151 or FU IN P < 216:
   (Aff) OMS ENG – OFF
   XFEED (two) – CL

Dumping Assist/ATO Not Dumping		When MET > 2:30 min: 3. G51 ITEM 9 +83 EXEC
	OX IN P > 151 and FU IN P > 216	4. (Aff) OMS ENG – ARM/PRESS 5. If ATO: G51 √ICNCT = INH 6. (Aff) OMS XFEED (two) – CL When aff Pc < 80% (depletion cutoff): 7. (Aff) OMS ENG – OFF G51 ITEM 9 +0 EXEC >> If depletion cutoff does not occur ⇒A
	Repress NO JOY	8. G51 ITEM 9 +0 EXEC
Subs RTLS/TAL/G51		9. (Good) OMS ENG – ARM/PRESS
	OX IN P > 151 and FU IN P > 216	10. (Aff) OMS XFEED (two) – OP ENG – ARM/PRESS 11. G51 ENA ICNCT (N/A SERC)
	AFT QTY < 20% or He P < 2000	12. If SERC: G51 DUMP STOP If not SERC: G51 INH ICNCT 13. (Aff) OMS XFEED (two) – CL When aff Pc < 80% (depletion cutoff): 14. (Aff) OMS ENG – OFF 15. After 2:00 min: (Good) OMS ENG – OFF >>
	Repress NO JOY after 2:00 min	16. (Good) OMS ENG – OFF >>

P & I

HOOK

OMS TEMP DURING DUMP

1. G51 INH ICNCT

	L	R
If aff OMS FU IN P ≥	230	230
2. Go to ENG FAIL >>		
If aff OMS FU IN P ≤	214	212

3. Go to PRPLT FAIL >>
4. Otherwise, snsr fail

RCS JET/ AFT RCS

Pc LOW DURING DUMP

1. ENG VLV < 70%: Go to ENG FAIL >>
2. ENG VLV > 70%: G51 INH ICNCT
   If aff OMS OX IN P > 227:
   3. Go to ENG FAIL >>
   If aff OMS OX IN P ≤ 136:
   4. Go to PRPLT FAIL >>
5. Otherwise, snsr fail

ENG FAIL (During Dump)

1. (Failed) OMS ENG – OFF
2. If RTLS/TAL/ATO/ G51 DUMP:
   G51 ENA ICNCT ⇒G

PRPLT FAIL (During Dump)

1. ASSIST/ATO: (Both) OMS ENG (two) – OFF
   (Failed) OMS XFEED (two) – CL
2. Other: (Aff) OMS ENG – OFF
   (Failed) OMS XFEED (two) – CL
   After 2:00 min, (good) OMS ENG – OFF ⇒G

OMS TK P LOW (↓, OX and FU) DURING DUMP

(√ENG IN P)

1. (Aff) OMS He PRESS/VAP ISOL (two) – OP

If aff TK P not incr:

2. G51 √ICNCT = INH
3. OMS He PRESS/VAP ISOL (two) – CL

At Pc < 72% or OMS TEMP: Go to PRPLT FAIL

OMS TK P HIGH (↑, OX and FU) DURING DUMP

(√ENG IN P)

1. G51 √ICNCT = INH
2. (Aff) OMS He PRESS/VAP ISOL A – CL

If aff TK P not decr:

3. OMS He PRESS/VAP ISOL A – OP
   B – CL

P & I

TOP
BACK OF 'OMS TEMP DURING DUMP'

PILE

RCS JET FAIL (LEAK)
If OX/FU Qty diverging:
(Aff) RCS MANF ISOL – CL

OMS T, Pc/ FAIL/ OMS OX/FU

RCS JET FAIL (ON)
1. (Aff) RCS MANF ISOL – CL
If MANF P > 130 and stable (false alarm):
2. (Aff) RCS MANF ISOL – OP ⇒G

RM DLMA MANF
If (aff) MANF tb – OP or sw not thrown:
1. If FRCS: √MCC
2. If ARCS: G51 RCS RM MANF CL OVRD – ITEM 41 EXEC
3. If (aff) MANF tb – bp: (aff) MANF – GPC

RCS JET FAIL (OFF)
If > one jet/pod/dir failed:
1. G23 resel jets
2. DES INH (*) (reprioritize)

RCS TK P HIGH (FU or OX) (√MANF P)
1. RCS He PRESS (two) – CL
2. A – OP
If He P decr:
3. RCS He PRESS A – CL
B – OP

XFEED: RCS to RCS
If AUTO XFEED:
1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. OMS XFEED (four) – CL
3. MSTR RCS XFEED – FEED FROM L(R) >>
If MANUAL XFEED:
4. L,R OMS XFEED (four) – CL
5. RCS XFEED (four) – OP
6. (Receiving) RCS TK ISOL (three) – CL
He PRESS (two) – CL
7. MSTR RCS XFEED – FEED FROM L(R)

HOOK

RCS SECURE
RCS MANF ISOL (five) – CL
XFEED (two) – CL
TK ISOL (all) – CL
He PRESS (two) – CL

AFT RCS LK
N/A During Dump/SE Roll Cntl
(check He P decr: CRT and meter)
1. If TK P '↑': Go to TK P HIGH >>

TK P ≥ 254 and not decr (He Leak)	2. MSTR XFEED – feed from good side 3. (Aff) RCS He PRESS (two) – CL 4. G51 AFT RCS – INH (ITEM 13) >>
TK P < 254 or decr (prop leak)	5. (N/A RTLS) ET SEP – MAN 6. (N/A RTLS) MPS PRPLT DUMP SEQ – STOP 7. (Aff) MANFs (five) – CL 8. (Aff) TK ISOLs (three) – CL
Single MANF leak	9. TK ISOLs (three) – OP (tb-OP),GPC 10. (Good) MANFs (four) – OP
QTY < 75%	11. MSTR XFEED – feed from good side
Two MANF P decr (TK leg leak)	12. (Good leg) TK ISOL(s) – OP (tb-OP), GPC 13. (Good leg) Pri MANFs (two) – OP 14. (Leaking leg) XFEED (one) – CL
QTY < 75%	15. MSTR XFEED – feed from good side
No MANF P decr (Prplt TK or MANF 5 leak)	16. L,R RCS XFEED (four) – OP 17. (Aff) RCS MANF 1,2,3,4 (four) – OP 18. (Aff) RCS He PRESS (two) – CL 19. MSTR XFEED – feed from good side
	20. ET SEP – AUTO 21. G51 AFT RCS – INH (ITEM 13) 22. Post ET SEP -Z transl: MPS PRPLT DUMP SEQ – GPC

FWD RCS LK

PILE

FWD RCS LK
(check He P decr: CRT and meter)
(check TK P; if '↑': Go to TK P HIGH >>)

RCS JET/ AFT RCS

RTLS		1. Perform RCS SECURE, then: 2. Post PPD – reopen RCS Post ET SEP -Z transl: 3. Go to RCS SECURE >>
Pre ET SEP (N/A RTLS)		4. ET SEP – MAN 5. MPS PRPLT DUMP SEQ – STOP 6. Perform RCS SECURE, then:
	Single MANF leak	7. Reopen RCS, except bad MANF 8. ET SEP – AUTO Post ET SEP -Z transl: 9. MPS PRPLT DUMP SEQ – GPC >>
	TK leg leak (two MANF P Low)	10. Reopen RCS, except bad leg 11. ET SEP – AUTO Post ET SEP -Z transl: 12. MPS PRPLT DUMP SEQ – GPC >>
	PRPLT TK P decr	
	Post MECO	13. RATE DAMP with ARCS 14. Reopen FRCS
	TK P > 200 & QTY > 0%	15. ET SEP – AUTO
	TK P < 200 or QTY = 0%	16. Perform RCS SECURE, then: 17. DAP – INRTL, PITCH – PULSE 18. ET SEP pb – SEP 19. THC -Z (UP) (2 sec; -1.25°/sec) 20. THC -X (OUT) and hold
		At SEP (SEP init + approx 12 sec): 21. THC +Z (DOWN) (3 sec; +0.3°/sec) THC -Z (UP) (2 sec; -0.9°/sec) COAST (5 sec) THC +X (IN) (20 sec) After 10 sec of +X, then: PITCH – DISC RATE
		22. OPS 104 PRO, DAP – AUTO
	Otherwise: (He TK or He leg)	Post MECO: 23. Reopen RCS 24. ET SEP – AUTO
Post ET SEP -Z transl		25. MPS PRPLT DUMP SEQ – GPC 26. Go to RCS SECURE

GLIDED FLIGHT

PLT OVERHEAD FLIP BOOK

GLIDED FLIGHT

PLT OVERHEAD FLIP BOOK

FAB USE ONLY

GLIDED FLIGHT

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PLT OVERHEAD FLIP BOOK

FAB USE ONLY

TOP
FACING LEFT SIDE OF BACKBOARD

HOOK

OMS
SEC
RCS
JET
XFD

OMS TEMP DURING DUMP

1. G51 INH ICNCT

	L	R
If aff OMS FU IN P ≥	230	230
2. Go to ENG FAIL >>		
If aff OMS FU IN P ≤	214	212

3. Go to PRPLT FAIL >>
4. Otherwise, snsr fail

Pc LOW DURING DUMP

1. ENG VLV < 70%: Go to ENG FAIL >>
2. ENG VLV > 70%: G51 INH ICNCT
   If aff OMS OX IN P > 227:
   3. Go to ENG FAIL >>
   If aff OMS OX IN P ≤ 136:
   4. Go to PRPLT FAIL >>
5. Otherwise, snsr fail

ENG FAIL (During Dump)

1. (Failed) OMS ENG – OFF
⇒ 2. √G51 INH ICNCT
3. Balance prop by XFEED

PRPLT FAIL (During Dump)

⇒ (Both) OMS ENG (two) – OFF

P & I

FAB USE ONLY

TOP
BACK OF 'OMS TEMP DURING DUMP'

PILE

OMS, Pc/ FAIL

OMS SECURE

If leak and
M > 24 or M < 3.5:
1. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
2. (Aff) OMS ENG – OFF
XFEED (two) – CL
TK ISOL (two) – CL
He PRESS (two) – CL

If leak isolated or
FU TK leak or
M < 24 & M > 3.5:
3. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

OMS XFEED: R to L

1. L,R OMS XFEED (four) – OP
2. L OMS TK ISOL (two) – CL
He PRESS/VAP ISOL (two) – CL

OMS XFEED: L to R

1. L,R OMS XFEED (four) – OP
2. R OMS TK ISOL (two) – CL
He PRESS/VAP ISOL (two) – CL

OMS XFEED RETURN: OMS to OMS

L,R OMS TK ISOL (four) – OP
XFEED (four) – CL

FAB USE ONLY

HOOK

RCS JET FAIL (LEAK)
If OX/FU Qty diverging:
(Aff) RCS MANF ISOL – CL

RCS JET FAIL (ON)
1. (Aff) RCS MANF ISOL – CL
If MANF P > 130 and stable (false alarm):
2. (Aff) RCS MANF ISOL – OP
⇒ 3. √AFT RCS RM LOSS

AFT RCS LK QBAR

RM DLMA MANF
If (aff) MANF tb – OP or sw not thrown:
1. If FRCS: √MCC
2. If ARCS: G51 RCS RM MANF CL OVRD – ITEM 41 EXEC
3. If (aff) MANF tb – bp: (aff) MANF – GPC

RCS JET FAIL (OFF)
If > one jet/pod/dir failed:
1. G23 resel jets
2. DES INH (*) (reprioritize)

RCS TK P HIGH (FU or OX) (√MANF P)
1. RCS He PRESS (two) – CL
2. A – OP
If He P decr:
3. RCS He PRESS A – CL
B – OP

XFEED: RCS to RCS
If AUTO XFEED:
1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. OMS XFEED (four) – CL
3. MSTR RCS XFEED – FEED FROM L(R) >>
If MANUAL XFEED:
4. L,R OMS XFEED (four) – CL
5. RCS XFEED (four) – OP
6. (Receiving) RCS TK ISOL (three) – CL
He PRESS (two) – CL
7. MSTR RCS XFEED – FEED FROM L(R)

TOP
BACK OF 'RCS JET FAIL (LEAK)'

PILE

LOW QBAR AFT RCS LK (GRTLS/304/305)

(√He P decr: CRT and meter)
(√$\bar{q}$ < 20: CRT)
1. If TK P '↑': Go to TK P HIGH >>

OMS SEC RCS JET XFD

OX Leak & M > 24		2. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
RTLS/TAL		3. G51 AFT RCS – INH (ITEM 13)
		4. (Aff) 3/4/5 MANFs – CL 5. (Aff) 3/4/5 TK ISOLs – CL
	Single MANF leak	6. TK ISOL(s) – OP (tb-OP),GPC 7. (Good) Pri MANF (one) – OP
	Two MANF P decr (TK leg leak)	8. (Leaking leg) XFEED (one) – CL
	No MANF P decr	9. TK ISOL(s) – OP (tb-OP),GPC 10. Pri MANFs (two) – OP 11. Repeat steps 4-10 for 1/2 leg
Leak not found		12. (Aff) RCS He PRESS (two) – CL
	He P decr (He TK leak)	13. RCS He PRESS (two) – OP 14. When He P < 456: MSTR XFEED – feed from good side
	OX/FU TK P diverge (Prplt TK leak)	15. RCS He PRESS (two) – OP 16. When QTY = 0: MSTR XFEED – feed from good side and (aff) RCS He PRESS (two) – CL
	Leak not found	17. RCS He PRESS (two) – OP
		He P decr (He leg leak)	18. RCS He PRESS (two) – CL 19. Cycle He PRESS so 220 < TK P < 245 20. When He P < 456: MSTR XFEED – feed from good side
		Leak not found	21. Assume MANF 5 leak
3.5 < M < 24			22. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

HOOK

AFT RCS LK (GRTLS/304/305)

(√He P decr: CRT and meter)

1. If TK P '↑': Go to TK P HIGH >>
2. If $\bar{q}$ < 20 or control problems:
   Go to LOW QBAR AFT RCS LK >>

		3. ENTRY MODE – NO Y JET (R/Y CSS; expect sluggish control)
RTLS/TAL		4. G51 AFT RCS – INH (ITEM 13)
		5. (Aff) RCS MANF ISOL (five) – CL XFEED (two) – CL TK ISOL (all) – CL HE PRESS (two) – CL
	(N/A RTLS)	6. G51 ELEVON FIXED – ITEM 18 EXEC (*)
	Single MANF leak	7. Return to normal config except bad MANF ENTRY MODE – AUTO >>
	Two MANF P decr (TK leg leak)	8. Return to normal config except bad leg ENTRY MODE – AUTO >>
	He P decr (He TK leak)	9. Return to normal config ENTRY MODE – AUTO 10. When He P < 456: MSTR XFEED – feed from good side >>
	OX/FU TK P diverge (Prplt TK leak)	11. Return to normal config ENTRY MODE – AUTO 12. When QTY = 0: MSTR XFEED – feed from good side and (aff) RCS He PRESS (two) – CL >>
	Leak not found	13. RCS He PRESS (two) – OP
	He P decr (He leg leak)	14. Return to normal config ENTRY MODE – AUTO 15. RCS He PRESS (two) – CL 16. Cycle He PRESS so 220 < TK P < 245 17. When He P < 456: MSTR XFEED – feed from good side >>
	Leak not found (Assume MANF 5 leak)	18. Return to normal config except MANF 5 ENTRY MODE – AUTO >>

AFT RCS/ LK RM

TOP
BACK OF 'AFT RCS LK (GRTLS/304/305)'

PILE

RCS SECURE

If OX leak and
M > 24 or M < 3.5:
1. G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC
2. RCS MANF ISOL (five) – CL
   XFEED (two) – CL
   TK ISOL (all) – CL
   He PRESS (two) – CL

If leak isolated or
M < 24 & M > 3.5:
3. G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC

QBAR AFT RCS/ LK/ RM

AFT RCS RM LOSS

If loss of jet RM and > 3Y,2P jets/pod/dir:
1. G23 aff jet DES INH (*) (reprioritize)
2. If yaw jet: desel >>

If total RM loss (BCE) and < 3Y,2P jets/pod/dir:
3. Aff jet DES INH (*) (reprioritize)
4. Aff MANF VLVS STAT OP – OVRD

FAB USE ONLY

POWERED FLIGHT

PLT WINDOW FLIP BOOK

POWERED FLIGHT

PLT WINDOW FLIP BOOK

FAB USE ONLY

POWERED FLIGHT

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PLT WINDOW FLIP BOOK

FAB USE ONLY

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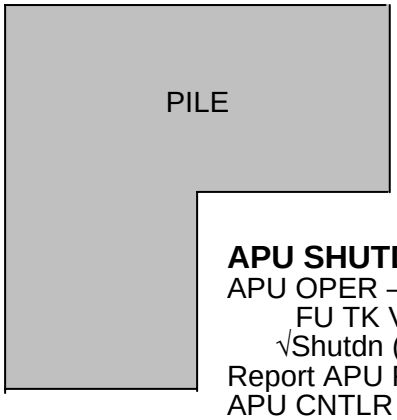
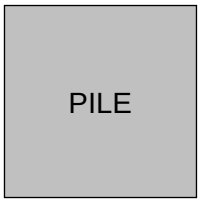
TOP
MOUNT ON LEFT SIDE OF BACKBOARD FACING 'COMM LOST'



APU SHUTDN
APU OPER – OFF
FU TK VLV – CL
√Shutdn (HYD PRESS < 200)
Report APU F7 lts
APU CNTLR PWR – OFF
AUTO SHTDN (two) – INH
SPEED SEL (two) – HI ⇒

APU SPD HI
If SPEED % exceeds 111:
APU SPEED SEL – HI ⇒



APU OVERSPEED
If SPEED % exceeds 129:
Go to APU SHUTDN

APU UNDERSPEED G51
If 'PRL SYS X ↓' or if APU has shut dn:
Perform APU SHUTDN, then: ⇒G

APU OIL OVERTEMP
♦BLR CNTLR/HTR – B
√N2 SPLY – ON ⇒

HYD PRESS (LOW) G51
If 'PRL SYS X ↓' and APU still oper:
1. APU AUTO SHTDN (two) – INH
2. SPEED SEL (two) – HI ⇒

HYD RSVR QTY (LOW)
Post MECO:
(Aff) HYD MPS/TVC ISOL VLV SYS – CL
(hold 5 sec, tb-CL) ⇒

W/B QTY (LOW)
1. If W/B QTY = 0 >>
2. BLR N2 SPLY – OFF
3. CNTLR/HTR – OFF ⇒

PLT WND FB A12-2 AESP/ALL/A/GEN O

FAB USE ONLY

HOOK

COMM LOST (mult pnls)
1. AUD CTR – 2
2. No joy, S-BD PM CNTL – PNL,CMD
3. Config per COMM COVER (ASC) BFS G51:
   TDRS – ITEM 46 EXEC (*****)
   STDN-HI – ITEM 47 EXEC (*****)
   SGLS – ITEM 49 EXEC (*****)
4. No joy, sel best S-BD PM ANT; else GPC ⇒

DPS
GPC
MDM

ICOM LOST
1. AUD CNTL sel – sel alt
2. No joy, AUD CTR – 2

FCS CH 1(2,3,4) (2nd FAIL) G53
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL)
(Aff) FLT CNTLR PWR – OFF

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA BFS G51
Aff LRU – desel

RM DLMA IMU G51 BFS G51
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

POST BFS ENGAGE
If PASS GPCs running:
1. (Aff) GPC MODE – STBY/HALT
2. BFS I/O RESET
3. √FCS CHs, IMU config

If Pre MECO:
4. If SSME failed: MN ENG LIMIT SHUTDN – INH
5. G51 DES failed(commfaulted) RGA,AA,SURF ⇒G

PILE

APU
HYD
COMM
GNC
DPS

PASS GPC FAIL

1. (Aff) FCS CH – OFF

If two GPC/FA/FCS CHs ↓:

2. (Good) FCS CHs – ORIDE
3. √MPS CMD
4. G53 aff SURF FDBK – desel
5. If FTS, ASAP, GPC MODE – STBY,HALT
6. √BIG 'X', then assign IDPs as reqd
7. √MULT DATA PATH LOSS

Post MECO:

8. ASAP, GPC MODE – STBY,HALT ⇒

BFS GPC FAIL

1. Post SRB SEP: FLASH EVAP CNTLR PRI A – ON

Post MECO:

2. GPC MODE – STBY,HALT
♦ OUTPUT – TERM
3. If no comm: sel best S-BD PM ANT ⇒

FF(FA) MDM OUTPUT

FAULT

♦ (Take action only if annun by entire set)

If single 'MDM OUTPUT':

1. Go to FA/FF MDM I/O ERROR >>

If both FF and FA annun:

2. I/O RESET; if reqd, BFS I/O RESET
3. If msgs repeat: Go to PASS GPC FAIL >>
4. If reqd, (aff) FCS CH – ORIDE,AUTO

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
♦ 2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL2 down:
   Post SRB SEP: FLASH EVAP CNTLR PRI A – ON
   If no comm: sel best S-BD PM ANT ⇒

PCM I/O ERROR

OI PCMMU PWR – 2

HOOK

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
		4. BFS I/O RESET >>
NOT RECOV	FA	5. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 6. G53 aff SURF FDBK – desel
		7. √MULT DATA PATH LOSS ♦ 8. Go to FA/FF MDM PORT MODE ⇒

DPS
BCE
MDP

FA/FF MDM PORT MODE

NOTE

If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF	5. >>
	NOT RECOV	FA	6. BFS G51 aff SURF FDBK, RGA – desel
		FF	7. BFS G51 aff AA – desel
			8. √MULT DATA PATH LOSS ⇒
@GPC	FA RECOV (FF Give Up)		9. (Aff) FCS CH – AUTO 10. G51 aff IMU – desel 11. G53 aff SURF FDBK – resel 12. √MULT DATA PATH LOSS ⇒A
	FF RECOV (FA Give Up)		13. (Aff) FCS CH – OFF 14. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 15. G53 aff SURF FDBK – desel 16. √MULT DATA PATH LOSS ⇒A

PILE

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU	1. G51 IMU – desel
		2. I/O RESET
RECOV	IMU	3. >>
		4. >>
NOT RECOV	NSP	5. And no comm: PNL,CMD 6. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*****) STDN-HI – ITEM 47 EXEC (*****) SGLS – ITEM 49 EXEC (*****) >>
		♦ 7. G01 aff String – port mode 8. BFS I/O RESET 9. If recov, go to RECOV steps >>
	B	10. BFS G51 aff AA – desel
	D	11. BFS G51 aff SURF FDBK,RGA – desel
	B/D	12. If RTLS: G23 OVRD aff MANF(s) – OP 13. √MULT DATA PATH LOSS ⇒

DPS GPC MDM

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

HOOK

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config

11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

PILE

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FAB USE ONLY

HOOK

FLT INST DISPLAY ANOMALY

1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY

1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC prob and not MDM, BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FA any combo	D	√BFS MM at each transition Expect 'SEP INH' (FDLN Fail) combos 2&3,2&4
	I/O	√OMS MAN SHUTDOWN Post MECO: Before MECO + 25 sec: •• 1. MPS FDLN RLF ISOL (two) – OP 2. MPS PREVLVs (six) – OP RTLS/TAL: MPS FILL/DRAIN LH2 INBD, OUTBD – OP
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA SWs
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA SWs

EPS MN AC

PILE

MN BUS UNDERVOLTS/FC VOLTS

If MN V < 26.4, FC V < 26.6, FC A > 480 (2 of 3)
(SHORT or degraded FC):
1. MSTR MADS PWR – OFF
2. If aff BUS tied – untie
3. PL PRI (three) – OFF

If AC VOLTS < 95, or STACK T > 243 and incr:
4. (Aff) ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF

If FC VOLTS < 32 (FC SHORT)
5. (Aff) FC REAC VLV – CL
6. Perform BUS LOSS ACTION (do not perform FC SHUTDN)

Post MECO:
7. ⇒ FC SHUTDN (do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (BUS SHORT)
8. Go to BUS LOSS ACTION >>

9. ⇒

If MN V < 26.4 and FC V > 32 and FC A < 20
(FC disconnect, check APUs):
10. AC BUS SNSR (three) – OFF
11. MSTR MADS PWR – OFF
12. PL PRI (three) – OFF
13. FC/MN BUS – ON

If FC3 aff:
14. PL PRI MNC – ON
    FC3 – ON
15. If MNC V < 26.4: PL PRI (three) – OFF

DPS
BCE
MDP

If MN BUS recovered (FC VOLTS < 32):
16. GNC I/O RESET
17. ⇒ BUS TIE >>

If MN BUS not recovered (FC VOLTS > 32):
18. Perform BUS LOSS ACTION (do not perform FC SHUTDN)

Post MECO:
19. ⇒ FC SHUTDN

AC VOLT HIGH

If AC V > 123 and F7 "AC VOLTAGE":
1. (Unaff) AC BUS SNSRS (two) – OFF

If AC V ≥ 130:
2. (Aff) AC BUS SNSR – AUTO TRIP

If AC V < 130 and AC3 aff:
3. H2O PUMP LOOP 2 – OFF

If RTLS/TAL:
4. AC VOLTS HIGH ⇒G

5. ⇒ AC VOLTS (LOW or HIGH)

HOOK

AC VOLT LOW or OVERLOAD

1. AC BUS SNSR (three) – OFF

If amps > 14 and V < 95:
  If single Φ amps > 14:
    2. cb AC CONTR – cl
       INV/AC BUS – OFF
       INV PWR – OFF
       cb AC CONTR – op
    3. If other Φ amps > 14:
         Go to step 6
    If RTLS/TAL:
      4. Go to aff BUS LOSS ⇒ G
    5. Go to AC OVERLOAD ⇒ A
  If multi Φ (bus short):
    6. (Aff) cb AC CONTR (three) – cl
         INV/AC BUS – OFF (tb-OFF)
         INV PWR – OFF (tb-OFF)
         cb AC CONTR (three) – op
  7. Go to aff BUS LOSS >>

8. ⇒ AC VOLTS (LOW or HIGH)

3Φ AC MOTORS STOPPED

1. AC BUS SNSR (three) – OFF
2. Determine AC BUS:
     FC1 and FREON PUMP 2B: AC1
     FC2 and FREON PUMP 1B: AC2
     FC3 and CAB FAN A: AC3
3. (Aff) FC – STOP

If AC3 aff:
  4. AV BAY 3 FAN B – OFF, A – ON
  5. CAB FAN A – OFF

Isolate aff ΦB(ΦC,ΦA):
  6. (Aff) cb AC CONTR – cl
  7. INV/AC BUS – OFF
  If AC1(2,3) aff and AV BAY 3(2,3) FAN ΔP ≥ 0.5:
    8. Go to step 16 (bad Φ isolated)
  9. (Aff) INV/AC BUS – ON
  10. cb AC CONTR – op
  11. Repeat from step 6 to isolate aff ΦC(ΦA), then:

MN ESS CNTL

Drop aff AC bus (three Φs):
  12. (Aff) cb AC CONTR (three) – cl
  13. INV/AC BUS – OFF
  14. INV PWR – OFF
  15. Go to aff BUS LOSS >>

Bad Φ isolated:
  16. (Aff) FC – START (10 sec or ΔP tb-gray)
  17. Perform aff BUS LOSS and if AC1(AC2) aff >>
  18. If AC3 aff:
        Post MECO:
          CAB FAN B – ON

PILE

MNA or AC1 Multi Φ
1. Do not isolate MPS He C
2. MSTR MADS PWR – OFF
3. AC BUS SNSR (three) – OFF
4. Perform FC SHUTDN (within 9 min), then:

Post MECO:
5. L OMS – sel SEC ⇒

MNB or AC2 Multi Φ
1. Do not isolate MPS He L
2. MSTR MADS PWR – OFF
3. AC BUS SNSR (three) – OFF
4. Perform FC SHUTDN (within 9 min), then: ⇒

FAILED: S-BD PM 1 (NO PNL,CMD)

MNC or AC3 Multi Φ
1. Do not isolate MPS He R
2. S-BD PM CNTL – PNL,CMD
3. Config per COMM COVER (ASC) BFS G51:
   - TDRS – ITEM 46 EXEC (*****)
   - STDN-HI – ITEM 47 EXEC (*****)
   - SGLS – ITEM 49 EXEC (*****)
4. MSTR MADS PWR – OFF
5. AC BUS SNSR (three) – OFF
6. Perform FC SHUTDN (within 9 min), then:

Post MECO:
7. R OMS – sel SEC ⇒

AC SINGLE Φ ⇒

SUBBUS [APC4(5,6) or ALC1(2,3)]
Do not isolate MPS He C(L,R) ⇒

ESS BUS V LOW
If verified by F9 voltmeter:
1. Perform FC SHUTDN (< 9 min), then:
2. Go to aff ESS BUS LOSS

MN AC 3Φ

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost ⇒A
		3. ⇒A
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk) ⇒A
		3. ⇒A
ESS 3AB	**O13**	1. GPC CAM Lights lost
		2. Do not engage BFS ⇒

HOOK

CNTL BUS V LOW/CNTL BUS RPC

WARNING
If VISIBLE FIRE/SMOKE AT ANY TIME, cb CNTL BUS AB1/2/3(BC1/2/3,CA1/2/3) – op (pnl R14:B)

1. Identify BUS (√BUS LOSS ID)

If bus critical (per MCC):

♦ 2. ⇒

♦ If one CNTL BUS RPC tripped (*****):

Aff CNTL BUS:

AB1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
3.	**A**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS AB1/2/3 – op
4.	**B**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS AB1/2/3 – op

BC1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
5.	**B**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS BC1/2/3 – op
6.	**C**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS BC1/2/3 – op

CA1(2,3)

	Tripped RPC (*****)	Action (for RESET, hold w/sw reten device)
7.	**C**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS CA1/2/3 – op
8.	**A**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS CA1/2/3 – op

♦ If no CNTL BUS RPC tripped (no *****):

	aff CNTL BUS	Panel R1 action (RESET, hold w/sw reten device)
9.	**AB1(2,3)**	CNTL BUS PWR MNA,MNB (two) – RESET
10.	**BC1(2,3)**	CNTL BUS PWR MNB,MNC (two) – RESET
11.	**CA1(2,3)**	CNTL BUS PWR MNA,MNC (two) – RESET

CNTL BUS LOSS

Cont next page

PILE

♦ 12. Perform aff CNTL BUS LOSS, then:

If pwr reqd (< 3 sec) for crit function:
13. Hold crit function sw
For tripped RPC:
14. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn
15. ⇒

CNTL BUS LOSS

AB1	⇒
AB2	G23 RCS FWD MANF VLVS 1 OVRD – ITEM 40 EXEC (CL) ⇒
AB3	1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC If BFS engage reqd: 2. Use PLT's RHC, then GPCs 1,2,4 – STBY,HALT 3. BFS I/O RESET 4. ⇒
BC1	Failed: S-BD PM 1 (NO PNL,CMD) ⇒
BC2	1. S-BD PM CNTL – PNL,CMD 2. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) 3. G23 RCS FWD MANF VLVS 2 OVRD – ITEM 41 EXEC (CL) 4. PLT disp sws – green dot ⇒
BC3	G51 RCS RM MANF CL OVRD – ITEM 41 EXEC ⇒
CA1	No BFS engage ⇒
CA2	G23 RCS FWD MANF VLVS 3 OVRD – ITEM 42 EXEC (CL) ⇒
CA3	⇒

CNTL LOW/ RPC

HOOK

FC

FC REAC VLV CLOSED

1. FC REAC VLV (three) – OP
2. Perform BUS TIE, then:

If FC COOL P < 50:

3. Go to FC SHUTDN

FC pH ↓ 1(2,3) or FC DELTA V 1(2,3)

If pH ↓ and FC SS 1(2,3) ΔV > 150
or FC SS ΔV > 150 and incr:

1. Perform BUS TIE, then:
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

If pH ↓ only and Post SRB SEP:

♦ 5. Perform BUS TIE, then:

6. ⇒A FC pH 1(2,3)

FC STACK T

1. MSTR MADS PWR – OFF

If STACK T > 243 and incr:

2. If 2nd FC: Go to 2nd FC SHUTDN >>
3. PL PRI (three) – OFF

If aff FC amps < 190 or > 360:

4. Go to MN BUS UNDERVOLTS/FC VOLTS, step 4 >>

♦ 5. Perform BUS TIE, then:

6. ESS BUS SOURCE FC – OFF
7. FC/MN BUS – OFF

If aff FC VOLTS < 32 or STACK T not decr:

8. (Aff) FC REAC VLV – CL
9. FC – STOP after COOL P < 15 and STACK T < 243
10. Go to LOSS OF 1 FC PWRDN

FC EXIT T

1. MSTR MADS PWR – OFF
2. Perform LOSS OF 1 FC PWRDN
3. Post SRB SEP:

♦ Perform BUS TIE, then: ⇒

PILE

FC

FC COOLANT PUMP ΔP LOW

1. FC – START (10 sec or ΔP tb-gray)
♦ 2. MSTR MADS PWR – OFF
Perform LOSS OF 1 FC PWRDN, then:

If > 9 min since failure:

♦ If EXIT T > 164 and not decr or
RDY tb – bp or
FC PUMP cb(s) open (pnl L4:C):
3. Go to FC SHUTDN >>

4. If < 9 min since failure ⇒

FC COOL P

1. Perform BUS TIE, then:

If COOL P < 75: ⇒
If COOL P incr and not 100 (H),
or FC COOL PUMP = ΔP (intermittent),
or STACK/EXIT T unstable:

2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN

LOSS OF 1 FC PWRDN

1. PRI PL (three) – OFF
AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
One MDU – OFF ⇒

HOOK

2nd FC SHUTDN

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA if RTLS or TAL)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. All TACAN/RA – OFF

Post MECO:

13. MPS PRPLT DUMP B/U LH2 VLV – OP
14. ⇒ LOSS OF 2nd FC PWRDN

CRYO

OV103,104

TOP
BACK OF '2nd FC SHUTDN'

PILE

O2(H2) CRYO PRESS/TEMP HIGH
O2(H2) TK HTR (two) – OFF ⇒A

CRYO O2(H2) LEAK (three or more tanks aff)
Use meter if CRT data OSL
1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

2FC

If TK1 and TK2 P decr slowly (HTR logic fail): ⇒
3. Perform aff MN BUS TIE, then:
If O2(H2) TK1(2) aff (open unaff manf):
4. O2(H2) MANF VLV TK2(1) – OP
If O2 TK1(2) aff:
5. O2 SYS 1(2) SPLY – CL
6. If O2 TK1(2) P now incr (PCS leak): >>
7. (Aff) TK HTR B – AUTO
If no aff FC COOL P alarm: ⇒
8. (Aff) TK HTRS A,B (two) – OFF
9. MSTR MADS PWR – OFF
10. Perform LOSS OF 1 FC PWRDN, then: ⇒

OV103,104

FAB USE ONLY

HOOK

2nd FC SHUTDN

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA if RTLS or TAL)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. All GPS/RA – OFF

Post MECO:

13. MPS PRPLT DUMP B/U LH2 VLV – OP
14. ⇒ LOSS OF 2nd FC PWRDN

CRYO

OV105

TOP
BACK OF '2nd FC SHUTDN'

PILE

2FC

O2(H2) CRYO PRESS/TEMP HIGH
O2(H2) TK HTR (two) – OFF ⇒A

CRYO O2(H2) LEAK (three or more tanks aff)
Use meter if CRT data OSL
1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

If TK1 and TK2 P decr slowly (HTR logic fail): ⇒
3. Perform aff MN BUS TIE, then:

If O2(H2) TK1(2) aff (open unaff manf):
4. O2(H2) MANF VLV TK2(1) – OP

If O2 TK1(2) aff:
5. O2 SYS 1(2) SPLY – CL
6. If O2 TK1(2) P now incr (PCS leak): >>
7. (Aff) TK HTR B – AUTO

If no aff FC COOL P alarm: ⇒
8. (Aff) TK HTRS A,B (two) – OFF
9. MSTR MADS PWR – OFF
10. Perform LOSS OF 1 FC PWRDN, then: ⇒

GLIDED FLIGHT

PLT WINDOW FLIP BOOK

GLIDED FLIGHT

PLT WINDOW FLIP BOOK

GLIDED
FLIGHT

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PLT WINDOW
FLIP BOOK

FAB USE ONLY

HOOK

APU SHUTDN

1. APU OPER – OFF
   FU TK VLV – CL
   √Shutdn (HYD PRESS < 200)
   Report APU F7 lts
   APU CNTLR PWR – OFF

If one APU failed:

⇒
2. √APU AUTO SHTDN (three) – ENA
3. MM304: √APU SPEED SEL (two) – NORM
4. MM602/305: APU SPEED SEL (two) – HI

If two APUs failed:

5. APU SPEED SEL (one) – HI
6. AUTO SHTDN (one) – INH

APU SPD HI

If SPEED % exceeds 111:

1. APU SPEED SEL – HI

⇒ Pre-TAEM if two good APUs:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU OVERSPEED

If SPEED % exceeds 129:

Go to APU SHUTDN

APU UNDERSPEED G51

If 'PRL SYS X ↓' or if APU has shut dn:

1. Perform APU SHUTDN, then:

⇒
2. Go to APU COOLDOWN

APU OIL OVERTEMP

1. BLR CNTLR/HTR – A(B)
   √N2 SPLY – ON

⇒ If M > 1:

If OIL IN T incr, and OUT T > 305:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU PUMP LEAK P

1. √MCC

Pre-TAEM if two good APUs:

2. Perform APU SHUTDN, then:
3. Go to APU COOLDOWN

APU THERM (T HI)

If APU GG/FU PMP HTR or APU TK/FU LN HTR fail ON (↑):

(Aff) HTR – OFF

PILE

APU

APU COOLDOWN

At M = 7:

1. HYD MN PUMP PRESS – LO
   APU CNTLR PWR – ON
   OPER – INJ COOL (start watch)

If APU not leaking:

2. APU FU TK VLV – OP

At Wheel Stop:

3. Go to APU SHUTDN

APU RESTART

♦ 1. √APU AUTO SHTDN – ENA
2. HYD MN PUMP PRESS – LO
3. APU CNTLR PWR – ON

If COOLDOWN for > 3.5 min or APU TEMP INJ < 380:

4. Go to step 7
5. APU OPER – INJ COOL (start watch)

If after 1.5 min, APU TEMP INJ not decr:

6. Go to APU SHUTDN >>

At 3.5 min:

7. √APU FU TK VLV – OP
   OPER – START/RUN

If restart unsuccessful:

8. Go to APU SHUTDN >>
9. HYD MN PUMP PRESS – NORM

HOOK

HYD PRESS (LOW)

GNC 51 OVERRIDE
BFS, SM SYS SUMM 2

⇒ 1. Compare 'PRL SYS X' status and aff HYD PRESS (HYD/APU meter and CRT):

HYD/ COMM GNC

PRL SYS	HYD PRESS	ACTION
'↓'	both meter and CRT P < 300	Go to APU SHUTDN >>
blank	either meter or CRT P > 2600	No action reqd >>
'?'	ACUM P > 2800	No action reqd >>

2. (Aff) HYD MN PUMP PRESS – LO

If two good APU/HYD remain:

3. √APU AUTO SHTDN (three) – ENA
4. MM304: √APU SPEED SEL (two) – NORM
5. MM305/602: APU SPEED SEL (two) – HI >>

If only one good APU/HYD remains:

6. APU AUTO SHTDN (one) – INH
   SPEED SEL (one) – HI

On MCC call:

7. (Degraded) HYD MN PUMP PRESS – NORM

PILE

APU/ HYD

HYD RSVR QTY (LOW)

1. (Aff) √HYD MPS/TVC ISOL VLV SYS – CL (hold 5 sec, tb-CL)

⇒ √BK ISOL VLV – CL (hold 5 sec, tb-CL)

If HYD sys 1 leaking:

√LG EXTD ISO VLV – CL (hold 5 sec, tb-CL)

If qty still decr:

If two good Hyd sys:

2. (Aff) HYD MN PUMP PRESS – LO

If second sys fails:

3. At TAEM: (Leaking) HYD MN PUMP PRESS – NORM

4. At TAEM: (Good) APU SPEED SEL (two) – HI

If one good Hyd sys:

5. (Good) APU AUTO SHTDN – INH
6. (Good) APU SPEED SEL – HI

If prior to TAEM:

7. (Leaking) HYD MN PUMP PRESS – LO
8. At TAEM: (Leaking) HYD MN PUMP PRESS – NORM

HYD RSVR T

1. BLR CNTLR/HTR – A(B)

If HYD RSVR T > 250:

2. HYD MN PUMP PRESS – LO

If HYD RSVR T > 268 and incr:

3. Perform APU SHUTDN, then:
4. Go to APU COOLDOWN

W/B QTY (LOW)

1. BLR CNTLR/HTR – A(B)

⇒ 2. If BLR CNTLR/HTR – OFF:

3. BLR CNTLR/HTR – B
   N2 SPLY – ON

4. If W/B QTY = 0 or M ≤ 1 >>
5. Monitor W/B QTY for 2 min, then:
6. If W/B QTY change > 3:

7. Cycle BLR CNTLR/HTR to maintain:
   200 < LUBE OIL IN T < 290 (C&W)

When M ≤ 1:

8. BLR CNTLR/HTR – A(B)

HOOK

COMM LOST (mult pnls)
1. AUD CTR – 2

No comm (check UHF sites):
2. S-BD PM CNTL – PNL,CMD (pnl C3)
3. Config per COMM COVER (ASC) BFS G51:
   TDRS – ITEM 46 EXEC (*****)
   STDN-HI – ITEM 47 EXEC (*****)
   SGLS – ITEM 49 EXEC (*****)
   If ***** not next to selected config:
   4. Config pnl A1 per Comm Coverage (ASC/ENT PKT, COMM)
      S-BD PM CNTL – PNL,CMD (pnl C3)

No comm: **GNC**
5. Sel best S-BD PM ANT **MPS**

No comm: **DPS**
6. S-BD PM ANT – GPC

ICOM LOST
1. AUD CNTL sel – sel alt

No ICOM:
2. AUD CTR – 2

FCS CH 1(2,3,4) (2nd FAIL) G53
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL) GNC SYS SUMM 1
(Aff) FLT CNTLR PWR – OFF

G51 ROLL MODE SW G51
If ROLL MODE ≠ sw pos:
AUTO SEL – ITEM 42 EXEC

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA BFS G51
Aff LRU – desel

RM DLMA IMU G51 BFS G51
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

PILE

RM FAIL ADTA G51

♦ 1. √BFS GNC SYS SUMM 1
2. If '↓' for aff ADTA >>
3. If accessible, (bad) ADTA cb – op >>
4. BFS, ADTA to G&C – INH

RM DLMA ADTA * G51

M < 2.0		1. Fly Theta limits
ADTA data agrees		2. Desel,resel one ADTA 3. If no '?' >>
Bad probe		4. Stow bad probe >>
Bad ADTA	ADTA cb accessible	♦ 5. (Bad) ADTA cb – op >>
	ADTA cb not accessible	♦ 6. DES bad ADTA 7. √BFS GNC SYS SUMM 1 8. If '↓' for aff ADTA >> 9. BFS, ADTA to G&C – INH
Dilemma not resolved		10. ADTA to G&C – INH (PASS & BFS)

HYD/ COMM GNC

***If three ADTAs failed:**
ADTA to G&C – INH (PASS)
Fly Theta limits

RM FAIL TAC G50
(RM LIMITS: 6 DEG, 0.5 NM)
1. If data good: desel,resel aff TACAN >>
2. If failure verified: desel failed TACAN in BFS

RM DLMA TAC G50
Do not desel or resel while in 'TEST'
1. If both data good: desel,resel one TACAN in DLMA >>
2. √TACAN MODE (three) – GPC
3. If 'RM FAIL TAC': desel failed TACAN in BFS >>
4. If continuous 'TEST': TACAN MODE (three) – T/R
If bad TACAN identified:
5. Desel bad TACAN (PASS,√BFS)

SPD BRK G51 BFS G51

M>5.0	♦ WRAP MODE – INH
M≤5.0	WRAP MODE – INH √MCC for energy mgmt procs

TOP
FRONT

HOOK

MPS He P/MPS C&W LIGHT
PNEU REG

If M > 2.4: (Aff) MPS He ISOL – CL

G55 GPS FAIL 2 G50 BFS G50
GPS to NAV INH – ITEM 43 EXEC (PASS, √BFS)

NO UPDATE GPS G55
√MCC
If ALT < 300kft and ALT > 180kft
    No Update due to plasma, reevaluate at ALT < 180kft
Else
    INIT – ITEM 15 EXEC
    NAV – ITEM 18 EXEC

OV103,104

TOP
BACK

PILE

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OV103,104

PLT WND (OV103,104) FB E12-8 AESP/3,4/E/GEN O

FAB USE ONLY

HOOK

MPS He P/MPS C&W LIGHT
PNEU REG

If M > 2.4: (Aff) MPS He ISOL – CL

G55 GPS FAIL 1(2,3) G50 BFS G50
Aff LRU – desel (PASS, √BFS)

RM DLMA GPS G50 BFS G50
♦ 1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If 300kft > ALT > 180kft
DLMA due to plasma
Reevaluate when ALT < 180kft
Else
3. Desel GPS with highest P1σ
If P1σ values are equal, desel highest number LRU
If DLMA not resolved
4. Desel GPS with next highest P1σ

NO UPDATE GPS G55
1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If RM DLMA GPS message, see RM DLMA GPS >>
3. If 300kft > ALT > 180kft
No Update due to plasma
Reevaluate when ALT < 180kft
Else
4. Initialize GPS with highest P1σ
INIT – ITEM 14(15,16) EXEC
NAV – ITEM 17(18,19) EXEC
May take up to 2 minutes for GPS to provide SV

PILE

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FAB USE ONLY

HOOK

PASS GPC FAIL

1. (Aff) FCS CH – OFF
2. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE
3. GPC MODE – STBY,HALT
4. G53 aff SURF FDBK – desel
5. ⇒ If String 1(2): CDR(PLT) disp sws – green dot
   NWS – 2
6. √MULT DATA PATH LOSS

BFS GPC FAIL

1. GPC MODE – STBY,HALT
2. ♦ OUTPUT – TERM
   ⇒ MODE – STBY
3. If BFS cannot drive an IDP:
   GPC MODE – HALT, then go to step 8
4. If BFS currently in OPS 3 or 6:
   Go to step 7
5. If BFS currently in OPS 1:
   PRO to OPS 106
   BFS, OPS 000 PRO
   PRO to OPS 304
6. If BFS in desired MM (304):
   BFS G50 √BFS R/W sel
   GPC MODE – RUN
   OUTPUT – B/U
   Advise MCC BFS in BACKUP >>
7. √GPC MODE – STBY (BFS is SM Only)
8. If no comm: sel best S-BD PM ANT
9. MPS He ISOL B (three) – CL
   PNEU He ISOL – CL
10. If AOA/GRTLS/TAL < 120K:
    NH3 CNTLR B – SEC/ON

DPS
MDM
BFS

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
	FF 1,2,3	♦ 4. G51 IMU – resel
		5. BFS I/O RESET >>
NOT RECOV	FA	6. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 7. G53 aff SURF FDBK – desel
		8. √MULT DATA PATH LOSS
		⇒ ♦ 9. Go to FA/FF MDM PORT MODE ⇒

PILE

FA/FF MDM PORT MODE

NOTE
If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF 1,2,3	♦ 5. G51 IMU – resel >>
	NOT RECOV		⇒ If MCC GO for pwr cycle: 6. (Aff) FA/FF MDM – OFF,ON 7. I/O RESET 8. If recov, go to @MDM RECOV >> 9. (Aff) MDM – OFF
		FA	10. BFS G51 aff SURF FDBK, RGA – desel
		FF	11. BFS G51 aff AA – desel 12. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2
			13. √MULT DATA PATH LOSS >>
@GPC	FA RECOV (FF Give Up)		14. (Aff) FCS CH – AUTO 15. G53 aff SURF FDBK – resel 16. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2 17. √MULT DATA PATH LOSS >>
	FF RECOV (FA Give Up)		18. (Aff) FCS CH – OFF 19. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 20. G53 aff SURF FDBK – desel
		FF 1,2,3	♦ 21. G51 IMU – resel
			22. √MULT DATA PATH LOSS >>

GNC
MPS
DPS

HOOK

FF(FA) MDM OUTPUT FAULT

♦ (Take action only if annun by entire set)
If single 'MDM OUTPUT':
1. If 'FF MDM OUTPUT':
   G51 aff IMU – desel
2. Go to FA/FF MDM I/O ERROR >>
If both FF and FA annun:
3. G51 aff IMU – desel
4. I/O RESET; if reqd, BFS I/O RESET
5. If msgs repeat: Go to PASS GPC FAIL >>
6. If reqd, (aff) FCS CH – ORIDE,AUTO
♦ 7. G51 IMU – resel

PL MDM I/O ERROR
1. BFS I/O RESET; if recovered >>
2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL1 ↓ and pre MM305: FLASH EVAP CNTLR PRI B – ON
4. If PL2 ↓ and no comm: sel best S-BD PM ANT
5. If PL2 ↓ and AOA/GRTLS/TAL < 120K:
⇒ NH3 CNTLR B – SEC/ON

PCM I/O ERROR
OI PCMMU PWR – 2(1)

POST BFS ENGAGE
If PASS GPCs running:
1. (Aff) GPC MODE – STBY/HALT
2. BFS I/O RESET
3. √FCS CHs, IMU config
⇒ If Air Data not analyzed:
4. G50 INH AD to G&C
5. M = 5: Deploy,evaluate probes one at a time
6. √AD to G&C by M = 1.5
If failed ADTA(s) in PASS: **BCE**
7. cb(s) ADTA – op, or stow probe **CRT**
8. G51 DES failed(commfaulted) RGA,AA,SURF
9. G50 DES failed TAC
At M ≤ 2.7:
10. CDR TRIM PNL – OFF
RHC/PNL – ENA
At H = 3K:
11. SPDBK – MAN (check DEL PAD setting)
At MAIN GEAR TD:
12. SPDBK – 100%

PILE

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU		1. G21 √IMU OPER, if STBY >>
			2. I/O RESET
RECOV	IMU		3. G21 √att ANG, if delta > 1° >>
		♦	4. G51 IMU – resel >>
			5. >>
NOT RECOV	NSP		6. And no comm: PNL,CMD
			7. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) >>
			8. G01 aff String – port mode 9. BFS I/O RESET 10. If recov, go to RECOV steps >>
	A(B,C,D, IMU)	⇒	11. FF A(B,IMU) or FA C(D) MDM – OFF,ON 12. I/O RESET 13. If FA, (aff) FCS CH – ORIDE,AUTO 14. If recov, go to RECOV steps
		C(D)	15. If < 3Y,2P jets/pod/dir: a. G23 aff jet DES INH (*) (reprioritize) b. Aff MANF VLVS STAT OP – OVRD
		1A(2A)	16. CDR(PLT) disp sws – green dot
		B	17. BFS G51 aff AA – desel
		D	18. BFS G51 aff SURF FDBK,RGA – desel
			19. √MULT DATA PATH LOSS >>

DPS
MDM
BFS

HOOK

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config
11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

MDP

PILE

FLT INST DISPLAY ANOMALY
1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY
1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC prob and not MDM, BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA sws
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA sws
GPC/FA any combo	I/O or D	No impact

BCE
CRT

HOOK

MN
AC

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PILE

BCE
CRT
MDP

MN BUS UNDERVOLTS/FC VOLTS

If MN V < 26.4, FC V < 26.6, FC A > 480 (2 of 3)
(SHORT or degraded FC):
1. MSTR MADS PWR – OFF
2. If aff BUS tied – untie
3. PL PRI (three) – OFF
⇒ 4. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF

If FC VOLTS < 32 (FC SHORT)
5. (Aff) FC REAC VLV – CL
6. Go to FC SHUTDN (do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (BUS SHORT)
7. Go to BUS LOSS ACTION >>

If MN V < 26.4 and FC V > 32 and FC A < 20
(FC disconnect, check APUs):
8. MSTR MADS PWR – OFF
9. PL PRI (three) – OFF
10. FC/MN BUS – ON

If FC3 aff:
11. PL PRI MNC – ON
FC3 – ON
12. If MNC V < 26.4: PL PRI (three) – OFF

If 1st FC failure:
13. Perform BUS TIE, then:
If MN BUS recovered:
14. GNC I/O RESET

If aff FC VOLTS > 32:
15. Go to FC SHUTDN

AC VOLT HIGH

If AC V > 123 and F9 V > 123:
⇒ 1. (Aff) AC BUS SNSR – OFF
2. cb AC CONTR – cl
INV/AC BUS – OFF
INV PWR – OFF
cb AC CONTR – op
3. √H2O PUMP LOOP 2(1) – ON
4. Go to aff BUS LOSS

HOOK

AC VOLT LOW or OVERLOAD

⇒ If amps > 14 or V < 110:

If single Φ amps > 14 or V > 10:

1. cb AC CONTR – cl
   INV/AC BUS – OFF
   INV PWR – OFF
   cb AC CONTR – op
2. If other Φ amps > 14:
   Go to step 3

3Φ MN AC SUB

If multi Φ (bus short):

3. (Aff) cb AC CONTR (three) – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR (three) – op
   AC BUS SNSR – OFF
4. Go to aff BUS LOSS

PILE

3Φ AC MOTORS STOPPED

1. (Aff) AC BUS SNSR – OFF
2. Determine AC BUS:
   FC1 and FREON PUMP 2B: AC1
   FC2 and FREON PUMP 1B: AC2
   FC3 and CAB FAN A: AC3

MN
AC

3. (Aff) FC – STOP

If AC3 aff:

4. AV BAY 3 FAN B – OFF, A – ON
5. CAB FAN A – OFF

Isolate aff ΦB(ΦC,ΦA):

6. (Aff) cb AC CONTR – cl
7. INV/AC BUS – OFF

If AC1(2,3) aff and AV BAY 3(2,3) FAN $\Delta P \geq 0.5$:

8. Go to step 16 (bad Φ isolated):
9. (Aff) INV/AC BUS – ON
10. cb AC CONTR – op
11. Repeat from step 6 to isolate aff ΦC(ΦA), then:

Drop aff AC bus (three Φs):

12. (Aff) cb AC CONTR (three) – cl
13. INV/AC BUS – OFF
14. INV PWR – OFF
15. Go to aff BUS LOSS >>

Bad Φ isolated:

16. (Aff) FC – START (10 sec or ΔP tb-gray)
17. Perform aff BUS LOSS and if AC1(AC2) aff >>
18. If AC3 aff: CAB FAN B – ON

⇒ **AC SINGLE Φ**

AC1	**ΦA**	BLR CNTLR/HTR 1 – A When V = 12K: RAD CNTLR LOOP (two) – AUTO A
	ΦB	When V = 12K: RAD CNTLR LOOP (two) – AUTO A
	ΦC	BLR CNTLR/HTR 3 – B
AC2	**ΦA**	BLR CNTLR/HTR 1 – B
	ΦB	SIG CONDR FREON A – AC3
	ΦC	BLR CNTLR/HTR 2 – A
AC3	**ΦA**	BLR CNTLR/HTR 2 – B
	ΦB	SIG CONDR FREON B – AC2
	ΦC	BLR CNTLR/HTR 3 – A

HOOK

MNA or AC1 Multi Φ

1. MSTR MADS PWR – OFF
2. Perform FC SHUTDN (within 9 min), then:
⇒ 3. BLR CNTLR/HTR 1 – A
3 – B

FAILED: TAC 1
MLS 1, RA 1, NWS 1, L HUD

MNB or AC2 Multi Φ

1. MSTR MADS PWR – OFF
2. Perform FC SHUTDN (within 9 min), then:
⇒ 3. BLR CNTLR/HTR 2 – A
1 – B
4. SIG CONDR FREON A – AC3

FAILED: TAC 2
MLS 2, RA 2, NWS 2
PLT DRAG CHUTE ARM
S-BD PM 1 (NO PNL,CMD)

ESS CNTL

MNC or AC3 Multi Φ

1. S-BD PM CNTL – PNL,CMD
2. Config per COMM COVER (ASC) BFS G51:
TDRS – ITEM 46 EXEC (*****)
STDN-HI – ITEM 47 EXEC (*****)
SGLS – ITEM 49 EXEC (*****)
3. MSTR MADS PWR – OFF
4. Perform FC SHUTDN (within 9 min), then:
⇒ 5. BLR CNTLR/HTR 3 – A
2 – B
6. SIG CONDR FREON B – AC2

FAILED: TAC 3, MLS 3, R HUD
CDR DRAG CHUTE ARM

SUBBUS

SUBBUS APC or ALC	4 1	5 2	6 3
⇒ 1. BLR CNTLR/HTR	1 – A 3 – B	2 – A 1 – B	3 – A 2 – B

ESS BUS V LOW

If verified by F9 voltmeter:
1. Perform FC SHUTDN (< 9 min), then:
2. Go to aff ESS BUS LOSS

PILE

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk)
ESS 3AB	**O13**	1. GPC CAM Lights lost 2. Do not engage BFS ⇒ 3. BFS GPC OUTPUT – TERM

3Φ MN AC SUB

CNTL BUS V LOW/CNTL BUS RPC

WARNING
If VISIBLE FIRE/SMOKE AT ANY TIME, cb CNTL BUS AB1/2/3(BC1/2/3,CA1/2/3) – op (pnl R14:B)

1. Identify BUS (√BUS LOSS ID)

⇒ If bus critical (per MCC):

♦ 2. >>

♦ If one CNTL BUS RPC tripped (*****):

Aff CNTL BUS:

AB1(2,3)

	Tripped RPC (*)	Action (for RESET, hold w/sw reten device)
3.	**A**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS AB1/2/3 – op
4.	**B**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS AB1/2/3 – op

BC1(2,3)

	Tripped RPC (*)	Action (for RESET, hold w/sw reten device)
5.	**B**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS BC1/2/3 – op
6.	**C**	R1 CNTL BUS PWR MNB – RESET R14:B cb CNTL BUS BC1/2/3 – op

~

Cont next page

HOOK

CA1(2,3)

	Tripped RPC (*)	Action (for RESET, hold w/sw reten device)
7.	**C**	R1 CNTL BUS PWR MNA – RESET R14:B cb CNTL BUS CA1/2/3 – op
8.	**A**	R1 CNTL BUS PWR MNC – RESET R14:B cb CNTL BUS CA1/2/3 – op

♦ If no CNTL BUS RPC tripped (no *****):

	aff CNTL BUS	Pnl R1 Action (RESET, hold w/sw reten device)
9.	**AB1(2,3)**	CNTL BUS PWR MNA,MNB (two) – RESET
10.	**BC1(2,3)**	CNTL BUS PWR MNB,MNC (two) – RESET
11.	**CA1(2,3)**	CNTL BUS PWR MNA,MNC (two) – RESET

♦ 12. Perform aff CNTL BUS LOSS, then:

If pwr reqd (< 3 sec) for crit function:
13. Hold crit function sw
For tripped RPC:
14. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn
15. ⇒

CNTL BUS LOSS

CNTL BUS LOSS

AB1	⇒	1. Use R TRIM & BDY FLP sws 2. BLR CNTLR/HTR 1 – A
AB2		1. G23 RCS FWD MANF VLVS 1 OVRD – ITEM 40 EXEC (CL) ⇒ 2. BLR CNTLR/HTR 1 – A FAILED: L HUD
AB3		1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC If BFS engage reqd: 2. Use PLT's RHC, then GPCs 1,2,4 – STBY,HALT 3. BFS I/O RESET ⇒ 4. BLR CNTLR/HTR 1,3 (two) – B

Cont next page

PILE

CNTL BUS LOSS (Cont)

BC1	⇒	1. Use R TRIM & BDY FLP sws 2. BLR CNTLR/HTR 2 – A FAILED: R HUD CDR DRAG CHUTE DPY/JETT S-BD PM 1 (NO PNL,CMD)
BC2		1. S-BD PM CNTL – PNL,CMD 2. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) 3. G23 RCS FWD MANF VLVS 2 OVRD – ITEM 41 EXEC (CL) 4. PLT disp sws – green dot
	⇒	5. Use L TRIM & BDY FLP sws 6. BLR CNTLR/HTR 2 – A FAILED: CDR DRAG CHUTE DPY/JETT
BC3		1. G51 RCS RM MANF CL OVRD – ITEM 41 EXEC
	⇒	2. BLR CNTLR/HTR 1,2 (two) – B

CNTL BUS LOSS

CA1		1. No BFS engage GPC 3,5
	⇒ ♦	2. BFS GPC OUTPUT – TERM 3. BLR CNTLR/HTR 3 – A FAILED: PLT DRAG CHUTE DPY/JETT
CA2		1. G23 RCS FWD MANF VLVS 3 OVRD – ITEM 42 EXEC (CL)
	⇒	2. Use L TRIM & BDY FLP sws 3. BLR CNTLR/HTR 3 – A FAILED: PLT DRAG CHUTE DPY/JETT
CA3	⇒	1. BLR CNTLR/HTR 2,3 (two) – B

HOOK

FC REAC VLV CLOSED
1. FC REAC VLV (three) – OP
2. Perform BUS TIE, then:

If FC COOL P < 50:
3. Go to FC SHUTDN

FC pH ↓ 1(2,3) or FC DELTA V 1(2,3)
If pH ↓ and FC SS 1(2,3) ΔV > 150
or FC SS ΔV > 150 and incr:
1. Perform BUS TIE, then:
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

If pH ↓ only:
♦ 5. Go to BUS TIE

FC STACK T
1. MSTR MADS PWR – OFF

If STACK T > 243 and incr:
2. If 2nd FC: Go to 2nd FC SHUTDN >>
3. PL PRI (three) – OFF

If aff FC amps < 170 or > 360:
4. Go to MN BUS UNDERVOLTS/FC VOLTS, step 4 >>

♦ 5. Perform BUS TIE, then:
6. ESS BUS SOURCE FC – OFF
7. FC/MN BUS – OFF

If aff FC VOLTS < 32 or STACK T not decr:
8. (Aff) FC REAC VLV – CL
9. FC – STOP after COOL P < 15 and STACK T < 243
10. Go to LOSS OF 1 FC PWRDN

FC

OV103,104

PILE

FC EXIT T
1. MSTR MADS PWR – OFF
2. Perform BUS TIE, then:

⇒ If EXIT T > 164 and incr or < 131 and no comm:
3. Go to FC SHUTDN

FC COOLANT PUMP ΔP LOW
1. FC – START (10 sec or ΔP tb-gray)

⇒ ♦ If EXIT T > 164 and not decr or
RDY tb – bp (30 sec after START) or
FC PUMP cb(s) – op (pnl L4:C):
2. Go to FC SHUTDN >>

If EXIT T norm, RDY tb – gray, and no comm:
3. Monitor AC amps
4. FC – STOP
If AMPS decr 0.7-0.9 AMP/Φ:
5. FC – START (hold 30 sec if ΔP tb-bp)
6. If AMPS incr 0.7-0.9 AMP/Φ >>
7. Go to FC SHUTDN

FC COOL P
1. Perform BUS TIE, then:

⇒ If COOL P < 75: >>
If COOL P incr and not 100 (H),
or FC COOL PUMP = ΔP (intermittent),
or STACK/EXIT T unstable,
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN

LOSS OF 1 FC PWRDN (GRTLS/TAL)
1. PRI PL (three) – OFF
AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
One MDU – OFF

⇒ If TAL:
When V < 19K:
3. MPS ENG PWR (six) – OFF

LOSS OF 1 FC PWRDN (ENTRY)
1. If V < 15K >>
2. IDP/CRT4, one MDU,FLT CNTLR PWR – OFF
3. TACAN/RA/MLS – OFF
If middeck PL on:
4. cb MNB UTIL PWR – op (pnl O15:C)
♦ 5. PRI PL (three) – OFF
AFT PL (two) – OFF

FC

OV103,104

HOOK

FC REAC VLV CLOSED
1. FC REAC VLV (three) – OP
2. Perform BUS TIE, then:

If FC COOL P < 50:
3. Go to FC SHUTDN

FC pH ↓ 1(2,3) or FC DELTA V 1(2,3)
If pH ↓ and FC SS 1(2,3) ΔV > 150
or FC SS ΔV > 150 and incr:
1. Perform BUS TIE, then:
2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

If pH ↓ only:
♦ 5. Go to BUS TIE

FC STACK T
1. MSTR MADS PWR – OFF

If STACK T > 243 and incr:
2. If 2nd FC: Go to 2nd FC SHUTDN >>
3. PL PRI (three) – OFF

If aff FC amps < 170 or > 360:
4. Go to MN BUS UNDERVOLTS/FC VOLTS, step 4 >>

♦ 5. Perform BUS TIE, then:
6. ESS BUS SOURCE FC – OFF
7. FC/MN BUS – OFF

If aff FC VOLTS < 32 or STACK T not decr:
8. (Aff) FC REAC VLV – CL
9. FC – STOP after COOL P < 15 and STACK T < 243
10. Go to LOSS OF 1 FC PWRDN

FC

OV105

PILE

FC EXIT T

1. MSTR MADS PWR – OFF
2. Perform BUS TIE, then:

⇒ If EXIT T > 164 and incr or < 131 and no comm:

3. Go to FC SHUTDN

FC COOLANT PUMP ΔP LOW

1. FC – START (10 sec or ΔP tb-gray)

⇒ ♦ If EXIT T > 164 and not decr or
RDY tb – bp (30 sec after START) or
FC PUMP cb(s) – op (pnl L4:C):

2. Go to FC SHUTDN >>

If EXIT T norm, RDY tb – gray, and no comm:

3. Monitor AC amps
4. FC – STOP

If AMPS decr 0.7-0.9 AMP/Φ:

5. FC – START (hold 30 sec if ΔP tb-bp)
6. If AMPS incr 0.7-0.9 AMP/Φ >>

7. Go to FC SHUTDN

FC COOL P

1. Perform BUS TIE, then:

⇒ If COOL P < 75: >>
If COOL P incr and not 100 (H),
or FC COOL PUMP = ΔP (intermittent),
or STACK/EXIT T unstable,

2. (Aff) FC REAC VLV – CL
3. MSTR MADS PWR – OFF
4. Go to LOSS OF 1(2nd) FC PWRDN >>

LOSS OF 1 FC PWRDN (GRTLS/TAL)

1. PRI PL (three) – OFF
   AFT PL (two) – OFF
2. IDP/CRT4 PWR – OFF
   One MDU – OFF

⇒ If TAL:
When V < 19K:

3. MPS ENG PWR (six) – OFF

LOSS OF 1 FC PWRDN (ENTRY)

1. If V < 15K >>
2. IDP/CRT4, one MDU,FLT CNTLR PWR – OFF
3. RA/MLS – OFF

If middeck PL on:

4. cb MNB UTIL PWR – op (pnl O15:C)

♦ 5. PRI PL (three) – OFF
AFT PL (two) – OFF

FC

OV105

HOOK

2nd FC SHUTDN (GRTLS/TAL)

(CL PMP Lost: < 6 min)

1. Have CDR start LOSS OF 2nd FC PWRDN (GRTLS/TAL)

If three MN buses pwrd:

2. MN BUS TIE (three) – OFF
   (do not perform BUS LOSS ACTION)
3. LES O2 – OFF, visors – OP
4. Switch off all but one IDP/CRT with four MDUs
5. All PL pwr (seven) – OFF
6. O2,H2 TK HTRS (all) – OFF
7. After CDR pnl L1 config complete, continue:

If two MN buses pwrd:

8. Pwrd MN BUS TIES (two) – ON

If only one MN bus pwrd:

9. MN BUS TIE (three) – OFF
   If only MNA(B,C) pwrd: Secure APU 2(3,1)
   BUS TIE good FC/BUS (MNA)
   I/O RESET

When reqd:

10. ESS BUS SOURCE FC – OFF
    FC/MN BUS – OFF
    FC – STOP (1 sec)
    FC REAC VLV – CL
11. G51 √ICNCT ENA (if reqd for OMS load)
12. Go to LOSS OF 2nd FC PWRDN (GRTLS/TAL)

2nd FC SHUTDN (ENTRY)

1. Have CDR go to LOSS OF 2nd FC PWRDN (ENTRY)
2. O2/H2 HTRS (twelve) – OFF (pnl R1)
   PL pwr (seven) – OFF
3. √MSTR MADS PWR – OFF

If aff FC/MN BUS is tied:

4. MN BUS TIE (two) – OFF
5. If only MNA(B,C) pwrd: Secure APU 2(3,1)
6. Perform BUS TIE (good FC/BUS to another BUS), then:
7. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF
   FC – STOP (1 sec)
   FC REAC VLV – CL

2FC/ CRYO

TOP
BACK OF '2nd FC SHUTDN (GRTLS/TAL);
FACING RIGHT SIDE OF BACKBOARD

PILE

LOSS OF 2nd FC PWRDN
(GRTLS/TAL)

⇒ ♦ When MPS Dump complete:
1. MPS ENG PWR (six) – OFF
EIU (three) – OFF
2. MEC 1 – OFF, wait 2 sec, then
2 – OFF

If MNA(MNB) unpwrd:
3. O2,H2 TK1 HTRS B (two) – AUTO

If MNC unpwrd:
4. O2,H2 TK2 HTRS B (two) – AUTO
5. Safe Payload, if reqd
6. Go to APU RESTART for secured APU

O2(H2) CRYO P/T HIGH
O2(H2) TK HTRS (two) – OFF

CRYO O2(H2) LEAK (three or more tanks aff)
Use meter if CRT data OSL
1. O2(H2) MANF VLV TK1,TK2 (two) – CL
2. O2(H2) TK3 HTRS A – AUTO

⇒ If TK1 and TK2 P decr slowly (HTR logic fail):
3. If QTY > 55%: TK3 HTRS B – AUTO
4. MANF VLV 1,2 (two) – OP >>
5. Perform aff MN BUS TIE, then:

If O2(H2) TK1(2) aff (open unaff manf):
6. O2(H2) TK2(1) – OP

If O2 TK1(2) aff:
7. O2 SYS 1(2) SPLY – CL
8. If O2 TK1(2) P now incr (PCS leak): >>
9. If O2 leak: (Aff) TK HTR B – AUTO

If aff TK P not incr:
10. If TK3 aff: √HTRS A(&B if O2) – AUTO
11. Perform aff FC SHUTDN (post COOL P alarm if O2 leak), then:

If TK3 aff and P not decr within 2 min (FC leak):
12. MANF VLV 1,2 (two) – OP (ASAP) >>
13. (Aff) TK HTRS A,B (two) – OFF

2FC

POWERED FLIGHT

CDR WINDOW FLIP BOOK

POWERED FLIGHT

CDR WINDOW FLIP BOOK

POWERED FLIGHT

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CDR WINDOW FLIP BOOK

FAB USE ONLY

HOOK

DPS
GPC
MDM

COMM LOST (mult pnls)
1. AUD CTR – 2
2. No joy, S-BD PM CNTL – PNL,CMD
3. Config per COMM COVER (ASC) [BFS G51]:
   TDRS – ITEM 46 EXEC (*****)
   STDN-HI – ITEM 47 EXEC (*****)
   SGLS – ITEM 49 EXEC (*****)
4. No joy, sel best S-BD PM ANT; else GPC ⇒

ICOM LOST
1. AUD CNTL sel – sel alt
2. No joy, AUD CTR – 2

FCS CH 1(2,3,4) (2nd FAIL) [G53]
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL)
(Aff) FLT CNTLR PWR – OFF

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA [BFS G51]
Aff LRU – desel

RM DLMA IMU [G51] [BFS G51]
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

POST BFS ENGAGE
If PASS GPCs running:
   1. (Aff) GPC MODE – STBY/HALT
2. BFS I/O RESET
3. √FCS CHs, IMU config
If Pre MECO:
   4. If SSME failed: MN ENG LIMIT SHUTDN –INH
5. [G51] DES failed(commfaulted) RGA,AA,SURF ⇒G

PILE

COMM
GNC
DPS
BFS

PASS GPC FAIL

1. (Aff) FCS CH – OFF

If two GPC/FA/FCS CHs ↓:

2. (Good) FCS CHs – ORIDE
3. √MPS CMD
4. G53 aff SURF FDBK – desel
5. If FTS, ASAP, GPC MODE – STBY,HALT
6. √BIG 'X', then assign IDPs as reqd
7. √MULT DATA PATH LOSS

Post MECO:

8. ASAP, GPC MODE – STBY,HALT ⇒

BFS GPC FAIL

1. Post SRB SEP: FLASH EVAP CNTLR PRI A – ON

Post MECO:

2. GPC MODE – STBY,HALT
♦ OUTPUT – TERM
3. If no comm: sel best S-BD PM ANT ⇒

FF(FA) MDM OUTPUT

FAULT

♦ (Take action only if annun by entire set)

If single 'MDM OUTPUT':

1. Go to FA/FF MDM I/O ERROR >>

If both FF and FA annun:

2. I/O RESET; if reqd, BFS I/O RESET
3. If msgs repeat: Go to PASS GPC FAIL >>
4. If reqd, (aff) FCS CH – ORIDE,AUTO

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
♦ 2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL2 down:
   Post SRB SEP: FLASH EVAP CNTLR PRI A – ON
   If no comm: sel best S-BD PM ANT ⇒

PCM I/O ERROR

OI PCMMU PWR – 2

SUMWORD ICC

If TAL:

Go to OPS 1/6/TAL TRANSITION RESTRING (Cue Card) for aff GPC >>

If AOA/Uphill: ⇒A

HOOK

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
		4. BFS I/O RESET >>
NOT RECOV	FA	5. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 6. G53 aff SURF FDBK – desel
		7. √MULT DATA PATH LOSS ♦ 8. Go to FA/FF MDM PORT MODE ⇒

BCE MDP

FA/FF MDM PORT MODE

NOTE

If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF	5. >>
	NOT RECOV	FA	6. BFS G51 aff SURF FDBK, RGA – desel
		FF	7. BFS G51 aff AA – desel
			8. √MULT DATA PATH LOSS ⇒
@GPC	FA RECOV (FF Give Up)		9. (Aff) FCS CH – AUTO 10. G51 aff IMU – desel 11. G53 aff SURF FDBK – resel 12. √MULT DATA PATH LOSS ⇒A
	FF RECOV (FA Give Up)		13. (Aff) FCS CH – OFF 14. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 15. G53 aff SURF FDBK – desel 16. √MULT DATA PATH LOSS ⇒A

PILE

DPS GPC MDM

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU	1. G51 IMU – desel
		2. I/O RESET
RECOV	IMU	3. >>
		4. >>
NOT RECOV	NSP	5. And no comm: PNL,CMD 6. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) >>
		♦ 7. G01 aff String – port mode 8. BFS I/O RESET 9. If recov, go to RECOV steps >>
	B	10. BFS G51 aff AA – desel
	D	11. BFS G51 aff SURF FDBK,RGA – desel
	B/D	12. If RTLS: G23 OVRD aff MANF(s) – OP 13. √MULT DATA PATH LOSS ⇒

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

HOOK

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config

11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

TOP
BACK OF ‘BFS DISPLAY FAIL’

PILE

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FAB USE ONLY

HOOK

FLT INST DISPLAY ANOMALY
1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY
1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

BFS INADVERTENT DISENGAGE/UNSUCCESSFUL ENGAGE (Lightning Strike)
1. CDR and PLT RHC BFS engage pb – push

If no response:
2. BFS OUTPUT – NORM,B/U
3. CDR,PLT RHC BFS engage pb – push

CAB P
ECLSS
FREON

MULT DATA PATH LOSS (non-Recov)

NOTE
If LRU data path loss due to GPC prob and not MDM, BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FA any combo	I/O D	√BFS MM at each transition Expect 'SEP INH' (FDLN Fail) combos 2&3,2&4
		√OMS MAN SHUTDOWN Post MECO: Before MECO + 25 sec: •• 1. MPS FDLN RLF ISOL (two) – OP 2. MPS PREVLVs (six) – OP RTLS/TAL: MPS FILL/DRAIN LH2 INBD, OUTBD – OP
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA SWs
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA SWs

PILE

CAB PRESS LEAK
1. CAB RELIEF A – CL,pause,
   B – CL
2. Check tabs, visors – CL, LES O2 – ON
3. If RTLS/TAL: O2/N2 CNTLR VLV SYS 2 – OP
4. O2 TK1,TK2 HTRS A,B (four) – AUTO ⇒

CAB PRESS HIGH
1. If incr: LES O2 – OFF, visors – OP

If still incr:
2. N2 SYS 1,2 REG INLET (two) – CL
3. O2 SYS 1,2 SPLY (two) – CL ⇒A

BCE
MDP

PPO2 ABNORMAL ⇒A

H2O LOOP PRESS HIGH
♦ Deact pump ⇒

H2O LOOP PRESS LOW ⇒

AV BAY FAN ΔP
♦ Deact fan ⇒

AV BAY TEMP HIGH ⇒

CABIN FAN FAIL ⇒

IMU FAN FAIL ⇒

HOOK

FREON FLOW LOW

♦ 1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)

If flow still low:

3. Perform LOSS OF FREON LOOP(s), then ⇒A

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH
4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF
   A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM

EVAP

7. If no comm: sel best S-BD PM ANT

ESS

Post MECO:

If RTLS:

8. TACAN (three) – OFF
9. RDR ALTM 1 – OFF ⇒G

If TAL:

10. All TACAN/RA – OFF
11. Use one FLT CNTLR PWR ⇒G

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

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PILE

EVAP OUT TEMP HIGH

If temp high in only one loop (snsr failed) >>

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)

   If T decr >>

2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)

   If T decr:

   3. TOP EVAP HTR DUCT sel – A/B >>

4. HI LOAD EVAP – OFF (wait 30 sec)

   If T decr (HI LOAD EVAP only lost):

   5. HI LOAD DUCT HTR sel – A/B ⇒A

6. RAD BYP VLV (four) – MAN, RAD FLOW

   (total FES lost) ⇒A

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. ♦ FREON PUMP LOOP 1,2 (two) – B

   NH3 CNTLR A,B (two) – SEC/ON

CAB P ECLSS FREON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. FLASH EVAP CNTLR PRI B – ON
12. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
13. NH3 CNTLR A,B (two) – OFF

FREON LEAK

♦ 1. FREON ISOL MODE – MAN

2. (Aff) FREON ISOL LOOP 1(2) – ISOL

   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop ⇒

If (aff) FREON LOOP 1(2) ACCUM QTY not decr, ⇒A

OV103,104

HOOK

FREON FLOW LOW

♦ 1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)

If flow still low:

3. Perform LOSS OF FREON LOOP(s), then ⇒A

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH

4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF
   A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM

EVAP

7. If no comm: sel best S-BD PM ANT

ESS

Post MECO:

8. GPS 1,3 (two) – OFF

If RTLS:

9. RDR ALTM 1 – OFF ⇒G

If TAL:

10. RA 1,2 (two) – OFF
11. Use one FLT CNTLR PWR ⇒G

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

OV105

PILE

EVAP OUT TEMP HIGH

If temp high in only one loop (snsr failed) >>

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)

   If T decr >>

2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)

   If T decr:

   3. TOP EVAP HTR DUCT sel – A/B >>

4. HI LOAD EVAP – OFF (wait 30 sec)

   If T decr (HI LOAD EVAP only lost):

   5. HI LOAD DUCT HTR sel – A/B ⇒A

6. RAD BYP VLV (four) – MAN, RAD FLOW
   (total FES lost) ⇒A

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. ♦ FREON PUMP LOOP 1,2 (two) – B
   NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. FLASH EVAP CNTLR PRI B – ON
12. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
13. NH3 CNTLR A,B (two) – OFF

CAB P
ECLSS
FREON

FREON LEAK

1. ♦ FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop

If (aff) FREON LOOP 1(2) ACCUM QTY not decr, ⇒A

OV105

HOOK

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost ⇒A
		3. ⇒A
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk) ⇒A
		3. ⇒A
ESS 3AB	**O13**	1. GPC CAM Lights lost
		2. Do not engage BFS ⇒

LOSS OF 2nd FC PWRDN

1. LES O2 – OFF, visors – OP
2. L1: Select one FREON PUMP on good FC/MN BUS and place other pump to OFF
   Switch OFF all HUM SEPS, IMU FANS, H2O PUMPS, AV BAY FANS, CAB FANS, FES HTRS
3. Switch off all but one IDP/CRT with four MDUs

After BUS TIE, if MNC unpwrd:

4. FLASH EVAP CNTLR PRI A – OFF
   B – ON
5. ⇒ LOSS OF 2nd FC PWRDN

MN AC CNTL

FWD

PILE

MNA
Post SRB SEP:
♦ 1. TOP EVAP HTR DUCT sel – B
2. HI LOAD DUCT HTR sel – B
3. BFS G51 AA1 – desel ⇒
4. MS AUD CNTL – PS (MS can't talk)
FAILED: UHF HI PWR XMIT

MNB
Post SRB SEP:
BFS G51 AA2, RGA 2 – desel ⇒
FAILED: S-BD PM 1 (NO PNL,CMD)

MNC
Post SRB SEP:
1. FLASH EVAP CNTLR PRI A – OFF, B – GPC
2. BFS G51 RGA 3 – desel ⇒

ANY AC BUS LOSS ⇒

SUBBUS [MNA O14] ⇒G

SUBBUS [APC6 or ALC3]
1. FLASH EVAP CNTLR PRI A – OFF, B – GPC

CNTL BUS LOSS

AB1	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B ⇒
AB2	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B ⇒
AB3	1. TOP EVAP HTR DUCT sel – B 2. HI LOAD DUCT HTR sel – B If BFS engage reqd: 3. Use PLT's RHC, then GPCs 1,2,4 - STBY,HALT 4. BFS I/O RESET 5. ⇒
BC1	BFS G51 RGA 2 – desel ⇒
BC2	⇒
BC3	⇒
CA1	1. No BFS engage Post SRB SEP: 2. FLASH EVAP CNTLR PRI A – ON 3. BFS G51 RGA 3 – desel ⇒
CA2	⇒

EVAP
ESS

HOOK

FWD RCS LK
(check He P decr: CRT and meter)
(check TK P; if '↑': Go to TK P HIGH >>)

RTLS	1. Perform RCS SECURE, then: 2. Post PPD – reopen RCS Post ET SEP -Z transl: 3. Go to RCS SECURE >>
Pre ET SEP (N/A RTLS)	4. ET SEP – MAN 5. MPS PRPLT DUMP SEQ – STOP 6. Perform RCS SECURE, then:
Single MANF leak	7. Reopen RCS, except bad MANF 8. ET SEP – AUTO Post ET SEP -Z transl: 9. MPS PRPLT DUMP SEQ – GPC >>
TK leg leak (two MANF P Low)	10. Reopen RCS, except bad leg 11. ET SEP – AUTO Post ET SEP -Z transl: 12. MPS PRPLT DUMP SEQ – GPC >>
PRPLT TK P decr	
Post MECO	13. RATE DAMP with ARCS 14. Reopen FRCS
TK P > 200 & QTY > 0%	15. ET SEP – AUTO
TK P < 200 or QTY = 0%	16. Perform RCS SECURE, then: 17. DAP – INRTL, PITCH – PULSE 18. ET SEP pb – SEP 19. THC -Z (UP) (2 sec; -1.25°/sec) 20. THC -X (OUT) and hold
At SEP (SEP init + approx 12 sec)	21. THC +Z (DOWN) (3 sec; +0.3°/sec) THC -Z (UP) (2 sec; -0.9°/sec) COAST (5 sec) THC +X (IN) (20 sec) After 10 sec of +X, then: PITCH – DISC RATE
	22. OPS 104 PRO, DAP – AUTO
Otherwise: (He TK or He leg)	Post MECO: 23. Reopen RCS 24. ET SEP – AUTO
Post ET SEP -Z transl	25. MPS PRPLT DUMP SEQ – GPC 26. Go to RCS SECURE

TOP
BACK OF 'FWD RCS LK'

PILE

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MN
AC
CNTL

FWD

CDR WND FB A13-14 AESP/ALL/A/GEN O

FAB USE ONLY

GLIDED FLIGHT

CDR WINDOW FLIP BOOK

GLIDED FLIGHT

CDR WINDOW FLIP BOOK

GLIDED FLIGHT

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CDR WINDOW FLIP BOOK

FAB USE ONLY

HOOK

GNC

COMM LOST (mult pnls)

1. AUD CTR – 2

No comm (check UHF sites):

2. S-BD PM CNTL – PNL,CMD (pnl C3)
3. Config per COMM COVER (ASC) BFS G51:
   - TDRS – ITEM 46 EXEC (*****)
   - STDN-HI – ITEM 47 EXEC (*****)
   - SGLS – ITEM 49 EXEC (*****)

   If ***** not next to selected config:

4. Config pnl A1 per Comm Coverage (ASC/ENT PKT, COMM)
   S-BD PM CNTL – PNL,CMD (pnl C3)

No comm:

5. Sel best S-BD PM ANT

No comm:

6. S-BD PM ANT – GPC

ICOM LOST

1. AUD CNTL sel – sel alt

No ICOM:

2. AUD CTR – 2

PILE

COMM

FCS CH 1(2,3,4) (2nd FAIL) G53
If two FCS CH ↓ on any actuator:
♦ (Remaining) FCS CH (two) – ORIDE

RHC L(R) (2nd FAIL) GNC SYS SUMM 1
(Aff) FLT CNTLR PWR – OFF

G51 ROLL MODE SW G51
If ROLL MODE ≠ sw pos:
AUTO SEL – ITEM 42 EXEC

DISPLAY SW L(R)
L(R) disp sws – green dot

RM FAIL IMU,RGA,AA BFS G51
Aff LRU – desel

RM DLMA IMU G51 BFS G51
1. √MCC, bad IMU – desel (PASS & BFS) >>
♦ 2. Desel lower # IMU with '?' (PASS)

RM FAIL ADTA G51
♦ 1. √BFS GNC SYS SUMM 1
2. If '↓' for aff ADTA >>
3. If accessible, (bad) ADTA cb – op >>
4. BFS, ADTA to G&C – INH

RM DLMA ADTA * G51

M < 2.0		1. Fly Theta limits
ADTA data agrees		2. Desel,resel one ADTA 3. If no '?' >>
Bad probe		4. Stow bad probe >>
Bad ADTA	ADTA cb accessible	♦ 5. (Bad) ADTA cb – op >>
	ADTA cb not accessible	♦ 6. DES bad ADTA 7. √BFS GNC SYS SUMM 1 8. If '↓' for aff ADTA >> 9. BFS, ADTA to G&C – INH
Dilemma not resolved		10. ADTA to G&C – INH (PASS & BFS)

***If three ADTAs failed:**
ADTA to G&C – INH (PASS)
Fly Theta limits

HOOK

RM FAIL TAC G50
(RM LIMITS: 6 DEG, 0.5 NM)
1. If data good: desel,resel aff TACAN >>
2. If failure verified: desel failed TACAN in BFS

RM DLMA TAC G50
Do not desel or resel while in 'TEST'
1. If both data good: desel,resel one TACAN in DLMA >>
2. √TACAN MODE (three) – GPC
3. If 'RM FAIL TAC': desel failed TACAN in BFS >>
4. If continuous 'TEST': TACAN MODE (three) – T/R
   If bad TACAN identified:
   5. Desel bad TACAN (PASS,√BFS)

DPS
GPC
MDM

SPD BRK G51 BFS G51

M>5.0	♦ WRAP MODE – INH
M≤5.0	WRAP MODE – INH √MCC for energy mgmt procs

G55 GPS FAIL 2 G50 BFS G50
GPS to NAV INH – ITEM 43 EXEC (PASS, √BFS)

NO UPDATE GPS G55
√MCC
If ALT < 300kft and ALT > 180kft
  No Update due to plasma, reevaluate at ALT < 180kft
Else
  INIT – ITEM 15 EXEC
  NAV – ITEM 18 EXEC

OV103,104

PILE

GNC

PASS GPC FAIL

1. (Aff) FCS CH – OFF
2. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE
3. GPC MODE – STBY,HALT
4. G53 aff SURF FDBK – desel
5. ⇒ If String 1(2): CDR(PLT) disp sws – green dot
   NWS – 2
6. √MULT DATA PATH LOSS

BFS GPC FAIL

1. GPC MODE – STBY,HALT
2. ♦ OUTPUT – TERM
   ⇒ MODE – STBY
3. If BFS cannot drive an IDP:
   GPC MODE – HALT, then go to step 8
4. If BFS currently in OPS 3 or 6:
   Go to step 7
5. If BFS currently in OPS 1:
   PRO to OPS 106
   BFS, OPS 000 PRO
   PRO to OPS 304
6. If BFS in desired MM (304):
   BFS G50 √BFS R/W sel
   GPC MODE – RUN
   OUTPUT – B/U
   Advise MCC BFS in BACKUP >>
7. √GPC MODE – STBY (BFS is SM Only)
8. If no comm: sel best S-BD PM ANT
9. MPS He ISOL B (three) – CL
   PNEU He ISOL – CL
10. If AOA/GRTLS/TAL < 120K:
    NH3 CNTLR B – SEC/ON

FA/FF MDM I/O ERROR
(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
	FF 1,2,3	♦ 4. G51 IMU – resel
		5. BFS I/O RESET >>
NOT RECOV	FA	6. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 7. G53 aff SURF FDBK – desel
		8. √MULT DATA PATH LOSS ⇒ ♦ 9. Go to FA/FF MDM PORT MODE ⇒

OV103,104

HOOK

RM FAIL TAC G50
(RM LIMITS: 6 DEG, 0.5 NM)
1. If data good: desel,resel aff TACAN >>
2. If failure verified: desel failed TACAN in BFS

RM DLMA TAC G50
Do not desel or resel while in 'TEST'
1. If both data good: desel,resel one TACAN in DLMA >>
2. √TACAN MODE (three) – GPC
3. If 'RM FAIL TAC': desel failed TACAN in BFS >>
4. If continuous 'TEST': TACAN MODE (three) – T/R
   If bad TACAN identified:
   5. Desel bad TACAN (PASS,√BFS)

DPS
GPC
MDM

SPD BRK G51 BFS G51

M>5.0	♦ WRAP MODE – INH
M≤5.0	WRAP MODE – INH √MCC for energy mgmt procs

G55 GPS FAIL 1(2,3) G50 BFS G50
Aff LRU – desel (PASS, √BFS)

RM DLMA GPS G50 BFS G50
♦ 1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If 300kft > ALT > 180kft
   DLMA due to plasma
   Reevaluate when ALT < 180kft
   Else
   3. Desel GPS with highest P1σ
      If P1σ values are equal, desel highest number LRU
   If DLMA not resolved
   4. Desel GPS with next highest P1σ

NO UPDATE GPS G55
1. √MCC, bad GPS – desel (PASS, √BFS) >>
2. If RM DLMA GPS message, see RM DLMA GPS >>
3. If 300kft > ALT > 180kft
   No Update due to plasma
   Reevaluate when ALT < 180kft
   Else
   4. Initialize GPS with highest P1σ
      INIT – ITEM 14(15,16) EXEC
      NAV – ITEM 17(18,19) EXEC
      May take up to 2 minutes for GPS to provide SV

OV105

PILE

GNC

PASS GPC FAIL

1. (Aff) FCS CH – OFF
2. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE
3. GPC MODE – STBY,HALT
4. G53 aff SURF FDBK – desel
5. ⇒ If String 1(2): CDR(PLT) disp sws – green dot
   NWS – 2
6. √MULT DATA PATH LOSS

BFS GPC FAIL

1. GPC MODE – STBY,HALT
2. ♦ OUTPUT – TERM
   ⇒ MODE – STBY
3. If BFS cannot drive an IDP:
   GPC MODE – HALT, then go to step 8
4. If BFS currently in OPS 3 or 6:
   Go to step 7
5. If BFS currently in OPS 1:
   PRO to OPS 106
   BFS, OPS 000 PRO
   PRO to OPS 304
6. If BFS in desired MM (304):
   BFS G50 √BFS R/W sel
   GPC MODE – RUN
   OUTPUT – B/U
   Advise MCC BFS in BACKUP >>
7. √GPC MODE – STBY (BFS is SM Only)
8. If no comm: sel best S-BD PM ANT
9. MPS He ISOL B (three) – CL
   PNEU He ISOL – CL
10. If AOA/GRTLS/TAL < 120K:
    NH3 CNTLR B – SEC/ON

FA/FF MDM I/O ERROR

(Annunciated by entire set)

	FA	1. (Aff) FCS CH – OFF
		♦ 2. I/O RESET
RECOV	FA	3. (Aff) FCS CH – AUTO
	FF 1,2,3	♦ 4. G51 IMU – resel
		5. BFS I/O RESET >>
NOT RECOV	FA	6. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 7. G53 aff SURF FDBK – desel
		8. √MULT DATA PATH LOSS ⇒ ♦ 9. Go to FA/FF MDM PORT MODE ⇒

OV105

HOOK

FA/FF MDM PORT MODE

NOTE

If BFS, 'BCE STRG X PASS', @GPC; else @MDM.
For '@GPC' port mode results in alternate MDM bypass

			1. G01 aff String – port mode 2. BFS I/O RESET
@MDM	RECOV	FA	3. (Aff) FCS CH – AUTO 4. G53 aff SURF FDBK – resel >>
		FF 1,2,3	♦ 5. G51 IMU – resel >>
	NOT RECOV		⇒ If MCC GO for pwr cycle: 6. (Aff) FA/FF MDM – OFF,ON 7. I/O RESET 8. If recov, go to @MDM RECOV >> 9. (Aff) MDM – OFF
		FA	10. BFS G51 aff SURF FDBK, RGA – desel
		FF	11. BFS G51 aff AA – desel 12. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2
			13. √MULT DATA PATH LOSS >>
@GPC	FA RECOV (FF Give Up)		14. (Aff) FCS CH – AUTO 15. G53 aff SURF FDBK – resel 16. FF 1(2): CDR(PLT) disp sws – green dot NWS – 2 17. √MULT DATA PATH LOSS >>
	FF RECOV (FA Give Up)		18. (Aff) FCS CH – OFF 19. If two GPC/FA/FCS CHs ↓: (Good) FCS CHs – ORIDE 20. G53 aff SURF FDBK – desel
		FF 1,2,3	♦ 21. G51 IMU – resel
			22. √MULT DATA PATH LOSS >>

DPS BCE

PILE

FF(FA) MDM OUTPUT FAULT

♦ (Take action only if annun by entire set)

If single 'MDM OUTPUT':

1. If 'FF MDM OUTPUT':
   G51 aff IMU – desel
2. Go to FA/FF MDM I/O ERROR >>

If both FF and FA annun:

3. G51 aff IMU – desel
4. I/O RESET; if reqd, BFS I/O RESET
5. If msgs repeat: Go to PASS GPC FAIL >>
6. If reqd, (aff) FCS CH – ORIDE,AUTO

♦ 7. G51 IMU – resel

DPS GPC MDM

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
2. G01 PL1/2 – port mode, then BFS I/O RESET; if recovered >>
3. If PL1 ↓ and pre MM305: FLASH EVAP CNTLR PRI B – ON
4. If PL2 ↓ and no comm: sel best S-BD PM ANT
5. If PL2 ↓ and AOA/GRTLS/TAL < 120K:

⇒ NH3 CNTLR B – SEC/ON

PCM I/O ERROR

OI PCMMU PWR – 2(1)

POST BFS ENGAGE

If PASS GPCs running:

1. (Aff) GPC MODE – STBY/HALT

2. BFS I/O RESET
3. √FCS CHs, IMU config

⇒ If Air Data not analyzed:

4. G50 INH AD to G&C
5. M = 5: Deploy,evaluate probes one at a time
6. √AD to G&C by M = 1.5

If failed ADTA(s) in PASS:

7. cb(s) ADTA – op, or stow probe

8. G51 DES failed(commfaulted) RGA,AA,SURF
9. G50 DES failed TAC

At M ≤ 2.7:

10. CDR TRIM PNL – OFF
    RHC/PNL – ENA

At H = 3K:

11. SPDBK – MAN (check DEL PAD setting)

At MAIN GEAR TD:

12. SPDBK – 100%

HOOK

BCE STRG X (no 'MDM OUTPUT' msg)

	IMU		1. G21 √IMU OPER, if STBY >>
			2. I/O RESET
RECOV	IMU		3. G21 √att ANG, if delta > 1° >>
		♦	4. G51 IMU – resel >>
			5. >>
NOT RECOV	NSP		6. And no comm: PNL,CMD 7. BFS G51 Config per COMM COVER (ASC): TDRS – ITEM 46 EXEC (*) STDN-HI – ITEM 47 EXEC (*) SGLS – ITEM 49 EXEC (*) >>
			8. G01 aff String – port mode 9. BFS I/O RESET 10. If recov, go to RECOV steps >>
	A(B,C,D, IMU)	⇒	11. FF A(B,IMU) or FA C(D) MDM – OFF,ON 12. I/O RESET 13. If FA, (aff) FCS CH – ORIDE,AUTO 14. If recov, go to RECOV steps
		C(D)	15. If < 3Y,2P jets/pod/dir: a. G23 aff jet DES INH (*) (reprioritize) b. Aff MANF VLVS STAT OP – OVRD
		1A(2A)	16. CDR(PLT) disp sws – green dot
		B	17. BFS G51 aff AA – desel
		D	18. BFS G51 aff SURF FDBK,RGA – desel
			19. √MULT DATA PATH LOSS >>

DPS/ MDP

CAB P ECLS

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP

If reqd to clean up display:

2. (Aff) IDP/CRT PWR – OFF,ON

PILE

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms

If MCC GO for pwr cycle:

6. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

7. Set other MDU on same IDP to DPS Mode; if recovered >>
8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms

If MCC GO for pwr cycle:

8. IDP/CRT PWR – OFF,ON; if recovered >>

If MDU blank or autonomous:

9. Set other MDU on same IDP to DPS Mode; if recovered >>
10. Return other MDU to nominal config
11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

DPS
BCE

HOOK

FLT INST DISPLAY ANOMALY
1. DATA BUS sel alt FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY
1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

BFS INADVERTENT DISENGAGE/UNSUCCESSFUL ENGAGE (Lightning Strike)
1. CDR and PLT RHC BFS engage pb – push

If no response:
2. BFS OUTPUT – NORM, B/U
3. CDR,PLT RHC BFS engage pb – push

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC prob and not MDM, BFS will pick up MDMs/LRU when engaged

FAILURE	TYPE	ACTIONS
GPC/FF 1&2	I/O or B	Use R BODY FLAP & TRIM ENA sws
GPC/FF 3&4	I/O or B	Use L BODY FLAP & TRIM ENA sws
GPC/FA any combo	I/O or D	No impact

PILE

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HOOK

CAB PRESS LEAK

1. CAB RELIEF A – CL,pause,
   B – CL
2. Check tabs, visors – CL, LES O2 – ON
3. If RTLS/TAL: O2/N2 CNTLR VLV SYS 2 – OP
4. O2 TK1,TK2 HTRS A,B (four) – AUTO

⇒ 5. TK3 HTRS A,B (two) – AUTO

If possible:

6. Remove INNER HATCH cap (two)
7. Equal vlv (two) – EMER

When CAB PRESS < 10 psia, if dP/dT EQ < 0.67:

8. √O2/N2 CNTLR VLV SYS 2 – OP >>

When CAB PRESS < 6.5 psia:

9. √O2/N2 CNTLR VLV SYS 2 – OP
10. CAB FAN (two) – ON

CAB PRESS HIGH

1. If incr: LES O2 – OFF, visors – OP

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL
3. O2 SYS 1,2 SPLY (two) – CL

H2O LOOP PRESS LOW(HIGH)

⇒ Switch loops

AV BAY FAN ΔP

⇒ 1. If Av Bay 1 aff: FAN A – ON; FAN B – OFF
If Av Bay 2 aff: FAN B – ON; FAN A – OFF
If Av Bay 3 aff: FAN A – ON; FAN B – OFF

2. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

AV BAY TEMP HIGH

⇒ 1. (Aff) AV BAY FAN (two) – ON
2. If not decr: Switch H2O Loops
3. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

LOSS OF AV BAY COOLING PWRDN

Bay 1: MLS 1 – OFF
Bay 2: 2,3 – OFF
Bay 3: N/A

FREON EVAP

CABIN FAN FAIL

⇒ 1. Switch fans

If both fans lost:

2. Minimize use of IDPs/MDUs/FLT CNTLR PWR

IMU FAN FAIL

⇒ Switch fans

OV103,104

TOP
BACK OF 'CAB PRESS LEAK'

PILE

FREON FLOW LOW

1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MODE – AUTO
   CNTLR LOOP – AUTO A(B) (wait 90 sec)

If flow still low in both loops:

3. Go to LOSS OF FREON LOOP(s)

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH

4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF, A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT

If RTLS:

8. TACAN (three) – OFF
9. RDR ALTM 1 – OFF

If TAL/AOA/ENTRY and V > 15K:

10. All TACAN/RA/MLS – OFF
11. Use one FLT CNTLR PWR

⇒ 12. DC UTIL PWR – OFF

♦ 13. FCS CH 4 – OFF

DPS/ MDP

14. GPC 4 – STBY,HALT,PWR – OFF
15. FF4,FA4 – OFF
16. ANNUN BUS SEL ACA 2/3 – OFF

CAB P ECLS

♦ When MPS dump complete:

17. MPS ENG PWR (six) – OFF
18. EIU (three) – OFF
19. MEC 1 – OFF, wait 2 sec, then:
20. MEC 2 – OFF

♦ 21. G50 √GPS, INCORPORATE
22. At M = 2.9: √RA 2 – ON
23. If reqd: Use one MLS, GNC I/O RESET

OV103,104

HOOK

CAB PRESS LEAK

1. CAB RELIEF A – CL,pause,
   B – CL
2. Check tabs, visors – CL, LES O2 – ON
3. If RTLS/TAL: O2/N2 CNTLR VLV SYS 2 – OP
4. O2 TK1,TK2 HTRS A,B (four) – AUTO

⇒ 5. TK3 HTRS A,B (two) – AUTO

If possible:

6. Remove INNER HATCH cap (two)
7. Equal vlv (two) – EMER

When CAB PRESS < 10 psia, if dP/dT EQ < 0.67:

8. √O2/N2 CNTLR VLV SYS 2 – OP >>

When CAB PRESS < 6.5 psia:

9. √O2/N2 CNTLR VLV SYS 2 – OP
10. CAB FAN (two) – ON

CAB PRESS HIGH

1. If incr: LES O2 – OFF, visors – OP

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL
3. O2 SYS 1,2 SPLY (two) – CL

H2O LOOP PRESS LOW(HIGH)

⇒ Switch loops

AV BAY FAN ΔP

⇒ 1. If Av Bay 1 aff: FAN A – ON; FAN B – OFF
If Av Bay 2 aff: FAN B – ON; FAN A – OFF
If Av Bay 3 aff: FAN A – ON; FAN B – OFF

2. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

AV BAY TEMP HIGH

⇒ 1. (Aff) AV BAY FAN (two) – ON
2. If not decr: Switch H2O Loops
3. If no joy: Go to LOSS OF AV BAY COOLING PWRDN

LOSS OF AV BAY COOLING PWRDN

Bay 1: MLS 1 – OFF
Bay 2: 2,3 – OFF
Bay 3: N/A

FREON EVAP

CABIN FAN FAIL

⇒ 1. Switch fans

If both fans lost:

2. Minimize use of IDPs/MDUs/FLT CNTLR PWR

IMU FAN FAIL

⇒ Switch fans

OV105

PILE

FREON FLOW LOW

1. Switch pumps

If flow still low:

2. (Aff) RAD BYP VLV MODE – AUTO
   CNTLR LOOP – AUTO A(B) (wait 90 sec)

If flow still low in both loops:

3. Go to LOSS OF FREON LOOP(s)

LOSS OF 1 FREON LOOP

1. (Bad) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) lost:

2. O2 SYS 1(2) SPLY (one) – CL
3. √FLOW PROP VLV LOOP 2(1) – ICH

4. Monitor EVAP OUT TEMP

If TAL/AOA/RTLS and LOOP 2 lost:

5. NH3 CNTLR B – OFF, A – PRI/GPC

LOSS OF 2 FREON LOOPS – PWRDN

1. When loops fail (flow <700), CDR execute LOOPS FAILED
2. MSTR MADS PWR – OFF
3. Use one IDP/CRT with two MDUs (three max)
4. All PL pwr (seven) – OFF
5. O2,H2 TK HTRS (all) – OFF
6. MCC CMD FC purge, then BFS GPC – STBY,HALT
   PWR – OFF
   OUTPUT – NORM
7. If no comm: sel best S-BD PM ANT
8. GPS 1,3 – OFF

If RTLS:

9. RDR ALTM 1 – OFF

If TAL/AOA/ENTRY and V > 15K:

10. All RA/MLS – OFF
11. Use one FLT CNTLR PWR

⇒ 12. DC UTIL PWR – OFF

♦ 13. FCS CH 4 – OFF

DPS/ MDP

14. GPC 4 – STBY,HALT,PWR – OFF
15. FF4,FA4 – OFF
16. ANNUN BUS SEL ACA 2/3 – OFF

CAB P ECLS

♦ When MPS dump complete:

17. MPS ENG PWR (six) – OFF
18. EIU (three) – OFF
19. MEC 1 – OFF, wait 2 sec, then:
20. MEC 2 – OFF

♦ 21. G50 √GPS, INCORPORATE
22. At M = 2.9: √RA 2 – ON
23. If reqd: Use one MLS, GNC I/O RESET

OV105

HOOK

LOSS OF 2 FREON LOOPS – LOOPS FAILED

1. LES O2 – OFF, visor – OP
2. O2 SYS 1,2 SPLY (two) – OP

Panel L1: All sws off, except:

3. H2O PUMP LOOP 2 – ON
4. Perform PWRDN if not already accomplished

EVAP OUT TEMP HIGH (Rads cold soaked)

If temp high in only one loop (snsr failed) >>

1. If V < 12K:
   RAD BYP VLV LOOP 1 – MAN,BYP
   NH3 CNTLR B – PRI/GPC >>
2. FLASH EVAP CNTLR PRI B(A) – OFF
   A(B) – ON (wait 30 sec)
   If T decr >>
3. FLASH EVAP CNTLR PRI A(B) – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr:
   TOP EVAP HTRS (three) – OFF >>
4. HI LOAD EVAP – OFF
   DUCT HTR sel – OFF (wait 30 sec)
   If T decr >>
5. TOP EVAP HTRS (three) – OFF
   RAD BYP VLV sel (two) – AUTO
   CNTLR LOOP (two) – AUTO B(A) (wait 90 sec)

EVAP OUT TEMP HIGH (Rads *not* cold soaked)

If temp high in only one loop (snsr failed) >>

If V > 12K:

1. FLASH EVAP CNTLR PRI A – OFF
   B – ON (wait 30 sec)
   If T decr >>
2. FLASH EVAP CNTLR PRI B – OFF
   SEC – ON (HI LOAD ena)
   (wait 30 sec)
   If T decr >>
3. HI LOAD EVAP – OFF
   If T decr >>

⇒ 4. RAD BYP VLV (four) – MAN,RAD FLOW

5. NH3 CNTLR B – SEC/ON (wait 60 sec)
6. If T decr >>
7. NH3 CNTLR B – OFF, A – SEC/ON

EVAP
ESS

PILE

EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H2O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
6. √RAD BYP VLV MODE (two) – MAN
7. √MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. ♦ FREON PUMP LOOP 1,2 (two) – B
   NH3 CNTLR A,B (two) – SEC/ON

Wait 3 min, then if any Freon Loop off:

10. FREON PUMP LOOP 1,2 (two) – B

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

11. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
12. NH3 CNTLR A,B (two) – OFF

If V > 12K and FLASH EVAP CNTLR PRI A(B) previously selected:

13. FLASH EVAP CNTLR PRI B(A) – GPC >>

If V < 12K:

14. RAD BYP VLV MODE 1,2 (two) – AUTO
15. CNTLR LOOP 1,2 (two) – OFF
    AUTO A(B)

FREON LEAK

1. ♦ FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL
   Hold for 5 sec

If (aff) FREON LOOP 1(2) ACCUM QTY decr:

3. ♦ (Aff) FREON ISOL LOOP 1(2) – RAD
   Hold for 5 sec
4. When loop fails ('SM2 FREON FLOW 1(2)'), CDR execute LOSS OF 1 FREON LOOP for (aff) Freon Loop >>

If (aff) FREON LOOP 1(2) ACCUM QTY not decr:

When V<12K and rads cold soaked:

In good loop:

5. √RAD BYP VLV MODE 2(1) – AUTO
6. √RAD CNTLR LOOP 2(1) – AUTO B
7. NH3 CNTLR B(A) – PRI/GPC

FREON EVAP

HOOK

FC
MN

ESS BUS LOSS

ESS 1BC	**O13&R14**	1. L AUD CNTL sel – R (CDR can't talk) 2. Pri C/W & F7 Matrix lost
ESS 2CA	**O13&R14**	1. AUD CTR – 2 2. R AUD CNTL sel – L (PLT can't talk)
ESS 3AB	**O13**	1. GPC CAM Lights lost 2. Do not engage BFS ⇒ 3. BFS GPC OUTPUT – TERM

LOSS OF 2nd FC PWRDN (ENTRY)

1. MDM PL1 – OFF
2. FCS CH 4 – OFF
   GPC MODE 4 – STBY,HALT
   PWR 4 – OFF
   MDM FF4,FA4 – OFF
3. HUM SEP (two) – OFF
4. FLASH EVAP FDLN HTR SPLY (two) – OFF
5. TOP EVAP HTR NOZ L,R (two) – OFF
   DUCT sel – OFF
   HI LOAD DUCT HTR sel – OFF
6. If V > 10K: √CAB FAN A(B) – ON
7. M = 2.9: CAB FAN (two) – OFF
   AV BAY FAN (six) – OFF

PILE

EVAP

ESS

LOSS OF 2nd FC PWRDN (GRTLS/TAL)

1. LES O2 – OFF, visors – OP
2. L1: Select one FREON PUMP on good FC/MN BUS and place other pump to OFF
   Switch OFF all HUM SEPS, IMU FANS, H2O PUMPS, AV BAY FANS, CAB FANS, FES HTRS
3. Switch off all but one IDP/CRT with four MDUs

After BUS TIE, if MNC unpwrd:

4. FLASH EVAP CNTLR PRI A – OFF
   B – ON

⇒ 5. Assign all strings to GPC 1 OPS 30X(60X) PRO

6. Unassigned GPCs MODE – STBY (tb-bp),HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)
   GPC PWR – OFF
7. IMU (one) – OFF (choose previously failed IMU, if any)
8. IMU FAN (one) – ON
9. H2O PUMP (one) – ON
10. AV BAY 1,2 FAN (two) – ON (check fan ON in each bay with a pwrd GPC)

After MPS Pwrdn:

If MNA unpwrd:

11. FREON PUMP LOOP 1 – B
    2 – A
12. TOP EVAP HTR DUCT sel – B
    HI LOAD DUCT HTR sel – B

If MNB(C) unpwrd:

13. FREON PUMP LOOP 1,2 (two) – A(B)
14. TOP EVAP HTR DUCT sel – A
    HI LOAD DUCT HTR sel – A

If TAL:

15. HUM SEP (one) – ON
16. CAB FAN (one) – ON

HOOK

MNA or AC1 Multi Φ

1. FLASH EVAP CNTLR PRI B – OFF, A – GPC
2. TOP EVAP HTR DUCT sel – B
3. HI LOAD DUCT HTR sel – B
4. ⇒ FREON PUMP LOOP 2 – A
5. AV BAY 3 FAN A – ON, B – OFF

If rads cold soaked:

When V ≤ 12K:

6. RAD BYP VLV MODE 1,2 (two) – AUTO
7. RAD CNTLR LOOP 1,2 (two) – AUTO A

8. ANNUN BUS SEL ACA 1 – MNB
9. NWS – 2
10. BFS G51 AA1 – desel
11. MS AUD CNTL – PS (MS can't talk)

FAILED: NH3 A PRI, NWS 1,
UHF HI PWR XMIT, L HUD, AUTO B

CNTL

MNB or AC2 Multi Φ

1. ⇒ AV BAY 1 FAN A – ON, B – OFF
2. FREON PUMP LOOP 1 – A
3. HUM SEP A – ON, B – OFF
4. IMU FAN A – ON, B – OFF
5. AV BAY 2 FAN B – ON, A – OFF
6. √cb AC3 ΦA LG SNSR 1 – cl
7. ANNUN BUS SEL ACA 2/3 – MNC
8. BFS G51 AA2, RGA 2 – desel

FAILED: NH3 B SEC, RA 2, NWS 2
PLT DRAG CHUTE ARM
S-BD PM 1 (NO PNL,CMD)

MNC or AC3 Multi Φ

1. FLASH EVAP CNTLR PRI A – OFF, B – GPC
2. ⇒ CAB FAN B – ON, A – OFF
3. √AV BAY 3 FAN B – ON
4. H2O PUMP LOOP 1 – ON, 2 – OFF
5. √cb AC2 ΦA LG SNSR 2 – cl
6. BFS G51 RGA 3 – desel

FAILED: NH3 A SEC, B PRI
CDR DRAG CHUTE ARM

ANY AC2 SINGLE Φ

⇒ FREON PUMP LOOP 1 – A

TOP
BACK OF 'MNA or AC1 Multi Φ'
FACING RIGHT SIDE OF BACKBOARD

PILE

FC MN

CNTL BUS LOSS

AB1	⇒	1. Use R TRIM & BDY FLP sws FAILED: NH3 A SEC, FES PRI B GPC
AB2	⇒	1. CDR disp sws – green dot FAILED: NH3 B SEC, L HUD, FES PRI B ON, H2O LOOP 1, A ON
AB3	⇒	If BFS engage reqd: 1. Use PLT's RHC, then GPCs 1,2,4 – STBY,HALT 2. BFS I/O RESET
BC1	⇒	1. Use R TRIM & BDY FLP sws 2. BFS G51 RGA 2 – desel FAILED: R HUD CDR DRAG CHUTE DPY/JETT
BC2	⇒	If TAL/AOA/RTLS: 1. NH3 CNTLR B – OFF A – PRI/GPC FAILED: NH3 B PRI, FES SEC GPC, H2O LOOP 1, B ON, CDR DRAG CHUTE DPY/JETT
BC3	⇒	FAILED: NH3 A PRI, FES SEC ON
CA1	⇒ ♦	1. No BFS engage GPC 3,5 2. BFS GPC OUTPUT – TERM 3. BFS G51 RGA 3 – desel FAILED: NH3 B SEC, FES PRI A GPC, H2O LOOP 2 GPC, PLT DRAG CHUTE DPY/JETT
CA2	⇒	FAILED: NH3 A SEC, FES PRI A ON, PLT DRAG CHUTE DPY/JETT

SUBBUS [MNA O14]

1. NWS – 2

If rads cold soaked:

When V ≤ 12K:

2. RAD BYP VLV MODE 1,2 (two) – AUTO
3. RAD CNTLR LOOP 1,2 (two) – AUTO A

FAILED: AUTO B

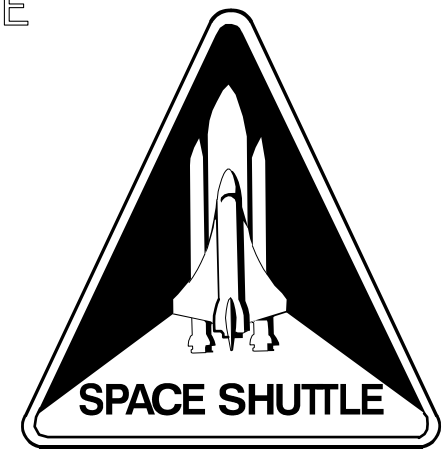
SUBBUS [APC4(5,6) or ALC1(2,3)]

SUBBUS	APC or ALC	4 1	5 2	6 3
1. FLASH EVAP CNTLR		PRI A – GPC		√PRI B – GPC

FAB USE ONLY

Space Shuttle Program
FLIGHT DATA FILE

JSC-48001
GENERIC, REV O



AESP:	MM101
APCL:	MM104
OPCL:	MM106
EPCL:	MM301
AESP:	MM304

ASCENT/ENTRY SYSTEMS PRO

OV
ALL

Flight Cover (trim bottom to expose tabs)