

Ascent Pocket Checklist

Volume II: OV102,4

**Mission Operations Directorate
Operations Division**

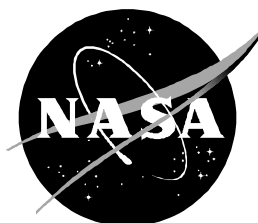
**Generic, Rev I
August 9, 1999**

NOTE
For STS-108 and subsequent OV102,4 flights
Cover replaced in PCN-11
Also see note #9 on page iii

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://fltproc.jsc.nasa.gov/dfd>

ASCENT POCKET CHECKLIST

GENERIC, Rev I (Aug 9, 1999)

PCN-12 (Oct 18, 2001) Sheet 1 of 1

List of Implemented Change Requests (482s):

MULTI-1560
MULTI-1562**NOTE**
For STS-108 and subsequent flights~~Incorporate the following changes to Volume I (OV103,5):~~

- ~~1. Replace v thru x~~
- ~~2. Replace 3-1 and 3-2, 3-5 thru 3-8~~
- ~~3. Replace A4-11 thru B4-12 with 4-11 and 4-12~~

Incorporate the following changes to Volume II (OV102,4):

1. Replace v thru viii
2. Replace 3-1 and 3-2, 3-5 thru 3-8
3. Replace 4-11 and 4-12

Prepared by:

Cindy Simon 10/22/01
Book Manager

Approved by:

Sharon Jones
Manager, Shuttle Procedures Management (USA)

Accepted by:

John B. Early 10/23/01
FDF Subsystem Manager (NASA)

Encl: Volume I - 14 pages; Volume II - 12 pages

File this PCN immediately behind the front cover as a permanent record

MISSION OPERATIONS DIRECTORATE

ASCENT POCKET CHECKLIST

GENERIC, REVISION I
August 9, 1999

PREPARED BY:

Cindy A. Simon
Book Manager

APPROVED BY:

ACCEPTED BY:

Paul D. Hancock
Supervisor,
Procedures Management
(USA)

John W. Bearley
FDF Subsystem Manager
(NASA)

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on JSC Form 482 to DO3/FDF Manager.

Additional distribution of this book for official use must be requested in writing to DO3/FDF Manager. 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.

APCL/ALL/GEN I

Incorporates the following:		
482#:	MULTI-1433	APCL-203
	MULTI-1448A	APCL-204A
	MULTI-1450	APCL-205
	MULTI-1454	APCL-206
	MULTI-1469	APCL-207

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DO35/C. Simon	281-483-0656
Alternate	DO35/J. Gourdine	281-244-1189
APU/HYD	DF05/R. Doremus	281-483-0680
COMM	DF2/S. Murray	281-483-4061
DPS	DF2/T. Murphy	281-483-3290
ECLS	DF8/P. Hasbrook	281-483-0768
EPS	DF7/J. Azbell	281-483-0742
GNC	DF6/K. Dwyer	281-483-2476
OMS/RCS	DF6/C. Koerner	281-483-2617
MPS	DF5/N. Knight	281-483-4899
PWRDN	DF7/J. Azbell	281-483-0742

NOTES

1. The pocket checklists contain contingency procedures to safe a system and continue the flight. As a rule, these procedures do not troubleshoot a malfunction to determine its cause.
2. The pocket checklist is generally constrained to include only those procedures that can and must be performed within 5 minutes. All procedures should be completed promptly and in the step sequence noted. For longer or less time-critical procedures during the orbit phase, the Flight Data File Malfunction Procedures (MAL) book is available.
3. The Ascent Pocket Checklist alone includes the TROUBLESHOOT notation, alerting the crew to the malfunction procedure which may be required later at a less flight-critical time.
4. The absence of a procedure implies no immediate action required.
5. The Ascent Pocket Checklist is unstowed post ET SEP (MM104) and is stowed post OMS-2 (MM106). When a Powered Flight cue card action requires follow-up action, the symbol '⇒' addresses the entry point in the pocket checklist procedure.
6. Steps are numbered sequentially to facilitate reference for orbiter/ground communications and for procedural cross-reference.
7. Applicable procedures from the A/E SYS book (i.e., Sections A1 thru E9) are placed at the front of the flight copies of this book.
8. Applicable procedures from the PL PWR book (i.e., Section 1) are placed at the end of the flight copies of this book.
9. This document (Ascent Pocket Checklist) is published in multiple volumes to accommodate vehicle configuration differences. Volume I is dedicated to OV103 and OV105; |

Volume II is dedicated to OV102 and OV104. Pages which contain procedures that are applicable to all vehicles are duplicated in each volume. The number of volumes and vehicles covered by a particular volume will change as required to keep pace with hardware and/or software upgrades. Only the applicable volume will be manifested on a given flight.

Although published with separate covers, the volumes will be considered together as one book for configuration control, review, and sign-off purposes. This is to ensure that all vehicle configurations are considered when individual procedure changes are made. Updates to all the various affected volumes will be made at the same time regardless of the flights to which the vehicles are assigned.

ASCENT POCKET CHECKLIST – Vol II

LIST OF EFFECTIVE PAGES

GENERIC	04/07/87	PCN-7	11/20/00
REV I	08/09/99	PCN-8	12/15/00
PCN-1	09/17/99	PCN-9	02/05/01
PCN-2	01/13/00	PCN-10	04/24/01
PCN-3	05/23/00	PCN-11	09/25/01
PCN-4	08/11/00	PCN-12	10/18/01
PCN-5	08/31/00		
PCN-6	10/31/00		

Sign Off	* ALL/GEN I	3-9	4/GEN I
ii	* ALL/GEN I	3-10	ALL/GEN I
iii	* ALL/GEN I,11	4-1	ALL/GEN I,1
iv	* ALL/GEN I,11	4-2	4/GEN I, 5
v	* 2,4/GEN I,12	4-3	ALL/GEN I
vi	* 2,4/GEN I,12	4-4	ALL/GEN I
vii	* 2,4/GEN I,12	A4-5	ALL/GEN I,10
viii	* ALL/GEN I	A4-6	OI-28/GEN I,10
ix	* 4/GEN I	B4-5	ALL/GEN I,10
x	* 2,4/GEN I,11	B4-6	OI-29/GEN I,10
xi	* 2,4/GEN I,11	4-7	4/GEN I
xii	* ALL/GEN I,5	4-8	4/GEN I,2
1-1	ALL/GEN I	4-9	ALL/GEN I
1-2	ALL/GEN I	4-10	ALL/GEN I,7
1-3	ALL/GEN I	4-11	ALL/GEN I,12
1-4	ALL/GEN I	4-12	ALL/GEN I,12
2-1	ALL/GEN I,9	4-13	ALL/GEN I
2-2	ALL/GEN I,9	4-14	ALL/GEN I
2-3	ALL/GEN I,9	4-15	ALL/GEN I
2-4	ALL/GEN I,9	4-16	ALL/GEN I
3-1	ALL/GEN I	4-17	ALL/GEN I
3-2	2,4/GEN I,12	4-18	ALL/GEN I,2
3-3	ALL/GEN I	5-1	ALL/GEN I
3-4	4/GEN I	5-2	ALL/GEN I
3-5	2,4/GEN I,12	5-3	ALL/GEN I
3-6	ALL/GEN I,12	5-4	ALL/GEN I,4
3-7	ALL/GEN I,12	5-5	ALL/GEN I,4
3-8	ALL/GEN I,12	5-6	ALL/GEN I,4

* – Omit from flight book

5-6a	ALL/GEN I,4	6-1	ALL/GEN I
5-6b	ALL/GEN I,4	6-2	ALL/GEN I
5-7	ALL/GEN I	6-3	ALL/GEN I
5-8	ALL/GEN I,2	6-4	ALL/GEN I
5-9	ALL/GEN I,2	6-5	ALL/GEN I,1
5-10	ALL/GEN I	6-6	ALL/GEN I,1
5-11	ALL/GEN I	6-7	ALL/GEN I,1
5-12	ALL/GEN I	6-8	ALL/GEN I,1
5-13	ALL/GEN I	7-1	4/GEN I
5-14	ALL/GEN I	7-2	4/GEN I
5-15	ALL/GEN I,3	7-3	4/GEN I,3
5-16	ALL/GEN I	7-4	4/GEN I,2
A5-17	ALL/GEN I,11	7-5	ALL/GEN I,9
A5-18	2/GEN I,11	7-6	ALL/GEN I,9
A5-19	2/GEN I,11	7-7	ALL/GEN I
A5-20	ALL/GEN I,11	7-8	ALL/GEN I
B5-17	ALL/GEN I,11	7-9	ALL/GEN I,9
B5-18	4/GEN I,11	7-10	ALL/GEN I,9
B5-19	4/GEN I,11	7-11	ALL/GEN I
B5-20	ALL/GEN I,11	7-12	ALL/GEN I
5-21	ALL/GEN I	7-13	ALL/GEN I
5-22	4/GEN I,1	7-14	ALL/GEN I
5-23	ALL/GEN I,3	8-1	ALL/GEN I
5-24	4/GEN I	8-2	ALL/GEN I
5-25	ALL/GEN I	8-3	ALL/GEN I
5-26	4/GEN I	8-4	ALL/GEN I
5-27	4/GEN I	8-5	ALL/GEN I
5-28	4/GEN I	8-6	ALL/GEN I
5-29	ALL/GEN I	8-7	ALL/GEN I
5-30	ALL/GEN I	8-8	ALL/GEN I
5-31	4/GEN I	9-1	ALL/GEN I
5-32	ALL/GEN I	9-2	ALL/GEN I
5-33	4/GEN I,9	9-3	ALL/GEN I
5-34	4/GEN I,9	9-4	ALL/GEN I,5
5-35	4/GEN I,9	10-1	ALL/GEN I
5-36	4/GEN I,9	10-2	4/GEN I
5-37	4/GEN I	10-3	ALL/GEN I
5-38	ALL/GEN I	10-4	ALL/GEN I
5-39	ALL/GEN I	10-5	4/GEN I
5-40	ALL/GEN I	10-6	4/GEN I

10-7	.....	ALL/GEN I	10-48	.....	ALL/GEN I
10-8	.....	ALL/GEN I			
10-9	.....	ALL/GEN I			
10-10	.....	ALL/GEN I			
10-11	.....	ALL/GEN I			
10-12	.....	ALL/GEN I			
10-13	.....	ALL/GEN I			
10-14	.....	ALL/GEN I			
10-15	.....	ALL/GEN I			
10-16	.....	4/GEN I			
10-17	.....	4/GEN I			
10-18	.....	ALL/GEN I			
10-19	.....	4/GEN I			
10-20	.....	4/GEN I			
10-21	.....	ALL/GEN I			
10-22	.....	4/GEN I,5			
10-23	.....	4/GEN I,5			
10-24	.....	4/GEN I,5			
10-25	.....	4/GEN I,5			
10-26	.....	4/GEN I,5			
10-27	.....	4/GEN I,5			
10-28	.....	4/GEN I,5			
10-29	.....	4/GEN I,10			
10-30	.....	ALL/GEN I,10			
10-31	.....	4/GEN I			
10-32	.....	4/GEN I			
10-33	.....	4/GEN I			
10-34	.....	ALL/GEN I			
10-35	.....	ALL/GEN I			
10-36	.....	4/GEN I			
10-37	.....	4/GEN I,1			
10-38	.....	4/GEN I			
10-39	.....	4/GEN I			
10-40	.....	4/GEN I,1			
10-41	.....	4/GEN I			
10-42	.....	4/GEN I,1			
10-43	.....	4/GEN I			
10-44	.....	4/GEN I,3			
10-45	.....	4/GEN I,5			
10-46	.....	4/GEN I,3			
10-47	.....	ALL/GEN I,5			

This Page Intentionally Blank

CONTENTS

PAGE

POST MM104 TRANSITION

APU/HYD

APU/HYD SCHEMATIC	1-1
APU SHUTDN	1-2
SPD HI (✓CRT)	1-2
OVERSPEED/UNDERSPEED	1-2
OIL OVERTEMP	1-2
PUMP LEAK P	1-2
RESTART	1-2
HYD PRESS (LOW) (CIL)	1-3
RSVR QTY (LOW)	1-4
T	1-4
ACCUM P (LOW) (CIL)	1-4
W/B QTY (LOW)	1-4

COMM

ICOM LOST	2-2
COMM LOST (mult pnls)	2-2

DPS

DUAL DPS DISPLAY COMMANDERS/DK	
XMTR 1(2,3)	3-2
I/O ERROR CRT/DPS DISPLAY ANOMALY	3-2
FLT INST DISPLAY ANOMALY	3-2
SUBSYS STATUS DISPLAY ANOMALY	3-2
BCE STRG X (no 'MDM OUTPUT' msg)	3-2
MULT DATA PATH LOSS (non-Recov) (CIL)	3-4
BFS GPC FAIL	3-4
PASS GPC (1st FAIL)	3-5
(2nd FAIL)	3-5
BITE	3-5
SUMWORD ICC	3-6
FA MDM I/O ERROR	3-6
FF MDM I/O ERROR	3-7
FF(FA) MDM OUTPUT	3-8
PL MDM I/O ERROR	3-8
PCM I/O ERROR	3-8
BFS GPC IPL	3-9
ASC/AOA TRANSITION RESTRING	3-10

ECLS

EQUIPMENT COOLING MATRIX	4-1
PRESSURE CONTROL SYSTEM	4-4

CONTENTS (Cont)

PAGE

ECLS (Cont)

CAB PRESS HIGH (14.7 REGS Closed)	4-5
FREON FLOW LOW	4-5
EMER PLBD OPENING	4-6
H2O LOOP PRESS LOW(HIGH)	4-7
AV BAY TEMP HIGH	4-8
FAN ΔP	4-8
CAB FAN FAIL	4-8
IMU FAN FAIL	4-9
EVAP OUT T HIGH	4-10
LOW	4-11
FREON QTY LOW	4-12
CAB PPO2 ABNORMAL (14.7 REGS Closed)	4-12
PRESS LEAK (14.7 REGS Closed)	4-13
CONTINGENCY CABIN DEPRESS	4-14
THERMAL HTR	4-16
POST-FIRE CABIN CLEANUP	4-17

EPS

MN BUS UNDERVOLTS/FC VOLTS (CIL)	5-2
AC VOLTS (LOW or HIGH)	5-4
OVERLOAD	5-6
3Φ AC MOTORS STOPPED	5-7
ESS BUS VOLTS LOW (CIL)	5-8
CNTL BUS VOLTS LOW	5-8
SHORT (TIME CRITICAL)	5-9
FC COOLANT PUMP ΔP LOW (CIL)	5-10
REACTANT VLV CLOSED	5-11
COOL P	5-11
STACK T	5-12
EXIT T	5-12
pH 1(2,3)	5-13
DELTA V 1(2,3)	5-13
SHUTDN (1st) (CIL)	5-14
2nd FC SHUTDN	5-14
BUS TIE (CIL)	5-15
FC SAFING	5-15
CRYO O2(H2) PRESS/TEMP HIGH	5-16
LEAK	5-16
SCHEMATIC	5-17
O2/H2 HTR LOSS (All Except OV102)	B5-18
(OV102 Only)	A5-19

CONTENTS (Cont)

PAGE

EPS (Cont)

MAIN DC BUS LOSS ID TABLE	5-21
ESS DC BUS LOSS ID TABLE	5-23
BUS LOSS ACTION (Note CIL Items on 5-25)	5-25
AC1	5-26
MNA (CIL)	5-27
AC2	5-29
MNB (CIL)	5-30
AC3	5-32
MNC (CIL)	5-33
CNTL AB	5-35
BC	5-36
CA	5-37
ESS 1BC (CIL)	5-38
2CA (CIL)	5-39
3AB (CIL)	5-40

GNC

DISPLAY SW L(R)	6-3
ADTA RM	6-4
RM FAIL IMU, RGA, AA	6-5
DLMA IMU	6-5
IMU RM	6-5
TACAN RM	6-6
GPS RM	6-7

OMS

OMS SCHEMATIC	7-1
N2 TK P LOW	7-2
REG P LOW	7-2
HIGH	7-2
TK P (FU and OX) HIGH	7-2
(FU or OX) LOW	7-3
He TK P LOW	7-4
XFEED: L OMS PRPLT to R OMS ENG	7-5
R OMS PRPLT to L OMS ENG	7-5
XFEED RETURN: OMS to OMS (N/A during I'CNCT) .	7-5
OMS SECURE	7-5
L(R) OMS GIMBAL	7-5
DEORBIT MIXED XFD BURN PREP	7-6
AOA DEORBIT MIXED XFD BURN	7-7
OMS-1/OMS-2 UPHILL MIXED XFD	7-10
OMS TABLES	7-12

CONTENTS (Cont)

PAGE

RCS

RCS SCHEMATIC	8-1
SECURE (FWD,AFT)	8-2
I'CNCT: L OMS to RCS	8-2
R OMS to RCS	8-2
I'CNCT TK SWITCH	8-2
RETURN: OMS to RCS (CIL)	8-3
XFEED: R RCS to L RCS (CIL)	8-3
L RCS to R RCS (CIL)	8-4
XFEED RETURN: RCS to RCS (CIL)	8-4
RCS TK P HIGH (FU or OX)	8-5
JET FAIL (LEAK)	8-5
(ON)	8-5
(OFF)	8-5
RM DLMA MANF	8-5
RCS LEAK ISOL	8-6

MPS

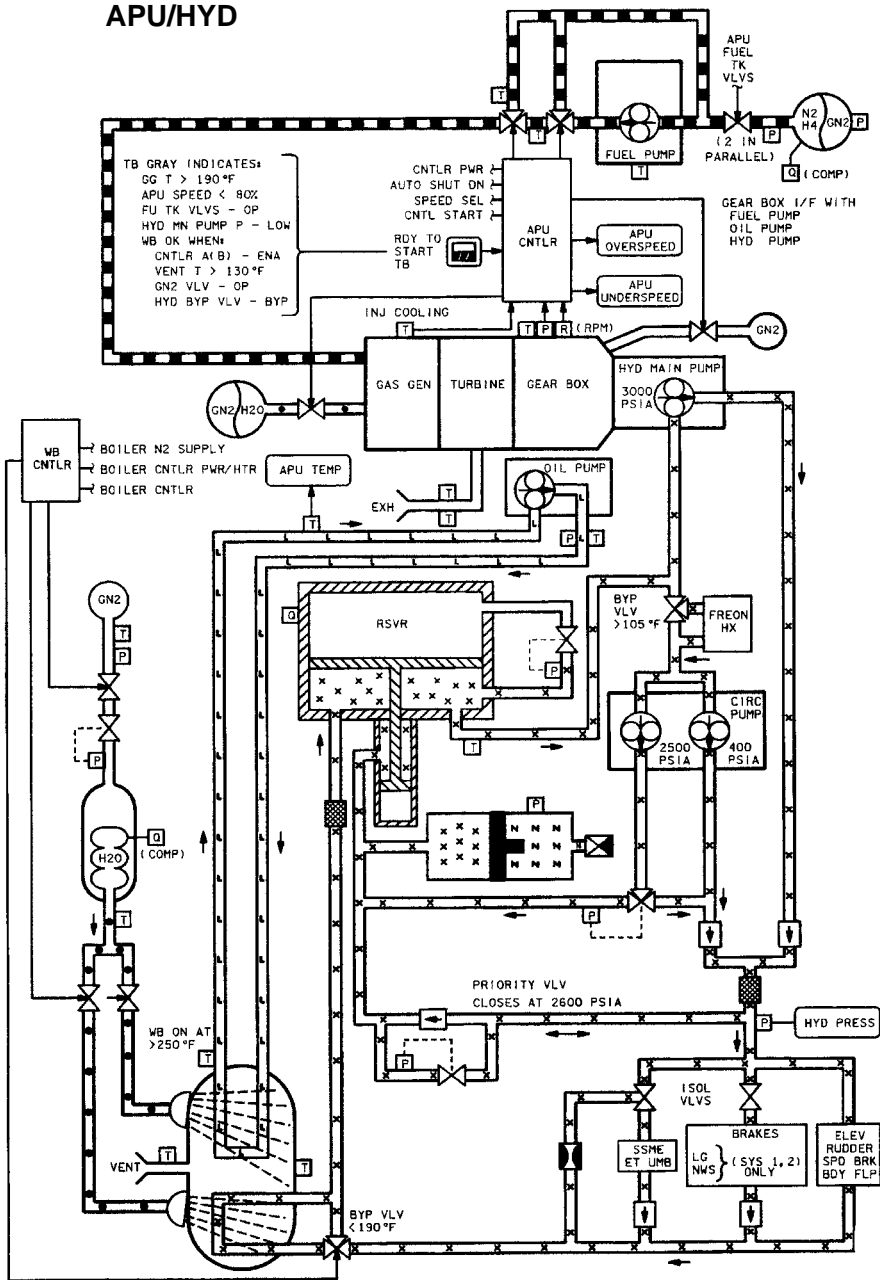
MPS PRPLT SCHEMATIC	9-1
He SCHEMATIC	9-2
P (Post ET Sep)	9-3
VACUUM INERT	9-3
LH2/O2 MANF	9-4

PWRDN

LOSS OF 2 CAB FANS	10-2
AV BAY 1 COOLING/AV BAY 1 FIRE	10-7
2 COOLING/AV BAY 2 FIRE	10-10
3 COOLING/AV BAY 3 FIRE	10-13
CAB PRESS (MINOR PWRDN)	10-16
(MAJOR PWRDN)	10-17
2 H2O LOOPS (POST OMS-2)	10-21
1 FREON LOOP	10-29
HI LOAD EVAP	10-33
2 FREON LOOPS (POST OMS-2)	10-35
FES/1 FC	10-39
2nd FC	10-43

APU/HYD

APU/
HYD



DATE 08/09/99
480330101.SCH:2

APU/
HYD

APU SHUTDN

1. APU OPER – OFF
 FUEL TK VLV – CL
 ✓SHUTDN (HYD PRESS)
 Report APU F7 lts
 APU CNTLR PWR – OFF
⇒ ✓AUTO SHUTDN (three) – ENA
 ✓SPEED SEL (two) – NORM

APU SPD HI (✓CRT)

BFS, SM SYS SUMM 2

- ⇒ 1. Go to APU SHUTDN

APU OVERSPEED/UNDERSPEED

BFS, SM SYS SUMM 2

If OVERSPEED confirmed by CRT or if APU has shut down:

1. Go to APU SHUTDN

APU OIL OVERTEMP

BFS, SM SYS SUMM 2

1. (Aff) BLR CNTLR/HTR – B
⇒ If APU OIL OUT TEMP > 305 and OIL IN TEMP incr:
2. Go to APU SHUTDN

APU PUMP LEAK P

BFS, SM SYS SUMM 2

1. Go to APU SHUTDN

APU RESTART

1. HYD MN PUMP PRESS – LO
2. APU CNTLR PWR – ON
3. ✓AUTO SHUTDN – ENA
4. OPER – INJ COOL (start watch)
If after 1.5 min, APU INJ TEMP not decr:
5. Go to APU SHUTDN >>
At 3.5 min:
6. APU FUEL TK VLV – OP
 OPER – START/RUN
 HYD MN PUMP PRESS – NORM
7. ✓BLR N2 SPLY – ON
 ✓PWR – ON
 ✓CNTLR/HTR – A(B)
If restart unsuccessful:
8. Go to APU SHUTDN

HYD PRESS (LOW)

GNC 51 OVERRIDE
BFS, SM SYS SUMM 2

⇒ 1. ✓APU SPEED SEL (three) – NORM

If AOA:

2. Compare 'PRL SYS X' status ('↓', '?', or blank) and aff HYD PRESS:

PRL SYS	HYD PRESS	PROCEDURE
'↓'	P > 300	HYD MN PUMP PRESS – LO Go to step 3
	P < 300	Go to APU SHUTDN >>
blank	meter <u>and</u> CRT P < 2600	If first HYD sys degraded: HYD MN PUMP PRESS – LO Go to step 3
		If two HYD sys degraded: HYD MN PUMP PRESS (two) – NORM, then: LO on sys with lowest pressure (Good) APU AUTO SHUTDN (one) – INH Go to step 3
	either meter <u>or</u> CRT P – OK (~3000)	No action reqd
'?'		No action reqd

3. At TAEM: APU SPEED SEL (two) – HI

If not AOA:

4. Go to APU SHUTDN

APCL/ALL/GEN I

APU

1-3

HYD
W/B QTY (Over)

HYD RSVR QTY (LOW)

GNC 51 OVERRIDE
BFS, SM SYS SUMM 2

- ⇒ 1. (Aff) MPS/TVC ISOL VLV – CL (5 sec)
If still decr:
2. Go to APU SHUTDN

HYD RSVR T

BFS, SM SYS SUMM 2

1. BLR CNTLR/HTR – B(A)
If HYD RSVR T > 250:
2. HYD MN PUMP PRESS – LO
If HYD RSVR T > 268 and incr:
3. Go to APU SHUTDN

HYD ACCUM P (LOW)

BFS, SM SYS SUMM 2

1. (Aff) HYD CIRC PUMP – ON
Leave HYD CIRC PUMP ON for APU start, then:
2. (Aff) HYD CIRC PUMP – OFF

W/B QTY (LOW)

BFS, SM SYS SUMM 2

- ⇒ 1. ✓BLR PWR – ON
If QTY = zero >>
2. BLR CNTLR/HTR – B(A)
3. Note QTY
Wait 2 min, then:
4. ✓QTY
If QTY change < 3 >>
If QTY change ≥ 3:
5. Go to APU SHUTDN

COMM

COMMUNICATIONS

APCL/ALL/GEN I,9

2-1

**ICOM LOST
COMM LOST**

ICOM LOST

1. (Aff) AUD CNTL sel – select alternate
If still no ICOM AUDIO:
2. AUD CTR – 2

COMM LOST (mult pnls)

COMM

NOTE

Perform COMM checks with MCC after each step

1. AUD CTR – 2
- ⇒ If all ICOM and A/G failed (✓three ATUs):
2. ✓cb AUD CTR (two) – cl (pnl R14:A,F)
 3. Go to step 11 (Both AUD CTRs failed)
 4. S-BD PM CNTL – PNL,CMD (pnl C3)
 5. **BFS, GNC 51 OVERRIDE**
Config for TDRS,STDN, or SGLS per COMMUNICATION COVERAGE (ASC, COMM COVER):
TDRS – ITEM 46 EXEC (*)
STDN-HI – ITEM 47 EXEC (*)
SGLS – ITEM 49 EXEC (*)
If * not next to selected config:
 6. Config pnl A1 for STDN,SGLS, or TDRS per COMMUNICATION COVERAGE (ASC, COMM COVER)

	STDN/SGLS	TDRS
PM MODE	STDN LO/SGLS	TDRS DATA
DATA RATE (two)	HI	HI
CODING (two)	OFF	ON

7. S-BD PM CNTL – PNL,CMD to effect reconfig (pnl C3)

Cont next page

8. Sel best ant, F9 meter > 300 (If TDRS, reorient veh and try diff ant); if no joy, return to GPC

NOTE

When selecting between DC Amps and Signal Strength posns, expect fluctuations which will dampen out within 1 min

9. Attempt UHF PRI,ALT and G (say freq) per COMMUNICATION COVERAGE (ASC, COMM COVER) (30 sec reqd for site reconfig)
10. Bypass encryption (1 min reqd for MCC reconfig):
NSP ENCRYPTION MODE – SEL (pnl A1L)
SEL – BYP
11. Confirm U/L CMD capability:
Cue MCC with: ITEM 88 +8 8 8 8 8 8
✓ Flashing U/L on PASS display
Ack with: ITEM 99 +9 9 9 9 9 9
✓ Abort light cycling ON/OFF (MCC ack)
✓ No flashing U/L
12. If U/L CMD confirmed: Go to MAL, COMM, SSR-1, LOSS OF ALL VOICE COMM
13. If still no COMM and no U/L CMD, perform REV 2 Deorb and go to MAL, COMM, 2.3a, NO S-BD COMM: TDRS, if time permits

— | |

| | —

This Page Intentionally Blank

— | |

| | —

DPS

DATA PROCESSING SYSTEM

**ICOM LOST
COMM LOST**

3-1

APCL/ALL/GEN I

DPS

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

I/O ERROR CRT/DPS DISPLAY ANOMALY

- If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
If NO big X/POLL FAIL:
 1. MDU PWR – OFF,ON; if recovered >>
If MCC GO for power cycle:
 2. IDP/CRT PWR – OFF, ON; if recovered >>

If big X/POLL FAIL:
 3. IDP/CRT PWR – OFF, ON; if recovered >>
If PASS:
 4. GPC/CRT – same GPC/aff IDP; if recovered >>
 5. BFC CRT SEL – aff IDP: Go to step 11

If BFS via BFC CRT SEL sw:
 6. BFC CRT SEL – unaff IDP; if both IDPs OK >>
 7. – original position
 8. In PASS: GPC/CRT 5X EXEC for aff IDP: Go to step 11

If BFS via GPC/CRT key:
 9. Deassign IDP 4 if assigned to PASS
 10. Assign aff IDP to PASS; if recovered >>
 11. If reqd: In PASS, deassign/assign IDPs to maintain PASS interface with three IDPs

FLT INST DISPLAY ANOMALY

1. DATA BUS Select alternate 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 >>

BCE STRG X (no 'MDM OUTPUT' msg)

- If IMU:
1. GNC 51 OVERRIDE
(Aff) IMU(s) – desel
 2. I/O RESET
 3. If recovered: IMU – resel >>
 4. GNC 1 DPS UTILITY
(Aff) STRING – port mode
 5. If recovered: Go to step 9

Cont next page

- ~
6. (Aff) MDM FF – OFF,ON
 7. I/O RESET; if recovered: Go to step 9
 8. **GNC 1 DPS UTILITY**
Orig ports – resel
 9. BFS I/O RESET
 - ◇ 10. If IMU recovered: **GNC 51 OVERRIDE**
(Aff) IMU(s) – resel >>
- If 'BCE STRG 3 NSP':
11. I/O RESET; if recovered >>
If msg repeats and LOS/no COMM:
 12. Go to COMM LOST (mult pnls), step 5 (**COMM**) >>
- If any other BCE BYP:
13. I/O RESET; if recovered: BFS I/O RESET >>
 14. **GNC 1 DPS UTILITY**
(Aff) STRING – port mode
 - ⇒ 15. BFS I/O RESET; if recovered or if GPS >>
 16. (Aff) MDM FA/FF – OFF,ON
 17. I/O RESET; if recovered:
BFS, GNC 51 OVERRIDE
If reqd: (aff) SURF feedback
RGA or AA – resel >>
 18. **GNC 1 DPS UTILITY**
Orig ports – resel
 19. BFS I/O RESET; if recovered >>
- If msg repeats and is BCE STRG B/C/D:
20. If BCE STRG 1D(4D): L(R) OMS – sel SEC GMBL
 21. If BCE STRG B: **BFS, GNC 51 OVERRIDE**
(Aff) AA – desel
 22. If BCE STRG D: **BFS, GNC 51 OVERRIDE**
(Aff) SURF feedback, RGA – desel
 23. If BCE STRG 2C: Go to MPS VACUUM INERT (**MPS**)

APCL/ALL/GEN I

DISPLAY ANOMALIES
BCE STRG X

3-3

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC problem and not MDM, BFS will pick up MDM(s)/LRU(s) when engaged

FAILURE	TYPE	ACTIONS
GPC/FF any combo	I/O or B	No impact
GPC/FA 1,2	I/O	Preburn (TVC): L OMS ENG – OFF
GPC/FA 1,3 or 2,4	I/O	Preburn (IGN): R OMS ENG – OFF
GPC/FA 1,4 or 2,3	I/O	Preburn (IGN): L OMS ENG – OFF
GPC/FA 3,4	I/O	Preburn (TVC): R OMS ENG – OFF

BFS GPC FAIL

1. GPC MODE – STBY,HALT
◇ OUTPUT – TERM
⇒ MODE – STBY,RUN
- If recovered:
 2. PRO to OPS 302; load TGTs (PEG 7)
 3. GPC OUTPUT – B/U >>
- If SM only:
 4. GPC MODE – STBY, then go to step 8
5. GPC MODE – HALT
- If IDP hard assigned to BFS:
 6. Deassign IDP 4 if assigned to PASS
 7. Reassign any hard assigned BFS IDP to PASS
8. If no COMM: sel best S–BD PM ANT

PASS GPC (1st FAIL)

- ⇒ 1. (Aff) GPC PWR – OFF
◇ 2. MPS PRPLT DUMP B/U LH2 VLV – OP
If STRG 1(4) and performing burn in OPS 1:
If GPC failed post-ET SEP:
3. MDM FF1(4) – OFF, ON
4. **GNC 51 OVERRIDE**
Aff IMU – des
5. L(R) OMS GMBL – sel SEC
6. ✓ MULT DATA PATH LOSS, then:
7. Reassign IDPs as reqd
If AOA, at MM301 trans:
8. (All) FCS CH – AUTO
9. Reassign aff string to highest # GPC

PASS GPC (2nd FAIL)

- ⇒ 1. (Aff) GPC PWR – OFF
If STRG 1(4) and performing burn in OPS 1:
If GPC failed post-ET SEP:
2. MDM FF1(4) – OFF, ON
3. **GNC 51 OVERRIDE**
Aff IMU – des
4. L(R) OMS GMBL – sel SEC
5. ✓ MULT DATA PATH LOSS, then:
6. Reassign IDPs as reqd
7. On MCC call: Restrung 1 and 3 to one GPC, 2 and 4 to other
8. If restrung OK, all FCS CH – AUTO
9. BFS I/O RESET

PASS GPC BITE

- If cyclic GPC BITE on single PASS GPC:
1. Go to PASS GPC (1st FAIL) >>
For Post Insertion:
2. Consider (aff) GPC failed

APCL/2,4/GEN I,12

**MULT DATA PATH LOSS
BFS GPC FAIL**

3–5

**PASS GPC (1st)
PASS GPC (2nd)/BITE**

SUMWORD ICC

NOTE

If only one GPC annun message, problem is at that GPC annun message

- ⇒ If AOA:
1. Prior to OPS 3 transition, config NBAT, then:
(Aff) GPC PWR – OFF
- If Uphill:
2. Consider (aff) GPC failed in Post Insertion

FA MDM I/O ERROR

1. I/O RESET; if recovered: Go to step 18
- ⇒◇ 2. MPS PRPLT DUMP B/U LH2 VLV – OP
3. If MDM FA1(4): L(R) OMS – sel SEC GMBL
If no BFS 'BCE STRG X PASS' (MDM problem):
 4. GNC 1 DPS UTILITY
(Aff) STRING – port mode
 5. If recovered: Go to step 18If OMS not burning and MCC GO for power cycle:
 6. MDM FA – OFF,ON
 7. I/O RESET
 8. If recovered: Go to step 18
 9. GNC 1 DPS UTILITY
Orig ports – resel
 10. If recovered: Go to step 18If not recovered:
 11. BFS, GNC 51 OVERRIDE
(Aff) SURF feedback, RGA – desel
 12. BFS I/O RESET
 13. ✓MULT DATA PATH LOSS >>If BFS 'BCE STRG X PASS' (GPC problem):
 14. ✓MULT DATA PATH LOSSOn MCC call:
 15. Restrung to swap aff string with string 4
(If MDM FA4, swap strings 3 and 4)

Cont next page

- If GPC fails during restring:
16. (Aff) GPC PWR – OFF
 17. Restring, assigning failed GPC string to highest # GPC
18. BFS I/O RESET
 19. (All good) FCS CH – AUTO

FF MDM I/O ERROR

1. I/O RESET; if recovered, BFS I/O RESET >>
- ⇒ If no BFS 'BCE STRG X PASS' (MDM problem):
2. GNC 1 DPS UTILITY
(Aff) STRING – port mode
 3. BFS I/O RESET; if recovered >>
- If MCC GO for power cycle:
4. (Aff) MDM FF – OFF,ON
 5. I/O RESET; if recovered >>
 6. GNC 1 DPS UTILITY
Orig ports – resel
 7. BFS I/O RESET; if recovered >>
 8. GNC 51 OVERRIDE
(Aff) IMU – desel
 9. If MDM FF 1(4): L(R) OMS – sel SEC GMBL
 10. Go to step 11
- If BFS 'BCE STRG X PASS' (GPC problem):
11. ✓MULT DATA PATH LOSS, then:
- If no BFS 'BCE STRG X PASS' (MDM problem):
12. MDM FF1(2): CDR(PLT) disp sws (eight) – green dot
 13. BFS, GNC 51 OVERRIDE
(Aff) AA – desel >>
- If BFS 'BCE STRG X PASS' (GPC problem):
- On MCC call:
14. Restring to swap aff string with string 4 (If MDM FF4, swap strings 3 and 4)
- If GPC fails during restring:
15. (Aff) GPC PWR – OFF
 16. Restring, assigning failed GPCs string to highest # GPC
 17. BFS I/O RESET

APCL/ALL/GEN I,12

SUMWORD ICC
FA MDM I/O ERROR

3–7

FF MDM I/O ERROR

FF(FA) MDM OUTPUT

FAULT

(Take action only if annun by entire set)

If single 'MDM OUTPUT':

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

If both MDM FF and MDM FA annun:

2. I/O RESET

3. If reqd: BFS I/O RESET

If msgs repeat:

4. Go to PASS GPC (1st FAIL) >>

5. If reqd: (Aff) FCS CH – ORIDE,AUTO

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>

⇒ 2. **GNC 1 DPS UTILITY**

PL 1/2 – port mode

3. BFS I/O RESET; if recovered >>

If I/O Error PL for other PL MDM (GPC problem):

4. Repeat steps 2,3 if reqd to recover second PL MDM

If I/O Error PL repeats for same MDM and MCC GO for power cycle:

5. (Aff) MDM PL – OFF,ON

6. BFS I/O RESET; if recovered >>

If PL2 lost and no COMM at AOS:

7. Sel best S–BD ANT

PCM I/O ERROR

BFS, SM SYS SUMM 1(2)

◇ 1. OI PCMMU PWR – 2(1)

BFS GPC IPL (On MCC Call)

NOTE

✓MCC for reapplication of GMEMs as reqd

Perform hardware dump:

1. GPC OUTPUT 5 – TERM
MEM DUMP sel – 5 (pnl MO42F)
MODE 5 – STBY

After 8 min:

2. GPC MODE 5 – HALT
OUTPUT 5 – NORM
MEM DUMP sel – OFF (pnl MO42F)
3. IPL SOURCE – MMU 1
4. GPC PWR 5 – OFF,ON
IPL pb – 5 (push) (tb–IPL, then bp within 2 min)

When tb – bp:

5. BFC CRT DISP – ON
SEL – 3+1 (Expect big 'X', POLL FAIL)
IDP 3 – LOAD
GPC MODE 5 – STBY (tb remains bp; expect CAM)
✓GPC IPL MENU displayed (within 2 min)

On IPL MENU:

6. Press MSG RESET to cycle thru MSGS STILL IN LIST
7. Load BFS software – ITEM 2 EXEC (*)

When 'BSL ... LOADED' appears (within 2 min):

8. MSG RESET pb – push

When 'KSC ... SET MMU SEL SW TO OFF' appears (within 2 min):

9. IPL SOURCE – OFF
10. MSG RESET pb – push
(repeat until 'MSG STILL IN LIST' = 0)
11. ✓GPC MODE 5 tb – RUN (BFS MEMORY appears within 15 sec):
12. GPC MODE 5 – RUN
13. Go to BFS GPC FAIL, step 2

ASC/AOA TRANSITION RESTRING

	<ol style="list-style-type: none">1. Config MC1(3) NBAT as reqd2. <input checked="" type="checkbox"/> G53 aff SURF FDBK – desel (*)3. ASAP, aff GPC (S) – STBY,HALT
ASC	<ol style="list-style-type: none">4. OPS Mode Recall: OPS XXX PRO5. BFS I/O RESET
AOA	<ol style="list-style-type: none">6. OPS 301 PRO7. BFS, OPS 301 PRO

EQUIPMENT COOLING MATRIX

AIR-COOLED		WATER-COOLED	
FORCED	FREE-FLOW		
AV BAY 1		AV BAY 1	
GPC 1,4 ① TACAN 1 ② MLS RF & DECODER 1 ADTA 3 AV BAY FAN A,B	BFC 1 (ENGAGE) CICU AA 1,4 PROXIMITY SW INVERTER DIST & CNTL BRK CNTL 1 SMOKE DET A,B CURRENT SNSR ADTA 1	AC INV 1A,1B,1C LCA(FWD) 1 PCA(FWD) 1 MCA(FWD) 1 MDM PL1,OF1, FF1,LF1 DSC OF1 ACCU 1,2 PWR SUPPLY/BATT CHARGER	MMU 1 RJDF 1A,1B P/L RECORDER PCMMU 1 PDI RADAR ALT 1
AV BAY 2		AV BAY 2	
GPC 2,5 ① TACAN 2 ② MLS RF & DECODER 2,3 ADTA 2,4 AV BAY FAN A,B	BFC 2,3 (ENGAGE) AA 2,3 PROXIMITY SW INVERTER DIST & CNTL BRK CNTL 2 SMOKE DET A,B CURRENT SNSRS	AC INV 2A,2B,2C LCA(FWD) 2 PCA(FWD) 2 MCA(FWD) 2 MDM PL2,OF2, FF2,FF4 DSC OF2 PL INTEROG 1,2	MMU 2 RJDF 2A,2B PCMMU 2 S-BD PI RF COAX SW OPS RECORDER 1,2 RADAR ALT 2 PSP 1,2
AV BAY 3A		AV BAY 3A	
GPC 3 ① TACAN 3 ② AV BAY FAN A,B C/W LIMIT MODULE SSOR ③	S-BAND EQUIP: FM MLTPLXR QUAD ANT SW ASSEMBLY FM SIG PRCSR SW BEAM ANT CNTL ASSY FM RF SWITCH CURRENT SNSR INVERTER DIST & CNTL SMOKE DET A,B	AC INV 3A,3B,3C LCA(FWD) 3 PCA(FWD) 3 MCA(FWD) 3 MDM FF3,OF3 DSC OF3 NSP 1,2 S-BAND PA 1,2; PRE-AMP 1,2; XPNDR 1,2; FM XMTR 1,2	EBIA (BYPASS SWITCH) COMSEC 1,2,3 UHF EVA XCVR KU-BND EA 1,2 GCIL
		AV BAY 3B	
		MTU KU-BAND SIGNAL PROCESSOR HUD ELECT 1,2 GPS 2	

ECLS

09/17/99

- ① GPC INSTALLATION REFERS TO CPU/IOP/MEMORY UNIT.
- ② TACAN CONFIG IS ORBITER-UNIQUE.
GOULD (AC) TACANS ARE FORCED-AIR COOLED.
COLLINS (DC) TACANS ARE FREE-FLOW AIR COOLED.
- ③ IF FLOWN.

Cont next page

EQUIPMENT COOLING MATRIX (Continued)

AIR-COOLED		WATER-COOLED
FORCED	FREE-FLOW	
CABIN		ECLSS EQUIPMENT BAY
MDUs (eleven) DDU 1,2,3	MTRS/LTS/IND C/W ANNUN SPKR UNITS ATUs CAMCORDER COLOR PRINTER PGSC VTR CSA CAB TEMP CNTLR A,B WMS HUMIDITY SEP SMOKE DET: L,R FLT DECK CABIN	WATER PUMP 1A,1B SEC
		FLIGHT DECK
CAB FAN A,B IMU 1,2,3 IMU FANS ④ TV MONITORS RCU VSU MCIU IDP 1,2,3,4	ADC 1A,1B,2A,2B MCM HUD PDU L,R	MDM OF4
MADS RCDR ⑤ MS & PS STATION		

ECLS

FREON-COOLED			
AFT COLDPLATES			MIDBODY
BAY 4	BAY 5	BAY 6	
LCA-1 PCA-1,4 MCA-1 MDM FA1 OA1	LCA-2 PCA-2,5 MCA-2 MDM FA2 OA2	LCA-3 PCA-3,6 MCA-3 MDM FA3,4 OA3	PCA(MID) 1,2,3 MCA(MID) 1,2,3,4 MDM PM1 RMA 1,2 FEA 1,2 SGSC H2/O2 CRYO HTR 1A,1B,2A,2B FCL 1 PMP A,B 2 PMP A,B FUEL CELLS 1,2,3 MN DA 1,2,3 MIDBODY PIC CNTLR DSC OM1,OM2,OM3
APU CNTLR 1 ATVC ELECT 1 EIU 1 MPS ULL P SC1 ASA 1 RGA 1 RJDA 1 MEC 1	APU CNTLR 2 ATVC ELECT 2 EIU 2 MPS ULL P SC2 ASA 2 RGA 2 MEC 2	APU CNTLR 3 ATVC ELECT 3,4 EIU 3 MPS ULL P SC3 ASA 3,4 RGA 3,4 RJDA 2 MPS DP SC	
DSC OA1 DBIA 1	DSC OA2 DBIA 2 PT SNSR	DSC OA3	

08/31/00

- ④ IMU FANS ARE LOCATED IN AVIONICS BAY 1 BUT CIRCULATE CABIN AIR RATHER THAN FLOW FROM AVIONICS BAY 1 THROUGH THE IMUs FOR COOLING.
- ⑤ MADS RECORDER DUCT COOLING.

This Page Intentionally Blank

CAB PRESS HIGH

BFS, SM SYS SUMM 1

(14.7 REGS Closed)

1. If incr: LES O2 – OFF, open visor

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL (tb-CL)

3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)

⇒ TROUBLESHOOT: MAL, ECLS, CABIN PRES ↑↓, 6.2b [1]

FREON FLOW LOW

BFS, SM 0 THERMAL

BFS, SM SYS SUMM 2

1. Switch pumps in (aff) loop(s)

If flow still low:

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

⇒ If flow still low in both loops, and pre OMS 2:

3. Go to LOSS OF 2 FREON LOOPS (AOA) (SYS AOA),
TIME CRITICAL >>

If flow still low in both loops and post OMS 2:

4. Go to LOSS OF 2 FREON LOOPS (POST OMS-2)
(PWRDN), TIME CRITICAL >>

If flow still low in one loop:

If RAD OUT T in good loop not incr in 3–5 min >>

If RAD OUT T in good loop incr in 3–5 min:

5. (Aff) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) deactivated:

6. O2 SYS 1(2) SPLY – CL

7. In good loop, ✓FLOW PROP VLV LOOP – ICH

If EVAP OUT T not –39 degF and stable:

8. FLASH EVAP CNTLR PRI A(B) – OFF
SEC – ON (HI LOAD ENA)

OI-28

Cont next page

APCL/ALL/GEN I,10

PCS SCHEMATIC
EQUIP COOL (4-1)

A4-5

CAB PRESS HIGH
FREON FLOW LOW

When EVAP OUT T stable:

9. FLASH EVAP CNTLR SEC – OFF
PRI A(B) – ON

10. Go to LOSS OF 1 FREON LOOP (PWRDN)

TROUBLESHOOT: MAL, ECLS, FREON FLOW LOW, 6.4b 1

EMER PLBD OPENING BFS, SM 63 PL BAY DOORS

CAUTION

Do not assign more than 3 IDPs at a time to BFS

1. If BFS engaged and IDP4 desired:
GPC/CRT 0X EXEC (if 3 FWD IDPs assigned)
GPC/CRT 54 EXEC
✓IDP/CRT4 PWR – ON

Open PLBD ASAP:

2. PL BAY DR SYS (two) – ENA
3. AC POWER ON – ITEM 1 EXEC
AUTO MODE SEL – ITEM 3 EXEC
PBD SW BYPASS – ITEM 14 EXEC
OPEN – ITEM 15 EXEC
4. Monitor CRT for proper seq

After PLBD OP:

5. STOP – ITEM 16 EXEC
AC POWER OFF – ITEM 2 EXEC
6. PL BAY DR SYS (two) – DSBL
7. RAD CNTLR LOOP (two) – AUTO A

Wait 10 sec:

- RAD BYP VLV MODE (two) – AUTO

OI-28

NOTE

Do not perform RAD ACT in POST INSERTION

CAB PRESS HIGH

BFS, SM SYS SUMM 1

(14.7 REGS Closed)

1. If incr: LES O2 – OFF, open visor

If still incr:

2. N2 SYS 1,2 REG INLET (two) – CL (tb-CL)

3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)

⇒ TROUBLESHOOT: MAL, ECLS, CABIN PRES ↑↓, 6.2b 1

FREON FLOW LOW

BFS, SM 0 THERMAL

BFS, SM SYS SUMM 2

1. Switch pumps in (aff) loop(s)

If flow still low:

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

⇒ If flow still low in both loops, and pre OMS 2:

3. Go to LOSS OF 2 FREON LOOPS (AOA) (SYS AOA),
TIME CRITICAL >>

If flow still low in both loops and post OMS 2:

4. Go to LOSS OF 2 FREON LOOPS (POST OMS-2)
(PWRDN), TIME CRITICAL >>

If flow still low in one loop:

If RAD OUT T in good loop not incr in 3–5 min >>

If RAD OUT T in good loop incr in 3–5 min:

5. (Aff) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) deactivated:

6. O2 SYS 1(2) SPLY – CL

7. In good loop, ✓FLOW PROP VLV LOOP – ICH

If EVAP OUT T not –39 degF and stable:

8. FLASH EVAP CNTLR PRI A(B) – OFF
SEC – ON (HI LOAD ENA)

OI-29

Cont next page

APCL/ALL/GEN I,10

**PCS SCHEMATIC
EQUIP COOL (4-1)**

B4-5

**CAB PRESS HIGH
FREON FLOW LOW**

When EVAP OUT T stable:

9. FLASH EVAP CNTLR SEC – OFF
PRI A(B) – ON

10. Go to LOSS OF 1 FREON LOOP (PWRDN)

TROUBLESHOOT: MAL, ECLS, FREON FLOW LOW, 6.4b 1

EMER PLBD OPENING

BFS, SM 63 PL BAY DOORS

Open PLBD ASAP:

11. PL BAY DR SYS (two) – ENA
12. AC POWER ON – ITEM 1 EXEC
AUTO MODE SEL – ITEM 3 EXEC
PBD SW BYPASS – ITEM 14 EXEC
OPEN – ITEM 15 EXEC
13. Monitor CRT for proper seq

After PLBD OP:

14. STOP – ITEM 16 EXEC
AC POWER OFF – ITEM 2 EXEC
15. PL BAY DR SYS (two) – DSBL
16. RAD CNTLR LOOP (two) – AUTO A

Wait 10 sec:

- RAD BYP VLV MODE (two) – AUTO

NOTE

Do not perform RAD ACT in POST INSERTION

OI-29

B4-6

APCL/4/GEN I,10

H2O LOOP PRESS LOW(HIGH)

BFS, SM SYS SUMM 1

- ⇒ 1. Switch to Loop 1
If press high in Loop 1:
| 2. Go to step 4
If press < 45 psia in Loop 1:
3. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
Switch pumps
If press still < 45 psia and CABIN HX OUT T incr:
4. H2O PUMP LOOP 1 – OFF
If press was high in Loop 2:
| 5. Go to step 8
If press was low in Loop 2:
6. ✓cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
H2O PUMP LOOP 2 – GPC
If CABIN HX OUT T not decr:
7. H2O PUMP LOOP 2 – OFF
8. MSTR MADS PWR – OFF
9. Use only one IDP/CRT with two MDUs
10. TACAN MODE sel (three) – OFF
11. ✓MLS (three) – OFF
12. HUM SEP A(B) – OFF
13. RADAR ALTM (two) – OFF
If both H2O loops lost and pre OMS 2:
| 14. Go to LOSS OF 2 H2O LOOPS (AOA) (SYS AOA, 2 H2O LOOPS (AOA)), TIME CRITICAL >>
If both H2O loops lost and post OMS 2:
15. Go to LOSS OF 2 H2O LOOPS (POST OMS-2) (PWRDN), TIME CRITICAL

APCL/2/GEN I,X

EMER PLBD OPEN

4-7

H2O LOOP P

AV BAY TEMP HIGH

BFS, SM SYS SUMM 2

1. (Aff) AV BAY FAN A,B (two) – ON
- If temp not decr:
2. Switch H2O loops
- ⇒ If temp not decr:
3. H2O LOOP 1(2) BYP MAN – DECR (hold 40 sec)
- If temp still incr:
4. Go to LOSS OF AV BAY COOLING (PWRDN)

TROUBLESHOOT: MAL, ECLS, AV BAY TEMP, 6.1b **1**

AV BAY FAN ΔP

BFS, SM SYS SUMM 2

1. Switch fans
- ⇒ If FAN ΔP still high(low) and AV BAY TEMP decr, airflow is lost:
2. Go to LOSS OF AV BAY COOLING (PWRDN)

TROUBLESHOOT: MAL, ECLS, AV BAY FAN ΔP, 6.1c **1**

CAB FAN FAIL

BFS, SM SYS SUMM 1

- ⇒ 1. Switch fans
- If no CAB FAN airflow:
2. Go to LOSS OF 2 CAB FANS (PWRDN)

TROUBLESHOOT: MAL, ECLS, CABIN FAN ΔP, 6.1a **1**

IMU FAN FAIL

BFS, SM SYS SUMM 1

- ⇒ 1. Switch fans
- If AOA and no fans:
2. IMU 1 – OFF
 3. **GNC 51 OVERRIDE** IMU 1 – desel
 4. Perform OMS/RCS POST BURN RECONFIG (ASC, AOA **POST D/O BURN**), then:
 5. IMU 1 – ON
 6. **GNC 21 IMU ALIGN** , wait for OPER * (~4 min), then I/O RESET
 7. Align IMU 1,3, using IMU/IMU option with IMU 2 as REF
- When align complete:
8. **GNC 50 HORIZ SIT** , NAV DELTA zero update
 9. **GNC 51 OVERRIDE** IMU 1 – sel
- If no fans:
- After MM201 trans:
10. IMU 1,2 – OFF
 11. **GNC 21 IMU ALIGN** IMU 1,2 – desel
 12. Perform IMU CONTINGENCY COOLING (IFM), then:
 13. IMU 1,2 – ON
 14. **GNC 21 IMU ALIGN** , wait for OPER * (~4 min), then I/O RESET
 15. Align IMU 1,2 using IMU/IMU option with IMU 3 as REF
- When align complete:
16. IMU 1,2 – sel

APCL/ALL/GEN I

AV BAY TEMP/FAN Δ P
CAB FAN FAIL

4-9

IMU FAN FAIL

EVAP OUT T HIGH

BFS, SM SYS SUMM 2

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

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

If EVAP OUT T decr (FES PRI A lost) >>

If EVAP OUT T not decr:

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

If EVAP OUT T decr (TOPPING EVAP lost) >>

If EVAP OUT T not decr:

3. HI LOAD EVAP – OFF (TOPPING EVAP ENA)
4. MSTR MADS PWR – OFF (wait 30 sec)

If EVAP OUT T decr (HI LOAD lost):

5. Go to LOSS OF HI LOAD EVAP (PWRDN) >>

If EVAP OUT T not decr (FES lost):

6. TOP EVAP HTR NOZ (two) – OFF
DUCT sel – OFF
7. HI LOAD DUCT HTR sel – OFF
8. ✓RAD BYP VLV MODE (two) – MAN
MAN SEL (two) – RAD FLOW
(hold 5 sec)

⇒ If HI LOAD EVAP only lost:

9. Go to LOSS OF HI LOAD EVAP (PWRDN) >>

If total FES lost:

10. Perform EMER PLBD OPENING (4–6), then:
11. Go to LOSS OF FES/1 FC (PWRDN)

EVAP OUT T LOW

1. If low in only one loop (snsr failed) >>
 2. FREON PUMP LOOP 1,2 (two) – OFF
 3. H2O PUMP LOOP 1 (two) – ON,B
- If no PL H2O Loop present:
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb–PL)
- If PL H2O Loop present:
5. Activate PL H2O Loop
 6. O2 SYS 1,2 SPLY (two) – CL
 7. ✓RAD BYP VLV MODE (two) – MAN
 8. ✓MAN SEL (two) – BYP (tb–BYP ~3 sec)
 9. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
- ◇ 10. FREON PUMP LOOP 1,2 (two) – B
NH3 CNTLR A,B (two) – SEC/ON
- If FREON LOOP 1(2) running:
11. O2 SYS 1(2) SPLY – OP
- When EVAP OUT T > 55 for at least 2 min (NH3 depleted):
- If any Freon Loop off:
12. FREON PUMP LOOP 1(2) – B
 13. O2 SYS 1(2) SPLY – OP
 14. Wait 3 min, then:
 15. FLASH EVAP CNTLR PRI B – ON

APCL/ALL/GEN I,12

EVAP OUT T HIGH

4–11

EVAP OUT T LOW

FREON QTY LOW

BFS, SM 0 THERMAL

If accum qty < 12% and decr:

1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL (hold for 5 sec)
- ⇒ ◇ 3. (Aff) FREON PUMP LOOP – OFF
4. O2 SYS 1(2) SPLY – CL
5. In good loop, ✓FLOW PROP VLV LOOP – ICH

If EVAP OUT T not 39 degF and stable:

6. FLASH EVAP CNTLR PRI A(B) – OFF
SEC – ON (HI LOAD – ENA)

When EVAP OUT T stable:

7. FLASH EVAP CNTLR SEC – OFF
PRI A(B) – ON
8. Go to LOSS OF 1 FREON LOOP (PWRDN)

CAB PPO2 ABNORMAL

BFS, SM SYS SUMM 1

(14.7 REGS Closed)

If PPO2 ≤ 2.70:

1. ✓Tabs/close visor, LES O2 – ON

If PPO2 ≥ 3.60:

2. LES O2 – OFF, open visor
3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)

TROUBLESHOOT: MAL, ECLS, PPO2 ↑↓, 6.2c 1

CAB PRESS LEAK

BFS, SM SYS SUMM 1

(14.7 REGS Closed)

1. CAB RELIEF A – CL (tb-CL) (pause)
B – CL (tb-CL)
 - ⇒ 2. ✓ VENT ISOL – ctr (tb-CL)
✓ VENT – ctr (tb-CL)
 3. cb MNA VAC VENT ISOL VLV – cl
 4. ✓ VAC VENT ISOL VLV BUS SEL – MNA
CNTL – CL (tb-CL)
 5. NEG PRES RLF vlv covers (two) – push firmly
 6. Remove INNER A/L HATCH Equal vlv caps (two)
 7. Equal vlv (two) – OFF
- If dP/dT zero: >>
8. Equal vlv (two) – EMER
- When CAB P < 13 psia:
9. Record dP/dT EQ _____
 10. ✓ Tabs/close visor, LES O2 – ON
 11. O2 TK 1,2,3 HTRS A,B (six) – AUTO
 12. If dP/dT EQ > 0.34: DIRECT O2 vlv – OP
 13. Perform LOSS OF CAB PRESS (MINOR PWRDN)
(PWRDN), then:
- If dP/dT EQ < 0.6 (Stabilize CAB P at 8 psia):
14. ✓ O2/N2 CNTLR VLV SYS 2 – OP >>
 15. Perform LOSS OF CAB PRESS (MAJOR PWRDN)
(PWRDN), then:
- When CAB P decr < 6.5 psia:
16. ✓ O2/N2 CNTLR VLV SYS 2 – OP

TROUBLESHOOT: MAL, ECLS, CABIN PRES ↑↓, 6.2b 54

APCL/ALL/GEN I

FREON QTY LOW
CAB PPO2 ABNORM

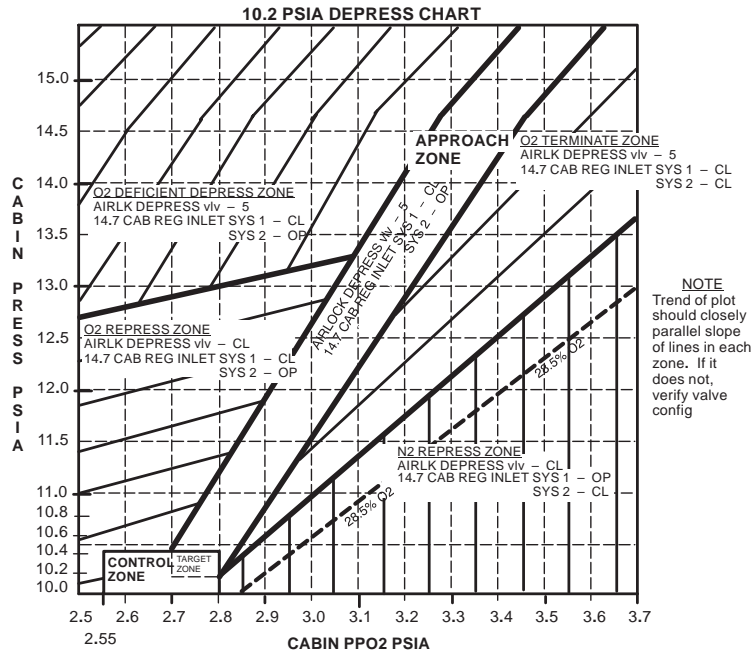
4-13

CAB PRESS LK

CONTINGENCY CABIN DEPRESS

BFS, SM SYS SUMM 1

1. LES O2 – OFF, open visor
2. O2 XOVR SYS 2 – CL (pnl L2)
3. O2 REG INLET SYS 2 vlv – OP (pnl MO10W)
4. cb MNA H2O LINE HTR A – cl (pnl ML86B:A)
 VAC VENT ISOL VLV – cl (pnl ML86B:B)
 MNB VAC VENT NOZ HTR – cl (pnl ML86B:B)
5. VAC VENT ISOL VLV CNTL – OP (tb-OP) (pnl ML31C)
 NOZ HTR – ON
6. Open INNER A/L HATCH
 AIRLK DEPRESS vlv cap – vent, remove and stow
 (pnl AW82B)
7. To start depress, config following vlvs to position as shown on appropriate zone of chart below



When in **CONTROL ZONE**
 (**TARGET ZONE** preferred):

STOP DEPRESS
 AIRLK DEPRESS vlv – CL
 Install AIRLK DEPRESS vlv Cap
 14.7 CAB REG INLET SYS 1 – CL
 SYS 2 – CL

Cont next page

When CABIN PRESS and PPO2 are in CNTL ZONE (TGT ZONE preferred), stop depress using:

- AIRLK DEPRESS vlv – CL (pnl AW82B)
 - Install AIRLK DEPRESS vlv cap
 - 14.7 CAB REG INLET SYS 1 vlv – CL (pnl MO10W)
 - 2 vlv – CL
 - 8. INNER A/L HATCH – CL, latch
 - 9. VAC VENT ISOL VLV CNTL – CL (tb-CL) (pnl ML31C)
 - NOZ HTR – OFF
 - 10. O2 XOVR SYS 2 – OP
 - 11. ✓ H2O PUMP LOOP 1 (two) – OFF,B
 - H2O LOOP 2 BYP MAN – DECR (30 sec)
 - 12. Perform LOSS OF CAB PRESS (MINOR PWRDN) (PWRDN), then:
 - 13. Time permitting, perform 10.2 PSI MAINTENANCE (EVA, 10.2 PSI CABIN), then:
 - 14. Time permitting, perform PREP FOR 10.2 PSI CABIN, Reset FDA & C/W Limits (EVA, 10.2 PSI CABIN), then:
- If > REV 3:
- 15. Deltas to DEORB PREP at TIG –4 hr:
Go to 10.2 PSI MAINTENANCE (EVA, 10.2 PSI CABIN)

APCL/ALL/GEN I

CONT CAB DEPRESS 4-15 **THERMAL HTR (Over)**
POST-FIRE CLEANUP (4-17)

THERMAL HTR

BFS, SM 0 THERMAL

If disp param '↑' or '↓' (only), take action as indicated:
No action reqd for 'M', 'L', or 'H'

PARAM #	PNL #	CRT DISPLAY	ACTION
		H T R T E M P	
		P R P L T	
1-7	A14	P O D	None
8-13	A14	O M S C R S F D	None
		E V A P	
14-16	L1	H I L O A D	If '↓' only, Switch to dual htr A/B pos Switch to alt htr when possible
17-18	L1	T O P D U C T	
19	L1	N O Z	
20-23	L2	F D L N	
24	R2	H Y D B L R / H T R	
		A P U	
25-29	A12	G G / F U P M P	If htrs OFF, switch A – AUTO; else switch to alt htr
30-36	A12	T K / F U L N	
37-38		P U M P / V L V	

PARAMETER (PARAM)

1. POD DRN PNL 1 L(R)
2. VERN PNL 1 L(R)
3. OX DRN PNL 2 L(R)
4. 1 L(R)
5. ENG SERV PNL L(R)
6. FDLN OX AFT L(R)
7. FU L(R)
8. OMS CRSFD BLD MID FU*
9. OX*
10. DRN OX L
11. R
12. BLD AFT FU*
13. OX*
14. EVAP HI LOAD INBD DUCT
15. OUTBD DUCT
16. NOZ
17. TOPPING FWD
18. AFT
19. NOZ L(R)
20. FDLN T FWD A(B)

PARAMETER (PARAM)

21. EVAP FDLN T MID 1 A(B)
22. MID 2 A(B)
23. AFT A(B)
24. W/B X BLR
25. APU X GG BED
26. INJ
27. PUMP OUT
28. GGVM SPLY LN
29. PUMP BYP LN
30. FEED LN
31. PUMP IN
32. TEST LN
33. SERVICE LN
34. PUMP DRN LN 1
35. 2
36. H2O LN INJ
37. FU PUMP BDY
38. GGVM HTSK

*OMS CRSFD High Point Bleedlines removed from all vehicles

POST-FIRE CABIN CLEANUP (Cabin and AV Bay fires)

Continue from FIRE/SMOKE Cue Card:

NOTE

This procedure is to be performed simultaneously by three crewmembers

- CM1 1. If AV Bay fire: Post OMS-1, perform LOSS OF AV BAY 1(2,3) COOLING/AV BAY 1(2,3) FIRE (PWRDN)
- CM2 If CO2 RMVL SYS flown:
2. Unstow/install one fresh LiOH, ATCO canister (LiOH Box); leave charcoal canister in place, temp stow ATCO canister
- If no CO2 RMVL SYS flown:
3. Unstow/install two fresh LiOH, ATCO canisters (LiOH Box); temp stow ATCO canister
4. When HCL < 5 ppm, install ATCO canister (in place of LiOH canister)
- If cabin fire:
5. CAB FAN A(B) – ON (pnl L1)
6. cb MNA,MNB WCS CNTLR (two) – cl (pnl ML86B:B)
AC1,2 WCS FAN SEP 1,2 (six) – cl (pnl MA73C:E)
- If WCS:
If AV Bay 1 fire:
7. HOSE BLOCK to SEP 2
8. FAN SEP SEL sw – 2
9. MODE – COMMODE/MANUAL/EMU
10. COMMODE CNTL – PULL UP
– PUSH FWD
- If EDO WCS:
11. Open commode lid
12. Remove Fecal Bag (temp stow)
- If AV Bay 1 fire:
13. WCS PWR SEL – OFF1, MAN2
14. URN DIV VLV – FAN SEP 2
15. Go to step 18
16. WCS PWR SEL – MAN1, OFF2
17. ✓URN DIV VLV – FAN SEP 1

Cont next page

- CM3
18. Unstow CSA-CP
 19. MODE pb – press, hold until ‘RELEASE’ displayed; Wait ~1 min for nominal display
 20. Monitor cabin atmosphere in vicinity of fire and report results to MCC
 21. Unstow ATCO canister (LiOH Box)
- If AV Bay fire: Post OMS-1, set up for AV Bay purge
22. Obtain from Cont Hose & Cable Kit (Window Shade Bag):
 - Free Fluid Nozzle
 - 20-ft Y/Y Hose
 - Gray Tape
 23. Connect Free Fluid Nozzle to Y/Y Hose
 24. Insert tip of Free Fluid Nozzle into fire port of AV Bay
 25. Secure nozzle and hose with Gray Tape
 26. Mate free end of Y/Y Hose to Vacuum Vent QD (front of WCS)
 27. VAC VLV – OP (WCS/EDO WCS)
 28. cb MNA(MNB) H2O LINE HTR A(B) – cl (ML86B:E)
 - cb MNA,MNB VAC VENT ISOL VLV (two) – cl
 - MNB VAC VENT NOZ HTR – cl
 29. ✓ VAC VENT ISOL VLV BUS SEL – MNA (ML31C)
 - NOZ HTR – ON
 - ISOL VLV CNTL – OP (tb-OP)
 30. Go to MAL, ECLS FRP-2, POST-FIRE CABIN CLEANUP CONTINUATION

ELECTRICAL POWER SYSTEM

EPS

5-1

APCL/ALL/GEN I

**MN BUS UNDERVOLTS
FC VOLTS**

BFS, SM SYS SUMM 1

If MN VOLTS < 26.4, FC VOLTS < 26.6, FC AMPS > 480
(2 of 3) (SHORT OR DEGRADED FC):

1. MSTR MADS PWR – OFF

If aff FC/MN BUS tied:

2. Untie buses

If short eliminated and MN BUS not pwr'd after untie:

3. Go to (aff) MN BUS LOSS ACTION (MN BUS or TIE BUS SHORT) >>

If short eliminated and all MN BUSES pwr'd after untie
(TIE BUS SHORT) >>

If short not eliminated, then:

If aff FC/MN BUS connected to PL PRI BUS:

4. PL PRI (three) – OFF (tb–OFF)

⇒

If short eliminated (PRI PL SHORT):

5. If a MN BUS not pwr'd, perform BUS TIE (Cue Card), then:
6. Go to PL PWRDN >>

7. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb–OFF)

If aff FC VOLTS < 32 (FC SHORT):

8. (Aff) FC REAC VLV – CL (tb–CL)
9. Go to FC SHUTDN (Cue Card) (Do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (BUS SHORT):

EPS

CAUTION

Do not Bus Tie to Shorted Bus

10. Go to (aff) MN BUS LOSS ACTION >>

If MN VOLTS < 26.4 and FC VOLTS > 32 and FC AMPS < 20 (FC DISCONNECT):

11. MSTR MADS PWR – OFF

If PL PRI BUS pwr lost due to FC disconnect:

12. PL PRI (three) – OFF (tb–OFF)
13. (Aff) FC/MN BUS – ON (tb–ON)

If PL PRI disconnected in step 12:

14. Perform PL PWRDN, then:

Cont next page

If FC3 aff:

15. PL PRI FC3 – ON (tb–ON)
MNC – ON (tb–ON)

If first FC problem:

16. Perform BUS TIE (Cue Card), then:

If (aff) FC VOLTS still > 32:

17. Go to FC SHUTDN (Cue Card) >>
18. (Aff) AC BUS SNSR – OFF, AUTO TRIP
19. GNC I/O RESET

If second FC failure and aff MN BUS not recovered:

20. PL PRI (three) – OFF (tb–OFF)
21. Go to 2nd FC SHUTDN

APCL/ALL/GEN I

MN BUS UVOLTS
FC VOLTS

5–3

AC VOLTS (LOW or HIGH)

BFS, SM SYS SUMM 1

- ⇒ 1. If AC OVERLOAD alarm: Go to AC OVERLOAD >>
If single Φ AC VOLTS > 123 or between 10 and 110 (confirm with
: F9 meter):
: If (aff) INV/AC BUS tb – ON (inverter lost):
: : 2. (Aff) cb AC CONTR – cl
: : INV/AC BUS – OFF (tb–OFF)
: : INV/PWR – OFF (tb–OFF)
: : cb AC CONTR – op
: : If other Φ AC VOLTS < 110 or AC AMPS > 14:
: : 3. Go to step 8
: L 4. Go to aff BUS LOSS ACTIONS >>
: If (aff) INV/AC BUS tb – OFF (O/V, unannun OVLD, or snsr
: prob):
: If other Φ AMPS > 10:
: : 5. Isolate shorted Φ : Open all (aff) AC1(2,3)
: : three- Φ ganged cbs and all (aff) AC1(2,3)
: : Φ A(B,C) single- Φ cbs as follows:
: :
: :
~ ~

Cont next page

AC OVERLOAD

If single Φ :

- : If AC VOLTS < 110 or AC AMPS > 14 (OVLD):
- : : 1. (Aff) cb AC CONTR - cl
- : : INV/AC BUS - OFF (tb-OFF)
- : : INV PWR - OFF (tb-OFF)
- : : cb AC CONTR - op
- : : If other Φ VOLTS < 110 or AMPS > 14:
- : : 2. Go to step 6
- : : 3. Isolate shorted Φ : Open all (aff) AC1(2,3) three- Φ
- : : ganged cbs and all (aff) AC1(2,3) Φ A(B,C) single- Φ cbs
- : : as noted below:

Number of cbs to open

BUS	L4	MA73C
AC1 3 Φ	1	5
Φ A	15	5
Φ B	15	4
Φ C	12	5
AC2 3 Φ	0	9
Φ A	15	5
Φ B	16	4
Φ C	13	5
AC3 3 Φ	1	7
Φ A	15	3
Φ B	16	3
Φ C	12	3

Cont next page

~ ~
: :
: L 4. Go to aff BUS LOSS ACTION >>
: If AC VOLTS, AMPS normal (snsr prob):
: 5. ✓AC BUS SNSR – MON
L Do not take snsr – AUTO >>
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 ACTION

TROUBLESHOOT:

If snsr prob: MAL, EPS, 7.5b, AC OVLD 1(2,3) ↓ 52

— | |

| | —

This Page Intentionally Blank

— 5–6b

APCL/ALL/GEN I,4 —

— | |

| | —

3Φ AC MOTORS STOPPED

(No AC VOLTS Alarm: Φ Shift)

WARNING

If no FC Coolant Pump within 9 min, go to aff
AC BUS (2 or 3Φs) BUS LOSS ACTION

1. Determine (aff) AC BUS:
FC1 and FREON PUMP 2B: AC1
FC2 and FREON PUMP 1B: AC2
FC3 and CAB FAN A: AC3
2. (Aff) FC – STOP
If AC3 aff:
 3. AV BAY 3 FAN B – OFF
A – ON
CAB FAN A – OFFIsolate aff ΦB:
 4. (Aff) cb AC CONTR – cl
INV/AC BUS – OFF (tb-OFF)If AC1(2,3) aff and AV BAY FAN 3(2,3) ΔP < 0.5:
 5. (Aff) INV/AC BUS – ON
cb AC CONTR – op
 6. Repeat from step 4 to isolate aff ΦC,ΦA, then:
 7. (Aff) cb AC CONTR (three) – cl
 8. INV/AC BUS – OFF
 9. Go to aff AC BUS (2 or 3Φs) BUS LOSS ACTION >>If AC1(2,3) aff and AV BAY FAN 3(2,3) ΔP ≥ 0.5:
 10. (Aff) INV PWR – OFF (mtrs restarted)
cb AC CONTR – op
FC – START (10 sec or ΔP tb-gray)
 11. If AC3 aff: CAB FAN B – ON
 12. Go to aff Φ BUS LOSS ACTION

APCL/ALL/GEN I

AC OVERLOAD

5-7

3Φ AC MTRS STOPPED

ESS BUS VOLTS LOW

If verified by F9 voltmeter:

	1BC	2CA	3AB
If (aff) cb op	MNA CONTR (pnl O15:B)	MNB CONTR (pnl O16:B)	MNC CONTR (pnl O14:B)
1. (Aff) cb op	MNA CONTR (pnl O13:A)	MNB CONTR (pnl O13:C)	MNC CONTR (pnl O13:E)
2. (Aff) cb cl	MNA CONTR (pnl O15:B)	MNB CONTR (pnl O16:B)	MNC CONTR (pnl O14:B)

3. Perform FC SHUTDN (Cue Card) [FC/MN BUS A(B,C) and MN BUS TIE A(B,C) tbs lost]
4. Go to aff BUS LOSS ACTION (ESS)

CNTL BUS VOLTS LOW

BFS, SM SYS SUMM 1

1. ✓ BUS LOSS ID:
If pwr reqd (<3 sec) for crit function:
 2. Hold crit function sw
For CNTL BUS AB(BC,CA) VOLTS LOW:
 3. CNTL BUS PWR MNA(MNB,MNC) – RESET
- ⇒ 4. Go to CNTL BUS SHORT (TIME CRITICAL)

CNTL BUS SHORT (TIME CRITICAL)

BFS, SM SYS SUMM 1

WARNING

If visible fire/smoke at any time, cb CNTL BUS
AB1/2/3 (BC1/2/3,CA1/2/3) – op (pnl R14:B)

NOTE

CNTL BUS PWR switches must be held continuously
in RESET position to unpwr bus(es)

1. ✓ MCC for any tripped RPCs
If CNTL AB1(AB2,AB3):
If AB3:
 2. NSP ENCRYPTION SEL – BYP (pnl A1L)
 3. CNTL BUS PWR MNA,MNB (two) – RESET (hold) (pnl R1)If CNTL BC1(BC2,BC3):
If BC2:
 4. Perform COMM LOST (mult pnls), steps 5 and 4
(COMM)
 5. CNTL BUS PWR MNB,MNC (two) – RESET (hold) (pnl R1)If CNTL CA1(CA2,CA3):
 6. CNTL BUS PWR MNC,MNA (two) – RESET (hold) (pnl R1)For all CNTL V < 25.0:
 7. Perform BUS LOSS ACTIONS (CNTL), then:
If AOA >>
 8. Perform CONTROL BUS POWERDOWN (IFM, PROCEDURES
A THRU F) for shorted bus, then:
 9. If reqd, back out of BUS LOSS ACTIONS for regained buses

APCL/ALL/GEN I,2

**ESS/CNTL V LOW
FC COOL PUMP (5–10)**

5–9

**CNTL BUS SHORT
FC REAC/FC COOL P (5–11)**

FC COOLANT PUMP Δ P LOW

BFS, SM SYS SUMM 1

If other 3 Φ AC motors aff, and AC VOLTS OK:

1. Go to 3 Φ AC MOTORS STOPPED >>
- ⇒ 2. (Aff) cb FC PUMP (three) – cl (pnl L4:C)
 ✓FC CNTLR – ON (pnl O14(O15,O16))
 FC – START (10 sec or Δ P tb–gray)

If FC EXIT T > 164 and not decr or RDY tb – bp (30 sec after

START):

3. Go to FC SHUTDN (Cue Card) >>
- If FC EXIT T norm, RDY tb – gray, no MCC in 5 min:
4. Note AC1(2,3) AMPS, FC – STOP
- If AMPS decr:
 If decr 0.7–0.9 amp/ Φ :
 5. FC – START (hold 30 sec if Δ P tb–bp)
 6. If AMPS incr 0.7–0.9 amp/ Φ >>
7. Go to FC SHUTDN (Cue Card)

FC REACTANT VLV CLOSED

BFS, SM SYS SUMM 1

1. FC REAC (three) – OP (tb–OP or hold 1 sec max) (pnl R1)
 2. Perform BUS TIE (Cue Card), then:
If no joy on REAC open:
 3. ✓cb FC REAC VLV CL ENA (three) – op (pnl C3)
 4. FC REAC (three) – OP (tb–OP or hold 10 sec) (pnl R1)
- If aff FC COOL P < 50 (ALERT):
5. Go to FC SHUTDN (Cue Card)

FC COOL P

BFS, SM SYS SUMM 1

1. Perform BUS TIE (Cue Card), then:
⇒ If COOL P > 75, incr, and not 100 (H), or
FC COOL PUMP ΔP tb – bp (intermittent), or
STACK/EXIT T unstable, or
FC SS 1(2,3) $\Delta V \geq 150$:
If COOL P > 75:
| 2. Go to FC SAFING >>
If COOL P < 50:
3. Go to FC SHUTDN (Cue Card) >>
4. Two min after bus ties: Record $\Delta AMPS$ between aff and tied FC, and monitor for 20 min
If change in $\Delta AMPS > 12$:
 5. Go to FC SHUTDN (Cue Card)

TROUBLESHOOT:

Post Insert: If COOL P ↓, do not press SPLY H2O TKA until MCC GO. Vent TKs B,C,D before TKA fills.
MAL, EPS, FUEL CELL COOL P ↑↓, 7.3e 1

FC STACK T

BFS, SM SYS SUMM 1

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 7 >>

◇ 5. Perform BUS TIE (Cue Card), 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 – CL

9. After COOL P < 15 and STACK T < 243:
FC – STOP

10. ✓PWRDN

TROUBLESHOOT:

MAL, EPS, FC STACK T 1(2,3) ↑↓, 7.1b 1

FC EXIT T

BFS, SM SYS SUMM 1

1. MSTR MADS PWR – OFF

2. Perform BUS TIE (Cue Card), then:

⇒ If EXIT T > 164 and incr:

3. Go to FC SHUTDN (Cue Card) >>

If EXIT T < 131 and decr and no COMM:

4. Go to FC SHUTDN (Cue Card)

TROUBLESHOOT: MAL, EPS, FUEL CELL EXIT T ↑↓, 7.3d 1

FC SHUTDN (1st)

WARNING
If FC Coolant Pump lost,
Emergency FC use OK for 9 min

1. Pre OMS 2 or Entry: MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE (Cue Card), then:
If ORB (not D/O Prep), kW > 18:
 3. MN BUS TIE (three) – ON (tb–ON)
4. ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb–OFF)
FC – STOP (COOL PUMP Δ P tb–bp or 1 sec)
5. FC REAC – CL (tb–CL)
6. Go to LOSS OF FES/1 FC (PWRDN)

2nd FC SHUTDN

BFS, SM SYS SUMM 1

NOTE
If FC Coolant Pump lost,
Emergency FC use OK for 6 min

1. MSTR MADS PWR – OFF
2. If aff FC pwr 1 MN bus: Go to step 5
3. MN BUS TIE (three) – OFF (tb–OFF)
4. Perform BUS TIE (Cue Card) to good FC/BUS, then:
5. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb–OFF)
FC – STOP (COOL PUMP Δ P tb–bp or 1 sec)
6. FC REAC – CL (tb–CL)
7. Go to LOSS OF 2nd FC (PWRDN)

BUS TIE

If no bus short:

If MN Volts > 20:

1. Bus Tie (A to B, B to C, C to A) >>

If MN Volts < 20:

2. (Aff) AC BUS SNSR – OFF
3. cb AC CONTR (three) – cl
4. (Aff) INV/AC BUS – OFF (tb-OFF)
5. (Aff) INV PWR – OFF (tb-OFF)
6. If MNC(B) dn: CAB FAN A(B) – OFF
7. Bus Tie (A to B, B to C, C to A)
8. (Aff) INV PWR – ON (tb-ON)
9. (Aff) INV/AC BUS – ON (tb-ON)
10. cb AC CONTR (three) – op
11. (Aff) AC BUS SNSR – AUTO TRIP
12. If pwrdn not reqd: ✓CAB FAN A(B) – ON
13. GNC I/O RESET

FC SAFING

BFS, SM SYS SUMM 1

If FC already SHUTDN:

1. ✓FC1(2,3) REAC – CL (O2,H2 tb-CL)
 2. FC1(2,3) – START (10 sec or ΔP tb-gray)
 3. FC/MN BUS A(B,C) – ON (tb-ON)
- When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:
4. FC/MN BUS A(B,C) – OFF (tb-OFF)
- When FC1(2,3) COOL P < 15, then:
5. FC1(2,3) – STOP (ΔP tb-bp or 1 sec) >>

If FC not SHUTDN:

6. MSTR MADS PWR – OFF

If not already tied:

7. Perform BUS TIE (Cue Card), then:
8. FC1(2,3) REAC – CL (O2,H2 tb-CL)

If either FC REAC tb still OP:

9. cb FC1(2,3) REAC VLV CL ENA – CL (pnl C3)
10. FC REAC VLV 1(2,3) – CL (pnl C3)

If no joy:

11. Install Switch Reten Device FC REAC sw (pnl R1)

When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:

12. ESS BUS SOURCE FC1(2,3) – OFF
13. FC/MN BUS A(B,C) – OFF (tb-OFF)

When FC1(2,3) COOL P < 15, then:

14. FC1(2,3) – STOP (ΔP tb-bp or 1 sec)

15. Go to LOSS OF 1 FC (2nd FC) (PWRDN)

APCL/ALL/GEN I,3

FC SHUTDN/2nd FC SHUTDN
BUS TIE/FC SAFING

5–15

CRYO (5–16)
O2/H2 HTR LOSS (5–18)

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

BFS, SM SYS SUMM 2
BFS, SM 168 CRYO PALLET

1. (Aff) O2(H2) TK HTRS (two) – OFF

For O2(H2) PRESS,

go to MAL, EPS, CRYO O2(H2) PRESS, TK P ↓↑, 7.6b 1 >>

For H2 TEMP HIGH, go to MAL, EPS, H2 HTR T, 7.6f 1 >>

For O2 TEMP HIGH, go to MAL, EPS, O2 HTR T, 7.6l 1 >>

CRYO O2(H2) LEAK

BFS, SM SYS SUMM 2
BFS, SM 168 CRYO PALLET

1. Use meter if CRT data OSL

If multiple TK Ps low:

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

If either MANF VLV fails to close:

3. Hold switch in CLOSE position (install Switch Retention Device if reqd), then:

⇒ If TK 1 and 2 P decr slowly (HTR logic fail):

4. O2(H2) MANF VLV TK1,TK2 (two) – OP

5. Go to MAL, EPS, CRYO O2(H2) PRESS, TK P ↓↑, 7.6b 1 >>

6. Perform aff BUS TIE (Cue Card), then:

If O2 TK1(2) aff:

7. O2 SYS 1(2) SPLY – CL, then:

If O2 TK 1(2) P now incr (PCS leak):

8. O2 MANF VLV TK1,TK2 (two) – OP >>

9. Perform aff FC SHUTDN (Cue Card), then:

If aff TK P not decr (FC leak):

10. O2(H2) MANF VLV TK1,TK2 (two) – OP (ASAP if FC3) >>

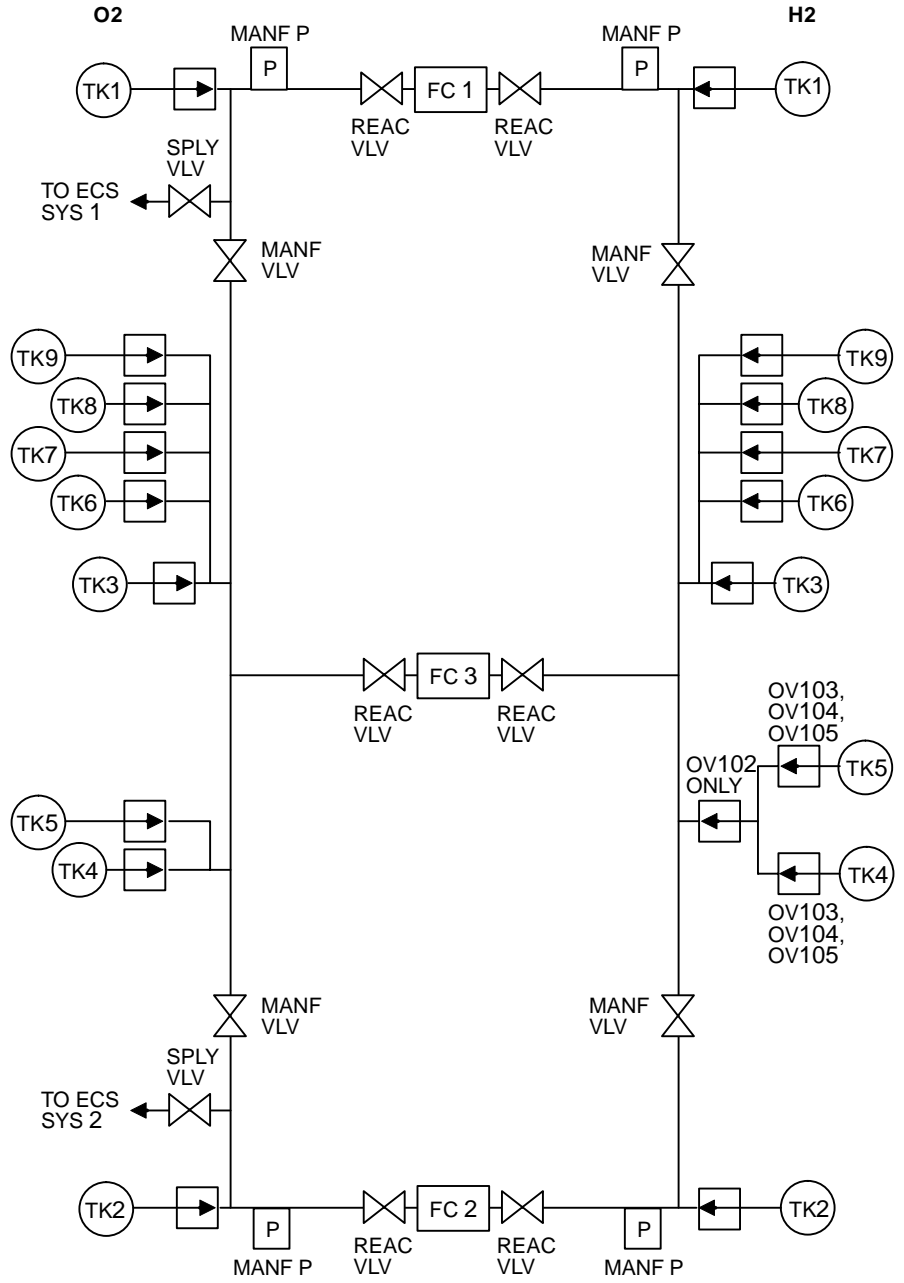
If aff TK P/MANF P decr (MANF leak):

11. (Aff) TK HTRS A(B) (two) – OFF >>

If only one TK P low (TK leak, xdcr, or cntlr fail):

12. (Aff) TK HTRS A(B) (two) – OFF

CRYO



A5-17

APCL/ALL/GEN I,11

This Page Intentionally Blank

A5-19

APCL/2/GEN 1,11

O2/H2 HTR LOSS (OV102 Only)																				
BUS LOSS	PAIRED				PAIRED								PAIRED				PAIRED			
	TK1		TK2		TK3		TK4 ←→ TK5				TK6		TK7		TK8		TK9			
	A	B	A	B	A	B	O2	H2A	H2B	O2	H2A	H2B	A	B	A	B	A	B		
MNA DA1	A/M				A/M								A/M				A/M			
MNB DA2			AUTO	A/M	AUTO	A/M	AUTO	A/M	A/M	A/M	AUTO	A/M			A/M				A/M	
MNC DA3	AUTO	A/M					AUTO	A/M												
CNTL AB1		MAN			MAN								MAN		MAN		MAN		MAN	
CNTL AB2		A/M			A/M								A/M		A/M		A/M		A/M	
CNTL AB3																				
CNTL BC1			MAN				MAN	MAN			MAN	MAN								
CNTL BC2			A/M				A/M	A/M												
CNTL BC3				MAN					MAN	AUTO	MAN									
CNTL CA1	MAN					MAN								MAN		MAN		MAN		
CNTL CA2	A/M				A/M				A/M	A/M				A/M		A/M		A/M		
CNTL CA3				A/M																
ESS 1BC	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	
ESS 2CA	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	
ESS 3AB	AUTO	AUTO	*	*	AUTO	AUTO	*	*	AUTO	AUTO	*	*	AUTO	AUTO	*	*	AUTO	AUTO	AUTO	

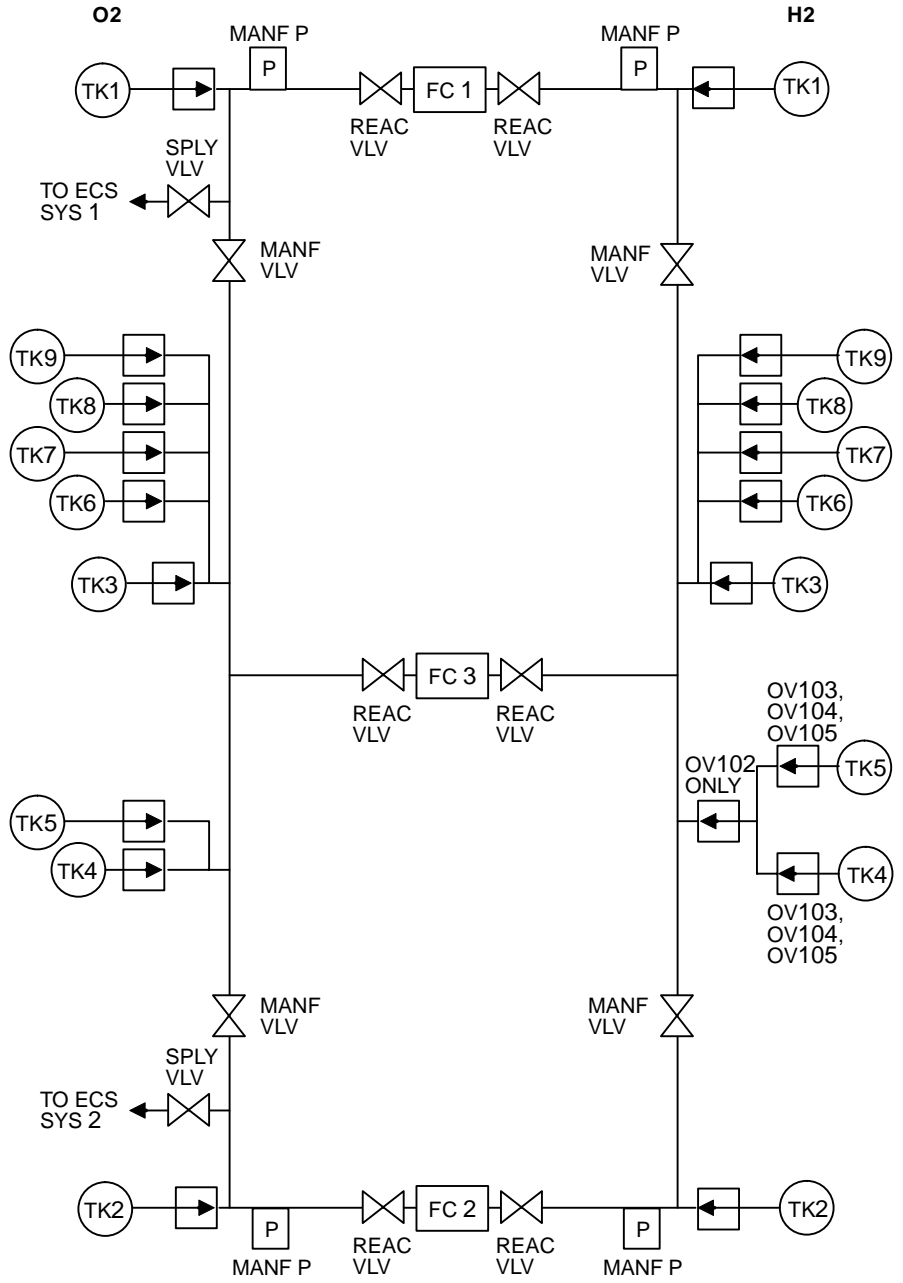
*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK(S) ARE NOT IN AUTO.
TK1 PAIRED WITH TK2, AND TK3 PAIRED WITH TK4/TK5

A/M = AUTO AND MANUAL LOSS

07/19/94

This Page Intentionally Blank

CRYO



B5-17

APCL/ALL/GEN I,11

O2/H2 HTR LOSS (All Except OV102)											
BUS LOSS		PAIRED				PAIRED					
		TK1		TK2		TK3		TK4		TK5	
		A	B	A	B	A	B	A	B	A	B
MNA	DA1	A/M				A/M				A/M	
MNB	DA2			AUTO	A/M	AUTO	A/M	AUTO	A/M		
MNC	DA3	AUTO	A/M	A/M				A/M		AUTO	A/M
CNTL	AB1		MAN			MAN					
	AB2		A/M			A/M					
CNTL	BC1			MAN				MAN			MAN
	BC2			A/M				A/M			A/M
	BC3				MAN			MAN			MAN
CNTL	CA1	MAN					MAN			MAN	
	CA2	A/M					A/M			A/M	
	CA3				A/M				A/M		
ESS	1BC	AUTO*	AUTO*	AUTO	AUTO	AUTO*	AUTO*	AUTO	AUTO		
	2CA	AUTO	AUTO	AUTO*	AUTO*					AUTO	AUTO
	3AB					AUTO	AUTO	AUTO*	AUTO*		

*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK(S) ARE NOI IN AUTO. A/M = AUTO AND MANUAL LOSS

02/02/96

B5-18

APCL/4/GEN I,11

This Page Intentionally Blank

B5-19

APCL/4/GEN I,11

This Page Intentionally Blank

B5-20

APCL/ALL/GEN I,11

MAIN DC BUS LOSS ID TABLE

BUS		MAIN A										MAIN B					MAIN C					
		*FPC1		MPC1		APC4			*FPC2		MPC2	APC5		*FPC3		MPC3		APC6				
		F L C 1	F M C 1	M M C 1	M M C 3	A P C 1	A L C 1	A M C 1	F L C 2	F M C 2	M M C 2	A P C 2	A L C 2	F L C 3	F M C 3	M M C 2	M M C 4	A P C 3	A L C 3			
CW	AC VOLTAGE (AC X Lost)	1						2						3								
	APU TEMP (-2 min if APU X ON)					3	3					1	1					2	2			
	FREON LOOP (If cooling by FES X only)					B	B											A	A			
	H2O LOOP (If Pump X Active)		1A						1B													
	OMS TVC (During OMS PRI GMBL)					L	L											R	R			
	OMS TVC (During OMS SEC GMBL)					R	R					L	L									
RCS JET (When Jet Commanded)		•						•					•									
DISP 67	DC AMPS XY = 0 (X: Fwd,Mid,Aft) (Y: A,B,C)	FA	FA	MA		AA	AA	FB	FB	MB	AB	AB	FC	FC	MC		AC	AC				
	DC V PCA XY = 0 (X: Fwd,Aft) (Y: A,B,C)	FA	FA			AA	AA	FB	FB		AB	AB	FC	FC			AC	AC				
	CNTL BUS RPC X = '*' (X: A,B,C)	A						B					C									
PLB LTS	PLB,FLOODS (Fwd,Mid,Aft Port,Stbd,Bkhd, Docking)			FP						FB					MS							
				AS						FS					AP							
				D						MP												
S-BAND	SYS X ORB voice & PL PSP msg (X: 1,2)							1					2									
	L2 ATM O2 SYS X SPLY tb - CL			1					2													
F6/F8	LANDING GEAR X tb - bp (X: L,R,NOSE)							LN					RN									
F7	CRT X Blanks	1						2					3,4									
O1	H2O PUMP OUT P X = 20 (Pump Loss)		1A						1B													
P A N E L S	O7 AFT X RCS He P Y tb - bp (X: Both,L,R) (Y: A,B)					BA	BA				RB	RB					LB	LB				
	AFT L,R RCS MANF ISOL 5 tb - bp																•	•				
	O8 FWD RCS He P X tb - bp	A						B														
R4	FWD RCS TK ISOL X tb - bp (X: 1/2,3/4/5)		3										1									
	FWD RCS MANF ISOL X tb - bp		1					2					5	4								
R13L	HYD BRAKE ISOL VLV X tb - OP					1	1				2	2					3	3				
	LG EXTEND ISOL VLV tb - OP					•	•															
A8U	RAD CNTL X tb - bp (X: PORT,STBD)			PS	S	P								PS	P	S						
A8U	RMS EE (except DERIGID) tbs - bp, MA LT - ON		•																			
A8L	X RMS DPY/STO tb - bp (X: PORT,STBD)		P						P					P								
PORT RMS R-F-L X tb - bp (X: FWD,MID,AFT)	X RMS RETEN LAT tb - bp (X: PORT,STBD)		P	P					P	P				P	P							
	PORT RMS R-F-L X tb - bp (X: FWD,MID,AFT)		M	M					F	F				A	A							

*For MNA(B,C) FPC 1(2,3) many other indications are present, most of which are associated with the resultant AC1(2,3) loads. Only the additional indications that positively identify the FPC bus loss are listed.

MAIN DC BUS LOSS ID TABLE

INDICATION		MAIN A				MAIN B			MAIN C		
		O 1 4	O 1 4 A 8	R 1 4	M L 8 6 B	O 1 5	R 1 4	M L 8 6 B	O 1 6	R 1 4	M L 8 6 B
C/W	CABIN ATM	•				•					
LIGHTS	FLOODS (L Seat,R Seat, CTR Cnsl, MS,OS,PS)			PS		LC	OS		RC	MS	
	Floods (L,R Ovhd Cnsl)	L				R					
	MIDDECK FLOODS X (X: 1,2,3,4,5,6,7,8)				18			26			34 57
	WMC FLOOD				•						
COMM	All Voice via AUDIO CTR 2									•	
	ATU PS,MS,MD CCU (CU),MD SMU (SM),AL,OS			MS OS CU			SM			PS AL	
	UHF SPLX PWR AMP			•							
TIMERS	X MISSION TIMER (X: Fwd,Aft)	F				A					
	X EVENT TIMER (X: Fwd,Aft)	A				F					
P A N E L S	FWD MDUs			MFD2 PLT1			CDR2 MFD1			CDR1 PLT2	
	AFT MDU									AFD1	
	L2 CAB RELIEF X tb - bp					A			B		
	ATM N2 SYS X SPLY, REG INLET tb - bp	1				2					
	O1 CAB dP/dT = 0.45					•					
	CAB PRESS = 0 psia	•									
	PPO2 SNSR X = 0 psia	A				BC					
	O3 RCS/OMS PRPLT QTY Disp Blanks								•		
	R11L SPLY H2O TK X INLET tb - bp				A			B			C
	SPLY H2O TK X OUTLET tb - bp				B			C			A
	SPLY H2O DUMP ISOL, B SPLY ISOL VLV tb - bp							•			
	SPLY H2O DUMP, XOVR, GALLEY SPLY VLV tb - bp										•
	A8U RMS EE (6), SAFING, S/W STOP tb - bp, BRAKES tb - OFF		•								
	ML31C WASTE H2O TK X VLV tb - bp				1						
	WASTE H2O DUMP ISOL VLV tb - bp				•						
SPLY H2O TK D X tb - bp (X: INLET,OUTLET)				0			1				

DATE 02/22/02

5-22

APCL/2/GEN I,Y

ESS DC BUS LOSS ID TABLE

BUS		ESS1BC					ESS2CA					ESS3AB						
		D A 1	FP & LC 1	M P C 1	F D	O 13 R 14	M L 86 B	D A 2	FP & LC 2	M P C 2	F D	O 13 R 14	D A 3	FP & LC 3	M P C 3	F D	O 13	M L 86 B
INDICATION																		
C/W	MA, but no F7 C/W Lts	•				•												
	O2 PRESS					•	•				•	•						•
	H2 PRESS					•	•				•	•						•
	FC REAC			•			•		•			•		•				
	FC PUMP			•	•				•	•		•		•	•			
	PRIMARY C/W (Cannot be Reset)							•				•						
	BACKUP C/W (Cannot be Reset)							•				•						
F9 METER	Aff ESS VOLTS OFF Scale Lo	•			•		•			•		•			•			
SM1	Aff DC VOLTS ESS = 0	•					•				•							
COMM	All Voice via AUDIO CTR 1						•				•							
	X ATU,CCU,MIC (X: Cdr,Plt)	C				C	P				P							
LIGHTS LOST	F7 C/W MATRIX	•				•												
	MA BULBS 2 of 4 per MA (except Lamp Test)	•				•	•				•							
	GPC STATUS LTS											•				•		
	X GLARESHIELD FLOOD (X: L,R)	L				L		R			R							
O2	O2,H2 TK X QTY = 0% (X: 1,2,3,4)	24				2	4	1			1	3					3	
P A N E L S	R1 FC/MN BUS X tb – OFF	A											C					
	PL PRI MNC tb – OFF												•					
	INV PWR X tb – OFF (Inv OK)		1							2			3					
	INV/AC BUS X tb – OFF (Bus OK)	1				1			2			2	3				3	
	O2,H2 MANF VLV TK X tb – CL	1		1					2	2				3		3		
	FC X REAC tb – CL	1	1						2	2			3		3			
	FC X RDY tb – bp	1	1	1					2	2	2		3	3	3			
A12 FC X COOL PUMP ΔP tb – bp	1	1	1					2	2	2		3	3	3				
A12	FC3 STRUCT RTN tb – OFF											•						

5-23

APCL/ALL/GEN,3

DATE 05/23/00

AC1/
MNA

AC1 (2 or 3Φs)

WARNING
FC1 will be lost within 9 min

- ⇒ C3 1. MSTR MADS PWR – OFF
If no MNA bus short:
 2. Perform BUS TIE (Cue Card), then:
If no MNA bus tie:
 3. Go to MNA DA1 >>
If MNA bus tie performed:
R2 4. BLR CNTLR/HTR 3 – B
 5. Perform FC1 SHUTDN (Cue Card), then:
L1 6. AV BAY 3 FAN A – ON
 B – OFF
 FREON PUMP LOOP 2 – A

AC1 ΦA

- ⇒ L1 1. FREON PUMP LOOP 2 – A

AC1 ΦB

- ⇒ L1 1. FREON PUMP LOOP 2 – A
O8 2. LTG PNL NUMERIC sel – OFF
OMS/MPS 3. Use He PRESS for L,R OMS Qty est

AC1 ΦC

- ⇒ R2 1. BLR CNTLR/HTR 3 – B
L1 2. FREON PUMP LOOP 2 – A
L4:P 3. cb AC1 ΦC TACAN 1 – op

MNA DA1 (Entire Bus) (Incls AC1)

NOTE

Loss of UHF SPLX Hi Pwr Xmit

- ⇒ Prior to OMS 2 burn:
- R2 1. MPS PRPLT DUMP B/U LH2 VLV – OP
 - 2. BLR CNTLR/HTR 3 – B
 - C3 3. MSTR MADS PWR – OFF
 - R1 4. AC BUS SNSR 1 – OFF
 - 5. Perform FC1 SHUTDN (Cue Card), then:
 - L1 6. ✓ AV BAY 1 FAN B – ON
3 FAN A – ON
B – OFF
FREON PUMP LOOP 2 – A
TOP EVAP HTR NOZ L – B AUTO
DUCT sel – B
HI LOAD DUCT HTR sel – B
 - L2 7. O2/N2 CNTLR VLV SYS 2 – OP
 - 8. XXXXXX MNVR YYYYYY L OMS – sel SEC
GMBL
 - 9. NWS – 2
 - OMS/MPS 10. Use He PRESS for L,R OMS Qty est
 - O6 11. ANNUN BUS SEL ACA 1 – MNB
 - R12L 12. MS AUD CNTL – PS
 - R1 13. ✓ O2,H2 MANF VLV TK1,TK2 (four) – OP
TK1,TK2 HTR A (four) – OFF
B (four) – AUTO
 - 14. BFS G51 AA1 – desel
- When BUS LOSS ACTIONS complete:
- 15. Go to LOSS OF FES/1 FC (PWRDN)

**AC2/
MNB**

MNA FPC1

- 1. Go to AC1 (2 or 3Φs)

MNA FLC1

- 1. GNC 23 RCS RCS FWD MANF VLVS 1
OVRD – ITEM 40 EXEC (CL)

MNA MPC1

- L1 1. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B

AC2/
MNB

MNA APC4

- ⇒ Prior to OMS 2 burn:
- R2 1. MPS PRPLT DUMP B/U LH2 VLV – OP
 - 2. BLR CNTLR/HTR 3 – B
 - L1 3. TOP EVAP HTR NOZ L – B AUTO
DUCT sel – B
HI LOAD DUCT HTR sel – B
NH3 CNTLR B – PRI/GPC
 - 4. XXXXX MNVR YYYY L OMS – sel SEC
GMBL

MNA APC1

- 1. XXXXX MNVR YYYY L OMS – sel SEC
GMBL

MNA ALC1

- ⇒ Prior to OMS 2 burn:
- R2 1. MPS PRPLT DUMP B/U LH2 VLV – OP
 - 2. BLR CNTLR/HTR 3 – B
 - L1 3. TOP EVAP HTR NOZ L – B AUTO
DUCT sel – B
HI LOAD DUCT HTR sel – B
NH3 CNTLR B – PRI/GPC

MNA O14

- L2 1. O2/N2 CNTLR VLV SYS 2 – OP
- 2. NWS – 2
- O6 3. ANNUN BUS SEL ACA 1 – MNB
- F6,F8 4. RADAR ALTM – 2
- 5. HSI SEL SOURCE – not MLS 1
- 6. BFS G51 AA1 – desel

MNA R14

NOTE
Loss of UHF SPLX Hi Pwr Xmit

- R12L 1. MS AUD CNTL – PS (MS can't talk)

AC2 (2 or 3Φs)

WARNING
FC2 will be lost within 9 min

- ⇒ C3 1. MSTR MADS PWR – OFF
If no MNB bus short:
 2. Perform BUS TIE (Cue Card), then:
If no MNB bus tie:
 3. Go to MNB DA2 >>
If MNB bus tie performed:
R2 4. BLR CNTLR/HTR 1 – B
 5. Perform FC2 SHUTDN (Cue Card), then:
L1 6. HUM SEP A – ON
 B – OFF
 IMU FAN A – ON
 B – OFF
 AV BAY 1 FAN A – ON
 B – OFF
 2 FAN A – OFF
 B – ON
O17:C 7. FREON PUMP LOOP 1 – A
 SIG CONDR FREON A – AC3

AC2 ΦA

- ⇒ R2 1. BLR CNTLR/HTR 1 – B
L1 2. FREON PUMP LOOP 1 – A

AC2 ΦB

- ⇒ O17:C 1. SIG CONDR FREON A – AC3
L1 2. FREON PUMP LOOP 1 – A

AC2 ΦC

- ⇒ L4:P 1. cb AC2 ΦC TACAN 2 – op
L1 2. FREON PUMP LOOP 1 – A

MNB DA2 (Entire Bus) (Incls AC2)

CAUTION
Do not sw S-BD PM CNTL to PNL if
subsequent Fault Msg – 'BCE
STRG 3 NSP' or loss of COMM

- ⇒
- | | | |
|-------|-----|--|
| R2 | 1. | MPS PRPLT DUMP B/U LH2 VLV – OP |
| | 2. | BLR CNTLR/HTR 1 – B |
| C3 | 3. | MSTR MADS PWR – OFF |
| R1 | 4. | AC BUS SNSR 2 – OFF |
| | 5. | Perform <u>FC2 SHUTDN</u> (Cue Card), then: |
| L1 | 6. | HUM SEP A – ON |
| | | B – OFF |
| | | IMU FAN A – ON |
| | | B – OFF |
| | | AV BAY 1 FAN A – ON |
| | | B – OFF |
| | | 2 FAN A – OFF |
| | | B – ON |
| | | FREON PUMP LOOP 1 – A |
| | | TOP EVAP HTR NOZ R – B AUTO |
| O6 | 7. | ANNUN BUS SEL ACA 2/3 – MNC |
| O17:C | 8. | SIG CONDR FREON A – AC3 |
| R1 | 9. | ✓O ₂ ,H ₂ MANF VLV TK1,TK2 (four) – OP |
| | | TK1 HTRS A,B (four) – AUTO |
| | 10. | <u>BFS G51</u> AA2, RGA 2 – desel |
| | | When BUS LOSS ACTIONS complete: |
| | 11. | Go to LOSS OF FES/1 FC (<u>PWRDN</u>) |

MNB FPC2

CAUTION
Do not sw S-BD PM CNTL to PNL
if subsequent Fault Msg – 'BCE
STRG 3 NSP' or loss of COMM

1. Go to AC2 (2 or 3Φs)

MNB FLC2

CAUTION
Do not sw S-BD PM CNTL to PNL
if subsequent Fault Msg – 'BCE
STRG 3 NSP' or loss of COMM

1. GNC 23 RCS RCS FWD MANF VLVS 2
OVRD – ITEM 41 EXEC (CL)

**AC3/
MNC**

MNB APC5

- ⇒ Prior to OMS 2 burn:
- | | |
|----|--|
| R2 | 1. MPS PRPLT DUMP B/U LH2 VLV – OP |
| | 2. BLR CNTLR/HTR 1 – B |
| L1 | 3. TOP EVAP HTR NOZ R – B AUTO |
| | 4. BFS G51 RGA 2 – desel |

MNB ALC2

- ⇒ Prior to OMS 2 burn:
- | | |
|----|------------------------------------|
| R2 | 1. MPS PRPLT DUMP B/U LH2 VLV – OP |
| | 2. BLR CNTLR/HTR 1 – B |
| L1 | 3. TOP EVAP HTR NOZ R – B AUTO |

MNB O15

- | | |
|-------|--|
| O6 | 1. ANNUN BUS SEL ACA 2/3 – MNC |
| F6,F8 | 2. RADAR ALTM – 1 |
| | 3. HSI SEL SOURCE – not MLS 2 |
| | 4. BFS G51 AA2 – desel |

MNC DA3 (Entire Bus) (Includes AC3)

NOTE
PS AUDIO lost

- | | | |
|----------------|-----|--|
| L1 | 1. | FLASH EVAP CNTLR PRI A – OFF
B – ON |
| ⇒ R2 | 2. | BLR CNTLR/HTR 2 – B |
| C3 | 3. | MSTR MADS PWR – OFF
√AUD CTR – 1 |
| R1 | 4. | AC BUS SNSR 3 – OFF |
| | 5. | Perform <u>FC3 SHUTDOWN</u> (Cue Card), then: |
| L1 | 6. | CAB FAN B – ON
A – OFF |
| | 7. | H2O PUMP LOOP 1 – ON
2 – OFF
√AV BAY 2 FAN A – ON
√3 FAN B – ON |
| O17:C | 8. | SIG CONDR FREON B – AC2 |
| | 9. | <u>XXXXX MNVR YYYY</u> R OMS – sel SEC
GMBL |
| C3 | 10. | S-BD PM CNTL – PNL,CMD |
| | 11. | <u>BFS, GNC 51 OVERRIDE</u>
TDRS – ITEM 46 EXEC (*) |
| R1 | 12. | √O2,H2 MANF VLV TK1,TK2 (four) – OP
TK2 HTRS B (two) – AUTO
TK3 HTRS A,B (four) – AUTO |
| <u>OMS/MPS</u> | 13. | Use He PRESS for L,R OMS Qty est |
| | 14. | <u>BFS, GNC 51 OVERRIDE</u> RGA 3 – desel |
| | | When BUS LOSS ACTIONS complete: |
| | 15. | Go to LOSS OF FES/1 FC (<u>PWRDN</u>) |

CNTL

CNTL

MNC FPC3

- C3 1. S-BD PM CNTL – PNL,CMD
- 2. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)
- 3. Go to AC3 (2 or 3Φs)

MNC FLC3

- C3 1. S-BD PM CNTL – PNL,CMD
- 2. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)
- 3. GNC 23 RCS RCS FWD MANF VLVS 4
OVRD – ITEM 43 EXEC (CL)

MNC MPC3

- 1. BFS, GNC 51 OVERRIDE RGA 3 – desel

MNC APC6

- ⇒ R2 1. BLR CNTLR/HTR 2 – B
- L1 2. FLASH EVAP CNTLR PRI A – OFF
B – ON
- 3. XXXXX MNVR YYYY R OMS – sel
SEC GMBL

MNC APC3

- 1. XXXXX MNVR YYYY R OMS – sel
SEC GMBL

MNC ALC3

- ⇒ R2 1. BLR CNTLR/HTR 2 – B
- L1 2. FLASH EVAP CNTLR PRI A – OFF
B – ON

MNC O16

- OMS/MPS 1. Use He PRESS for L,R OMS Qty est
- F6,F8 2. HSI SEL SOURCE – not MLS 3

MNC R14

NOTE
PS AUDIO lost

- C3 1. ✓AUD CTR – 1

CNTL AB1

⇒

CAUTION
Do not sw S-BD PM CNTL to PNL.
It will result in loss of Uplink S-BD
COMM

- L1 1. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B

CNTL AB2

- L1 1. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B
- 2. GNC 23 RCS RCS FWD MANF VLVS 1
OVRD – ITEM 40 EXEC (CL)
- R1 3. ✓O2,H2 MANF VLV TK2 (two) – OP

CNTL AB3

NOTE

CDR's BFS ENGAGE capability lost

If BFS ENGAGE reqd:

- 1. Use PLT's RHC, then:
- 2. GPC MODE 1,2,4 (three) – STBY,HALT
- 3. BFS I/O RESET

If no S-BD COMM:

- C3 4. S-BD PM CNTL – PNL,CMD
- 5. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)

- L1 6. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B

⇒

Do not perform next step if AB1,2,3 unpwr:

- 7. GNC 51 OVERRIDE
RCS RM MANF CL OVRD – ITEM 41
EXEC
- R2 8. BLR CNTLR/HTR 1,3 (two) – B

CNTL BC1

⇒

CAUTION
Do not sw S-BD PM CNTL to PNL
if subsequent Fault Msg – 'BCE
STRG 3 NSP' or loss of COMM

- L1 1. TOP EVAP HTR NOZ L – B AUTO
 2. BFS, GNC 51 OVERRIDE RGA 2 – desel

CNTL BC2

- C3 1. S-BD PM CNTL – PNL,CMD
 2. BFS, GNC 51 OVERRIDE |
 TDRS – ITEM 46 EXEC (*)
⇒ 3. GNC 23 RCS RCS FWD MANF VLVS 2 |
 OVRD – ITEM 41 EXEC (CL)
R1 4. ✓ O2,H2 MANF VLV TK1 (two) – OP
 TK2 HTRS B (two) – AUTO
 TK3 HTRS A,B (four) – OFF

CNTL BC3

- ⇒ R2 1. BLR CNTLR/HTR 1,2 (two) – B
L1 2. TOP EVAP HTR NOZ R – B AUTO
 Do not perform next step if BC1,2,3 unpwr:
 3. GNC 51 OVERRIDE
 RCS RM MANF CL OVRD – ITEM 41
 EXEC

CNTL CA1

NOTE
BFS ENGAGE capability lost

- ⇒◇ O6 1. GPC OUTPUT 5 – TERM
 2. BFS G51 RGA 3 – desel

CNTL CA2

- ⇒ L1 1. GNC 23 RCS RCS FWD MANF VLVS 3
 2. OVRD – ITEM 42 EXEC (CL)
R1 3. FLASH EVAP CNTLR PRI B – ON
 3. ✓O₂,H₂ MANF VLV TK1,TK2 (four) – OP
 TK1 HTRS B (two) – AUTO

CNTL CA3

- ⇒ R1 1. ✓O₂,H₂ MANF VLV TK1,TK2 (four) – OP
R2 2. BLR CNTLR/HTR 2,3 (two) – B

ESS

ESS 1BC DA1 (Entire Bus)

NOTE

Pri C/W Sys and Matrix lost
(B/U C/W Tone remains). GPC 1,4
lost if pwr cycled OFF(ON)

- O5 1. L AUD CNTL sel – R (CDR can't talk)
 2. Perform FC1 SHUTDN (Cue Card), then:
 If add'l Itg reqd:
C3 3. EMER LTG – ON/OFF
R1 4. ✓O2,H2 MANF VLV TK2 (two) – OP
 TK1 HTRS A,B (four) – AUTO
 TK2 HTRS A,B (four) – OFF
 TK3 HTRS A,B (four) – AUTO

ESS 1BC MPC1

1. Go to FC1 SHUTDN (Cue Card)

ESS 1BC FD

NOTE

GPC 1,4 lost if pwr cycled OFF(ON)

1. Go to FC1 SHUTDN (Cue Card)

ESS

ESS 1BC O13 & R14

NOTE

Pri C/W Sys and Matrix lost
(B/U C/W Tone remains)

- O5 1. L AUD CNTL sel – R (CDR can't talk)
 If add'l Itg reqd:
C3 2. EMER LTG – ON/OFF
R1 3. ✓O2,H2 MANF VLV TK1,TK2 (four) – OP
 TK1 HTRS A,B (four) – AUTO
 TK2 HTRS A,B (four) – OFF

ESS 2CA DA2 (Entire Bus)

NOTE

C/W B PWR SPLY lost (Pri C/W remains). FAULT SUMM MSG must be reset to avoid C/W Tone masking. GPC 2,5 lost if pwr cycled OFF(ON)

- C3 1. AUD CTR – 2
- O9 2. R AUD CNTL sel – L (PLT can't talk)
- 3. Perform FC2 SHUTDN (Cue Card), then:
If add'l Itg reqd:
- C3 4. EMER LTG – ON/OFF
- R1 5. ✓O₂,H₂ MANF VLV TK1 (two) – OP
TK1 HTRS A,B (four) – OFF
TK2 HTRS A,B (four) – AUTO
TK3 HTRS A,B (four) – AUTO

ESS 2CA MPC2

- 1. Go to FC2 SHUTDN (Cue Card)

ESS 2CA FD

NOTE

GPC 2,5 lost if pwr cycled OFF(ON)

- 1. Go to FC2 SHUTDN (Cue Card)

ESS 2CA O13 & R14

NOTE

C/W B PWR SPLY lost (Pri C/W remains).
FAULT SUMM MSG must be reset to avoid
C/W Tone masking

- C3 1. AUD CTR – 2
- O9 2. R AUD CNTL sel – L (PLT can't talk)
- If add'l Itg reqd:
- C3 3. EMER LTG – ON/OFF
- R1 4. ✓O₂,H₂ MANF VLV TK1,TK2 (four) – OP
TK1 HTRS A,B (four) – OFF
TK2 HTRS A,B (four) – AUTO

ESS 3AB DA3 (Entire Bus)

NOTE

BFS ENGAGE capability lost.
Computer Status Matrix lost. GPC 3
lost if pwr cycled OFF(ON)

- R1 1. ✓O₂,H₂ MANF VLV TK1,2 (four) – OP
 2. Perform FC3 SHUTDN (Cue Card), then:
⇒ 3. GPC OUTPUT 5 – TERM

ESS 3AB MPC3

1. Go to FC3 SHUTDN (Cue Card)

ESS 3AB FD

NOTE

GPC 3 lost if pwr cycled OFF(ON).
BFS ENGAGE capability lost

1. Go to FC3 SHUTDN (Cue Card)

ESS 3AB O13

NOTE

Computer Status Matrix lost

ESS 3AB ML86B

- R1 1. ✓O₂,H₂ MANF VLV TK1,2 (four) – OP

**GUIDANCE, NAVIGATION, AND
CONTROL**

GNC

6-1

APCL/ALL/GEN I



This Page Intentionally Blank

GNC



— | | | —

DISPLAY SW L(R)

1. L(R) disp sws (eight) – green dot

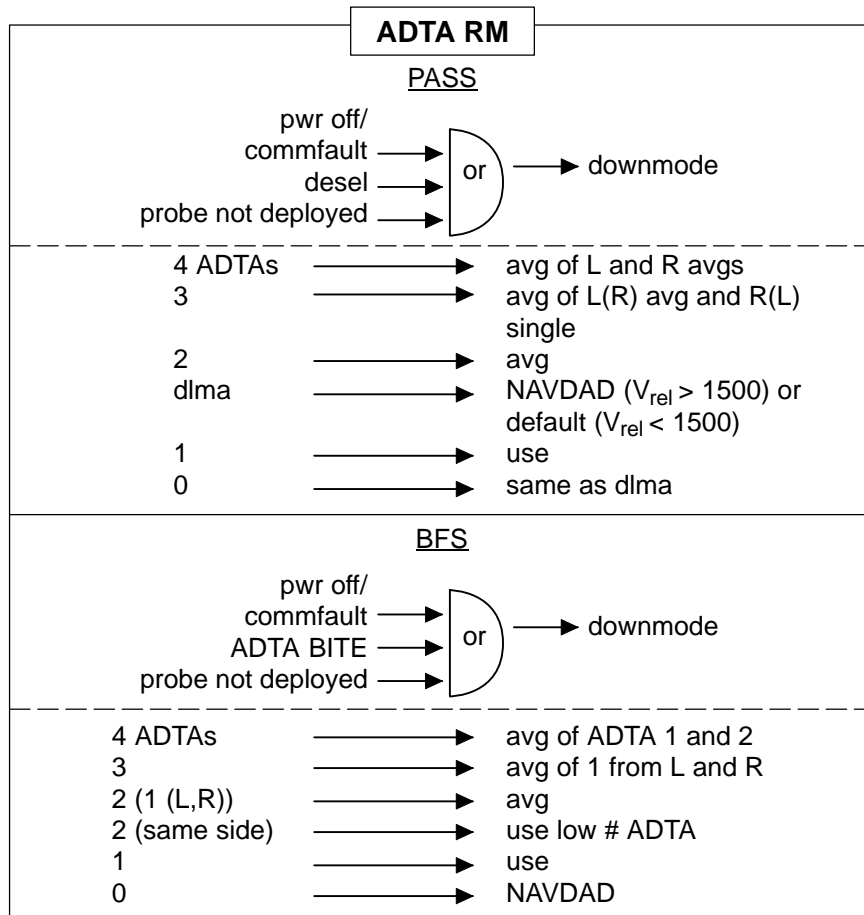
APCL/ALL/GEN I

6-3

DISPLAY SW

—

— | | | —



NOTE

When BFS engaged, if failed ADTA candidate for selection, pull ADTA cb, or stow applicable probe

RM FAIL IMU, RGA, AA

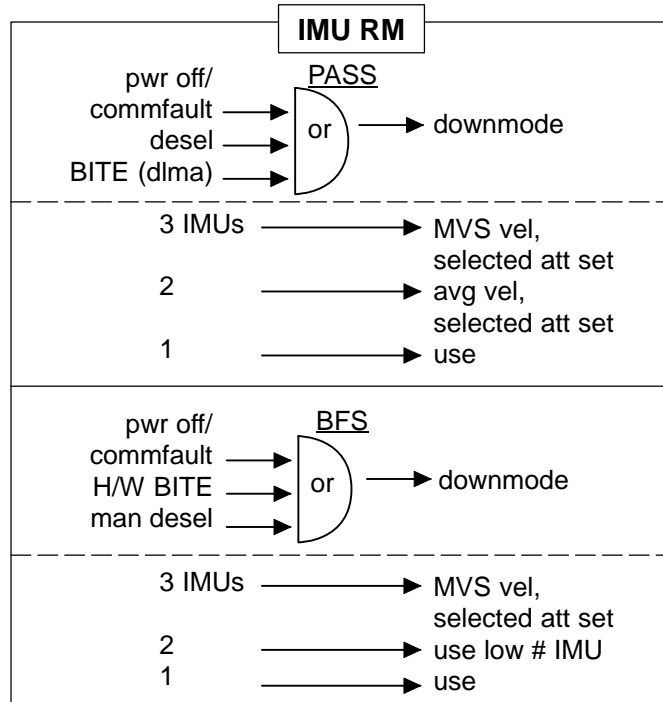
BFS, GNC 51 OVERRIDE

1. (Aff) LRU – desel

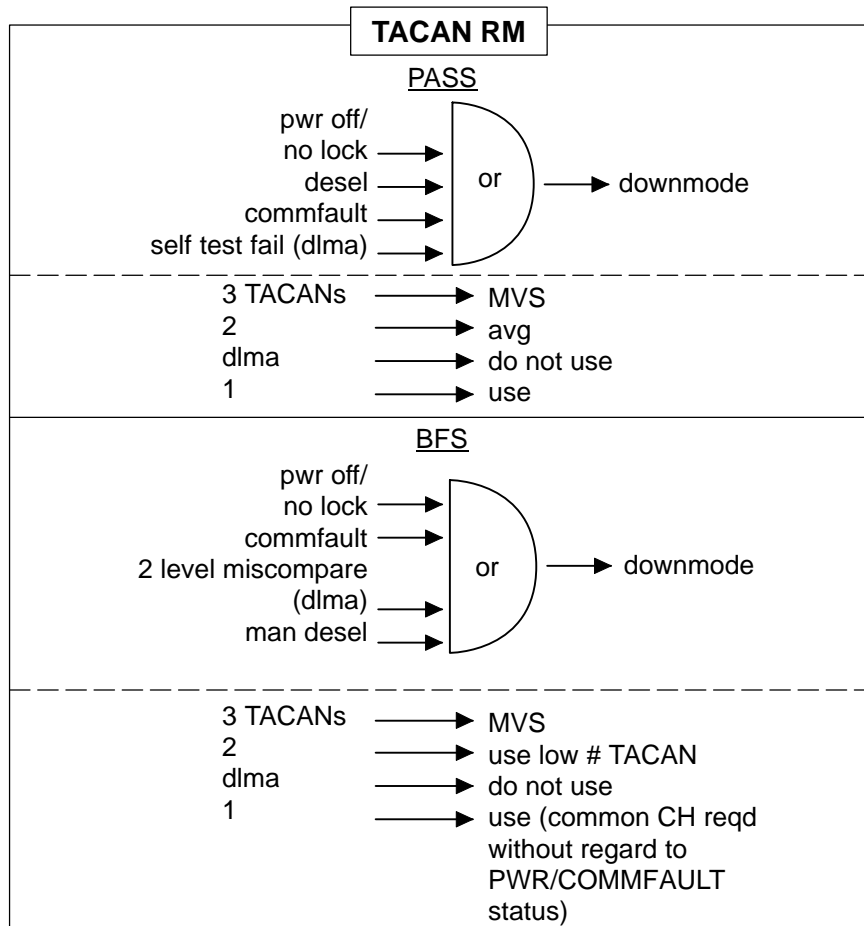
RM DLMA IMU

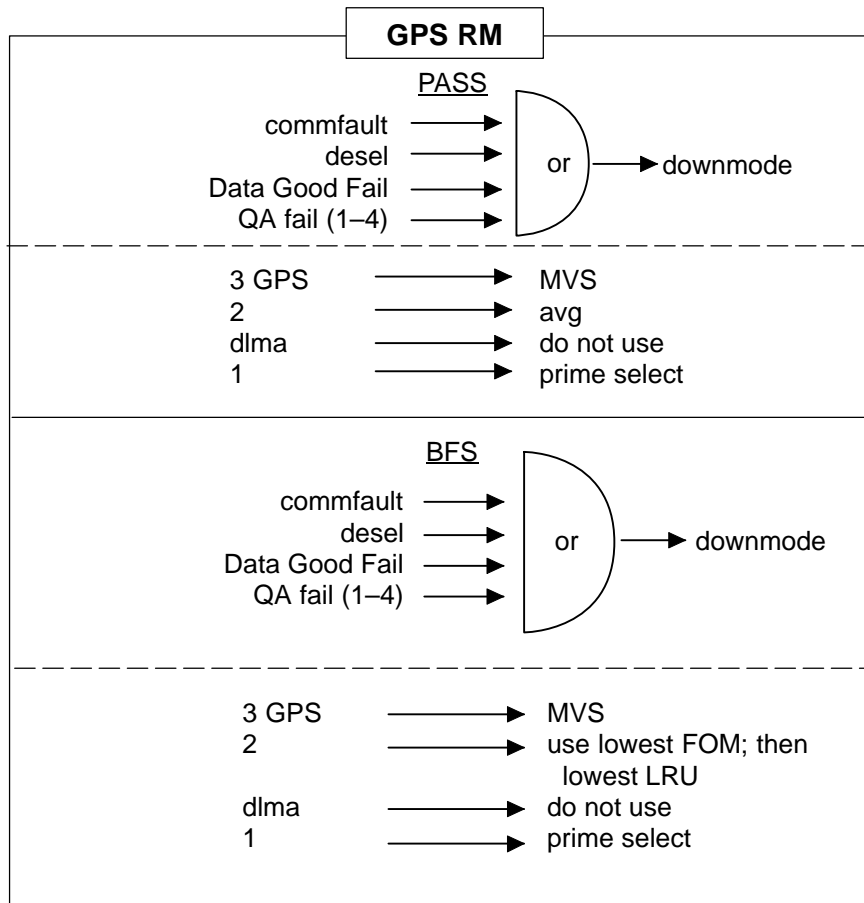
GNC 51 OVERRIDE
BFS, GNC 51 OVERRIDE

1. ✓ MCC, Bad IMU – desel (PASS and BFS) >>
2. If no MCC: Desel lower # IMU with '?' (PASS)

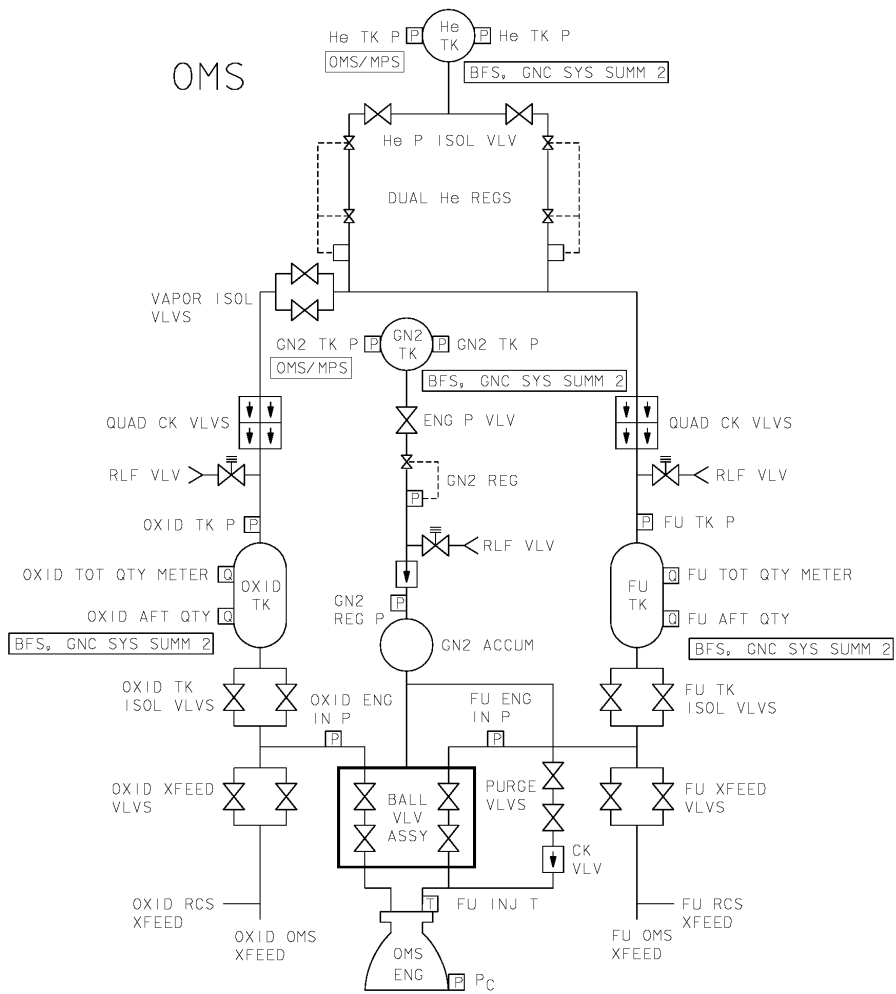


APCL/ALL/GEN I,1





This Page Intentionally Blank



DATE 06/17/98

48033A701, SCH 1

OMS

OMS N2 TK P LOW**BFS, GNC SYS SUMM 2**

1. ✓ N2 TK P < 1200 or decr (**OMS/MPS**) and SPEC)
If preburn:
 2. (Aff) OMS ENG – ARM
 3. If OMS N2 REG P decr: (Aff) OMS ENG – OFF
 4. ✓ MCC for use of OMS ENG

OMS N2 REG P LOW**BFS, GNC SYS SUMM 2****NOTE**

N2 REG P > 299 allows one OMS ENG start

1. ✓ N2 TK P decr (**OMS/MPS**) and SPEC)
If preburn:
 2. (Aff) OMS ENG – OFF
 3. ✓ MCC for use of OMS ENG

OMS N2 REG P HIGH**BFS, GNC SYS SUMM 2**

1. ✓ N2 TK P decr (**OMS/MPS**) and SPEC)
2. (Aff) OMS ENG – ARM

OMS TK P (FU and OX) HIGH**BFS, GNC SYS SUMM 2**

1. (Aff) OMS He PRESS/VAP ISOL (two) – CL, then cycle to maintain TK P 234–288

OMS

OMS TK P (FU or OX) LOW**BFS, GNC SYS SUMM 2**

If system not secured and corresp ENG IN P disagrees:

1. When time permits: Go to MAL, OMS, L(R) OMS TK P, 11.1a 29 >>

⇒ If OMS 1 reqd:

2. At TIG-2: (aff) He PRESS (two) – OP
OMS ENG (two) – ARM/PRESS

If FU IN P < 216 or OX < 151 prior to ign:

3. Go to OMS SECURE >>
4. At TIG-15 sec: RCS +X to TIG+1 sec
5. Post Burn: Continue with step 6

If pre-OMS 2:

6. (Aff) OMS TK ISOL (two) – CL (tb-CL)
- If corresp ENG IN P decr (OMS INLET LINE LEAK):
7. OMS 2 burn Single ENG, good Pod
 8. ENG cut off when \geq MIN Hp >>

If OMS TK P decr (PROP TK LEAK), dump ASAP:

9. LOAD Δ VY = 600, TIG in ~4 min
10. ✓ENG/TRIM CONFIG, LOAD TGTS, MNVR
11. (Good) OMS ENG – OFF
12. (Aff) OMS ENG – ARM/PRESS

At TIG-2:

13. FLT CNTLR PWR (two) – ON
14. (Aff) OMS He PRESS/VAP ISOL (two) – OP
TK ISOL (two) – OP (tb-OP)

If FU IN P < 216 or OX IN P < 151 prior to ign:

15. Go to OMS SECURE >>

At TIG-15 sec:

16. RCS +X to TIG+1 sec
17. Burn to depletion (OMS ↓)

Postburn:

18. (Aff) OMS ENG – OFF
19. FLT CNTLR PWR (two) – OFF
20. Perform OMS SECURE, then:
21. Cut off OMS 2 when \geq MIN Hp >>

If post-OMS 2:

22. Perform OMS SECURE, then:
- If OMS ENG IN P decr (OMS INLET LINE LEAK):

23. ✓MCC

If OMS TK P decr (PROP TK LEAK):

24. Go to LEAKING OMS PRPLT/He BURN
(ORB PKT, OMS)

APCL/4/GEN I,3

**OMS N2 TK/REG P
OMS TK P HIGH**

7-3

**OMS TK P LOW
OMS He TK P LOW (7-4)**

OMS He TK P LOW

BFS, GNC SYS SUMM 2

1. \checkmark He TK P < 1500 or decr (OMS/MPS) and SPEC)
- ⇒ If OMS 1 reqd:
- If Blowdown Dump completed:
 2. XFEED from good OMS >>
 - If Blowdown Dump not completed:
 3. XFEED from leaking OMS
 - At He P < 640 or QTY \leq 36%:
 4. XFEED from good OMS >>
 - If Blowdown Dump complete:
 5. XFEED from good OMS
 6. OMS ENG (two) – ARM/PRESS
 7. Cut off OMS 2 when \geq MIN Hp >>
 - If Blowdown Dump not complete:
 - If OMS He TK P < 640:
 8. XFEED from good OMS
 9. OMS ENG (two) – ARM/PRESS
 10. Cut off OMS 2 when \geq MIN Hp >>
 - If OMS He TK P > 640:
 11. \checkmark MCC
 12. LOAD Δ VY = 300, TIG in ~4 min
 13. \checkmark ENG/TRIM CONFIG, LOAD TGTS, MNVR
 14. XFEED from leaking OMS
 15. OMS ENG (two) – ARM/PRESS
 - When He TK P < 640 or Qty < 41%:
 16. OMS ENG (two) – OFF
 - OMS 2 config:
 17. XFEED from good OMS
 18. OMS ENG (two) – ARM/PRESS
 19. Cut off OMS 2 when \geq MIN Hp

XFEED: L OMS PRPLT to R OMS ENG

1. ✓ L OMS TK ISOL (two) – OP (tb–OP)
2. R OMS TK ISOL (two) – CL (tb–CL)
3. L,R OMS XFEED (four) – OP (tb–OP)

XFEED: R OMS PRPLT to L OMS ENG

1. ✓ R OMS TK ISOL (two) – OP (tb–OP)
2. L OMS TK ISOL (two) – CL (tb–CL)
3. L,R OMS XFEED (four) – OP (tb–OP)

XFEED RETURN: OMS to OMS (N/A during I'CNCT)

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

OMS SECURE

1. (Aff) OMS ENG – OFF
2. XFEED (two) – CL (tb–CL)
TK ISOL (two) – CL (tb–CL)
He PRESS/VAP ISOL (two) – CL

L(R) OMS GIMBAL

GNC XXXXX MNVR EXEC

If first failure:

1. (Aff) gimbal – sel SEC GMBL (twice) >>

If second failure:

2. Go to OMS GMBL, appropriate BURN MONITOR (Cue Card)

APCL/ALL/GEN I,9

**OMS XFEEDS
OMS SECURE/GIMBAL**

7–5

**DEORB/AOA XFD BURN (7–6)
RCS/FRCS COMPL (7–9)**

DEORBIT MIXED XFD BURN PREP

NOTE

Do Not Use MSTR RCS XFEED sw

1. L,R OMS TK ISOL (four) – CL (tb–CL)
XFEED (four) – CL (tb–CL)
He ISOL (four) – CL
2. AFT L,R RCS XFEED (four) – CL (tb–CL)
✓MSTR RCS XFEED – OFF
3. Set up GPC vlvs **SPEC 0** **GPC MEMORY**
✓HEX 27*
BIT RST – ITEM 23 EXEC
Configure ADD ID/DESIRED Addresses

ADD ID	DESIRED	
28 03 C8 B	29	} From Tables 1–8
30 03 D1 1	31	
32 03 D8 3	33	
34 03 DE 1	35	

4. WRITE – ITEM 25 EXEC
BIT SET – ITEM 22 EXEC

ADD ID	DESIRED	
28 03 C8 F	29	} From Tables 1–8
30 03 D1 5	31	
32 03 D8 7	33	
34 03 DE 5	35	

5. WRITE – ITEM 25 EXEC
Perform RECONFIG:
L,R OMS TK ISOL (four) – GPC
XFEED (four) – GPC
(✓tb config from table)
OMS BURN will be SE or +XRCS
(ck tables for ENG)
6. During AOS: ✓vlv config w/MCC
7. Perform POST OMS 1 BURN PROCEDURES (ASC, POST OMS 1)
EXCEPT:
DO NOT RECONFIGURE OMS VLVS
For deorbit burn:
TGT AOA
PRPLT = 0 (ITEM 18 +0)
Use AOA DEORBIT MIXED XFD BURN (7–7) for
DEORBIT BURN

AOA DEORBIT MIXED XFD BURN

✓MM302 ✓OMS L(R) or RCS

Enter TGO + 10 sec

✓L,R OMS TK ISOL (four) – GPC

 ✓XFEED (four) – GPC

✓tb config from table

✓DAP – AUTO(PASS)/DISC

ADI – LVLH(REF)/HI/MED

FLT CNTLR PWR (two) – ON

Man Repress to maintain good OMS TK Ps > 234 psi (simo)

If OMS BURN INITIATION:

 ✓TRIM: P +0.4, LY +5.2, RY -5.2

TIG-2 Good OMS ENG – ARM/PRESS

 - :15 EXEC

 - :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec

 :00 TIG Start watch (✓Pc, ΔVTOT, ENG VLVs)

If RCS BURN INITIATION:

Man Repress L,R OMS > L,R RCS TK Ps

L,R RCS XFEED (four) – OP

 TK ISOL (six) – CL

TIG- :00 THC +X

Maintain PITCH ATT ERR ± 3°

```

. . . . .
. OMS PRPLT LOW .
.
. AFT RCS RECONFIG at ΔVTOT =    .
. RCS COMPLETION .
. . . . .

```

Cont next page

* OMS PRPLT FAIL:	*
* OMS ENG – OFF	*
* ITEM 18 +Q EXEC	*
* Secure L,R OMS	*
* ✓ ADI – LVLH, center needles	*
* RCS COMPLETION	*
* OMS ENG FAIL:	*
* OMS ENG – OFF	*
* Man Repress L,R OMS > L,R RCS TK Ps	*
* L,R RCS XFEED (four) – OP	*
* TK ISOL (six) – CL	*
* ✓ ADI – LVLH, center needles	*
* THC +X (✓Lowest OMS % vs RCS Burn Time)	*
* AFT RCS RECONFIG	*
* RCS COMPLETION	*
* RCS +X JET FAIL OFF:	*
* ITEM 18 +Q EXEC	*
* G23 Resel jet	*
*	*

```

*
* RCS COMPLETION:
* If DIRECT INSERTION:
*   THC +X to  $\Delta VTOT = 0$  or TOT AFT QTY 1   %
*
*   At AFT QTY 1      THC +X to FLIP  $\Delta V$  or
*   if CUR  $\Delta VTOT$ :  TOT AFT QTY 2   % then
*                   FRCS COMPLETION
*
*   FLIP   -----
*    $\Delta V$                                      FRCS COMPLETION
*
*   AFT   -----
*    $\Delta V$                                      THC +X to TGT  $\Delta V$ 
*
*   TGT   -----
*    $\Delta V$ 
*
* If w/OMS 1:
*   THC +X to TGT HP or TOT AFT QTY 1   %
*
*   At AFT QTY 1      THC +X to FLIP HP or
*   if CUR HP:        TOT AFT QTY 2   % then
*                   FRCS COMPLETION
*
*   FLIP   -----
*   HP                                     FRCS COMPLETION
*
*   AFT   -----
*   HP                                     THC +X to TGT HP
*
*   TGT   -----
*   HP
*
* FRCS COMPLETION:
* MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4  $\Delta VTOT$ )
* THC -X to  $\Delta VTOT = 0$  or FRCS depletion (JETS FAIL OFF)
*

```

```

CUTOFF VGOx = 0, RELEASE THC
+ :02 OMS ENG(s) - OFF (If < 3 IMU, at  :  )
      * AFT RCS RECONFIG if INTERCONNECT *
      TRIM X,Z residuals < 2 fps (< 0.5 fps if shallow)

```

OMS-1/OMS-2 UPHILL MIXED XFD

NOTE

Do Not Use MSTR RCS XFEED sw

1. If OMS-1: Perform AOA-S (ASC, OMS TGTS)
2. L,R OMS TK ISOL (four) – CL (tb-CL)
XFEED (four) – CL (tb-CL)
3. AFT L,R RCS XFEED (four) – CL (tb-CL)
✓MSTR RCS XFEED – OFF
4. Set up GPC vlvs SPEC 0
✓HEX 27*
BIT RST – ITEM 23 EXEC
Configure ADD ID/DESIRED Addresses

ADD ID	DESIRED
28 03 C8 B	29
30 03 D1 1	31
32 03 D8 3	33
34 03 DE 1	35

} From Tables 1-8

5. WRITE – ITEM 25 EXEC
BIT SET – ITEM 22 EXEC

ADD ID	DESIRED
28 03 C8 F	29
30 03 D1 5	31
32 03 D8 7	33
34 03 DE 5	35

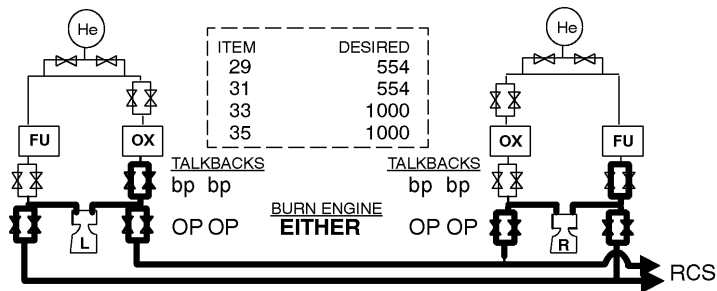
} From Tables 1-8

6. WRITE – ITEM 25 EXEC
Perform RECONFIG:
L,R OMS TK ISOL (four) – GPC
XFEED (four) – GPC
(✓tb config from table)
BURN will be SE or +XRCS (ck tables for ENG)
7. During AOS: ✓vlv config, TGT w/MCC

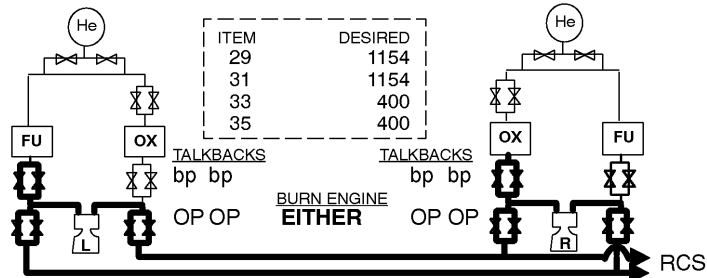
Cont next page

8. If OMS ENG burn:
 - OMS L or R
 - TRIM: P +0.0, LY +5.2, RY -5.2
 - L(R) OMS ENG - ARM/PRESS (other OMS ENG - OFF)
 - TIG -:15 EXEC
 - Man Repress from L and R OMS He TKs (240 < TK P < 250)
- If +XRCS burn:
 - ✓ Good OMS TK P > RCS TK P
 - OMS ENG - OFF
 - L,R RCS XFEED (four) - OP
 - TK ISOL (six) - CL
 - THC +X (✓OMS % vs RCS burn time)
 - Man Repress from L and R OMS He TKs (240 < TK P < 250)
9. POST BURN, OMS He VAP ISOL (four) - CL
10. If OMS-1: Perform POST OMS 1 BURN PROCEDURES
(ASC, POST OMS 1) EXCEPT:
 - DO NOT RECONFIGURE OMS VLVs
 - For OMS-2 TGTS, PRPLT = 0 (ITEM 18 +0)
 - Use AOA DEORBIT MIXED XFD BURN (for OMS-2 BURN)

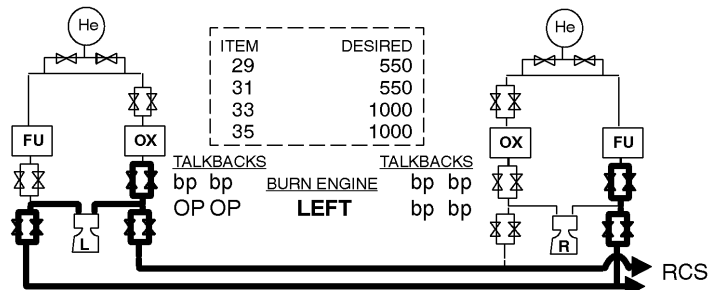
**TABLE 1
L OMS FU TK AND R OMS OX TK FAILED**



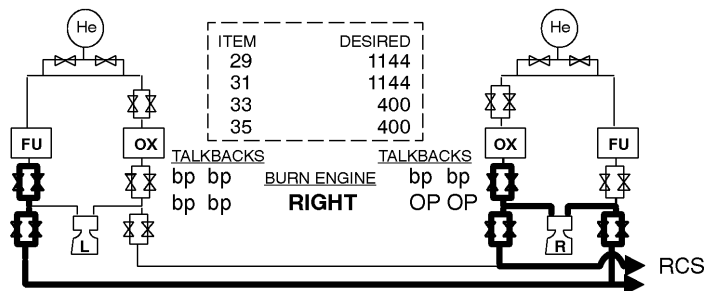
**TABLE 2
L OMS OX TK AND R OMS FU TK FAILED**



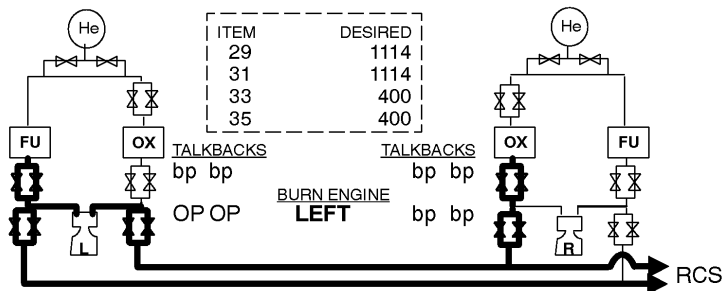
**TABLE 3
L OMS FU TK AND R OMS OX INLET FAILED**



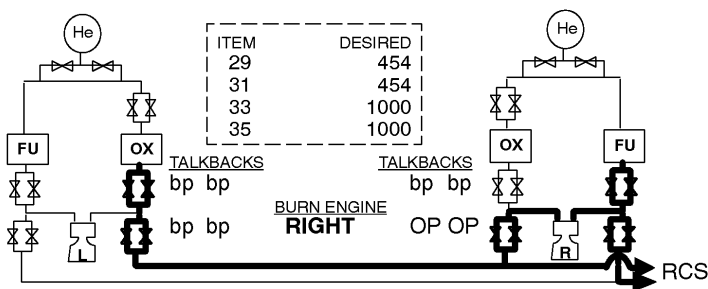
**TABLE 4
L OMS OX INLET AND R OMS FU TK FAILED**



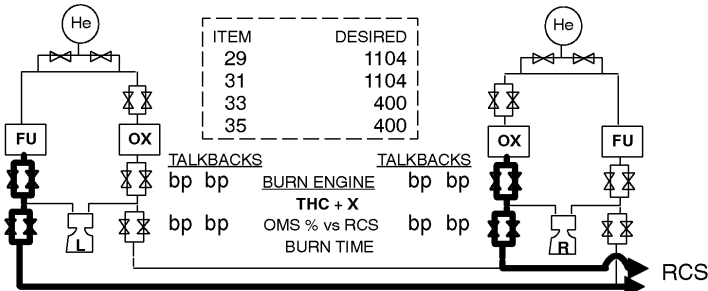
**TABLE 5
L OMS OX TK AND R OMS FU INLET FAILED**



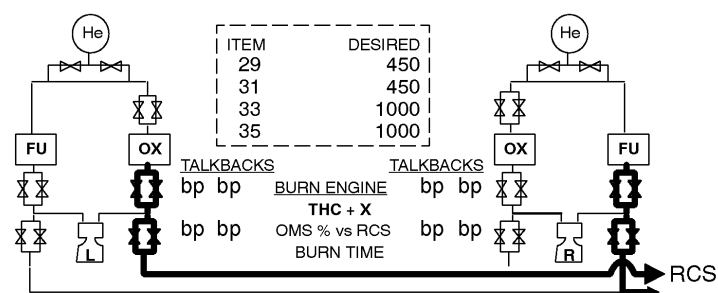
**TABLE 6
L OMS FU INLET AND R OMS OX TK FAILED**



**TABLE 7
L OMS OX INLET AND R OMS FU INLET FAILED**

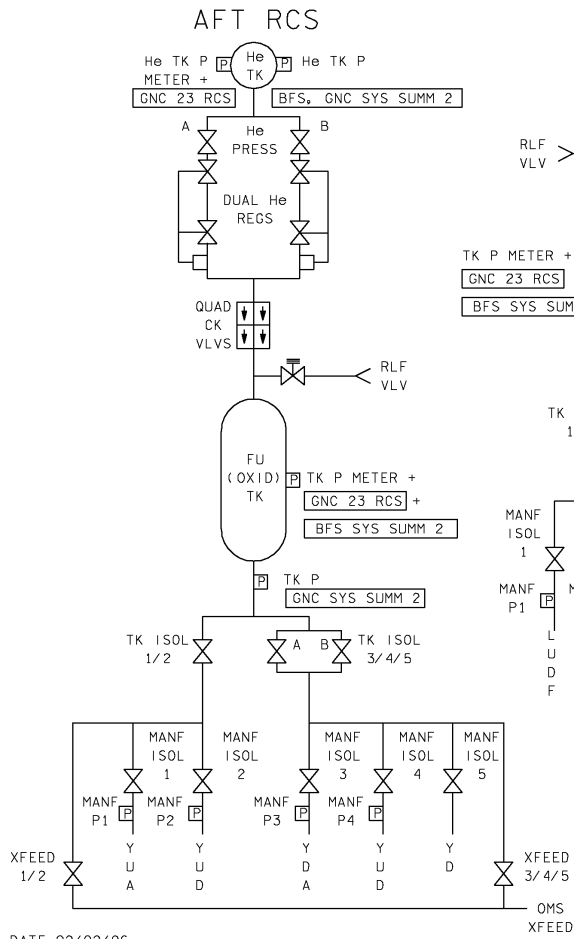


**TABLE 8
L OMS FU INLET AND R OMS OX INLET FAILED**



This Page Intentionally Blank

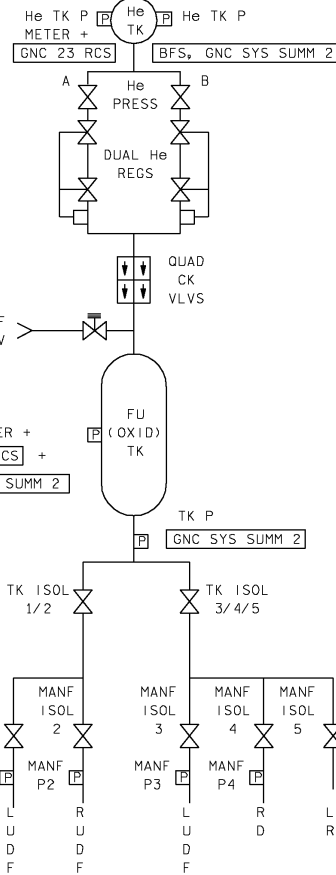
RCS



DATE 02/02/96

480330801, SCH# 2

FWD RCS



RCS**RCS SECURE (FWD,AFT)**

If normal config:

1. RCS MANF ISOL (five) – CL (tb-CL)
XFEED (two) – CL (tb-CL)
TK ISOL (all) – CL (tb-CL)
He PRESS (two) – CL (tb-CL) >>

If (feeding) XFEED:

2. L,R RCS MANF ISOL (ten) – CL (tb-CL)
Receiving XFEED (two) – CL (tb-CL)
Feeding XFEED (two) – CL (tb-CL)
TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL) >>

If (receiving) XFEED or OMS/RCS I'CNCT:

3. ✓ RCS TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL)

I'CNCT: L OMS to RCS

1. L OMS He PRESS/VAP ISOL (two) – OP
2. ✓ OMS TK P > RCS TK P and $\Delta P < 50$
3. L OMS XFEED (two) – OP (tb-OP)
4. L,R RCS XFEED (four) – OP (tb-OP)
TK ISOL (six) – CL (tb-CL)

I'CNCT: R OMS to RCS

1. R OMS He PRESS/VAP ISOL (two) – OP
2. ✓ OMS TK P > RCS TK P and $\Delta P < 50$
3. R OMS XFEED (two) – OP (tb-OP)
4. L,R RCS XFEED (four) – OP (tb-OP)
TK ISOL (six) – CL (tb-CL)

I'CNCT TK SWITCH

1. L(R) OMS XFEED (two) – OP (tb-OP)
He PRESS/VAP ISOL (two) – OP
2. R(L) OMS XFEED (two) – CL (tb-CL)
He PRESS/VAP ISOL (two) – CL

I'CNCT RETURN: OMS to RCS

1. ✓L(R) OMS He PRESS/VAP ISOL (two) – OP
2. ✓OMS TK P > RCS TK P and $\Delta P < 50$
3. L,R RCS TK ISOL (six) – OP (tb-OP), GPC
XFEED (four) – CL (tb-CL), GPC
4. OMS XFEED (four) – CL (tb-CL)
He PRESS/VAP ISOL (four) – CL

XFEED: R RCS to L RCS

If AUTO XFEED:

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

If MANUAL XFEED:

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

APCL/ALL/GEN I

**RCS SECURE
RCS I'CNCT/TK SW**

8-3

**I'CNCT RETURN
RCS XFEED**

XFEED: L RCS to R RCS

If AUTO XFEED:

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

If MANUAL XFEED:

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

XFEED RETURN: RCS to RCS

If AUTO XFEED:

1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. MSTR RCS XFEED – OFF >>

If MANUAL XFEED:

3. L,R RCS He PRESS (four) – OP (tb-OP)
TK ISOL (six) – OP (tb-OP), GPC
XFEED (four) – CL (tb-CL), GPC
4. MSTR RCS XFEED – OFF

RCS TK P HIGH (FU or OX)

BFS, GNC SYS SUMM 2

1. ✓ MANF P
2. (Aff) RCS He PRESS (two) – CL (tb–CL)
3. A – OP (tb–OP)

If He P decr:

4. (Aff) RCS He PRESS A – CL (tb–CL)
5. B – OP (tb–OP)

RCS JET FAIL (LEAK)

GNC 23 RCS

BFS, GNC SYS SUMM 2

If OX/FU Qty diverging:

1. (Aff) RCS MANF ISOL – CL (tb–CL)

RCS JET FAIL (ON)

GNC 23 RCS

BFS, GNC SYS SUMM 2

1. (Aff) RCS MANF ISOL – CL (tb–CL)
- If MANF P > 130 and stable (false alarm):
2. (Aff) RCS MANF ISOL – OP (tb–OP)
 3. (Aff) jet DES INH (*) (Reprioritize)

RCS JET FAIL (OFF)

GNC 23 RCS

BFS, GNC SYS SUMM 2

If > 1 jet/pod/dir failed:

1. Resel jets
2. (Aff) jet DES INH (*) (Reprioritize)

RM DLMA MANF

GNC 23 RCS

1. ✓ CRT to determine aff MANF
- If (aff) MANF tb – OP or sw not thrown:
2. OVRD (aff) RCS MANF VLVs STAT – OP
 3. If (aff) MANF tb – bp: (aff) MANF – GPC

APCL/ALL/GEN I

RCS XFEED (Cont)
XFEED RETURN

8–5

RCS TK P HIGH
RCS JET FAIL/RM DLMA

RCS LEAK ISOL

BFS, GNC SYS SUMM 2

1. If FU or OXID TK P high, Go to RCS TK P HIGH >>
If FU or OXID TK P normal:
2. ✓FU(OXID) He P (O3 meter and CRT) decr
3. DAP: INRTL/PULSE
4. After proc complete, DAP: as reqd

SECURE RCS

5. Perform aff RCS SECURE, then:
If aff RCS was receiving XFEED/I'CNCT when leak occurred:
6. Go to step 9

✓SINGLE MANF

If only one MANF P decr:

7. Return to normal config except leave (aff) MANF closed >>

✓PRPLT TK LEG (✓TWO MANF P)

If MANF 1,2 or MANF 3,4 P decr:

8. Return to normal config except leave (aff) TK ISOL (1/2 or 3/4/5), (aff) MANFs, and corresponding XFEED vlvs closed >>

✓He TK

9. ✓He P

If AFT decr:

10. I'CNCT from OMS, then open good MANFs >>

If FWD decr:

11. Return to normal config
12. When He P < 456: Go to RCS SECURE >>

Cont next page

✓PRPLT TK

13. ✓PRPLT TK P

If AFT decr:

14. I'CNCT from OMS, then open (aff) MANFs >>

If FWD decr:

15. Leave FWD RCS secured >>

✓He LEG

16. Open He PRESS A and B. ✓He P

If AFT decr:

17. Close He PRESS A and B
I'CNCT from OMS, then open (aff) MANFs >>

If FWD decr:

18. Return to normal config except close He PRESS A and B.
Cycle to maintain PRPLT TK P 200–245

When He TK P < 456:

19. Go to RCS SECURE >>

✓XFEED LINES

If aff RCS was feeding XFEED when leak occurred:

20. GNC 23 RCS
RCS L – ITEM 2 EXEC

If XFEED P decr or zero:

21. L,R RCS He PRESS (four) – OP (tb–OP)
TK ISOL (six) – OP (tb–OP)
MANF ISOL (ten) – OP (tb–OP)

22. MSTR RCS XFEED – OFF

23. Do not XFEED/I'CNCT >>

✓RCS MANF ISOL 5

24. If leak not found above: Assume RCS MANF ISOL 5 leak

25. Return to normal config except leave (aff) RCS MANF ISOL 5 –
GPC (tb–CL)

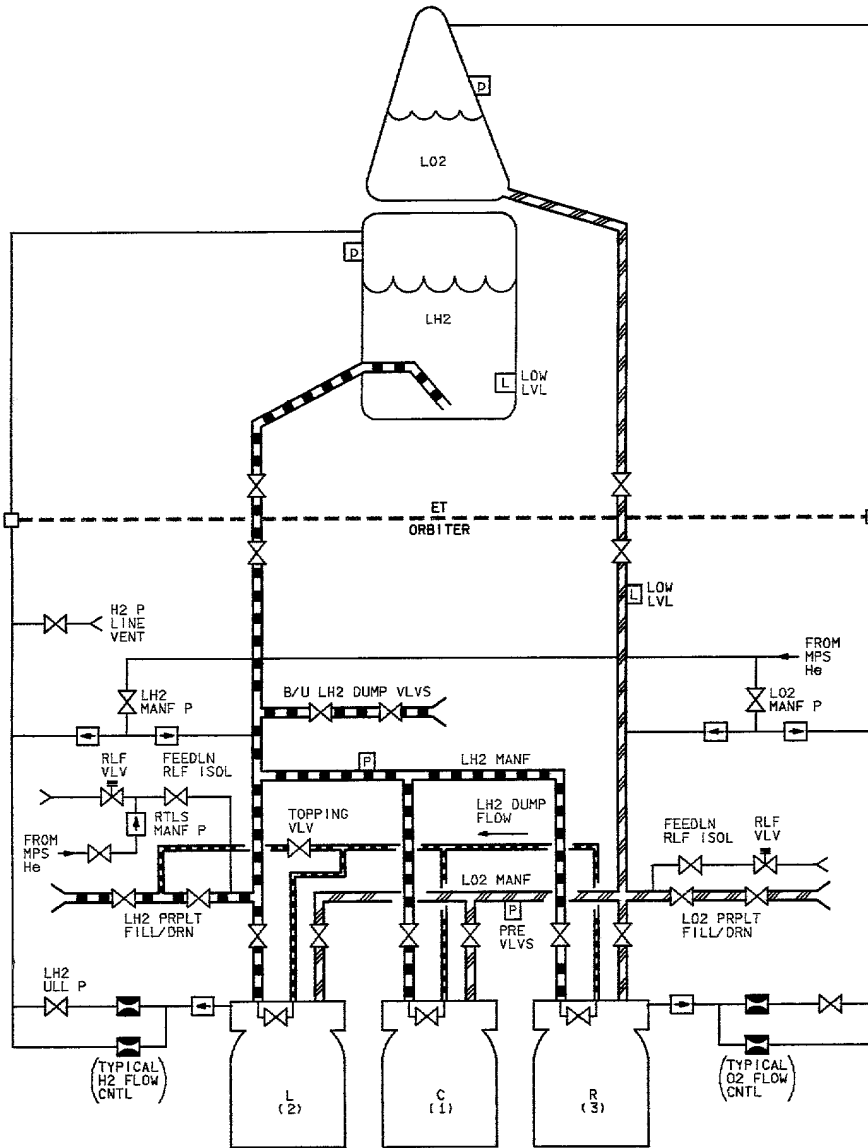
APCL/ALL/GEN I

RCS LEAK ISOL

8–7

This Page Intentionally Blank

MPS PRPLT

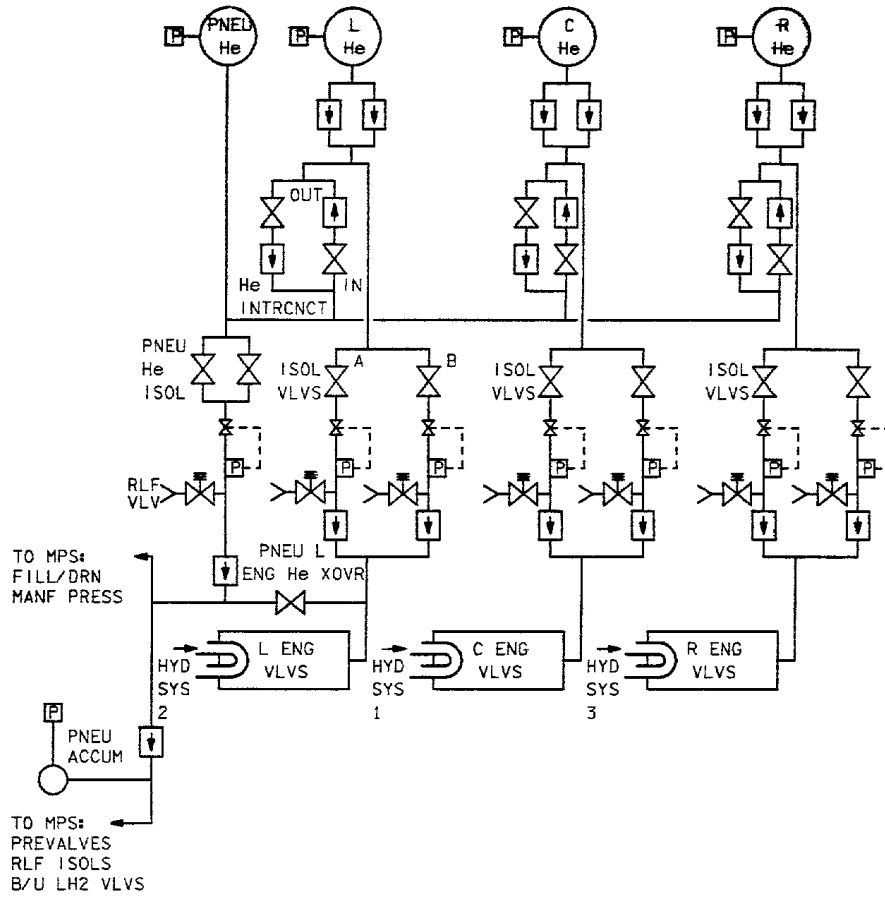


MPS

03/18/88
185370902. ART: 2

MPS He

MPS



DATE 01/20/99
8003092.SCH:6

MPS He P (Post ET Sep)

If HE TK P < 1150 and decr:

- ◇ 1. (Aff) He ISOL (two) – CL

If/when 2nd He TK P < 1150:

- ◇ 2. PNEU He ISOL – CL

MPS VACUUM INERT

20 min after MPS dump complete:

If LO2 MANF P > 30 psia, ✓MCC

Otherwise, proceed with activation

A. ACTIVATION

LO2 Inert

1. MPS FILL/DRAIN LO2 OUTBD – CL
2. INBD – CL

Wait 15 sec, then:

3. MPS FILL/DRAIN LO2 OUTBD – OP
4. INBD – OP

LH2 Inert

5. MPS FILL/DRAIN LH2 OUTBD – CL
6. INBD – CL

Wait 15 sec, then:

7. MPS FILL/DRAIN LH2 OUTBD – OP
8. INBD – OP

1 min after last FILL/DRAIN open or on MCC call, continue to termination:

B. TERMINATION

LO2 Inert

1. MPS FILL/DRAIN LO2 OUTBD – CL
Wait 15 sec, then:
2. MPS FILL/DRAIN LO2 OUTBD – GND
3. INBD – GND

LH2 Inert

4. MPS FILL/DRAIN LH2 OUTBD – CL
Wait 15 sec, then:
5. MPS FILL/DRAIN LH2 OUTBD – GND
6. INBD – GND

MPS LH2/O2 MANF

If LH2 MANF P > 65 psia:

- ◇ 1. MPS PNEU He ISOL – OP
- 2. PRPLT DUMP B/U LH2 VLV – OP
- 3. FILL/DRAIN LH2 OUTBD – OP
INBD – OP

PWRDN

LOSS OF 2 CAB FANS	10-2
AV BAY 1 COOLING/AV BAY 1 FIRE	10-7
2 COOLING/AV BAY 2 FIRE	10-10
3 COOLING/AV BAY 3 FIRE	10-13
CAB PRESS (MINOR PWRDN)	10-16
(MAJOR PWRDN)	10-17
2 H2O LOOPS (POST OMS-2)	10-21
1 FREON LOOP	10-29
HI LOAD EVAP	10-33
2 FREON LOOPS (POST OMS-2)	10-35
FES/1 FC	10-39
2nd FC	10-43

PWRDN

LOSS OF 2 CAB FANS

NOTE

Cab press increase due to air heating
may cause noisy CAB PRESS RELIEF
vlv cycling

PWRDN

- | | | |
|-------------------|-----|--|
| C3 | 1. | MSTR MADS PWR – OFF |
| | 2. | Minimize Itg |
| | 3. | Perform <u>PL PWRDN</u> , then: |
| L1 | 4. | ✓ CAB FAN A,B (two) – OFF |
| | | TEMP CNTLR – OFF |
| | 5. | HUM SEP A,B (two) – OFF |
| | 6. | Use only one FLT CNTLR PWR, PGSC |
| L4:L | 7. | cb Φ A CAB T CNTLR 1,2 (two) – op |
| | 8. | Cycle MDUs. If ON at loss of cooling, turn OFF
within 30 min. Allow 3 min OFF prior to each 1 min
ON (30 min max ON time). Save two MDUs that
interface with a single IDP for entry |
| O14:B | 9. | cb MNA EVENT TIMER AFT – op |
| :C | 10. | SMOKE DETN L/R FLT DK – op |
| O15:B | 11. | MNB OI H2O BYP LOOP 2 SNSR – op |
| | 12. | MSN TIMER AFT – op |
| O16:C | 13. | MNC SMOKE DETN CAB – op |
| L4:J | 14. | ✓cb AC3 Φ A SIG CONDR HUM SEP – op |
| | | Post OMS-2: |
| F6/F8 | 15. | ✓FLT CNTLR PWR (two) – OFF |
| O14,O15,
O16:E | 16. | cb DDU L,R,AFT (six) – op |
| W1-10 | | Install Window Shades or mnvr to tail sun att: |
| | | If in OPS 1: |
| | 17. | Manually mnvr to shade windows |
| | | If in OPS 3: |
| | 18. | Obtain ATT data from MCC |
| | | XXXXX MNVR YYYYY |

Cont next page

NOTE

If uncomfortable, doff LES. Use QDM as needed to provide respiratory cooling. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, ✓ tabs, close visor, LES O2 – ON.

Begin drinking H2O (one 8-oz container every 15 min with salt tablet in every other container) and continue thru entry

19. Continue with ASC, then LAUNCH DAY ORBIT 2 OR 3 (CONT DEORB). Use DEORB PREP/ENTRY DELTAS PULLOUT PAGE (10-5) for changes

This Page Intentionally Blank

DEORB PREP/ENTRY DELTAS PULLOUT PAGE

Deltas to CONT DEORB, LAUNCH DAY ORBIT 2(3)

1. Minimize use of IDPs & MDUs, FLT CNTLR PWR, DDUs; use one PGSC only if reqd
2. Minimize Itg
3. Minimize Sun in cab (delay mnvr to burn att until TIG-15 if necessary)

If orbit 2 deorb:

4. APU HTRS & DED DISP ENT CONFIG **3**
5. Go to step 7

If orbit 3 deorb:

6. ENT FWD FLT DECK CONFIG **10**
7. In ENT SW LIST/VER, do not activate pwrdrn items

Deltas to the ENT, DEORBIT BURN

At TIG-25:

If time permits, set up for cab purge:

- | | | |
|-------------|--|-------------------|
| MO10W | 8. 14.7 CAB REG INLET SYS 1,2 vlv (two) | - OP |
| | 9. O2 REG INLET SYS 1 vlv - OP | √2 vlv - CL |
| L2 | 10. O2/N2 CNTLR VLV SYS 1 - AUTO (O2/N2) | 2 - OP (N2) |
| | 11. ✓O2 SYS 1,2 SPLY (two) - OP (tb-OP) | |
| INNER HATCH | 12. Remove Equal vlv caps (two) | |
| | 13. ✓Equal vlv (two) - NORM | |
| | 14. Reinstall Equal vlv caps (two) | |
| | 15. Open INNER HATCH | |
| ML86B:B | 16. cb MNA VAC VENT ISOL VLV - cl | |
| ML31C | 17. VAC VENT ISOL VLV BUS SEL - MNA | CNTL - OP (tb-OP) |
| | | NOZ HTR - ON |

Cont next page

At TIG-20:

18. Initiate cab purge

<p style="text-align: center;">WARNING Do not use WCS once constant cab purge has started (because of high N2 concentration)</p>

MO32M,
MO69M,
C6
L2

19. LEH O2 1(2,...8) vlv – OP (as reqd)

20. O2 XOVR SYS 1 – CL
√2 – OP

AW82B

21. AIRLK DEPRESS CAP VENT – remove
vlv – 5

22. Close INNER HATCH

At TIG-15:

23. Mnv r to deorb burn att

At TIG-4:

24. Use two IDP/CRTs with four MDUs for deorb
burn

O14,O15,
O16:E
F6,F8

25. cb DDU L,R (four) – cl, then

26. L,R FLT CNTLR PWR (two) – ON

Deltas to ENT, POSTBURN:

27. Use one IDP/CRT with two MDUs

F6,F8

28. L,R FLT CNTLR PWR (two) – OFF

O14,O15,
O16:E

29. cb DDU L,R (four) – op

Deltas to ENTRY MANEUVERS (Cue Card):

At EI:

30. Use only two IDP/CRTs with four MDUs

O14,O15,
O16:E

31. cb DDU L,R (four) – cl

F6

32. L FLT CNTLR PWR – ON

At Wheel Stop:

33. Open visor, LES O2 – OFF

34. Go to EXPEDITED PWRDN (ENT, POST
LDG)

LOSS OF AV BAY 1 COOLING/AV BAY 1 FIRE

WARNING
 There is no smoke detection or air cooling in AV BAY 1. Failure of any LRU still pwr'd in AV BAY 1 may be indicative of fire in progress

- O7 1. ✓TACAN 1 MODE sel – OFF
- L1 2. ✓AV BAY 1 FAN A,B (two) – OFF
- O6 3. GPC MODE 1,4 (two) – STBY (tb-bp)
 - HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)

REASSIGN STRINGS TO GPCS 2,3 IN MC 1

4. GNC 0 GPC MEMORY

CONFIG – ITEM 1 +1 EXEC
 Modify MC 1 per table →

CONFIG	1
GPC	12340
STR 1	3
2	2
3	3
4	2
PL 1/2	2
CRT 1	2
2	2
3	3
4	0
L 1	1
2	2
MM 1	2
2	3

NOTE
 The following must be an OPS MODE Recall

- CRT 5. GNC, OPS 10X PRO
- 6. (BFS) GNC I/O RESET

If AV BAY 1 fire:

- 7. Continue, otherwise go to step 32

NOTE

While performing procedure, note any cbs open. Equipment still pwr'd in AV Bay following pwr'dn:

FPCA 1, FLCA 1, IMU FAN, MDM OF1, DSC OF1, and ACCU

Cont next page

- C3 28. ✓OI PCMMU FORMAT – GPC
PWR – 2
- MA73C:A 29. MCA LOGIC MNA FWD 1 – OFF
- AW18H 30. ✓PWR/BATT CHGR EMU 1,2 BUS SEL (two) – OFF
- If visors reqd to remain down due to fire and rev 3
available:
31. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3)
with AV BAY FIRE CONTINGENCY DELTAS
(CONT DEORB, LAUNCH DAY ORBIT 3) >>
- Otherwise:
- For MM201 trans:
32. Go to MAL, DPS, GPC FRP–7, DPS
RECONFIG FOR LOSS OF AV BAY
COOLING (ASCENT/ORBIT) >>
- If orbit 7 deorbit:
33. Perform P&I to nominal POST INSERT and
DEORB PREP (POST INSERT, ORBIT 7
DEORB), then:
- If AV BAY fire:
34. Go to ORB PKT, AV BAY FIRE (PWRDN) and
complete remaining actions

LOSS OF AV BAY 2 COOLING/AV BAY 2 FIRE

WARNING

There is no smoke detection or air cooling in AV BAY 2. Failure of any LRU still pwr'd in AV BAY 2 may be indicative of fire in progress

- O7 1. ✓TACAN 2 MODE sel – OFF
- L1 2. ✓AV BAY 2 FAN A,B (two) – OFF
- O6 3. GPC MODE 2 – STBY (tb-bp)
 - HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)

If AV BAY 2 fire:

- 4. Continue, otherwise go to step 25

NOTE

While performing procedure, note any cbs open. Equipment still powered in Av Bay following pwr'dn:

FPCA 2, FLCA 2, BFC 3A (when GPC 3 is pwr'd), MDM OF2, and DSC OF2

- R1 5. cb AC CONTR AC2 (three) – cl
- 6. INV/AC BUS 2 – OFF (tb-OFF)
INV PWR 2 – OFF (tb-OFF)
cb AC CONTR AC2 (three) – op
- R2 7. ✓BLR CNTLR/HTR 2 – A
1 – B
- 8. Perform FC2 SHUTDN, except PWRDN (Cue Card), then:
- L4:H 9. cb AC3 AV BAY 2 FAN B (three) – op
- L1 10. FREON PUMP LOOP 1 – A
- 11. AV BAY FAN 1 A – ON
B – OFF
- 12. ✓CAB FAN A – ON
✓B – OFF
- L2 13. ANTISKID – OFF
- O13:C 14. cb ESS 2CA AC2 SNSR – op

Cont next page

O15:A	15.	BRAKES MNB – OFF
:E	16.	cb MNB RDR ALTM 2 – op MLS 2 – op ADTA 2 – op ACCEL 2 – op
:F	17.	MMU 2 – OFF
O16:A	18.	✓BRAKES MNC – OFF
:E		cb MNC MLS 3 – op ADTA 4 – op
O8	19.	FWD RCS MANF ISOL 3,4 (two) – CL (tb-CL)
O16:F	20.	RJDF 2A F3 LOGIC – OFF DRIVER – OFF RJDF 2B F4/F5 LOGIC – OFF F4 DRIVER – OFF ACCEL 3 – OFF
A1R	21.	OPS RCDRS PWR 1 – OFF 2 – OFF
A1L	22.	S-BD PM MODE – TDRS DATA ✓NSP DATA RATE XMIT – HI ✓RCV – HI CODING XMIT – ON ✓RCV – ON ✓PWR – 1 S-BD PL PWR SYS – OFF CNTL – PNL,CMD
C3	23.	S-BD PM CNTL – PNL,CMD ✓OI PCMMU PWR – 1 FORMAT – GPC
MA73C:A	24.	MCA LOGIC MNB FWD 2 – OFF

Cont next page

25. ASAP post OMS 2:

REASSIGN STRINGS TO GPCS 1,3,4 IN MC 1

26. GNC 0 GPC MEMORY

CONFIG – ITEM 1 +1 EXEC

Modify MC 1 per table ---->

CONFIG	1
GPC	12340
STR 1	1
2	4
3	3
4	4
PL 1/2	1
CRT 1	1
2	4
3	3
4	0
L 1	1
2	2
MM 1	1
2	3

NOTE

The following must be an OPS MODE Recall

- CRT 27. GNC, OPS 10X PRO
28. (BFS) GNC I/O RESET
(BFS) GNC, OPS 106 PRO
000 PRO
- C3 29. BFC CRT DISP – OFF
- O6 30. GPC MODE 5 – STBY
(tb–RUN)
– HALT
OUTPUT 5 – NORM
- C3 31. Sel best S–BD PM ANT until SM GPC is established
If AV BAY 2 fire:
- O6 32. GPC PWR 2 – OFF
5 – OFF
MDM FF2, FF4 (two) – OFF
PL2 – OFF
- If visors reqd to remain down due to fire and rev 3 available:
33. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) with AV BAY FIRE CONTINGENCY DELTAS (CONT DEORB, LAUNCH DAY ORBIT 3) >>
- Otherwise:
- For MM201 trans:
34. Go to MAL, DPS, GPC FRP–7, DPS RECONFIG FOR LOSS OF AV BAY COOLING (ASCENT/ORBIT) >>
- If orbit 7 deorbit:
35. Perform P&I to nominal POST INSERT and DEORB PREP (POST INSERT, ORBIT 7 DEORB), then:
- If AV BAY fire:
36. Go to ORB PKT, AV BAY FIRE (PWRDN) and complete remaining actions

LOSS OF AV BAY 3 COOLING/AV BAY 3 FIRE

WARNING

There is no smoke detection or air cooling in AV BAY 3. Failure of any LRU still pwr'd in AV BAY 3 may be indicative of fire in progress

- O7 1. ✓TACAN 3 MODE sel – OFF
- L1 2. ✓AV BAY 3 FAN A,B (two) – OFF
- O6 3. GPC MODE 3 – STBY (tb-bp)
 - HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)

If AV BAY 3 fire:

- 4. Continue, otherwise go to step 20

NOTE

While performing procedure, note any cbs open. Equipment still pwr'd in Av Bay following pwr'dn:

FPCA 3, FLCA 3, MDM OF3, DSC OF3, and active comm equipment

- R1 5. cb AC CONTR AC3 (three) – cl
- 6. INV/AC BUS 3 – OFF (tb-OFF)
INV PWR 3 – OFF (tb-OFF)
cb AC CONTR AC3 (three) – op
- R2 7. BLR CNTLR/HTR 3 – A
2 – B
- 8. Perform FC3 SHUTDN, except PWRDN (Cue Card), then:
- L1 9. H2O PUMP LOOP 1 – ON
2 – OFF
CAB FAN B – ON
A – OFF
- L4:H 10. cb AC1 AV BAY 3 FAN B (three) – op

Cont next page

WARNING

The following steps will unpwr C/W system.
All Class 1, Class 2, and SM aural tones and
C/W annun lights will be lost. CRTs must be
monitored for fault summ msgs

- O13:A 11. cb ESS 1BC C/W A – op
 :C 2CA C/W B – op
 :E 3AB AC3 SNSR – op

NOTE

If comm presently working, performing a
PNL,CMD may result in loss of comm (if
fire has aff alt comm system)

If no COMM:

- A1L 12. S-BD PM MODE – TDRS DATA
 ✓NSP DATA RATE XMIT – HI
 ✓RCV – HI
 CODING XMIT – ON
 ✓RCV – ON
 ✓PWR – 1
- C3 13. S-BD PM CNTL – PNL,CMD
 If S-BD COMM available:
- O6 14. UHF MODE sel – OFF
- If COMM not recovered:
- C3 15. S-BD PM CNTL – PNL
A1L ANT SW ELEC – OFF
 PRE AMP – OFF
 PWR AMPL STBY – OFF
 OPER – OFF
 XPNDR – OFF
 NSP PWR – OFF
 ENCRYPTION SEL – BYP
 PWR – OFF
- O6 16. ✓UHF MODE sel – SPLX
- A1L 17. S-BD PL CNTL – PNL
 PL DATA INTLVR PWR – OFF

Cont next page

- A1R 65. S-BD FM PWR – OFF
CNTL – PNL
- MA73C:A 66. MCA LOGIC MNC FWD 3 – OFF

67. ASAP post OMS 2:

REASSIGN STRINGS TO GPCs 1,2,4 IN MC 1

68. GNC 0 GPC MEMORY

CONFIG – ITEM 1 +1 EXEC
Modify MC 1 per table ----->

CONFIG	1
GPC	12340
STR 1	1
2	2
3	4
4	2
PL 1/2	1
CRT 1	1
2	2
3	4
4	0
L 1	1
2	2
MM 1	1
2	2

NOTE

The following must be
an OPS MODE Recall

- 69. GNC, OPS 10X PRO
 - 70. (BFS) GNC I/O RESET
- If AV BAY 3 fire:
- 71. GPC PWR 3 – OFF
 - MDM FF3 – OFF

If visors reqd to remain dn due to fire and rev 3 available:

- 72. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3)
with AV BAY FIRE CONTINGENCY DELTAS
(CONT DEORB, LAUNCH DAY ORBIT 3) >>

Otherwise:

For MM201 trans:

- 73. Go to MAL, DPS, GPC FRP-7, DPS
RECONFIG FOR LOSS OF AV BAY
COOLING (ASCENT/ORBIT) >>

If orbit 7 deorbit:

- 74. Perform P&I to nominal POST INSERT and
DEORB PREP (POST INSERT, ORBIT 7
DEORB), then:

If AV Bay fire:

- 75. Go to ORB PKT, AV BAY FIRE (PWRDN) and
complete remaining actions

LOSS OF CAB PRESS (MINOR PWRDN)

NOTE

If EQ dP/dT < 0.6, CAB P will stabilize
at 8 psia

1. Minimize Itg
- O7 2. ✓TACAN MODE sel (three) – OFF
- O8 3. ✓MLS (three) – OFF
4. Perform PL PWRDN, then:
- L1 5. ✓H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (hold 30 sec)
6. ✓FLOW PROP VLV LOOP tb (two) – ICH
- C3 7. Use two IDP/CRTs with four MDUs
- If AOA:
P&I to ENTRY MANEUVERS (Cue Card):
'At V = 10K:
8. TACAN 2,3 MODE sel (two) – GPC
At M = 2.9:
9. Use two HUD, MLS, and RA as reqd
10. GNC I/O RESET'
11. Continue AOA procedures (ASC, AOA). Do not
perform ENT PKT pwrdn >>
- If GO to orbit:
12. Go to LOSS OF CAB PRESS (MAJOR PWRDN) |
(PWRDN)

LOSS OF CAB PRESS (MAJOR PWRDN)

NOTE

If EQ dP/dT > 0.6, CAB P will stabilize
below 8 psia

1. Minimize Itg
 - O7 2. ✓TACAN MODE sel (three) – OFF
 - O8 3. ✓MLS (three) – OFF
 - C3 4. MSTR MADS PWR – OFF
 5. Perform PL PWRDN, then:
 - L1 6. ✓H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (hold 30 sec)
 7. ✓FLOW PROP VLV LOOP tb (two) – ICH
 8. Use one IDP/CRT with two MDUs
 - F6,F8 9. FLT CNTLR PWR (two) – OFF
If FLT CNTLR PWR not reqd:
 - O14,O15, 10. cb DDU L,R (four) – op
O16:E ✓AFT (two) – op
 11. ADTA (four) – op
 - L2 12. ANTISKID – OFF
NWS – OFF
 - L1 13. HUM SEP B – OFF
 - O16:E 14. cb MNC RCS/OMS PRPLT QTY GAUGE – op(cl) as
reqd
- If AOA:
15. Continue AOA procedures (ASC, AOA)
Do not perform ENT PKT pwrdn
Use DEORB PREP/ENTRY DELTAS PULLOUT
PAGE (10–19) for changes >>
- If orbit 2 or 3 deorb:
16. Continue ASC
Use DEORB PREP/ENTRY DELTAS PULLOUT
PAGE (10–19) for changes

This Page Intentionally Blank

DEORB PREP/ENTRY DELTAS PULLOUT PAGE

NOTE

Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry

If no COMM or if CAB P stabilizes < 6 psia (MCC call), after OPS 301 transition:

PWRDN GPC 1 AND REASSIGN STRINGS TO REMAINING PASS GPCs IN MC3

		CONFIG GPC	3 02340
CRT	1.	GNC 0 GPC MEMORY CONFIG – ITEM 1 +3 EXEC Modify MC 3 per table----->	STR 1 4 2 2 3 3 4 2
	2.	GNC, OPS 301 PRO	PL 1/2 4
	3.	GNC 50 HORIZ SIT ✓RWY Selection Resel runway	CRT 1 4 2 2 3 3 4 0
	4.	(BFS) GNC, OPS 301 PRO	L 1 0 2 0
	5.	GPC MODE 1 – STBY (tb-bp) – HALT	MM 1 4 2 2
O6			

Continue with changes:

If Orbit 2(3):

6. Go to step 8

If AOA:

7. Go to step 12 (10–20)

NOTE

Single fault tolerance used for most cab air-cooled equipment. Add'l LRUs may be activated as reqd if cab press stable ≥ 8 psia

Deltas to CONT DEORB, LAUNCH DAY ORBIT 2(3):

8. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDU. Use one PGSC

If orbit 2:

9. APU HTRS & DED DISP ENT CONFIG **3**
Do not pwr MLS, TACANs

If orbit 3:

10. ENT FWD FLT DECK CONFIG **10**
Do not pwr MLS, TACANs
11. In ENT FORWARD, AFT, MIDDECK, do not activate pwr items

Cont next page

LOSS OF CAB PRESS

10–19

APCL/4/GEN I

Deltas to ENT, DEORBIT BURN:

At TIG-4:

- 12. Use two IDP/CRTs with four MDUs for deorb burn
- O14,O15, 13. cb DDU L,R (four) – cl
- O16:E
- F6,F8 14. L,R FLT CNTLR PWR (two) – ON

Deltas to ENT, POSTBURN:

- 15. Use one IDP/CRT with two MDUs
- F6,F8 16. L,R FLT CNTLR PWR (two) – OFF
- O14,O15, 17. cb DDU L,R (four) – op
- O16:E
- 18. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

Deltas to ENTRY MANEUVERS (Cue Card):

At EI:

- 19. Use only one IDP/CRT with two MDUs
- O14,O15, 20. cb DDU L,R (four) – cl
- O16:E
- F6 21. L FLT CNTLR PWR – ON
- O14,O15, 22. cb ADTA (three) – cl
- O16:E

23. (BFS) GNC I/O RESET

At V = 15K:

If CAB PRESS < 8 psia:

- 24. Delete NAVAIDS callout

If CAB PRESS ≥ 8 psia:

- 25. Activate all TACAN, RA, MLS
- 26. GNC I/O RESET
- 27. Disregard subsequent NAVAID callout DELTAS

At V = 10K:

- O7 28. TACAN 2,3 MODE sel (two) – GPC

At M = 2.7:

- 29. Use two HUD, MLS, and RA as reqd
- 30. GNC I/O RESET

At M = 0.9:

- L2 31. ANTISKID – ON
- 32. NWS – 1

**LOSS OF
CAB PRESS**

10-20

APCL/4/GEN I

LOSS OF 2 H2O LOOPS (POST OMS-2)

NOTES

- Loss of water loop cooling aff both water and air cooled equipment
- This procedure assumes loss of both water loops occurs after AOA opportunity has passed, but before OPS 2 transition
- If orbit 2 deorb, this pwrdn leads into LOSS OF 2 H2O LOOPS D/O PREP (CONT DEORB). For all other launch day deorb, this pwrdn leads to LOSS OF 2 H2O LOOPS ON-ORBIT WAIT (CONT DEORB)
- The ORB PKT, LOSS OF 2 H2O LOOPS (PWRDN) is used for MS pwrdn and comm config. This procedure powers down all comm. If comm reqd, preferred COMM config in order of heat production:
 1. UHF
 2. STDN LO PWR – If reqd
 3. TDRS – Only if mandatory

CAUTION

TDRS OR STDN – HI AOS may be limited to 10 min (pwr amp will overheat)

Cont next page

- O6 27. GPC MODE 2,3,4 (three) – STBY (tb–bp)
 - HALT
 - STBY (tb–RUN)
 - HALT (tb–bp)
- CRT 28. (BFS) GNC, OPS 106 PRO
000 PRO
- O6 29. GPC MODE 5 – STBY (tb–RUN), HALT (tb–bp)
OUTPUT 5 – NORM
- C3 30. BFC CRT DISP – OFF
- L1 31. AV BAY 2,3 FANS (four) – OFF
 - ✓1 FAN A – ON
 - B – OFF
- 32. IMU FAN A – ON
B,C (two) – OFF
- 33. If not orbit 2 deorb: Go to step 40
Transition GPC 1 to GNC OPS 3:
- O14,O15, 34. ✓RGA (four) – ON
O16:A
- O14,O15:E ✓cb ACCEL (two) – cl
- O15,O16:F ✓ACCEL 3,4 (two) – ON
- O14,O15, ✓ASA (four) – ON
O16:F
- C3 35. ✓FCS CH (four) – AUTO
- 36. GNC 0 GPC MEMORY

Reassign All Strings to GPC 1 in MC 3

- CRT 37. CONFIG – ITEM 1 +3 EXEC
Modify MC 3 per table ----->
- 38. GNC, OPS 301 PRO
GNC DEORB MNVR COAST
- 39. Go to step 43

CONFIG	3
GPC	10000
STR	1
2	1
3	1
4	1
PL	1/2
CRT	1
2	1
3	1
4	0
L	1
2	0
MM	1
2	1

Cont next page

RECONFIG DPS, TRANSITION TO OPS 2

40. GNC 0 GPC MEMORY

Reassign All Strings to GPC 1 in MC 2

	41. CONFIG – ITEM 1 +2 EXEC Modify MC 2 per table ----->	CONFIG GPC	2 10000
	42. GNC, OPS 201 PRO	STR	1 1
	43. For any CRT that is OFF: GPC/CRT1/X EXEC		2 1
O14:F	44. MMU 1 – OFF		3 1
	45. Calculate DEORBIT TARGETS using PGSC		4 1
C3	46. C/W MODE – ACK	PL 1/2	1
		CRT	1 1
			2 1
			3 1
			4 0
		L	1 0
			2 0
		MM	1 1
			2 1

NOTE

For F7 lts, hold F2 or
F4 MA in

Repress SPLY H2O TKA:

- ML26C 47. SPLY H2O GN2 TK VENT vlv – PRESS
TKA SPLY vlv – OP
R11L XOVR VLV – OP (tb-OP)

If time to CONUS TIG < 50 min:

48. Read notes below then go to step 71

If time to CONUS TIG > 50 min, continue:

- O14:A,
O15:A
O6 49. GNC 21 IMU ALIGN
IMU 1,3 (two) – desel
50. IMU 1,3 (two) – OFF
51. MDM FF1,3,4 (three) – OFF
If orbit 2 deorb:
52. Mnv to shade windows from Sun or install Window
Shades until TIG-10 min, then go to step 61
If not orbit 2 deorb:
53. Config DAPs A1,B1 with these exceptions:
(A) ITEM 10 +1.0 0 EXEC
ITEM 11 +3.0 0 EXEC
ITEM 15 EXEC (TAIL)
ITEM 16 EXEC (TAIL)

Cont next page

- (B) ITEM 30 +0.2 0 EXEC
- ITEM 31 +1.0 0 EXEC
- ITEM 35 EXEC (TAIL)
- ITEM 36 EXEC (TAIL)

Mnvr to tail Sun att:

- 54. GNC UNIV PTG
 - TGT ID - ITEM 8 +4 EXEC
 - BODY VECT - ITEM 14 +5 EXEC
 - P - ITEM 15 +2 2 5 EXEC
 - Y - ITEM 16 +0 EXEC
 - OM - blank (MCC provided if reqd)
 - DAP: A/AUTO/PRI
 - START TRK - ITEM 19 EXEC

Establish stabilized att:

- 55. DAP: B/AUTO/PRI
- ADI ATT - INRTL
- Wait 30 sec (✓rates)

Establish free drift:

- 56. DAP: FREE
- O6 57. GPC MODE 1 - STBY (tb-bp), HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)
 - PWR (five) - OFF
- 58. Record MET ___/___:___
- C2,R12L 59. ✓All IDPs and MDUs - OFF
- L1 60. AV BAY 1 FAN (two) - OFF
- O8 61. FWD RCS MANF ISOL 1,2,3,4 (four) - CL (tb-CL)
- O14:F 62. RJDF 1B F1 LOGIC - OFF
 - DRIVER - OFF
- O15:F 63. 1A F2 DRIVER - OFF
 - LOGIC - OFF
- O16:F 64. 2A F3, 2B F4 DRIVER (two) - OFF
 - F4/F5 LOGIC (two) - OFF
 - RJD MANF L5/F5/R5 DRIVER - OFF
- L4:J 65. ✓cb AC3 ΦA SIG CONDR HUM SEP - op
- :P 66. ΦA LG SNSR (two) - op

Cont next page

- MA73C
- If H2O PUMP LOOP 1 A(B) ON:
67. Leave MCA LOGIC MNA FWD 1 – ON
(MNB FWD 2 – ON)
MCA LOGIC MNA,B,C (thirteen) – OFF
- If H2O PUMP LOOP 1 A,B OFF:
68. MCA LOGIC MNA,B,C (fourteen) – OFF

NOTE

30 min after deact, cycle one CAB FAN – ON
(30 min ON, 30 min OFF) to control PPCO2 and
for cooling.

Cycle MDUs. If ON at loss of cooling, turn OFF
within 30 min. Allow 3 min OFF prior to each 1
min ON (30 min max ON time). Save two
MDUs that interface with a single IDP for entry.

If GPC 1 remains in RUN, limit its operation to
max of 1 hr. If reqd, reactivate GPC 2 and
restring in MC 3, take GPC 1 to HALT, turn AV
BAY 2 FAN B – ON, AV BAY 1 FAN – OFF,
then wherever GPC 1 is referenced, replace
with GPC 2 in the LOSS OF 2 H2O LOOPS D/O
PREP or LOSS OF 2 H2O LOOPS ON-ORBIT
WAIT (CONT DEORB).

Expect 100% cab humidity in ~2 hr.

Possible cab air OVBD RLF due to cab air
heating which may cause a loud noise

69. Verify MS PWRDN complete, then:
If not orbit 2 deorb:

NOTE

Use QDM as needed for temp > 90 degF. If
temp > 95 degF and no evaporative cooling is
sensed, don LES, ✓tabs, close visor, LES
O2 – ON.

Immediately begin drinking H2O (one 8-oz
container every 15 min with salt tablet in every
other container) and continue thru entry

Cont next page

70. Go to LOSS OF 2 H2O LOOPS ON-ORBIT
WAIT (CONT DEORB) >>
71. Go to LOSS OF 2 H2O LOOPS D/O PREP (CONT
DEORB). Perform all steps although some activities
may already have been performed

LOSS OF 1 FREON LOOP

- C3 1. MSTR MADS PWR – OFF
2. Minimize Itg
3. Use one IDP/CRT with two MDUs, FLT CNTLR PWR
- O7 4. TACAN MODE sel (three) – OFF
- O8 5. RADAR ALTM (two) – OFF
6. If reqd: Perform PL PWRDN, then:
- L1 7. ✓FLOW PROP VLV LOOP tb (two) – ICH
8. H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (30 sec)
- O14, 9. BRAKES (three) – OFF
O15,
O16:A
O16:E
10. cb ADTA (four) – op
If FLT CNTLR PWR not reqd:
11. cb DDU L,R,AFT (six) – op
12. ✓(Aff) FREON PUMP – OFF
If FREON QTY LOW performed and leak isolated (accum
qty > 3 and not decr)(✓MCC):
13. Perform EMER PLBD OPENING (ECLS)
14. Maneuver per MCC >>
- If AOA:
P&I to ASC, AOA:
'At TIG-10 min:
15. ✓cb DDU L,R (four) – cl
- O14,
O15,
O16:E
- Use two IDP/CRTs with four MDUs, two
FLT CNTLR PWR for burn'
P&I to ASC, AOA POST D/O BURN:
16. 'FLT CNTLR PWR (two) – OFF
17. cb DDU L,R (four) – op
- F7,F8
O14,
O15,
O16:E
- Use one IDP/CRT with two MDUs'
P&I to ENT, POSTBURN ENTRY SW CHECK:
18. 'Pwr NAV AIDS per ENTRY MANEUVERS
(Cue Card)'
P&I to ENTRY MANEUVERS (Cue Card):
19. 'Use DEORB PREP/ENTRY DELTAS
PULLOUT PAGE (10-31), starting with
step 13
20. Continue with ASC, AOA >>'

Cont next page

If LAUNCH DAY DEORBIT:

21. Install Window Shades or mnvr to shade windows from Sun

If orbit 5,7 deorb, after OPS 2 transition:

22. Go to LOSS OF 1 FREON LOOP (ORB PKT, PWRDN) >>

If orbit 2(3) deorb, continue with ASC, then:

23. Perform DEORB PREP/ENTRY DELTAS PULLOUT PAGE, then:
24. At TIG-1:30(2:00) hr, go to LAUNCH DAY ORBIT 2(3) (CONT DEORB)

DEORB PREP/ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

Deltas to CONT DEORB, LAUNCH DAY ORBIT 2(3):

1. Use one FLT CNTLR PWR, DDU, PGSC, and one IDP/CRT with two MDUs
2. Minimize Itg
3. Minimize Sun in cab if possible

If orbit 2:

4. APU HTRS & DED DISP ENT CONFIG 3
Do not pwr TACANs
5. Go to step 7

If orbit 3:

6. ENT FWD FLT DECK CONFIG 10
Do not pwr MLS, TACANs
7. In ENT SW LIST/VER, do not activate TACANs, MLS, RA, ADTAs until indicated by ENTRY MANEUVERS (Cue Card) deltas

Deltas to ENT, DEORBIT BURN:

At TIG-15 min:

8. Remove Window Shades/mnvr to deorb burn att

At TIG-10 min:

9. ✓cb DDU L,R (four) – cl

O14,
O15,
O16:E

10. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

Deltas to ENT, POSTBURN:

11. L,R FLT CNTLR PWR (two) – OFF
12. cb DDU L,R (four) – op

F6,F8
O14,
O15,
O16:E

13. Use one IDP/CRT with two MDUs, as reqd

Cont next page

LOSS OF HI LOAD EVAP

- | | |
|--------------------------------------|---|
| C3 | 1. ✓MSTR MADS PWR – OFF |
| | 2. Minimize ltg |
| | 3. Use one PGSC and one IDP/CRT with two MDUs, as reqd |
| O7 | 4. TACAN MODE sel (three) – OFF |
| O8 | 5. RADAR ALTM (two) – OFF |
| | 6. Perform <u>PL PWRDN</u> , then: |
| L1 | 7. H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (hold 30 sec) |
| | 8. ✓FLOW PROP VLV LOOP tb (two) – ICH |
| O14,
O15,
O16:A
O16:E | 9. BRAKES (three) – OFF |
| | 10. cb ADTA 1,2,3,4(four) – op |
| | If FLT CNTLR PWR not reqd: |
| | 11. cb DDU L,R (four) – op |
| | If AOA: |
| | P&I to ASC, <u>AOA</u> : |
| | 'At TIG-10: |
| O14,
O15,
O16:E | 12. ✓cb DDU L,R (four) – cl |
| | Use FLT CNTLR, and two IDP/CRTs with four MDUs, as reqd for burn' |
| L1
F6,F8
O14,
O15,
O16:E | P&I to ASC, <u>AOA POST D/O BURN</u> : |
| | 13. 'L,R FLT CNTLR PWR (two) – OFF |
| | 14. cb DDU L,R (four) – op |
| | 15. Use two IDP/CRTs with four MDUs' |
| | P&I to ENTRY SW CHECK: |
| O14,
O15,
O16:E | 16. 'BRAKES MNA,B,C (three) – ON |
| | 17. Do not pwr NAVAIDS, NWS |
| | 18. Perform LOSS OF HI LOAD EVAP DEORB OR ENTRY PULLOUT PAGE (ENT PKT, <u>PWRDN</u>), then:' |

Cont next page

If GO for orbit:

After MPS pwrn:

- O17:A 19. ATVC (four) – OFF
- :B 20. EIU (three) – OFF
- :D 21. MEC 1 – OFF (wait 2 sec), then:
2 – OFF

If launch day deorbit: Go to LOSS OF HI LOAD EVAP
(ORB PKT, PWRDN) >>

After PLB doors open:

- L1 22. SM 88 APU/ENVIRON THERM
- 23. H2O LOOP 1(2) BYP MODE – MAN
MAN – INCR, until
FLOW = 950
- 24. Go to MAL, ECLS, SSR-2, FES CORE FLUSH
PROCEDURE

LOSS OF 2 FREON LOOPS (POST OMS-2)

WARNING

FC purge must be started and loads pwr'd down ASAP

If all 3 FCs remain running, orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP. This assumes 3 FCs are pwr'd down to a total level of 8 kW immediately and are continuously purged

If 2 FCs are sh'dn for ON-ORBIT WAIT, max orbiter lifetime from time of failure is expected to be > 120 min

Earliest possible landing is req'd

NOTE

- Failure assumed to occur too late for an AOA and before OPS 2 transition
- FC purging and pwr'dn should be performed ASAP after failure
- COMM proc (ORB PKT) should be used throughout this proc and CONT DEORB. Preferred comm config is:
 - A. UHF only
 - B. GSTDN S-BD if req'd
 - C. Use TDRS only if mandatory

Cont next page

TIME CRITICAL PROCEDURES

1. MS initiate FC purge (step 4) and unstow ORB PKTs and PGSC, ASAP
2. MS perform COMM PWRDN (ORB PKT, PWRDN); delay 10 min max if AOS

CDR and PLT perform following steps ASAP:

- C3
MS:R11U
3. MSTR MADS PWR – OFF
 4. ✓FC PURGE HTR – ON
 ✓VLVS (three) – OP
 5. Perform PL PWRDN, then:
 6. Minimize Itg
- CRTX
7. Use only one FWD IDP/CRT with one MDU (Save IDP3 for entry)
 8. Use only one PGSC
- F6/F8
9. ✓FLT CNTLR PWR (two) – OFF

RESTRICTING TO GPC 1/TRANSITION TO OPS 3

10. GNC 0 GPC MEMORY
 CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table ----->

	CONFIG GPC	3
		10000
STR	1	1
	2	1
	3	1
	4	1
PL	1/2	1
CRT	1	1
	2	1
	3	1
	4	0
L	1	0
	2	0
MM	1	1
	2	1

- For any FWD IDP that is OFF:
- C3
O6
11. GNC, OPS 301 PRO
 12. GPC/CRT1/X EXEC
 13. BFC CRT DISP – OFF
 14. GPC MODE 2,3,4 (three)
 - STBY (tb–bp)
 - HALT
 - STBY (tb–RUN)
 - HALT (tb–bp)
 - PWR 2,3,4 (three) – OFF
 15. BFS GNC, OPS 106 PRO
 000 PRO
 16. GPC MODE 5 – STBY (tb–RUN)
 – HALT (tb–bp)
 OUTPUT 5 – NORM
 PWR 5 – OFF
 17. GNC 53 ENTRY CONTROLS
 RGA 1,3,4 (three) – desel
 18. Have MS perform MS OVHD AND AFT PNL PWRDN (ORB PKT, PWRDN), but leave RGA 2 pwr until step 57

Cont next page

PLT:

- O7 19. ✓TACAN MODE sel (three) – OFF
- O8 20. ✓RADAR ALTM (two) – OFF
- 21. ✓MLS (three) – OFF
- C3 22. FCS CH (four) – AUTO
- R4 23. ✓MPS ENG CNTLR HTR (three) – OFF
- 24. MANF PRESS LO2(LH2) (two) – CL
- R2 25. ✓HYD CIRC PUMP (three) – OFF
- 26. MPS He ISOL (six) – CL
PNEU He ISOL – CL
L ENG He XOVR – CL
- 27. Go to step 53

CDR:

- L1 28. HUM SEP A,B (two) – OFF
- 29. IMU FAN A – ON
B,C (two) – OFF
- L4:F 30. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 1 – A
– ON
- 31. LOOP 1 BYP MODE – MAN
MAN – DECR (30 sec)
- 32. PUMP LOOP 2 – OFF
- MD44F 33. Cab temp cntl act link – pin to FULL COOL
- L1 34. CAB FAN A,B (two) – OFF
- 35. AV BAY 1B,2,3 FAN A,B (five) – OFF
- 36. 1 FAN A – ON
- 37. FREON PUMP LOOP 1,2 (two) – OFF (one – ON,
if any flow)
- 38. ✓RAD CNTLR LOOP 1,2 (two) – OFF
- 39. NH3 CNTLR A,B (two) – OFF
- If no FREON PUMP ON:
- L2 40. O2 SYS 1,2 SPLY (two) – OP (tb–OP)
- L1 41. FLASH EVAP CNTLR PRI A,B (two) – OFF
- 42. TOP EVAP HTR NOZ (two) – OFF
DUCT sel – OFF
- 43. HI LOAD DUCT HTR sel – OFF
- L2 44. FLASH EVAP FDLN HTR SPLY (two) – OFF

Cont next page

- If one FREON PUMP ON:
- L1 45. FLASH EVAP CNTLR PRI A – ON
 - 46. TOP EVAP HTR NOZ (two) – OFF
 ✓DUCT sel – ON
 - L2 47. ✓HI LOAD DUCT HTR sel – ON
 - 48. FLASH EVAP FDLN HTR B SPLY – OFF
 - 49. ANTISKID – OFF
 - 50. NWS – OFF
 - O6 51. ✓S TRK PWR –Y,-Z (two) – OFF
 - 52. ANNUN BUS SEL ACA 2/3 – OFF
 - 53. GNC 51 OVERRIDE
 IMU 1,2 (two) – desel
 - O14,
O15:A 54. IMU 1,2 (two) – OFF
 - 55. All IDPs, MDUs – OFF (Use IDP1 as reqd until
 CONT DEORB Procedure,
 3 min OFF for each min ON)
 - 56. DAP: INRTL/PULSE
 - 57. RGA 2 – OFF
 - O6 58. MDM FF1,4 (two) – OFF
 FA1,4 (two) – OFF
 - F6 59. CDR disp – green dot
 - O8 60. FWD RCS MANF ISOL 1,2,3,4 (four) – CL (tb-CL)
 - MA73C:
A,B 61. ✓MCA LOGIC MNA FWD 1 – ON
 MID 1,AFT 1,MID 3 (three) – OFF
 MNB,MNC (ten) – OFF
 - O14:F 62. RJDA 1A,2A LOGIC,DRIVER (four) – OFF
 RJDF 1B F1 LOGIC,DRIVER (two) – OFF
 - O15:F 63. RJDA 1B LOGIC,DRIVER (two) – OFF
 RJDF 1A F2 LOGIC,DRIVER (two) – OFF
 - O16:F 64. RJDA 2B LOGIC,DRIVER (two) – OFF
 RJDF 2A F3 LOGIC,DRIVER (two) – OFF
 2B LOGIC,DRIVER (two) – OFF
 RJD MANF L5/F5/R5 DRIVER – OFF
 - 65. Go to LOSS OF 2 FREON LOOPS (ORB PKT,
 PWRDN), beginning at step 61 (Sel ELS TIG)

LOSS OF FES/1 FC

- C3
1. ✓ MSTR MADS PWR – OFF
 2. Mimimize Itg
 3. Use only one IDP/CRT with two MDUs
- If FLT CNTLR PWR not reqd:
- O14,O15,
O16:E
4. cb DDU L,R,AFT (six) – op
- O7
5. TACAN MODE sel (three) – OFF
- O8
6. RADAR ALTM (two) – OFF
- L2
7. ✓ FLASH EVAP FDLN HTR SPLY (two) – OFF
 8. NWS – OFF
 9. ANTISKID – OFF
- L1
10. ✓ CAB FAN A(B) – ON
 11. Perform PL PWRDN, then:
 12. ✓ FLOW PROP VLV LOOP 1,2 tb (two) – ICH
- If GO to orbit:
- After APU/HYD SHUTDN and MPS PWRDN/ISOL:
- O17:A
:B
:D
13. ATVC (four) – OFF
 - EIU (three) – OFF
 - MEC 1 – OFF (wait 2 sec)
 - 2 – OFF
- L2
- If FES failed, after MM201 transition:
14. FLASH EVAP FDLN HTR A,B SPLY (two) – 1
 15. Go to MAL, ECLS, SSR-2, FES CORE FLUSH PROCEDURE >>
- If FC lost, after MM201 transition:
16. FLASH EVAP FDLN HTR A,B SPLY (two) – 1
 17. Go to LOSS OF 1 FC (ORB PKT, PWRDN) >>
- If AOA and FES lost:
- MS perform pwrn activities (steps 18–23)
18. Minimize Itg
 19. BRAKES (three) – OFF
- O14,
O15,
O16:A
O16:E
O14,
O15:B
O15:F
20. cb ADTA (four) – op
 21. cb MSN TIMER FWD,AFT (two) – op
 22. EVENT TIMER AFT,FWD (two) – op
 23. MMU 1,2 (two) – OFF (MMU 2 ON for OPS TRANSITION, then OFF)

Cont next page

- L1
24. H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (hold 30 sec)
 25. Continue with ASC, AOA:
Do not perform LOSS OF FES (ENT PKT,
PWRDN)
Use ENTRY DELTAS PULLOUT PAGE (10–41)

ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

NOTE

Incorporate following changes or remove this page for use with indicated checklist or cue card

Deltas to ASC, AOA:

TIG-5 min:

- O14,O15,
O16:E
F6,F8
1. Use two IDP/CRTs with four MDUs
 2. cb DDU L,R (four) – cl
 3. L,R FLT CNTLR PWR (two) – ON

Deltas to AOA POST D/O BURN (ASC, POST D/O BURN)

- F6,F8
O14,
O15,
O16:E
4. Use one IDP/CRT with two MDUs
 5. L,R FLT CNTLR PWR (two) – OFF
 6. cb DDU L,R (four) – op

7. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

At EI-7:

8. Use two IDP/CRTs with four MDUs
9. Perform EMER PLBD CLOSING (ENT PKT, ECLS)

Deltas to ENTRY MANEUVERS (Cue Card):

At EI:

- L1
O14,
O15,
O16:E
F6,F8
O14,
O15,
O16:A
O16:E
10. NH3 CNTLR B(A) – SEC/ON
 11. cb DDU L,R (four) – cl
 12. L,R FLT CNTLR PWR (two) – ON
 13. BRAKES (three) – ON
 14. cb ADTA (four) – cl
 15. GNC I/O RESET

Cont next page

- At V = 15K:
- 16. Delete NAVAIDS callout
 - 17. TACAN MODE sel (three) – GPC
- At V = 12K:
- 18. Delete ref to RAD FLOW
- At V = 6K:
- 19. NH3 CNTLR B(A) – OFF
A(B) – PRI/GPC
- At M = 2.7:
- 20. Use two HUD, three MLS, and two RA as reqd
 - 21. GNC I/O RESET
 - 22. ANTISKID – ON
 - 23. NWS – 1
- At post Wheel Stop:
- 24. Go to EXPEDITED PWRDN (ENT, POST LDG)

LOSS OF 2nd FC

- C3 1. ✓MSTR MADS PWR – OFF
- 2. Use one IDP/CRT with three MDUs
- O7 3. ✓TACAN MODE sel (three) – OFF
- O8 4. ✓RADAR ALTM (two) – OFF

NOTE

Do not tie three main buses during ascent

- * FC capability is 12 kW for sustained *
- * operations, ~13 kW for short duration (~4 hr), *
- * ~16 kW for contingency situations (~15 min). *
- * Purge FC at 430 amps or less *

MS Perform MS OVHD AND AFT PNL PWRDN (10–47) immediately

- 5. Minimize Itg
- 6. Perform PL PWRDN, then:
- L1 7. ✓CAB FAN (two) – OFF
- 8. If in OPS 2: Go to step 15

CONTRACT RS AND REASSIGN STRINGS TOGPC 1 IN MC 1

GNC 0 GPC MEMORY

- 9. CONFIG – ITEM 1 +1 EXEC
Modify MC 1 per table ----->

CONFIG	1
GPC	12340
STR	1
2	1
3	1
4	1
PL	1/2
CRT	1
2	1
3	1
4	0
L	1
2	1
MM	1
2	1

NOTE

The following must be an OPS MODE recall

- CRT 10. GNC, OPS 10X PRO

For any IDP that is OFF:

- 11. GPC/CRT1/X EXEC

Cont next page

- O6 12. GPC MODE 2,3,4 (three) – STBY (tb–bp)
 – HALT
 – STBY (tb–RUN)
 – HALT (tb–bp)
- PWR 2,3 (two) – OFF
13. (BFS) GNC I/O RESET
14. Go to step 21
15. **GNC 0 GPC MEMORY**
 CONFIG – ITEM 1 +2 EXEC
 Modify MC 2 per table ----->
 DOWNLIST GPC – ITEM 44 +1 EXEC
- | CONFIG | 2 |
|--------|-------|
| GPC | 10000 |
| STR 1 | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 1 |
| PL 1/2 | 0 |
| CRT 1 | 1 |
| 2 | 1 |
| 3 | 0 |
| 4 | 1 |
| L 1 | 0 |
| 2 | 0 |
| MM 1 | 1 |
| 2 | 1 |
- CRT O6 16. GNC, OPS 201 PRO
17. GPC MODE 2 – STBY (tb–bp)
 – HALT
 PWR 2 – OFF
18. ✓GPC MODE 3,5 (two) – HALT (tb–bp)
 PWR 3 – OFF
19. **GNC 20 DAP CONFIG**
 P OPTION – ITEM 15 EXEC (TAIL)
 Y OPTION – ITEM 16 EXEC (TAIL)
- C3 20. DAP: A/AUTO/PRI
- R2 21. When MPS dump complete:
 MPS ENG PWR (six) – OFF
22. **GNC 51 OVERRIDE**
 Any comm faulted IMU – desel
- L1 23. ✓IMU FAN (one) – ON
24. ✓H2O PUMP LOOP (one) – ON
25. AV BAY 1,2 FAN (two) – ON (✓Fan ON in each bay with a pwr GPC)
- If MNA unpwr:
26. FREON PUMP LOOP 1 – B
 2 – A
27. TOP EVAP HTR DUCT sel – B
 HI LOAD DUCT HTR sel – B
28. L OMS – sel SEC

Cont next page

- If MNB(C) unpwrld:
- L1 29. FREON PUMP LOOP 1,2 (two) – A(B)
 30. TOP EVAP HTR DUCT sel – A
 HI LOAD DUCT HTR sel – A
- If MNC unpwrld:
 31. R OMS – sel SEC
- If no MANF leak:
 R1 32. ✓ O2,H2 MANF VLV TK1,TK2 (four) – OP
 TK1 HTRS B – AUTO (MNA or MNB ↓) or
 TK2 HTRS B – AUTO (MNC or NO
 MN BUS ↓); then:
 All others OFF
- If MANF leak:
 33. ✓ O2/H2 HTR LOSS TABLE (EPS)
 34. Sel one htr in one O2,H2 TK
- R4 35. ✓ MPS ENG CNTLR HTR (three) – OFF
 36. Activate PGSC if reqd
- L2 37. ✓ FLASH EVAP FDLN HTR A,B SPLY (two) – OFF
- L4:L 38. cb ΦA CAB T CNTLR (two) – op
- C3 39. C/W MODE – ACK
- F6/F8 40. FLT CNTLR PWR (two) – OFF, use one as reqd
- R2 41. BLR CNTLR/HTR (three) – OFF
42. ✓ HYD CIRC PUMP (three) – OFF
- O8 43. GNC 23 RCS
 ITEM 1 EXEC (FRCS page)
 OVRD FRCS MANF 1,2,3,4 STAT (four) – CL
- O14,O15, 44. RJDF DRIVER (four) – OFF
 O16:F LOGIC (four) – OFF
 ✓ RJD MANF L5/F5/R5 DRIVER – OFF
- If not MN BUS SHORT:
 45. Tie three MN Buses, BUS TIE (Cue Card)
- Post BUS TIE config check:
 L1 46. ✓ CAB FAN A(B) – ON
 47. ✓ AV BAY 1 FAN B(A) – ON
 48. ✓ MS OVHD AND AFT PNL PWRDN complete (10–47),
 then continue:
- If in OPS 2:
 49. Go to LOSS OF 2 FC LAUNCH DAY DEORBIT
 PREP (ORBIT 2 OR ORBIT 3) (CONT DEORB)
 (Read notes, 4–3) >>
50. AV BAY 2 FAN A(B) – ON
51. Set watch to count down to DEORBIT TIG (Use
 PGSC or MCC for TIG time)

Cont next page

OPS 3 TRANSITION CONFIG – POST OMS 2

- O14,O15, O16:F 52. ASA (four) – ON
 O16:A 53. ✓RGA 1,2,3 (three) – ON
 O14, O15:E 54. ✓cb ACCEL (two) – cl
 O16:F 55. ✓ACCEL 3 – ON
 C3 56. ✓FCS CH (four) – AUTO

TRANSITION GPC 1 TO GNC OPS 3

- CRT1 57. GNC 0 GPC MEMORY
 CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table ----->
 CRT 58. GNC, OPS 301 PRO
 59. GNC DEORB MNVR COAST

CONFIG	3
GPC	10000
STR	1
	2
	3
	4
PL	1/2
CRT	1
	2
	3
	4
L	1
	2
MM	1
	2

TRANSITION BFS GPC TO GNC OPS 3

- C3 60. BFC CRT DISP – ON
 ✓SEL – 3+1
 CRT 61. (BFS) GNC OPS 301 PRO
 O14, O15:F 62. MMU (two) – OFF

63. Go to LOSS OF 2 FC LAUNCH DAY DEORB
 PREP (ORBIT 2 OR ORBIT 3) (CONT DEORB,
LOSS OF 2 FC ORB 2 OR 3); DO NOT perform PRE
 DPS TRANSITION SWITCH CONFIG 5 and DPS
 ENTRY CONFIG 6

MS OVHD AND AFT PNL PWRDN

- O14,O15, 1. BRAKES (three) – OFF
O16:A
- O14,O15, 2. cb ADTA (four) – op |
O16:E
- O16:E 3. cb MNC RCS/OMS PRPLT QTY GAUGE – OP |
- O15, 4. cb DDU R (two) – op
- O16:E
- O14:A 5. Desel IMU – OFF (1 of 3 IMUs OFF)
- :B 6. cb MNA MSN TIMER FWD – op
EVENT TIMER AFT – op
- O15:B 7. MNB MSN TIMER AFT – op
EVENT TIMER FWD – op
- Post MPS pwrdn and APU SHUTDN:
- O14,O15, 8. ASA (four) – OFF
O16:F
- O17:A 9. ATVC (four) – OFF
- :B 10. EIU (three) – OFF
- :D 11. MEC 1 – OFF (wait 2 sec), then
2 – OFF
- A1R 12. PL RCDR PWR – OFF
- A12 13. APU HTR LUBE OIL LINE (three) – OFF
- 14. HYD HTR (eight) – OFF
- A14 15. RCS/OMS HTR FWD RCS – OFF
FWD RCS JET 1,2,3,4,5
(five) – OFF |
AFT RCS JET 5 (one) – OFF |
- ML26C 16. SPLY H2O GN2 TK VENT vlv – PRESS
TKA SPLY vlv – OP

— | |

| | —

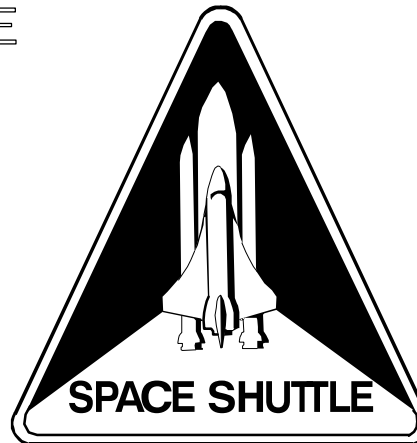
This Page Intentionally Blank

— | |

| | —

Space Shuttle Program
FLIGHT DATA FILE

JSC-48003-II
GENERIC, REV I



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

ASCENT PKT CHECKLIST

OV
102,
104

Flight Cover (trim bottom to expose tabs)