

Orbit Pocket Checklist

**Mission Operations Directorate
Systems Division**

**Generic, Rev C
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NOTE
This Revision is for use
after STS-33
(for STS-32 and subsequent flights)

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PL SAFING

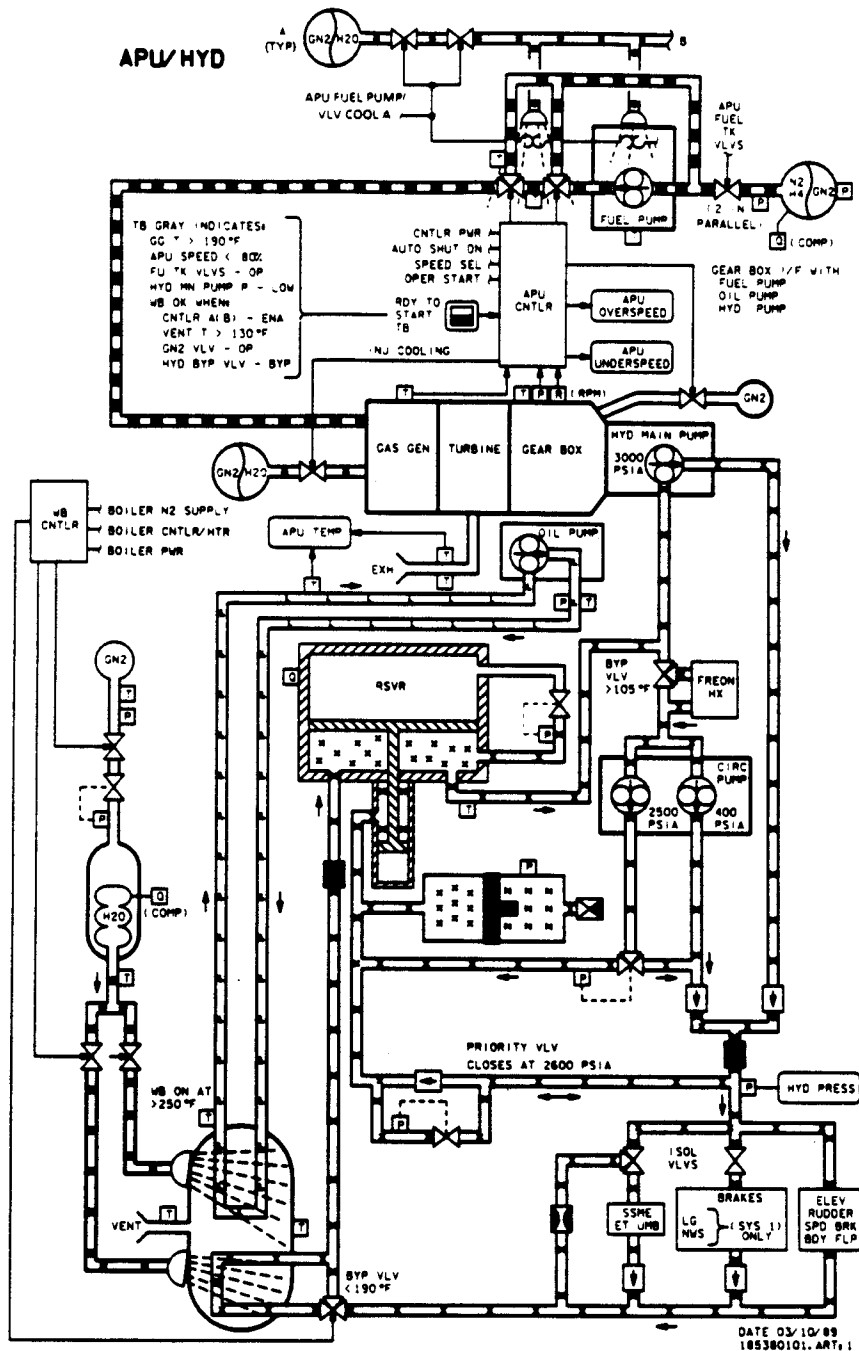
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NOTES

1. The pocket checklists contain contingency procedures to safe a system and continue the flight. Normally, these procedures do not troubleshoot a malfunction to determine its cause.
2. The absence of a procedure implies no immediate action required. The crewmember should proceed to the MAL book as soon as practical.
3. The Orbit 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 in the step sequence noted. For longer or less time-critical procedures during the orbit phase, the Malfunction Procedures (MAL) book is available.
4. The procedures in this book are in effect from MM106 transition until transition to MM301 for deorbit.
5. During all on-orbit OMS burns (from TIG-2 min to achievement of required velocity), appropriate OMS and related critical malfunction symptoms and response data are covered by cue cards. For all other on-orbit time periods, OMS procedures contained in this document apply.
6. Critical malfunction symptoms and response data for other orbiter systems are handled by cue cards (if existing), otherwise by procedures included herein.
7. When supermals, the entire Orbit Pocket C/L procedure is contained verbatim as the first block in the MAL procedure.

APU/HYD

APU/
HYD



APU/
HYD

HYD ACCUM (RSVR) P LOW
(ACCUM P < 1930)
(RSVR P < 45)

SM 87 HYD THERMAL
SM 86 APU/HYD

CAUTION

MN Pump may be damaged if APU started with HYD ACCUM P zero

1. (Aff) HYD CIRC PUMP - ON
If aff HYD CIRC PUMP PRESS > 100:
2. Go to MAL, APU/HYD, 1.2 1.1 >>
- If aff HYD CIRC PUMP PRESS < 100:
3. HYD CIRC PUMP PWR - alt position (pn1 A12)
4. Go to MAL, APU/HYD, 1.2 1.1

HYD CIRC PUMP PRESS LOW
(PRESS < 100)

SM 87 HYD THERMAL

CAUTION

CIRC PUMP - OFF within 60 sec to avoid damage

1. HYD CIRC PUMP - OFF
2. When time permits go to MAL, APU/HYD, 1.3 1.1

APU FUEL TK VLV T
(TEMP > 140°)

SM 86 APU/HYD

1. ✓APU FUEL TK VLV - CL (pn1 R2)
2. (Aff) cb APU FU TK VLV ENA A(B) - op
If temp still incr:
3. (Aff) APU HTR TK/FU LINE/H2O SYS A - OFF (AUTO)
B - AUTO (OFF)
4. Go to MAL, APU/HYD, 1.1 1.1

APU FUEL T

SM 88 THERMAL APU

1. APU HTR GAS GEN/FUEL PUMP (three) - OFF (pn1 A12)
2. TK/FU LINE/H2O/SYS A (three) - OFF
B (three) - OFF
3. ✓MCC

COMM

COMMUNICATIONS

PROBLEM	PWRUP	
	LOW LEVEL (Group B)	MSN EXT (Group C)
COMM LOSS	N/A	PL 1

COMM

ICOM LOST

Try following until ICOM AUDIO regained:

1. (Aff) AUD CNTL - sel alt
2. AUD CTR - 2
3. Plug into another ATU
4. Try another HDST/CCU
5. Go to MAL, COMM 2.1 **1.1**

SM 76 COMM/RCDR
SM ANTENNA

COMM LOST (Mult Pnls)

NOTE

If Spacelab: If LOS exceeds 10 min while working COMM LOST procedure, then HRM/HDRR CONFIG FOR UNEXPECTED LOS > 10 MIN (Cue Card) should be completed. Then continue this procedure

1. AUD CTR - 2
- If all ICOM and A/G failed (✓three ATUs):
2. ✓cbs ACCU (two) - c1 (pnl R15:A,F)
3. Go to step 9
4. Config pnl A1 for STDN, SGLS, or TDRSS per site coverage

NOTE

With two TDRS, STDN/SGLS not routinely providing on-orbit support between ascent and entry but available within 1-2 hrs after a WSGT outage. Normal comm outages occur when TDRS line-of-sight is near nose or tail regions, **SM ANTENNA** 70° < ELEV < -60°

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

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

NOTE

If TDRS, xmit may be delayed 140 sec for PA warmup. Receive not affected

6. Sel best ant, F9 meter > 300 (If TDRS, reorient veh and try diff ant); if no joy, return to GPC (when TDRS E/W coverage overlaps assume W support)

Cont next page

7. Attempt UHF PRI,ALT and G (say freq) per site coverage (30 sec reqd for site reconfig)

NOTE

Best chance for UHF COMM with DOD ELS requires heads up attitude, UHF SQUELCH - OFF, and selection of GUARD frequency

8. Bypass encryption (1 min reqd for MCC reconfig):
OI PCMMU FORMAT - FXD (pn1 C3)
NSP ENCRYPTION MODE - SEL (pn1 A1L)
SEL - BYP

NOTE

If DOD and encryption bypassed, all transmissions and dumped OPS recorded data will not be encrypted

9. Confirm U/L CMD capability:
Cue MCC with: ITEM 88 +8 8 8 8 8 8
✓Flashing U/L on GNC CRT
Ack with: ITEM 99 +9 9 9 9 9 9
✓Abort Light cycling ON/OFF (MCC ack)
✓No flashing U/L
10. If U/L CMD confirmed: Go to MAL, COMM
SSR-1 >>
11. If no COMM and no U/L CMD, go to MAL, COMM,
2.3 1.1

UHF COMM LOST (Mult Pnls)

Attempt COMM recovery after each step:

1. UHF SQUELCH - OFF
2. AUD CTR - 2
3. UHF XMIT FREQ - 296.8
Call site stating 'on 296.8', wait 30 sec for site reconfig
4. Roll veh HEADS UP
5. UHF SPLX PWR AMP - OFF (LO PWR XMIT)
6. UHF MODE - G T/R
Call site stating 'on 243.0', wait 30 sec for site reconfig
7. If no COMM, wait until next S-BD site or go to MAL, COMM, 2.3 1.2

OPCL/ALL/GEN C,18

ICOM LOST/COMM LOST 2-3

UHF COMM LOST

DPS

DATA PROCESSING SYSTEM

TEMP A3-1

OI-8D |
OPCL/ALL/GEN C,17

ALL CRTs ASSIGNED TO FAILED GPC

CAUTION

If GPC/CRT key used to assign CRT1(2,3) to BFS, deassign to avoid dual commanders

DPS

1. If no active GNC GPC, go to FD GPC ACTIVATE >>
 2. Failed GPC PWR - OFF
 3. CRT1,2,3 MAJ FUNC - PL
 4. (FD) GPC PWR - ON
MODE - STBY,RUN (tb-RUN)
 5. CRT1,2,3 MAJ FUNC - as desired
 6. If G2FD GPC used, go to step 8
 7. IGNC 0 GPC MEMORY - assign FD GPC, strings, CRTs 1,2,3, and MMUs to MC 3. ✓PL1/2 deassigned
- If FD GPC not needed to recover lost major function:
8. (FD) GPC MODE - STBY (tb-bp),HALT
PWR - OFF
- If GNC GPC failed, go to PASS GNC GPC (1st FAIL) >>
If SM GPC failed, go to PASS SM GPC FAIL

DUAL CRT COMMANDERS

- If aff CRT assigned to BFS via BFC sw:
1. BFC CRT DISP - OFF, then go to step 3
 2. BFC CRT DISP - ON
SEL - (aff) CRT
- If reqd to clean up display:
3. (Aff) CRT PWR - OFF,ON

OI-8D |

TEMP A3-2

OPCL/OI-8D/GEN C,15

DPS

DATA PROCESSING SYSTEM

TEMP B3-1

OI-8F |
OPCL/ALL/GEN C,17

ALL CRTs ASSIGNED TO FAILED GPC

CAUTION

If GPC/CRT key used to assign CRT1(2,3) to BFS, deassign to avoid dual commanders

DPS

1. If no active GNC GPC, go to FD GPC ACTIVATE >>
 2. Failed GPC PWR - OFF
 3. CRT1,2,3 MAJ FUNC - PL
 4. (FD) ✓GPC PWR - ON
MODE - STBY,RUN (tb-RUN)
 5. CRT1,2,3 MAJ FUNC - as desired
 6. If G2FD GPC used, go to step 8
 7. GNC 0 GPC MEMORY - assign FD GPC, strings, CRTs 1,2,3, and MMUs to MC 3. ✓PL1/2 deassigned
- If FD GPC not needed to recover lost major function:
8. (FD) GPC MODE - STBY (tb-bp),HALT
- If GNC GPC failed, go to PASS GNC GPC (1st FAIL) >>
If SM GPC failed, go to PASS SM GPC FAIL

DUAL CRT COMMANDERS

- If aff CRT assigned to BFS via BFC sw:
1. BFC CRT DISP - OFF, then go to step 3
 2. BFC CRT DISP - ON
SEL - (aff) CRT
- If reqd to clean up display:
3. (Aff) CRT PWR - OFF,ON

OI-8F |

TEMP B3-2 OPCL/OI-8F/GEN C,15

DPS

DATA PROCESSING SYSTEM

TEMP C3-1

OI-20 |
OPCL/ALL/GEN C,17

ALL CRTs ASSIGNED TO FAILED GPC

CAUTION

If GPC/CRT key used to assign CRT1(2,3) to BFS, deassign to avoid dual commanders

DPS

1. If no active GNC GPC, go to FD GPC ACTIVATE >>
2. Failed GPC PWR - OFF
3. CRT1,2,3 MAJ FUNC - PL
4. (FD) ✓GPC PWR - ON
MODE - STBY,RUN (tb-RUN)
5. CRT1,2,3 MAJ FUNC - as desired
6. If G2FD GPC used, go to step 8
7. |GNC 0 GPC MEMORY| - assign FD GPC, strings,
CRTs 1,2,3, and MMUs to MC 3. ✓PL1/2 deassigned

If FD GPC not needed to recover lost major function:

8. (FD) GPC MODE - STBY (tb-bp),HALT
- STBY (tb-RUN)
- HALT (tb-bp)

If GNC GPC failed, go to PASS GNC GPC (1st FAIL) >>

If SM GPC failed, go to PASS SM GPC FAIL

DUAL CRT COMMANDERS

If aff CRT assigned to BFS via BFC sw:

1. BFC CRT DISP - OFF, then go to step 3
2. BFC CRT DISP - ON
SEL - (aff) CRT

If reqd to clean up display:

3. (Aff) CRT PWR - OFF,ON

OI-20

TEMP C3-2

OPCL/OI-20/GEN C,20

BFS ENGAGE

- 1. RGAs (four) - ON
- 2. (BFS) GPC PWR - ON
- MODE - STBY (tb-RUN)
- OUTPUT - B/U
- 3. (SM) GPC OUTPUT - NORM
- 4. BFC CRT DISP - ON
- 5. FLT CNTLR PWR - ON
- 6. ✓Pri RJDs (eight) - ON
- 7. BFS - ENGAGE

NOTE

BFS will take PL buses from SM GPC

- 8. (BFS) GNC, OPS 301 PRO
(RCS jet fail-offs may occur)
- 9. OI PCMMU FORMAT - FXD
- 10. If no comm at AOS, sel best S-BD PM ANT
- 11. Go to MAL, DPS, 5.1 1.5

SUMWORD ICC 1(2,3,4)

If CS = 2: When time permits

- 1. Go to MAL, DPS, 5.1 1.7 >>

If only one GPC annun:

Consider annunciating GPC failed

- 2. Go to PASS SM(GNC) GPC FAIL >>

If annun against SM GPC:

(prior to adding the GPC to redundant set)

- 3. Go to PASS SM GPC FAIL >>

If annun against single GNC GPC:

- 4. Go to PASS GNC GPC FAIL

OI-8D

OPCL/OI-8D/GEN C,15

**ALL CRTs/FAILED GPC
DUAL CDRS**

TEMP A3-3

**BFS ENGAGE
SUMWORD ICC**

FD GPC ACTIVATE

If OPS transition failure:

1. Go to MAL, DPS, 5.1 1.4 >>
2. Failed GNC GPCs PWR - OFF

If G2FD activation:

3. (G2FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
PWR - ON
MODE - STBY (tb-RUN), RUN

4. CRTX MAJ FUNC - GNC
5. GPC/CRT - G2FD/X EXEC

If G2FD activation fails:

6. (G2FD) GPC PWR - OFF
7. Go to step 17
8. GNC 0 GPC MEMORY - assign tgt GPC (G2FD),
all strings, CRTs, and MMUs in MC 2
9. ✓PL1/2 and L1,2 deassigned
10. DOWNLIST GPC - ITEM 44 +(G2FD) EXEC
11. GNC, OPS 201 PRO (G2FD CRT)
12. ✓VERN RJD - ON
13. DAP: A/AUTO/VERN
14. GNC 2 TIME TRY - ITEM 34 EXEC
15. If no comm at AOS, sel best S-BD PM ANT
16. Go to MAL, DPS, 5.1 1.4 >>

If G3FD activation:

Cont next page

TEMP A3-4

OI-8D
OPCL/OI-8D/GEN C,15

BFS ENGAGE

- 1. RGAs (four) - ON
- 2. (BFS) ✓GPC PWR - ON
MODE - STBY (tb-RUN)
OUTPUT - B/U
- 3. (SM) GPC OUTPUT - NORM
- 4. BFC CRT DISP - ON
- 5. FLT CNTLR PWR - ON
- 6. ✓Pri RJDs (eight) - ON
- 7. BFS - ENGAGE

NOTE

BFS will take PL buses from SM GPC

- 8. (BFS) GNC, OPS 301 PRO
(RCS jet fail-offs may occur)
- 9. OI PCMMU FORMAT - FXD
- 10. If no comm at AOS, sel best S-BD PM ANT
- 11. Go to MAL, DPS, 5.1 1.5

SUMWORD ICC 1(2,3,4)

If CS = 2: When time permits

- 1. Go to MAL, DPS, 5.1 1.7 >>

If only one GPC annun:

Consider annunciating GPC failed

- 2. Go to PASS SM(GNC) GPC FAIL >>

If annun against SM GPC:

(prior to adding the GPC to redundant set)

- 3. Go to PASS SM GPC FAIL >>

If annun against single GNC GPC:

- 4. Go to PASS GNC GPC FAIL

OI-8F

OPCL/OI-8F/GEN C,15

**ALL CRTs/FAILED GPC
DUAL CDRS**

TEMP B3-3

**BFS ENGAGE
SUMWORD ICC**

FD GPC ACTIVATE

If OPS transition failure:

1. Go to MAL, DPS, 5.1 1.4 >>
2. Failed GNC GPCs PWR - OFF

If G2FD activation:

3. (G2FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 ✓PWR - ON
 MODE - STBY (tb-RUN),RUN

4. CRTX MAJ FUNC - GNC
5. GPC/CRT - G2FD/X EXEC

If G2FD activation fails:

6. (G2FD) GPC PWR - OFF
7. Go to step 17
8. GNC 0 GPC MEMORY - assign tgt GPC (G2FD),
all strings, CRTs, and MMUs in MC 2
9. ✓PL1/2 and L1,2 deassigned
10. DOWNLIST GPC - ITEM 44 +(G2FD) EXEC
11. GNC, OPS 201 PRO (G2FD CRT)
12. ✓VERN RJD - ON
13. DAP: A/AUTO/VERN
14. GNC 2 TIME TRY - ITEM 34 EXEC
15. If no comm at AOS, sel best S-BD PM ANT
16. Go to MAL, DPS, 5.1 1.4 >>

If G3FD activation:

Cont next page

TEMP B3-4

OI-8F
OPCL/OI-8F/GEN C,15

BFS ENGAGE

1. RGAs (four) - ON
2. (BFS) ✓GPC PWR - ON
MODE - STBY (tb-RUN)
OUTPUT - B/U
3. (SM) GPC OUTPUT - NORM
4. BFC CRT DISP - ON
5. FLT CNTLR PWR - ON
6. ✓Pri RJDs (eight) - ON
7. BFS - ENGAGE

NOTE

BFS will take PL buses from SM GPC

8. (BFS) GNC, OPS 301 PRO
(RCS jet fail-offs may occur)
9. OI PCMMU FORMAT - FXD
10. If no comm at AOS, sel best S-BD PM ANT
11. Go to MAL, DPS, 5.1 1.5

SUMWORD ICC 1(2,3,4)

If CS = 2: When time permits

1. Go to MAL, DPS, 5.1 1.7 >>

If only one GPC annun:

Consider annunciating GPC failed

2. Go to PASS SM(GNC) GPC FAIL >>

If annun against SM GPC:

(prior to adding the GPC to redundant set)

3. Go to PASS SM GPC FAIL >>

If annun against single GNC GPC:

4. Go to PASS GNC GPC FAIL

OI-20

OPCL/OI-20/GEN C,16

ALL CRTs/FAILED GPC
DUAL CDRS

TEMP C3-3

BFS ENGAGE
SUMWORD ICC

FD GPC ACTIVATE

If OPS transition failure:

1. Go to MAL, DPS, 5.1 1.4
2. Failed GNC GPCs PWR - OFF

If SM GPC self-fail (diagonal) CSM lt on:

3. SM 1 DPS UTILITY
CKPT RETR ENA - ITEM 12 EXEC (no *)
4. (SM) GPC MODE - STBY (tb-bp), RUN (tb-RUN)
5. SM, OPS 201(401) PRO

If G2FD activation:

6. (G2FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
✓PWR - ON
MODE - STBY (tb-RUN), RUN
7. CRTX MAJ FUNC - GNC
8. GPC/CRT - G2FD/X EXEC

If G2FD activation fails:

9. (G2FD) GPC PWR - OFF

If another G2FD exists:

10. Go to step 6

If G3FD exists:

11. Go to step 25

If not:

12. Go to BFS ENGAGE

Cont next page

TEMP C3-4

OI-20
OPCL/OI-20/GEN C,20

If SM GPCs self fail (diagonal) CSM lt ON:

17. Checkpoint Retrieve Disable
SM 1 DPS UTILITY CKPT RETRENA - ITEM 12 (no *)
 18. (SM) GPC MODE - STBY (tb-bp), RUN (tb-RUN)
 19. SM, OPS 201(401) PRO
 20. RGAs (four) - ON
 21. (G3FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 PWR - ON
 MODE - STBY (tb-RUN), RUN
 22. CRTX MAJ FUNC - GNC
 23. GPC/CRT - G3FD/X EXEC
- If G3FD activation fails:
24. (G3FD) GPC PWR - OFF
 25. Go to BFS ENGAGE >>
 26. GNC 0 GPC MEMORY - assign tgt GPC (G3FD),
all strings, CRTs, and MMUs in MC 3
 27. ✓PL1/2 and L1,2 deassigned
 28. DOWNLIST GPC - ITEM 44 +(G3FD) EXEC
 29. GNC, OPS 301 PRO (G3FD CRT)
 30. DAP: free drift
 31. ✓PRI RJDs (eight) - ON
 32. SM 2 TIME TRY - ITEM 34 EXEC
- If RMS is powered and steps 17 thru 19 performed:
33. SM 94 PDRS CONTROL (MA, GPC DATA lt-on)
I/O ON - ITEM 5 EXEC (*)
 34. SAFING - CANCEL (tb-bp) (A8U)
 35. ✓GPC DATA lt - off
 36. SM 62 PCMMU/PL COMM
PCMMU FMT SEL FXD - ITEM 1 EXEC '*'
 37. Perform LOAD PCMMU FORMAT; use format for
LOSS OF 2 GNC GPCs (ORB OPS FS, COMM/INST),
then:
 38. If no comm at AOS, sel best S-BD PM ANT
 39. Go to MAL, DPS, 5.1 I.4

01-8D

OPCL/OI-8D/GEN C,17

FD GPC ACTIVATE TEMP A3-5

If SM GPCs self fail (diagonal) CSM lt ON:

17. Checkpoint Retrieve Disable
SM 1 DPS UTILITY CKPT RETRENA - ITEM 12 (no *)
 18. (SM) GPC MODE - STBY (tb-bp), RUN (tb-RUN)
 19. SM, OPS 201(401) PRO
 20. RGAs (four) - ON
 21. (G3FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
✓PWR - ON
MODE - STBY (tb-RUN), RUN
 22. CRTX MAJ FUNC - GNC
 23. GPC/CRT - G3FD/X EXEC
- If G3FD activation fails:
24. (G3FD) GPC PWR - OFF
 25. Go to BFS ENGAGE >>
 26. GNC 0 GPC MEMORY - assign tgt GPC (G3FD),
all strings, CRTs, and MMUs in MC 3
 27. ✓PL1/2 and L1,2 deassigned
 28. DOWNLIST GPC - ITEM 44 +(G3FD) EXEC
 29. GNC, OPS 301 PRO (G3FD CRT)
 30. DAP: free drift
 31. ✓PRI RJDs (eight) - ON
 32. SM 2 TIME TRY - ITEM 34 EXEC
- If RMS is powered and steps 17 thru 19 performed:
33. SM 94 PDRS CONTROL (MA, GPC DATA lt-on)
I/O ON - ITEM 5 EXEC (*)
 34. SAFING - CANCEL (tb-bp) (A8U)
 35. ✓GPC DATA lt - off
 36. SM 62 PCMMU/PL COMM
PCMMU FMT SEL FXD - ITEM 1 EXEC '*'
 37. Perform LOAD PCMMU FORMAT; use format for
LOSS OF 2 GNC GPCs (ORB OPS FS, COMM/INST),
then:
 38. If no comm at AOS, sel best S-BD PM ANT
 39. Go to MAL, DPS, 5.1 1.4

OI-8F

OPCL/OI-8F/GEN C,17

FD GPC ACTIVATE TEMP B3-5

13. **GNC 0 GPC MEMORY** - assign tgt GPC (G2FD), all strings, CRTs, and MMUs in MC 2
 14. ✓PL1/2 and L1,2 deassigned
 15. DOWNLIST GPC - ITEM 44 +(G2FD) EXEC
 16. GNC, OPS 201 PRO (G2FD CRT)
 17. ✓VERN RJD - ON
 18. DAP: A/AUTO/VERN
 19. **GNC 2 TIME** TRY - ITEM 34 EXEC
- If RMS powered and steps 3-5 performed:
20. **SM 94 PDRS CONTROL** (MA, GPC DATA 1t-on)
 21. I/O ON - ITEM 5 EXEC (*) (GPC DATA 1t-off)
 22. SAFING - CANCEL (A8U)
 23. If no comm at AOS, sel best S-BD PM ANT
 24. Go to MAL, DPS, 5.1 1.4
- If G3FD activation:
25. Go to MAL, G3FD GPC ACTIVATE, DPS SSR-22
- If no FD available:
26. Go to BFS ENGAGE

01-20

OPCL/OI-20/GEN C,20

FD GPC ACTIVATE

TEMP C3-5

BCE STRG X (no 'MDM OUTPUT' msg)

If IMU:

1. GNC 21 IMU ALIGN IMU - dese1
2. ✓OPER/STBY mode
3. If OPER, go to step 6

NOTE

If > 3 min since 'IMU' msg occurred
(poss undetect IMU cage), upon IMU
recovery, ✓att ANG prior to 'resel if IMU'

4. If STBY, go to MAL, DPS, 5.3 1.2 >>

If MTU:

If mult 'STRG MTU' msgs:

5. Go to MAL, DPS, 5.3 1.2 >>
6. GNC I/O RESET (✓DAP)
7. If recovered: resel if IMU >>

If NSP and msg repeats:

8. If AOS: ✓MCC

If LOS/no comm:

9. Go to COMM LOST (Mult Pnls), step 4 >>

GNC 1 DPS UTILITY

10. (Aff) STRING - port mode
11. If recovered: resel if IMU >>
12. Cycle MDM - OFF,ON (FF: may cage IMU)

NOTE

Cycle FF if 'A' or 'B' msg;
Cycle FA if 'C' or 'D'

13. GNC I/O RESET (✓DAP)
14. If recovered: resel if IMU >>
15. Resel original ports
16. If IMU: ✓MCC >>
17. If any other, go to MAL, DPS, 5.3 1.2

01-8D

OPCL/ALL/GEN C,17

TEMP A3-7

BCE STRG X

PL1(2) MDM I/O ERROR

PL1(2) MDM OUTPUT

1. ✓PL1,2 MDM PWR - ON

If mult simo 'I/O ERR' or 'MDM OUTPUT' msgs on PL1 and PL2 (GPC problem):

2. Go to PASS SM GPC FAIL >>
3. SM I/O RESET, if recovered:

If PSP reqd:

4. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*) >>
5. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS
SSR-11, SL MDM LINK DISABLE (SL MAL)
6. (Aff) PL MDM - OFF,ON
7. SM I/O RESET, if recovered:

If PSP reqd:

8. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*)
9. Go to PL/DPS RECONFIG, Recovery (PL SYS)
or CDMS SSR-10, REENABLE SL MDM LINKS
(SL MAL), as reqd >>

If msg repeats:

If PL2 msg and no COMM:

10. Sel best S-BD PM ANT
11. Go to MAL, DPS, 5.3 I.4

FF(FA) MDM OUTPUT

FAULT

1. GNC I/O RESET
 2. If no 'MDM OUTPUT' re-annun >>
- If single 'MDM OUTPUT' msg:
3. GNC I DPS UTILITY - port mode
 4. If no 'MDM OUTPUT' annun >>

If not recovered:

5. Go to PASS GNC GPC (1st FAIL)

NOTE

If dual GNC OPS and 'MDM OUTPUT' msg(s) annun by:
Redundant set - failed GPC is the one commanding
the aff strings.

Single GNC GPC - failed GPC is the one annun-
ciating fault msg(s)

01-8D

TEMP A3-8

OPCL/ALL/GEN C,17

BCE STRG X (no 'MDM OUTPUT' msg)

If IMU:

1. GNC 21 IMU ALIGN IMU - dese1
2. ✓OPER/STBY mode
3. If OPER, go to step 6

NOTE

If > 3 min since 'IMU' msg occurred
(poss undetect IMU cage), upon IMU
recovery, ✓att ANG prior to 'resel if IMU'

4. If STBY, go to MAL, DPS, 5.3 1.2 >>

If MTU:

If mult 'STRG MTU' msgs:

5. Go to MAL, DPS, 5.3 1.2 >>
6. GNC I/O RESET (✓DAP)
7. If recovered: resel if IMU >>

If NSP and msg repeats:

8. If AOS: ✓MCC

If LOS/no comm:

9. Go to COMM LOST (Mult Pnls), step 4 >>

GNC 1 DPS UTILITY

10. (Aff) STRING - port mode
11. If recovered: resel if IMU >>
12. Cycle MDM - OFF,ON (FF: may cage IMU)

NOTE

Cycle FF if 'A' or 'B' msg;
Cycle FA if 'C' or 'D'

13. GNC I/O RESET (✓DAP)
14. If recovered: resel if IMU >>
15. Resel original ports
16. If IMU: ✓MCC >>
17. If any other, go to MAL, DPS, 5.3 1.2

OI-8F

OPCL/ALL/GEN C,17

TEMP B3-7

BCE STRG X

PL1(2) MDM I/O ERROR
PL1(2) MDM OUTPUT

1. ✓PL1,2 MDM PWR - ON
- If mult simo 'I/O ERR' or 'MDM OUTPUT' msgs on PL1 and PL2 (GPC problem):
2. Go to PASS SM GPC FAIL >>
 3. SM I/O RESET, if recovered:
If PSP reqd:
 4. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*) >>
 5. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)
 6. (Aff) PL MDM - OFF,ON
 7. SM I/O RESET, if recovered:
If PSP reqd:
 8. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*)
 9. Go to PL/DPS RECONFIG, Recovery (PL SYS) or CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL), as reqd >>
- If msg repeats:
If PL2 msg and no COMM:
10. Sel best S-BD PM ANT
 11. Go to MAL, DPS, 5.3 1.4

FF(FA) MDM OUTPUT

FAULT

1. GNC I/O RESET
 2. If no 'MDM OUTPUT' re-annun >>
- If single 'MDM OUTPUT' msg:
3. GNC 1 DPS UTILITY - port mode
 4. If no 'MDM OUTPUT' annun >>
- If not recovered:
5. Go to PASS GNC GPC (1st FAIL)

NOTE
If dual GNC OPS and 'MDM OUTPUT' msg(s) annun by:
Redundant set - failed GPC is the one commanding the aff strings.
Single GNC GPC - failed GPC is the one annunciating fault msg(s)

OI-8F

TEMP B3-8

OPCL/ALL/GEN C,17

BCE STRG X (no 'MDM OUTPUT' msg)

If IMU:

1. GNC 21 IMU ALIGN IMU - desel
2. ✓OPER/STBY mode
3. If OPER, go to step 6

NOTE

If > 3 min since 'IMU' msg occurred
(poss undetect IMU cage), upon IMU
recovery, ✓att ANG prior to 'resel if IMU'

4. If STBY, go to MAL, DPS, 5.3 1.2 >>

If MTU:

If mult 'STRG MTU' msgs:

5. Go to MAL, DPS, 5.3 1.2 >>
6. GNC I/O RESET (✓DAP)
7. If recovered: resel if IMU >>

If NSP and msg repeats:

8. If AOS: ✓MCC

If LOS/no comm:

9. Go to COMM LOST (Mult Pnls), step 4 >>

GNC 1 DPS UTILITY

10. (Aff) STRING - port mode
11. If recovered: resel if IMU >>
12. Cycle MDM - OFF,ON (FF: may cage IMU)

NOTE

Cycle FF if 'A' or 'B' msg;
Cycle FA if 'C' or 'D'

13. GNC I/O RESET (✓DAP)
14. If recovered: resel if IMU >>
15. Resel original ports
16. If IMU: ✓MCC >>
17. If any other, go to MAL, DPS, 5.3 1.2

OI-20

OPCL/ALL/GEN C,17

TEMP C3-7

BCE STRG X

PL1(2) MDM I/O ERROR

PL1(2) MDM OUTPUT

1. ✓PL1,2 MDM PWR - ON

If mult simo 'I/O ERR' or 'MDM OUTPUT' msgs on PL1 and PL2 (GPC problem):

2. Go to PASS SM GPC FAIL >>
3. SM I/O RESET, if recovered:

If PSP reqd:

4. ISM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*) >>

5. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)

6. (Aff) PL MDM - OFF,ON

7. SM I/O RESET, if recovered:

If PSP reqd:

8. ISM 62 PCMMU/PL COMM
PSP I/O RESET PSP I(2) -
ITEM 6(7) EXEC (*)

9. Go to PL/DPS RECONFIG, Recovery (PL SYS) or CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL), as reqd >>

If msg repeats:

If PL2 msg and no COMM:

10. Sel best S-BD PM ANT
11. Go to MAL, DPS, 5.3 1.4

FF(FA) MDM OUTPUT

FAULT

1. GNC I/O RESET
2. If no 'MDM OUTPUT' re-annun >>

If single 'MDM OUTPUT' msg:

3. GNC I DPS UTILITY - port mode
4. If no 'MDM OUTPUT' annun >>

If not recovered:

5. Go to PASS GNC GPC (1st FAIL)

NOTE

If dual GNC OPS and 'MDM OUTPUT' msg(s) annun by:
Redundant set - failed GPC is the one commanding the aff strings.
Single GNC GPC - failed GPC is the one annunciating fault msg(s)

01-20

TEMP C3-8

OPCL/ALL/GEN C,17

FF(FA) MDM I/O ERROR

1. GNC I/O RESET, if recovered >>
 2. If OMS burn, continue postburn
- If simo 'I/O ERR' msgs for mult MDMs (possible GPC problem):
3. ✓MCC/restring as reqd >>
 4. If FF: ✓ADI (aff string)
 5. If ADI 'OFF' flag (GPC problem): Go to step 15
 6. GNC 1 DPS UTILITY aff STRING - port mode
7. If recovered >>
If alt msg on aff string (GPC problem):
8. Go to step 15
If any other:
9. (Aff) MDM - OFF,ON (FF: may cage IMU)
 10. GNC I/O RESET, if recovered: >>
 11. If FF: GNC 21 IMU ALIGN aff IMU - dese1
 12. Resel original ports
 13. If recovered: resel IMU if dese1 >>
 14. If not: Go to MAL, DPS, 5.3 1.1 >>
15. If time permits, restring (with possible F-T-S):
Go to MAL, DPS, 5.3 1.1 >>
- If not, sel desired FF/FA MDM:
16. GNC 1 DPS UTILITY port mode as reqd
If FF MDM not chosen:
17. GNC 21 IMU ALIGN aff IMU - dese1

01-8D

OPCL/ALL/GEN C,17

PL MDM I/O ERR/OUT

FF(FA) MDM OUTPUT TEMP A3-9 FF(FA) MDM I/O ERROR

PASS GNC GPC (1st FAIL)

NOTE

If Group B(C) LOW LEVEL (MSN EXT)
pwrn config, MMU 2 - ON

1. If no active GNC GPC: Go to FD GPC ACTIVATE >>
If failure is CS split and GPC config is 1 GNC
and 1 SM:
 2. Go to MAL, DPS, 5.1 1.2 >>
If RS split (CS intact) but both GPCs appear
functional (✓CRTs, dedicated displays, MODE tb):
 3. Retain GPC with two IMUs
 4. (Aff) GPC PWR - OFF
- If FF 1 PWR CYCLED, then:
GNC 21 IMU ALIGN
 5. IMU 1 (caged) - dese1
 6. Reassign failed GPC CRTs: GPC/CRT as reqd
- If redundant GNC GPCs reqd:
 7. (G3FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 PWR - ON
 MODE - STBY (tb-RUN), RUN
 8. CRTX MAJ FUNC - PL
 9. GPC/CRT - G3FD GPC/X EXEC
- If redundant GNC GPCs not reqd:
GNC 0 GPC MEMORY

Assign downlist to remaining GNC GPC:

 10. DOWNLIST GPC - ITEM 44 +X EXEC
- If GNC OPS 202:
 11. GNC, OPS 201 PRO
- If RNDZ NAV Ena:
 12. DAP: free drift
GNC UNIV PTG
 13. CNCL - ITEM 21 EXEC (no *)
14. Assign GNC GPC(s) strings, CRTs, and MMUs to
current MC (✓PL 1/2 and LB1 deassigned)
15. GNC, OPS XXX PRO (✓DAP)
- If RNDZ NAV reqd:
 16. Perform RNDZ NAV RECOVERY (RNDZ), then:
17. When time permits, go to MAL, DPS, 5.1 1.3

OI-8D

TEMP A3-10

OPCL/OI-8D/GEN C,15

FF(FA) MDM I/O ERROR

1. GNC I/O RESET, if recovered >>
 2. If OMS burn, continue postburn
- If simo 'I/O ERR' msgs for mult MDMs (possible GPC problem):
3. ✓MCC/restring as reqd >>
 4. If FF: ✓ADI (aff string)
 5. If ADI 'OFF' flag (GPC problem): Go to step 15
 6. GNC 1 DPS UTILITY aff STRING - port mode
7. If recovered >>
If alt msg on aff string (GPC problem):
8. Go to step 15
If any other:
9. (Aff) MDM - OFF,ON (FF: may cage IMU)
 10. GNC I/O RESET, if recovered: >>
 11. If FF: GNC 21 IMU ALIGN aff IMU - dese1
 12. Resel original ports
 13. If recovered: resel IMU if dese1 >>
 14. If not: Go to MAL, DPS, 5.3 1.1 >>
15. If time permits, restring (with possible F-T-S):
Go to MAL, DPS, 5.3 1.1 >>
- If not, sel desired FF/FA MDM:
16. GNC 1 DPS UTILITY port mode as reqd
- If FF MDM not chosen:
17. GNC 21 IMU ALIGN aff IMU - dese1

OI-8F

OPCL/ALL/GEN C,17

PL MDM I/O ERR/OUT
FF(FA) MDM OUTPUT TEMP B3-9 FF(FA) MDM I/O ERROR

PASS GNC GPC (1st FAIL)

NOTE

If Group B(C) LOW LEVEL (MSN EXT)
pwrn config, MMU 2 - ON

1. If no active GNC GPC: Go to FD GPC ACTIVATE >>
If failure is CS split and GPC config is 1 GNC
and 1 SM:
 2. Go to MAL, DPS, 5.1 1.2 >>
If RS split (CS intact) but both GPCs appear
functional (✓CRTs, dedicated displays, MODE tb):
 3. Retain GPC with two IMUs
 4. (Aff) GPC PWR - OFF
If FF 1 PWR CYCLED, then:
GNC 21 IMU ALIGN
 5. IMU 1 (caged) - dese1
 6. Reassign failed GPC CRTs: GPC/CRT as reqd
If redundant GNC GPCs reqd:
 7. (G3FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
✓PWR - ON
MODE - STBY (tb-RUN), RUN
 8. CRTX MAJ FUNC - PL
 9. GPC/CRT - G3FD GPC/X EXEC
If redundant GNC GPCs not reqd:
GNC 0 GPC MEMORY
Assign downlist to remaining GNC GPC:
 10. DOWNLIST GPC - ITEM 44 +X EXEC
If GNC OPS 202:
 11. GNC, OPS 201 PRO
If RNDZ NAV Ena:
 12. DAP: free drift
GNC UNIV PTG
 13. CNCL - ITEM 21 EXEC (no *)
 14. Assign GNC GPC(s) strings, CRTs, and MMUs to
current MC (✓PL 1/2 and LB1 deassigned)
 15. GNC, OPS XXX PRO (✓DAP)
If RNDZ NAV reqd:
 16. Perform RNDZ NAV RECOVERY (RNDZ), then:
 17. When time permits, go to MAL, DPS, 5.1 1.3

01-8F

TEMP B3-10

OPCL/OI-8F/GEN C,15

FF(FA) MDM I/O ERROR

1. GNC I/O RESET, if recovered >>
 2. If OMS burn, continue postburn
- If simo 'I/O ERR' msgs for mult MDMs (possible GPC problem):
3. ✓MCC/restring as reqd >>
 4. If FF: ✓ADI (aff string)
 5. If ADI 'OFF' flag (GPC problem): Go to step 15
 6. GNC 1 DPS UTILITY aff STRING - port mode
 7. If recovered >>
- If alt msg on aff string (GPC problem):
8. Go to step 15
- If any other:
9. (Aff) MDM - OFF,ON (FF: may cage IMU)
 10. GNC I/O RESET, if recovered: >>
 11. If FF: GNC 21 IMU ALIGN aff IMU - dese1
 12. Resel original ports
 13. If recovered: resel IMU if dese1 >>
 14. If not: Go to MAL, DPS, 5.3 1.1 >>
15. If time permits, restring (with possible F-T-S):
Go to MAL, DPS, 5.3 1.1 >>
- If not, sel desired FF/FA MDM:
16. GNC 1 DPS UTILITY port mode as reqd
- If FF MDM not chosen:
17. GNC 21 IMU ALIGN aff IMU - dese1

OI-20

OPCL/ALL/GEN C,17

PL MDM I/O ERR/OUT

FF(FA) MDM OUTPUT TEMP C3-9 FF(FA) MDM I/O ERROR

PASS GNC GPC (1st FAIL)

NOTE

If Group B(C) LOW LEVEL (MSN EXT)
pwrn config, MMU 2 - ON

1. If no active GNC GPC: Go to FD GPC ACTIVATE >>
If failure is CS split and GPC config is 1 GNC and 1 SM:
 2. Go to MAL, DPS, 5.1 1.2 >>
If RS split (CS intact) but both GPCs appear functional (✓CRTs, dedicated displays, MODE tb):
 3. Retain GPC with two IMUs
 4. (Aff) GPC PWR - OFF
If FF 1 PWR CYCLED, then:
GNC 21 IMU ALIGN
 5. IMU 1 (caged) - desel
 6. Reassign failed GPC CRTs: GPC/CRT as reqd
If redundant GNC GPCs reqd:
 7. (G2FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
✓PWR - ON
MODE - STBY (tb-RUN), RUN
 8. CRTX MAJ FUNC - PL
 9. GPC/CRT - (G2FD) GPC/X EXEC
If redundant GNC GPCs not reqd:
GNC 0 GPC MEMORY
Assign downlist to remaining GNC GPC:
 10. DOWNLIST GPC - ITEM 44 +X EXEC
 11. GNC, OPS 202:
 11. GNC, OPS 201 PRO
 12. RNDZ NAV Ena:
 12. DAP: FREE
GNC UNIV PTG
 13. CNCL - ITEM 21 EXEC (no *)
 14. Assign GNC GPC(s) strings, CRTs, and MMUs to current MC (✓PL 1/2 and LB1 deassigned)
 15. GNC, OPS XXX PRO (✓DAP)
If RNDZ NAV reqd:
 16. Perform RNDZ NAV RECOVERY (RNDZ), then:
 17. When time permits, go to MAL, DPS, 5.1 1.3

OI-20

TEMP C3-10

OPCL/OI-20/GEN C,17

PASS SM GPC FAIL

1. ✓MMU 2 PWR - ON

If failure is CS split and GPC config is 1 GNC and 1 SM:

2. Go to MAL, DPS, 5.1 1.2 >>
3. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)
4. (SM) GPC PWR - OFF
5. PL1/2 MDM PWR (two) - OFF,ON
6. GNC 1 DPS UTILITY
UL CNTL ENA - ITEM 36 EXEC (*)
✓CKPT RETRV ENA - ITEM 12 EXEC (*)

If redundant GNC GPCs reqd:

7. (G3FD) ✓GPC MODE - HALT
PWR - ON
MODE - STBY (tb-RUN),RUN

If redundant GNC GPCs not reqd:

If in dual GNC OPS:

If GNC 202:

8. GNC, OPS 201 PRO
9. Assign lowest ID GNC GPC strings, CRTs and MMUs in current MC (✓PL1/2 and LB1 deassigned) and delete other GNC GPC from target set.
10. GNC, OPS XXX PRO (✓DAP)

If in simplex GNC OPS

11. (G2FD) ✓GPC MODE - HALT
PWR - ON
MODE - STBY (tb-RUN),RUN

12. (Tgt) GPC OUTPUT - TERM
13. CRTX MAJ FUNC - SM
14. GPC/CRT tgt GPC/X EXEC
15. ISM 0 GPC MEMORY - assign tgt GPC CRTs, MMUs, PL1/2 and LB1 in MC 4(5)
16. SM, OPS 201(401) PRO (Tgt GPC CRT)
17. ISM 1 DPS UTILITY
UL CNTL AUTO - ITEM 35 EXEC (*)
CKPT RETRV ENA - ITEM 12 EXEC (*)

Cont next page

OI-8D

OPCL/OI-8D/GEN C,15

PASS GNC GPC (1st) TEMP A3-11

PASS SM GPC FAIL
PASS GPC BITE (Over)

18. LOAD PCMMU FORMAT (ORB OPS FS)

If PSP reqd:

19. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP 1(2) -
ITEM 6(7) EXEC (*)

If PLBD OPS:

20. PL BAY DR SYS (two) - ENA (pn1 R13L)

If RMS is powered:

21. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)
I/O ON - ITEM 5 EXEC (*)
SAFING - CANCEL (tb-bp) (A8U)
✓GPC DATA 1t - off

NOTE

If RMS is uncradled, WR RANGE
(ITEM 26) may need to be updated

22. Perform PL/DPS RECONFIG, Recovery (PL SYS) or
CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL),
then:
23. When time permits, go to MAL, DPS, 5.1 1.2

PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:

1. Go to PASS SM GPC FAIL >>

If single GNC GPC (RS \geq 1) annun BITE:

2. Go to PASS GNC GPC (1st FAIL) >>

If all GNC GPCs (RS \geq 2) annun BITE:

If cyclic logging of BITE:

- | 3. Go to FD GPC ACTIVATE >>

If non-cyclic logging of BITE:

4. When time permits, go to MAL, DPS, 5.1 1.6

OI-8D |

TEMP A3-12

OPCL/ALL/GEN C,17

PASS SM GPC FAIL

1. ✓MMU 2 PWR - ON
- If failure is CS split and GPC config is 1 GNC and 1 SM:
2. Go to MAL, DPS, 5.1 1.2 >>
 3. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)
 4. (SM) GPC PWR - OFF
 5. PL1/2 MDM PWR (two) - OFF,ON
 6. GNC 1 DPS UTILITY
UL CNTL ENA - ITEM 36 EXEC (*)
✓CKPT RETRV ENA - ITEM 12 EXEC (*)
- If redundant GNC GPCs reqd:
7. (G3FD) ✓GPC MODE - HALT
✓PWR - ON
MODE - STBY (tb-RUN),RUN
- If redundant GNC GPCs not reqd:
- If in dual GNC OPS:
- If GNC 202:
8. GNC, OPS 201 PRO
 9. Assign lowest ID GNC GPC strings, CRTs and MMUs in current MC (✓PL1/2 and LBI deassigned) and delete other GNC GPC from target set
 10. GNC, OPS XXX PRO (✓DAP)
- If in simplex GNC OPS
11. (G2FD) ✓GPC MODE - HALT
✓PWR - ON
MODE - STBY (tb-RUN),RUN
12. (Tgt) GPC OUTPUT - TERM
 13. CRTX MAJ FUNC - SM
 14. GPC/CRT tgt GPC/X EXEC
 15. SM 0 GPC MEMORY - assign tgt GPC CRTs, MMUs, PL1/2 and LBI in MC 4(5)
 16. SM, OPS 201(401) PRO (Tgt GPC CRT)
 17. SM 1 DPS UTILITY
UL CNTL AUTO - ITEM 35 EXEC (*)
CKPT RETRV ENA - ITEM 12 EXEC (*)

Cont next page

OI-8F

OPCL/OI-8F/GEN C,15

PASS GNC GPC (1st) TEMP B3-11 PASS SM GPC FAIL
PASS GPC BITE (Over)

18. LOAD PCMMU FORMAT (ORB OPS FS)

If PSP read:

19. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP 1(2) -
ITEM 6(7) EXEC (*)

If PLBD OPS:

20. PL BAY DR SYS (two) - ENA (pn1 R13L)

If RMS is powered:

21. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)
I/O ON - ITEM 5 EXEC (*)
SAFING - CANCEL (tb-bp) (ABU)
√GPC DATA 1t - off

NOTE

If RMS is uncradled, WR RANGE
(ITEM 26) may need to be updated

22. Perform PL/DPS RECONFIG, Recovery (PL SYS) or
CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL),
then:
23. When time permits, go to MAL, DPS, 5.1 1.2

PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:

1. Go to PASS SM GPC FAIL >>

If single GNC GPC ($RS \geq 1$) annun BITE:

2. Go to PASS GNC GPC (1st FAIL) >>

If all GNC GPCs ($RS \geq 2$) annun BITE:

If cyclic logging of BITE:

- | 3. Go to FD GPC ACTIVATE >>

If non-cyclic logging of BITE:

4. When time permits, go to MAL, DPS, 5.1 1.6

OI-8F |

TEMP B3-12

OPCL/ALL/GEN C,17

PASS SM GPC FAIL

1. ✓MMU 2 PWR - ON

If failure is CS split and GPC config is 1 GNC and 1 SM:

2. Go to MAL, DPS, 5.1 1.2 >>

3. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)

4. (SM) GPC PWR - OFF

5. PL1/2 MDM PWR (two) - OFF, ON

6. GNC 1 DPS UTILITY

UL CNTL ENA - ITEM 36 EXEC (*)

✓CKPT RETRV ENA - ITEM 12 EXEC (*)

If redundant GNC GPCs reqd:

7. (G2FD) ✓GPC MODE - HALT

✓PWR - ON

MODE - STBY (tb-RUN), RUN

If redundant GNC GPCs not reqd:

If in dual GNC OPS:

If GNC 202:

8. GNC, OPS 201 PRO

9. Assign lowest ID GNC GPC strings, CRTs and MMUs in current MC (✓PL1/2 and LB1 deassigned) and delete other GNC GPC from target set

10. GNC, OPS XXX PRO (✓DAP)

If in simplex GNC OPS

11. (G2FD) ✓GPC MODE - HALT

✓PWR - ON

MODE - STBY (tb-RUN), RUN

12. (Tgt) GPC OUTPUT - TERM

13. CRTX MAJ FUNC - SM

14. GPC/CRT tgt GPC/X EXEC

15. ISM 0 GPC MEMORY - assign tgt GPC CRTs, MMUs, PL1/2 and LB1 in MC 4(5)

16. SM, OPS 201(401) PRO (Tgt GPC CRT)

17. ISM 1 DPS UTILITY

UL CNTL AUTO - ITEM 35 EXEC (*)

CKPT RETRV ENA - ITEM 12 EXEC (*)

Cont next page

01-20

OPCL/OI-20/GEN C,17

PASS GNC GPC (1st) TEMP C3-11

PASS SM GPC FAIL
PASS GPC BITE (Over)

18. LOAD PCMMU FORMAT (ORB OPS FS)

If PSP reqd:

19. SM 62 PCMMU/PL COMM
PSP I/O RESET PSP 1(2) -
ITEM 6(7) EXEC (*)

If PLBD OPS:

20. PL BAY DR SYS (two) - ENA (pn1 R13L)

If RMS is powered:

21. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)
I/O ON - ITEM 5 EXEC (*)
SAFING - CANCEL (tb-bp) (A8U)
√GPC DATA 1t - off

NOTE

If RMS is uncradled, WR RANGE
(ITEM 26) may need to be updated

22. Perform PL/DPS RECONFIG, Recovery (PL SYS) or
CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL),
then:

23. When time permits, go to MAL, DPS, 5.1 1.2

PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:

1. Go to PASS SM GPC FAIL >>

If single GNC GPC (RS \geq 1) annun BITE:

2. Go to PASS GNC GPC (1st FAIL) >>

If all GNC GPCs (RS \geq 2) annun BITE:

If cyclic logging of BITE:

- | 3. Go to FD GPC ACTIVATE >>

If non-cyclic logging of BITE:

4. When time permits, go to MAL, DPS, 5.1 1.6

OI-20

TEMP C3-12

OPCL/ALL/GEN C,18

BFS ENGAGE

1. RGAs (four) - ON
2. (BFS) ✓GPC PWR - ON
MODE - STBY (tb-RUN)
OUTPUT - B/U
3. (SM) GPC OUTPUT - NORM
4. BFC CRT DISP - ON
5. FLT CNTLR PWR - ON
6. ✓Pri RJDs (eight) - ON
7. BFS - ENGAGE

NOTE

BFS will take PL buses from SM GPC

8. (BFS) GNC, OPS 301 PRO
(RCS jet fail-offs may occur)
9. OI PCMMU FORMAT - FXD
10. If no comm at AOS, sel best S-BD PM ANT
11. Go to MAL, DPS, 5.1 1.5

SUMWORD ICC 1(2,3,4)

If CS = 2: When time permits

1. Go to MAL, DPS, 5.1 1.7 >>

If only one GPC annun:

Consider annunciating GPC failed

2. Go to PASS SM(GNC) GPC FAIL >>

If annun against SM GPC:

(prior to adding the GPC to redundant set)

3. Go to PASS SM GPC FAIL >>

If annun against single GNC GPC:

4. Go to PASS GNC GPC FAIL

OI-8F |

OPCL/OI-8F/GEN C,15

**ALL CRTs/FAILED GPC
DUAL CDRS**

TEMP B3-3

**BFS ENGAGE
SUMWORD ICC**

FD GPC ACTIVATE

If OPS transition failure:

1. Go to MAL, DPS, 5.1 1.4 >>
2. Failed GNC GPCs PWR - OFF

If G2FD activation:

3. (G2FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 ✓PWR - ON
 MODE - STBY (tb-RUN), RUN
 4. CRTX MAJ FUNC - GNC
 5. GPC/CRT - G2FD/X EXEC
- If G2FD activation fails:
6. (G2FD) GPC PWR - OFF
 7. Go to step 17
 8. GNC 0 GPC MEMORY - assign tgt GPC (G2FD),
all strings, CRTs, and MMUs in MC 2
 9. ✓PL1/2 and L1,2 deassigned
 10. DOWNLIST GPC - ITEM 44 +(G2FD) EXEC
 11. GNC, OPS 201 PRO (G2FD CRT)
 12. ✓VERN RJD - ON
 13. DAP: A/AUTO/VERN
 14. GNC 2 TIME TRY - ITEM 34 EXEC
 15. If no comm at AOS, sel best S-BD PM ANT
 16. Go to MAL, DPS, 5.1 1.4 >>

If G3FD activation:

Cont next page

TEMP B3-4

OI-8F |
OPCL/OI-8F/GEN C,15

If SM GPCs self fail (diagonal) CSM 1t ON:

17. Checkpoint Retrieve Disable
SM 1 DPS UTILITY CKPT RETR ENA - ITEM 12 (no *)
18. (SM) GPC MODE - STBY (tb-bp), RUN (tb-RUN)
19. SM, OPS 201(401) PRO
20. RGAs (four) - ON
21. (G3FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 ✓PWR - ON
 MODE - STBY (tb-RUN), RUN

22. CRTX MAJ FUNC - GNC
23. GPC/CRT - G3FD/X EXEC

If G3FD activation fails:

24. (G3FD) GPC PWR - OFF
25. Go to BFS ENGAGE >>
26. GNC 0 GPC MEMORY - assign tgt GPC (G3FD),
all strings, CRTs, and MMUs in MC 3
27. ✓PL1/2 and L1,2 deassigned
28. DOWNLIST GPC - ITEM 44 +(G3FD) EXEC
29. GNC, OPS 301 PRO (G3FD CRT)
30. DAP: free drift
31. ✓PRI RJDS (eight) - ON
32. SM 2 TIME TRY - ITEM 34 EXEC

If RMS is powered and steps 17 thru 19 performed:

33. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)
I/O ON - ITEM 5 EXEC (*)
34. SAFING - CANCEL (tb-bp) (A8U)
35. ✓GPC DATA 1t - off
36. SM 62 PCMMU/PL COMM
PCMMU FMT SEL FXD - ITEM 1 EXEC '*'
37. Perform LOAD PCMMU FORMAT; use format for
LOSS OF 2 GNC GPCs (ORB OPS FS, COMM/INST),
then:
38. If no comm at AOS, sel best S-BD PM ANT
39. Go to MAL, DPS, 5.1 1.4

OI-8F

OPCL/OI-8F/GEN C,15

FD GPC ACTIVATE TEMP B3-5

BCE STRG X (no 'MDM OUTPUT' msg)

If IMU:

1. GNC 21 IMU ALIGN IMU - dese1
2. ✓OPER/STBY mode
3. If OPER, go to step 6

NOTE

If > 3 min since 'IMU' msg occurred
(poss undetect IMU cage), upon IMU
recovery, ✓att ANG prior to 'resel if IMU'

4. If STBY, go to MAL, DPS, 5.3 1.2 >>

If MTU:

If mult 'STRG MTU' msgs:

5. Go to MAL, DPS, 5.3 1.2 >>
6. GNC I/O RESET (✓DAP)
7. If recovered: resel if IMU >>

If NSP and msg repeats:

8. If AOS: ✓MCC

If LOS/no comm:

9. Go to COMM LOST (Mult Pnls), step 4 >>

GNC 1 DPS UTILITY

10. (Aff) STRG - port mode
11. If recovered: resel if IMU >>
12. Cycle MDM - OFF,ON (FF: may cage IMU)

NOTE

Cycle FF if 'A' or 'B' msg;
Cycle FA if 'C' or 'D'

13. GNC I/O RESET (✓DAP)
14. If recovered: resel if IMU >>
15. Resel original ports
16. If IMU: ✓MCC >>
17. If any other, go to MAL, DPS, 5.3 1.2

OPCL/ALL/GEN C,13

**PL1(2) MDM I/O ERROR
PL1(2) MDM OUTPUT**

1. ✓PL1,2 MDM PWR - ON
- If mult simo 'I/O ERR' or 'MDM OUTPUT' msgs on PL1 and PL2 (GPC problem):
2. Go to PASS SM GPC FAIL >>
 3. SM I/O RESET, if recovered >>
 4. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS |
SSR-11, SL MDM LINK DISABLE (SL MAL)
 5. (Aff) PL MDM - OFF,ON
 6. SM I/O RESET, If recovered:
 7. Go to PL/DPS RECONFIG, Recovery (PL SYS) |
or CDMS SSR-10, REENABLE SL MDM LINKS |
(SL MAL), as reqd >>

If msg repeats:

If PL2 msg and no COMM:

8. Sel best S-BD PM ANT
9. Go to MAL, DPS, 5.3 1.4

FF(FA) MDM OUTPUT

FAULT

1. GNC I/O RESET
 2. If no 'MDM OUTPUT' re-annun >>
- If single 'MDM OUTPUT' msg:
3. GNC 1 DPS UTILITY - port mode
 4. If no 'MDM OUTPUT' annun >>
- If not recovered:
5. Go to PASS GNC GPC (1st FAIL)

NOTE

If dual GNC OPS and 'MDM OUTPUT' msg(s) annun by:
Redundant set - failed GPC is the one commanding
the aff strings.
Single GNC GPC - failed GPC is the one annun-
ciating fault msg(s)

FF(FA) MDM I/O ERROR

1. GNC I/O RESET, if recovered >>
If OMS burn, continue postburn
If simo 'I/O ERR' msgs for mult MDMs (possible GPC problem):
 2. ✓MCC/restring as reqd >>
 3. If FF: ✓ADI (aff string)
 4. If ADI 'OFF' flag (GPC problem): Go to step 14
 5. GNC 1 DPS UTILITY Aff STRG - port mode
 6. If recovered >>
If alt msg on aff string (GPC problem):
 7. Go to step 14
 8. (Aff) MDM - OFF,ON (FF: may cage IMU)
 9. GNC I/O RESET, if recovered: >>
 10. If FF: GNC 21 IMU ALIGN aff IMU - dese1
 11. Resel original ports
 12. If recovered: resel IMU if dese1 >>
 13. If not: Go to MAL, DPS, 5.3 1.1 >>
 14. If time permits restring (with possible F-T-S):
 15. Go to MAL, DPS, 5.3 1.1 >>
- If not, sel desired FF/FA MDM:
 16. GNC 1 DPS UTILITY port mode as reqd
 - If FF MDM not chosen:
 17. GNC 21 IMU ALIGN aff IMU - dese1

OPCL/ALL/GEN C,15

PL MDM I/O ERR/OUT
FF(FA) MDM OUTPUT TEMP A3-9 FF(FA) MDM I/O ERROR

PASS GNC GPC (1st FAIL)

NOTE

If Group B(C) LOW LEVEL (MSN EXT)
pwrn config, MMU 2 - ON

1. If no active GNC GPC: Go to FD GPC ACTIVATE >>
If failure is CS split and GPC config is 1 GNC
and 1 SM:
 2. Go to MAL, DPS, 5.1 1.2 >>
If RS split (CS intact) but both GPCs appear
functional (✓CRTs, dedicated displays, MODE tb):
 3. Retain GPC with two IMUs
 4. (Aff) GPC PWR - OFF
If FF 1 PWR CYCLED, then:
GNC 21 IMU ALIGN
 5. IMU 1 (caged) - dese1
 6. Reassign failed GPC CRTs: GPC/CRT as reqd
If redundant GNC GPCs reqd:
 7. (G3FD) ✓GPC MODE - HALT
 ✓OUTPUT - NORM
 PWR - ON
 MODE - STBY (tb-RUN), RUN
 8. CRTX MAJ FUNC - PL
 9. GPC/CRT - G3FD GPC/X EXEC
 - If redundant GNC GPCs not reqd:
GNC 0 GPC MEMORY
Assign downlist to remaining GNC GPC:
 10. DOWNLIST GPC - ITEM 44 +X EXEC
 - If GNC OPS 202:
 11. GNC, OPS 201 PRO
 - If RNDZ NAV Ena:
 12. DAP: free drift
GNC UNIV PTG
 13. CNCL - ITEM 21 EXEC (no *)
 14. Assign GNC GPC(s) strings, CRTs, and MMUs to
current MC (✓PL 1/2 and LB1 deassigned)
 15. GNC, OPS XXX PRO (✓DAP)
If RNDZ NAV reqd:
 16. Perform RNDZ NAV RECOVERY (RNDZ), then:
 17. When time permits, go to MAL, DPS, 5.1 1.3

OI-8D

TEMP A3-10

OPCL/OI-8D/GEN C,15

PASS SM GPC FAIL

1. ✓MMU 2 PWR - ON
- If failure is CS split and GPC config is 1 GNC and 1 SM:
2. Go to MAL, DPS, 5.1 1.2 >>
 3. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)
 4. (SM) GPC PWR - OFF
 5. PL1/2 MDM PWR (two) - OFF,ON
 6. GNC 1 DPS UTILITY
UL CNTL ENA - ITEM 36 EXEC (*)
✓CKPT RETRV ENA - ITEM 12 EXEC (*)
- If redundant GNC GPCs reqd:
7. (G3FD) ✓GPC MODE - HALT
PWR - ON
MODE - STBY (tb-RUN),RUN
- If redundant GNC GPCs not reqd:
- If in dual GNC OPS:
- If GNC 202:
8. GNC, OPS 201 PRO
 9. Assign lowest ID GNC GPC strings, CRTs and MMUs in current MC (✓PL1/2 and LB1 deassigned) and delete other GNC GPC from target set
 10. GNC, OPS XXX PRO (✓DAP)
- If in simplex GNC OPS
11. (G2FD) ✓GPC MODE - HALT
PWR - ON
MODE - STBY (tb-RUN),RUN
12. (Tgt) GPC OUTPUT - TERM
 13. CRTX MAJ FUNC - SM
 14. GPC/CRT tgt GPC/X EXEC
 15. ISM 0 GPC MEMORY - assign tgt GPC CRTs, MMUs, PL1/2 and LB1 in MC 4(5)
 16. SM, OPS 201(401) PRO (Tgt GPC CRT)
 17. ISM 1 DPS UTILITY
UL CNTL AUTO - ITEM 35 EXEC (*)
CKPT RETRV ENA - ITEM 12 EXEC (*)

Cont next page

OI-8D

OPCL/OI-8D/GEN C,15

PASS GNC GPC (1st) TEMP A3-11 PASS SM GPC FAIL
PASS GPC BITE (Over)

If TFL 183/188/204/208, reload TFLs:

18. LOAD PCMMU FORMAT (ORB OPS FS)

If PLBD OPS:

19. PL BAY DR SYS (two) - ENA (pn1 R13L)

If RMS is powered:

20. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)

I/O ON - ITEM 5 EXEC (*)

SAFING - CANCEL (tb-bp) (A8U)

√GPC DATA 1t - off

NOTE

If RMS is uncradled, WR RANGE
(ITEM 26) may need to be updated

21. Perform PL/DPS RECONFIG, Recovery (PL SYS) or

CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL)

22. When time permits, go to MAL, DPS, 5.1 1.2

PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:

1. Go to PASS SM GPC FAIL >>

If single GNC GPC (RS \geq 1) annun BITE:

2. Go to PASS GNC GPC (1st FAIL) >>

If all GNC GPCs (RS \geq 2) annun BITE:

If cyclic logging of BITE:

| 3. Go to FD GPC ACTIVATE >>

If non-cyclic logging of BITE:

4. When time permits, go to MAL, DPS, 5.1 1.6

FF(FA) MDM I/O ERROR

1. GNC I/O RESET, if recovered >>
If OMS burn, continue postburn
If simo 'I/O ERR' msgs for mult MDMs (possible GPC problem):
2. ✓MCC/restring as reqd >>
3. If FF: ✓ADI (aff string)
4. If ADI 'OFF' flag (GPC problem): Go to step 14
5. GNC 1 DPS UTILITY Aff STRG - port mode
6. If recovered >>
If alt msg on aff string (GPC problem):
7. Go to step 14
If any other:
8. (Aff) MDM - OFF,ON (FF: may cage IMU)
9. GNC I/O RESET, if recovered: >>
10. If FF: GNC 21 IMU ALIGN aff IMU - dese1
11. Resel original ports
12. If recovered: resel IMU if dese1 >>
13. If not: Go to MAL, DPS, 5.3 1.1 >>
14. If time permits restring (with possible F-T-S):
15. Go to MAL, DPS, 5.3 1.1 >>
- If not, sel desired FF/FA MDM:
16. GNC 1 DPS UTILITY port mode as reqd
If FF MDM not chosen:
17. GNC 21 IMU ALIGN aff IMU - dese1

OPCL/ALL/GEN C,15

PL MDM I/O ERR/OUT
FF(FA) MDM OUTPUT TEMP B3-9 FF(FA) MDM I/O ERROR

PASS GNC GPC (1st FAIL)

NOTE

If Group B(C) LOW LEVEL (MSN EXT)
pwrn config, MMU 2 - ON

1. If no active GNC GPC: Go to FD GPC ACTIVATE >>
If failure is CS split and GPC config is 1 GNC
and 1 SM:
 2. Go to MAL, DPS, 5.1 1.2 >>
If RS split (CS intact) but both GPCs appear
functional (✓CRTs, dedicated displays, MODE tb):
 3. Retain GPC with two IMUs
 4. (Aff) GPC PWR - OFF
- If FF 1 PWR CYCLED, then:
GNC 21 IMU ALIGN
 5. IMU 1 (caged) - dese1
 6. Reassign failed GPC CRTs: GPC/CRT as reqd
- If redundant GNC GPCs reqd:
 7. (G3FD) ✓GPC MODE - HALT
✓OUTPUT - NORM
✓PWR - ON
MODE - STBY (tb-RUN), RUN
 8. CRTX MAJ FUNC - PL
 9. GPC/CRT - G3FD GPC/X EXEC
- If redundant GNC GPCs not reqd:
GNC 0 GPC MEMORY

Assign downlist to remaining GNC GPC:

 10. DOWNLIST GPC - ITEM 44 +X EXEC
- If GNC OPS 202:
 11. GNC, OPS 201 PRO
- If RNDZ NAV Ena:
 12. DAP: free drift
GNC UNIV PTG
 13. CNCL - ITEM 21 EXEC (no *)
14. Assign GNC GPC(s) strings, CRTs, and MMUs to
current MC (✓PL 1/2 and LBl deassigned)
15. GNC, OPS XXX PRO (✓DAP)
- If RNDZ NAV reqd:
 16. Perform RNDZ NAV RECOVERY (RNDZ), then:
17. When time permits, go to MAL, DPS, 5.1 1.3

OI-8F

TEMP B3-10

OPCL/OI-8F/GEN C,15

PASS SM GPC FAIL

1. ✓MMU 2 PWR - ON
- If failure is CS split and GPC config is 1 GNC and 1 SM:
2. Go to MAL, DPS, 5.1 1.2 >>
 3. Perform PL/DPS RECONFIG, Secure (PL SYS) or CDMS SSR-11, SL MDM LINK DISABLE (SL MAL)
 4. (SM) GPC PWR - OFF
 5. PL1/2 MDM PWR (two) - OFF,ON
 6. GNC 1 DPS UTILITY
UL CNTL ENA - ITEM 36 EXEC (*)
✓CKPT RETRV ENA - ITEM 12 EXEC (*)
- If redundant GNC GPCs reqd:
7. (G3FD) ✓GPC MODE - HALT
✓PWR - ON
MODE - STBY (tb-RUN),RUN
- If redundant GNC GPCs not reqd:
- If in dual GNC OPS:
- If GNC 202:
8. GNC, OPS 201 PRO
 9. Assign lowest ID GNC GPC strings, CRTs and MMUs in current MC (✓PL1/2 and LB1 deassigned) and delete other GNC GPC from target set
 10. GNC, OPS XXX PRO (✓DAP)
- If in simplex GNC OPS
11. (G2FD) ✓GPC MODE - HALT
✓PWR - ON
MODE - STBY (tb-RUN),RUN
12. (Tgt) GPC OUTPUT - TERM
 13. CRTX MAJ FUNC - SM
 14. GPC/CRT tgt GPC/X EXEC
 15. ISM 0 GPC MEMORY - assign tgt GPC CRTs, MMUs, PL1/2 and LB1 in MC 4(5)
 16. SM, OPS 201(401) PRO (Tgt GPC CRT)
 17. ISM 1 DPS UTILITY
UL CNTL AUTO - ITEM 35 EXEC (*)
CKPT RETRV ENA - ITEM 12 EXEC (*)

Cont next page

OI-8F

OPCL/OI-8F/GEN C,15

PASS GNC GPC (1st) TEMP B3-11

PASS SM GPC FAIL
PASS GPC BITE (Over)

If TFL 183/188/204/208, reload TFLs:

18. LOAD PCMMU FORMAT (ORB OPS FS)

If PLBD OPS:

19. PL BAY DR SYS (two) - ENA (pn1 R13L)

If RMS is powered:

20. SM 94 PDRS CONTROL (MA, GPC DATA 1t-on)
I/O ON - ITEM 5 EXEC (*)
SAFING - CANCEL (tb-bp) (A8U)
√GPC DATA 1t - off

NOTE

If RMS is uncradled, WR RANGE
(ITEM 26) may need to be updated

21. Perform PL/DPS RECONFIG, Recovery (PL SYS) or
CDMS SSR-10, REENABLE SL MDM LINKS (SL MAL)
22. When time permits, go to MAL, DPS, 5.1 1.2

PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:

1. Go to PASS SM GPC FAIL >>

If single GNC GPC ($RS \geq 1$) annun BITE:

2. Go to PASS GNC GPC (1st FAIL) >>

If all GNC GPCs ($RS \geq 2$) annun BITE:

If cyclic logging of BITE:

| 3. Go to FD GPC ACTIVATE >>

If non-cyclic logging of BITE:

4. When time permits, go to MAL, DPS, 5.1 1.6

EQUIPMENT COOLING MATRIX

AIR-COOLED		WATER-COOLED
FORCED	CONVECTIVE	
AV BAY 1		AC INV 1,2,3 LCA (FWD) 1,2,3 PCA (FWD) 1,2,3 MCA (FWD) 1,2,3 MDM FF 1,2,3,4 MDM OF 1,2,3,4 SCU OF 1,2,3 MM 1,2 NSP 1,2 COMSEC 1,2 PCMMU 1,2 S-BD EQUIP (PM,FM) MDM PL 1,2 RA 1,2 RJDF 1A,1B,2A,2B PL RCDR OPS RCDR 1,2 GCIU A,B ACCU 1,2 MTU PL DATA INTLVR INTEROG SP H2O PUMP 1A,1B SEC UHF XCVR HUDE L,R
GPC 1,4 TACAN 1 MLS 1 ADTA 1,3 AV BAY FAN A,B	BFC 1 (ENGAGE) AA 1,4 MLS 1 BRK CNTL 1 SMOKE DET A,B	
AV BAY 2		
GPC 2,5 TACAN 2 MLS 2,3 ADTA 2,4 AV BAY FAN A,B	BFC 2,3 (ENGAGE) AA 2,3 MLS 2,3 BRK CNTL 2 SMOKE DET A,B	
AV BAY 3		FREON-COOLED LCA (AFT) 1,2,3 PCA (AFT) 1,2,3 (MID) 1,2,3 MCA(AFT) 1,2,3,4,5,6 (MID) 1,2,3,4 MDM FA 1,2,3,4 MDM OA 1,2,3 APU CNTLR 1,2,3 ATVC ELEC 1,2,3,4 EIU 1,2,3 MPS ULL P SC 1,2,3 ASA 1,2,3,4 RGA 1,2,3,4 RIDA 1A,1B,2A,2B MEC 1,2 MPS ΔP SC DBIA 1,2 MN DIST & CNTL 1,2,3 MIDBDY PIC CNTLR H2/O2 CRYO 1A,1B,2A,2B FCL 1 PMP A,B 2 PMP A,B FC 1,2,3
GPC 3 TACAN 3 AV BAY FAN A,B CW	S-BD EQ (PM,FM) SMOKE DET A,B TELEPRINTER	
CABIN		
CRT 1,2,3,4 DDU 1,2,3 AMI L,R AVVI L,R CAB FAN A,B IMU 1,2,3 TV MON RCU/VSU	MTRS/LTS/IND CW ANNUN SPKR/MIKE UNITS ATUs TV CAM/VTR CNTLRS CSA CAB TEMP CNTLR A,B WMS HUMIDITY SEP 1,2 SMOKE DET - FLT DK L,R - CAB MCM (not on 102) HUD PDU L,R	
MADS RCDR (not on 102)		

ECLS

10/27/89

O2(N2) FLOW HIGH/CAB P LOW/dP/dT SM SYS SUMM 1

WARNING
If, after alarm, O2(N2) flow > 1.0: assume
flow rate exceeds 5.0 lb/hr (OSH)

If dP/dT EQ positive or zero after steps 2 (3,4,5):

1. Go to MAL, ECLS, 6.2 1.1 >>
2. 14.7 CAB REG INLET SYS 1,2 vlv (two) - CL
(pn1 M010W)

LEAK ISOLATION

3. CAB RELIEF A - CL (tb-CL)
4. B - CL (tb-CL)
 ✓VENT ISOL - ctr (tb-bp)
 ✓VENT - ctr (tb-bp)
5. ✓VAC VENT ISOL VLV BUS SEL - MNA (pn1 ML31C)
 CNTL - CL (tb-CL)
6. Close inner A/L hatch
 Remove inner A/L hatch Equalization vlv caps
 (two)
 Equalization vlv (two) - OFF

If dP/dT positive or zero (A/L leak: Possible
loss of EVA capability and LES suit access):

7. CAB RELIEF (two) - ENA (tb-ENA)
- If 14.7 psi ops:
8. 14.7 CAB REG INLET SYS 1(2) vlv - OP
 (pn1 M010W)
 9. VAC VENT ISOL VLV CNTL - OP (tb-OP)
 (pn1 ML31C) >>

ECLS

Cont after next page

EQUIPMENT COOLING MATRIX

AIR-COOLED		WATER-COOLED
FORCED	CONVECTIVE	
AV BAY 1		
GPC 1,4 TACAN 1 MLS 1 ADTA 1,3 AV BAY FAN A,B	BFC 1 (ENGAGE) AA 1,4 MLS 1 BRK CNTL 1 SMOKE DET A,B	AC INV 1,2,3 LCA (FWD) 1,2,3 PCA (FWD) 1,2,3 MCA (FWD) 1,2,3 MDM FF 1,2,3,4 MDM OF 1,2,3,4 SCU OF 1,2,3 MM 1,2 NSP 1,2 COMSEC 1,2 PCMMU 1,2 S-BD EQUIP (PM,FM) MDM PL 1,2 RA 1,2 RJDF 1A,1B,2A,2B PL RCDR OPS RCDR 1,2 GCIU A,B ACCU 1,2 MTU PL DATA INTLVR INTEROG SP H2O PUMP 1A,1B SEC UHF XCVR HUDE L,R
AV BAY 2		
GPC 2,5 TACAN 2 MLS 2,3 ADTA 2,4 AV BAY FAN A,B	BFC 2,3 (ENGAGE) AA 2,3 MLS 2,3 BRK CNTL 2 SMOKE DET A,B	
AV BAY 3		
GPC 3 TACAN 3 AV BAY FAN A,B C/W	S-BD EQ (PM,FM) SMOKE DET A,B TELEPRINTER	
CABIN		
CRT 1,2,3,4 DDU 1,2,3 AMI L,R AVVI L,R CAB FAN A,B IMU 1,2,3 TV MON RCU/VSU	MTRS/LTS/IND C/W ANNUN SPKR/MIKE UNITS ATUs TV CAM/VTR CNTLRS CSA CAB TEMP CNTLR A,B WMS HUMIDITY SEP 1,2 SMOKE DET - FLT DK L,R - CAB MCM (not on 102) HUD PDU L,R	
MADS RCDR (not on 102)		
		FREON-COOLED
		LCA (AFT) 1,2,3 PCA (AFT) 1,2,3 (MID) 1,2,3 MCA(AFT) 1,2,3,4,5,6 (MID) 1,2,3,4 MDM FA 1,2,3,4 MDM OA 1,2,3 APU CNTLR 1,2,3 ATVC ELEC 1,2,3,4 EIU 1,2,3 MPS ULL P SC 1,2,3 ASA 1,2,3,4 RGA 1,2,3,4 RJDA 1A,1B,2A,2B MEC 1,2 MPS ΔP SC DBIA 1,2 MN DIST & CNTL 1,2,3 MIDBDY PIC CNTLR H2/O2 CRYO 1A,1B,2A,2B FCL 1 PMP A,B 2 PMP A,B FC 1,2,3

ECLS

10/27/89

SLM |

TEMP 4-1

OPCL/ALL/GEN C,17

O2(N2) FLOW HIGH/CAB P LOW/dP/dT

SM SYS SUMM 1

SM 223 S/L ATMOSPHERE

WARNING
If -dP/dT is 0.55 psi/min (OSH), loss of vehicle atmosphere imminent

WARNING
If -dP/dT EQ > 0.33 or PPO2 < 2.35, LES suit and helmet config reqd (dP/dT x 0.2 ≈ PPO2 decay rate)

WARNING
If, after alarm, O2(N2) flow > 1.0: assume flow rate exceeds 5.0 lb/hr (OSH)

ECLS

If SL Tunnel open and module activated:

Go to step 29, TEMP 4-7

1. If dP/dT EQ positive or zero after steps 2 (3,4,5):
Go to MAL, ECLS, 6.2 I.I. >>
2. 14.7 CAB REG INLET SYS 1,2 vlv (two) - CL (pn1 M010W)

LEAK ISOLATION

3. CAB RELIEF A - CL (tb-CL)
4. B - CL (tb-CL)
✓ VENT ISOL - ctr (tb-bp)
✓ VENT - ctr (tb-bp)
5. ✓ VAC VENT ISOL VLV BUS SEL - MNA (pn1 ML31C)
CNTL - CL (tb-CL)
6. Close INNER A/L HATCH
Remove INNER A/L HATCH Equalization vlv caps (two)
Equalization vlv (two) - OFF

If dP/dT positive or zero (A/L leak: Possible loss of EVA capability and LES suit access):

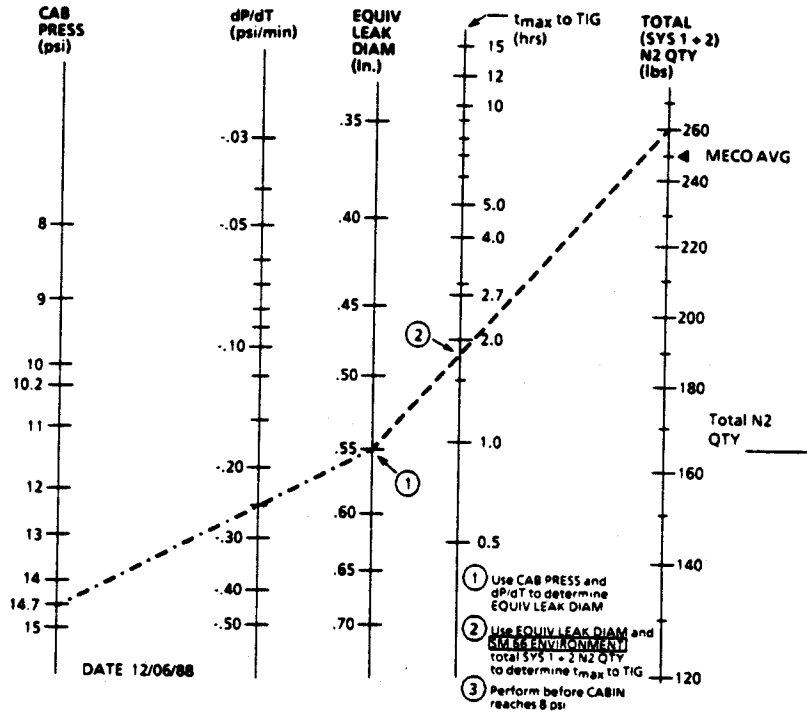
7. CAB RELIEF (two) - ENA (tb-ENA)
- If 14.7 psi ops:
8. 14.7 CAB REG INLET SYS 1(2) vlv - OP (pn1 M010W)
9. VAC VENT ISOL VLV CNTL - OP (tb-OP) (pn1 ML31C) >>

Cont after next page

SLM

CAB PRESS LEAK NOMOGRAPH

SM 66 ENVIRONMENT



Time leak check made ---:---:--- MET
 (+) T max to TIG (nomog) ---:---:--- MET
 (=) Latest possible TIG ---:---:--- MET

OPCL/ALL/GEN C

O2(N2) FLOW/
 CAB P/dP/dT

4-3

CAB LK NOMOGRAPH

LEAK UNISOLABLE: PREPARE FOR DEORBIT

10. INNER A/L HATCH Equalization vlv (two) - EMER

Flow Max O2

11. O2 MANF VLV TK1,TK2 (two) - OP (tb-OP) (pn1 R1)
TK1,TK2,TK3 HTR A (three) - AUTO

If any O2 QTY > 60%:

12. (Aff) O2 TK HTR B - AUTO

13. DIRECT O2 vlv - OP (pn1 C5)

14. O2/N2 CNTLR VLV SYS 1 - CL (O2) (pn1 L2)
2 - OP (N2)

O2 XOVR SYS 1 - CL

2 - OP

15. 14.7 CAB REG INLET SYS 1 vlv - OP (pn1 M010W)
2 vlv - CL

O2 REG INLET SYS 1 vlv - OP

2 vlv - CL

16. MS perform LOSS OF CAB PRESS (PWRDN)

WARNING

- Maintain O2 concentration < 29% (CABIN PRESS > 10.3) or PPO2 < 3.0 (CABIN PRESS ≤ 10.3)
- If -dP/dT EQ > 0.48 or PPO2 < 2.2, don LES (step 21)

Quantify Leak and Determine Tmax

17. Log dP/dT _____; CAB P _____; MET _____:_____:____;
N2 QTY 1 _____; N2 QTY 2 _____
18. Determine latest possible TIG, Tmax, and avail
landing sites using HP-41 (preferred)/
NOMOGRAPH and SPOC

Manage O2 Levels

Using O2 REG INLET SYS 1 VLV (pn1 M010W) and DIRECT O2
vlv (pn1 C5):

When CABIN PRESS > 10.3:

19. Maintain PP02 > 2.2 and O2 conc < 29

When CABIN PRESS \leq 10.3:

20. Maintain PP02 between 2.2 and 3.0

If $-dP/dT$ EQ > 0.48 or when PP02 < 2.2:

21. Don LES, open LEH O2 vlvs (pn1 C6, M032M,
M069M), close visors, and Suit O2 - ON

Cont next page

8 PSI CABIN MAINTENANCE (Flow N2)

When CABIN PRESS = 8:

- 22. Continue O2 mgmt per step 20
- 23. Recalculate Tmax:
 Log N2 qty using initial point (step 17) and time when 8 psia reached as first data point; then, periodically log new points when qty changes and recalculate.

N2 QTY LOG

TOTAL QTY, N1 + N2	LOG MET	Calculate N2 Use Rate (lbm/min): Divide Delta Total QTY by Delta MET	Est. New Tmax (min): Divide (Total Qty - 34) by N2 Use Rate, then Subtract 60
	DD: HH : MM		
(1)	: :		
(2)	: :		
(3)	: :		

If CABIN PRESS not stabilized ≥ 7.8 psi (max N2 flow reqd):

- 24. 14.7 CAB REG INLET SYS 1 vlv - CL (pn1 M010W) |
- 25. O2/N2 CNTLR VLV SYS 1,2 (two) - OP (N2) (pn1 L2)
 O2 XOVR SYS 1,2 (two) - OP
- 26. REG INLET SYS 1,2 vlv (two) - CL (pn1 M010W)

Cont next page

27. Reconfig C/W parameters:

PARAMETER NAME	C/W CH	H/W C/W LO V(LO EU)	ENA/INH
CAB P	4	1.80(7.45)	
O2 FLOW 1	14		INH
2	24		INH
PP02 A	34	2.20(2.20)	
B	44	2.20(2.20)	
N2 FLOW 1	54		INH
2	64		INH

28. Once PP02 < 3.00, reconfig C/W parameters:

PARAMETER NAME	C/W CH	H/W C/W HI V(HI EU)
CAB PP02 A	34	3.00(3.00)
B	44	3.00(3.00)

H2O FREE IN CAB

1. CAB FAN (two) - OFF
2. IMU FAN (three) - OFF

CAUTION
Do not operate IMUs without
IMU FANS for more than 30 min

3. FLT CNTLR PWR (three) - OFF
4. cb DDU (six) - op
5. Minimize CRT use:
If CRT currently ON, turn OFF within
30 min. Otherwise, allow 3 min OFF
prior to each 1 min ON (1 hr max ON time)
6. Minimize ltg
7. Go to FREE FLUID DISPOSAL (IFM) to remove
free water

OPCL/ALL/GEN C,15

**O2(N2) FLOW/
CAB P/dP/dT (Cont)**

4-7

H2O FREE IN CAB

H2O TK QTY LOW AND DECR

SM 66 ENVIRONMENT

If only one TKC or D:

1. Go to MAL, ECLS, 6.5 1.1 >>
2. If PLBD open, FLASH EVAP CNTLR PRI A,B - OFF
3. H2O TK N2 ISOL vlv (two) - CL (pn1 M010W)
4. If only TKA, go to MAL, ECLS, 6.5 1.1 >>

NOTE

Audible vent and 'S66 H2O' ALERT
for WASTE PRESS + when perform step 5

5. SPLY H2O GN2 TK VENT vlv - VENT (ML26C)
✓TKA SPLY vlv - OP
6. When WASTE PRESS ~0 psig (1-2 min):
Go to MAL, ECLS, 6.5 1.1

EVAP OUT T HIGH

SM 88 APU/ENVIRON THERM
SM SYS SUMM 2

- If temp high in only one loop, no action reqd
(snsr fail) >>
- If PLBD open and RADS in use:
1. Go to MAL, ECLS, 6.4 1.1 >>
- If PLBD closed or if PLBD open in RAD BYP:
2. FLASH EVAP CNTLR PRI A(B) - OFF
PRI B(A) - ON (wait 30 sec)
3. If EVAP OUT T decr (PRI A(B) cntl lost) >>

Cont next page

27. Reconfig C/W parameters:

PARAMETER NAME	C/W CH	H/W C/W LO V(LO EU)	ENA/INH
CAB P	4	1.80(7.45)	
O2 FLOW 1	14		INH
2	24		INH
PPO2 A	34	2.20(2.20)	
B	44	2.20(2.20)	
N2 FLOW 1	54		INH
2	64		INH

28. Once PPO2 < 3.00, reconfig C/W parameters: >>

PARAMETER NAME	C/W CH	H/W C/W HI V(HI EU)
CAB PPO2 A	34	3.00(3.00)
B	44	3.00(3.00)

29. If $-dP/dT$ EQ is 0.55 psi/min and CABIN PRESS
decr:

- SL F6D
30. CAB DEPRESS VLV - c1
 31. Evacuate SL
 32. Close INNER A/L HATCH
 33. INNER A/L HATCH Equalization vlv
(two) - OFF
 34. If orbiter dP/dT EQ positive or zero,
go to step 44
 35. Go to step 1

SLM
OPCL/SLM/GEN C,19

O2(N2) FLOW/
CAB P/dP/dT (Cont) TEMP 4-7

If SL ASCS in control:
 SL F3H | 36. CAB PRESS REG INLET vlv (two) - CL
 | If orbiter dP/dT EQ positive or zero:
 | 37. Go to O2(N2) FLOW +, 3.4b [2]
 | (SL MAL, ECLS) >>
 | Else, go to step 40
 MO10W | If orbiter PCS in control:
 | 38. 14.7 CAB REG INLET vlv (two) - CL
 | If orbiter dP/dT EQ positive or zero:
 | 39. Go to O2(N2) FLOW +, 6.2a [4]
 | (MAL, ECLS) >>
 SL F6D | 40. CAB DEPRESS VLV - c1
 | If decay rate (-dP/dT EQ) exceeds 0.33,
 | evacuate SL and isolate SL module:
 | 41. Perform SL EXPEDITED EGRESS (Cue
 | Card), then:
 | If orbiter decay rate (-dP/dT EQ) still
 | exceeds 0.33:
 TNL ADP | 42. Utilize SL Atmosphere:
 | S/L HATCH Equalization vlv (two) -
 | EMER
 | 43. Go to step 1

Cont next page

SLM

TEMP 4-7a

OPCL/SLM/GEN C,19

- R7 If orbiter dP/dT EQ positive or zero:
 - 44. ✓CAB DEPRESS - SAFE
 - 45. ✓ - CL (lts-OFF)
 - 46. SM 223 S/L ATMOSPHERE
 - 46. POS RLF VLV CL 1 - ITEM 2 EXEC (*),
pause
 - 47. POS RLF VLV CL 2 - ITEM 4 EXEC (*)

If SL CAB PRESS 1,2 or SL PPO2 1,2,3
stable:

- R7 48. ✓MCC for module recovery steps >>
- R1 If SL CAB PRESS 1,2 or SL PPO2 1,2,3
decr, remove power from SL when SL
pressure is < 13.8 psia and decr:
 - 49. O2 SPLY VLV - CL
 - 50. PL PRI MNB - OFF (tb-OFF)
 - 51. FC3 - OFF (tb-OFF)
 - 52. MNC - OFF (tb-OFF)
 - 53. AUX - OFF >>

If orbiter decay rate (-dP/dT EQ) between
0.00 and 0.33:

ORBITER LEAK ISOLATION

- L2 54. CAB RELIEF A - CL (tb-CL), pause
- 55. B - CL (tb-CL)
- 56. ✓VENT ISOL - ctr (tb-bp)
- 57. ✓VENT - ctr (tb-bp)
- ML31C 58. ✓VAC VENT ISOL VLV BUS SEL - MNA
- 59. CNTL - CL (tb-CL)

If orbiter dP/dT EQ positive or zero:

- 60. Go to 6.2b 1 (MAL, ECLS) >>

Cont next page

SLM

SL MODULE LEAK ISOLATION

- R7 61. ✓CAB DEPRESS - SAFE
- 62. ✓- CL (1t-off)
- SM 223 S/L ATMOSPHERE
- 63. POS RLF VLV CL 1 - ITEM 2 EXEC (*), pause
- 64. 2 - ITEM 4 EXEC (*)
- 65. If applicable:
 - EXP VENT LINE BLEED vlv 1,2 - c1
 - (see ECLSS Deltas to Nom Config for pn1)
- SL F6D, 66. If applicable:
 - A5D EXP VENT vlv 1,2 - c1
- SL F6D 67. ✓CAB DEPRESS VLV - c1
- If orbiter dP/dT EQ positive or zero:
- 68. ✓MCC for recovery steps >>
- SL F3H 69. AIRLK REG INLET vlv - OP
- TNL ADP 70. Close S/L HATCH
- 71. S/L HATCH Equalization vlv (two) - OFF
- 72. PL ISOL VLV - CL
- If orbiter dP/dT EQ positive or zero, remove power from SL when SL pressure is < 13.8 psia and decr:
- R7 73. 02 SPLY VLV - CL
- R1 74. PL PRI MNB - OFF (tb-OFF)
- 75. FC3 - OFF (tb-OFF)
- 76. MNC - OFF (tb-OFF)
- 77. AUX - OFF >>
- 78. ✓All essential equip for Entry (LESSs, helmets, etc) removed from airlock

Cont next page

SLM

TEMP 4-7c

OPCL/SLM/GEN C,19

AIRLOCK/TUNNEL ADAPTER LEAK ISOLATION

- 79. Disconnect airlock flex duct from cabin floor; stow
 - 80. INNER A/L HATCH - CL (per decal)
 - 81. INNER A/L HATCH Equalization vlv (two) - OFF
- If orbiter dP/dT EQ positive or zero:
- L2 82. CAB RELIEF A,B (two) - ENA (tb-ENA)
 - MO10W 83. 14.7 CAB REG INLET SYS 1(SYS 2) vlv - OP
 - ML31C 84. 02 REG INLET SYS 1(SYS 2) - OP
 - 85. VAC VENT ISOL VLV CNTL - OP (tb-OP) >>

ORBITER LEAK

Utilize SL Atmosphere

- 86. INNER A/L Equalization vlv (two) - EMER (Vlvs remain in EMER for duration of flt)
- TNL ADP 87. INNER A/L HATCH - OP (per decal)
- 88. S/L HATCH Equalization vlv (two) - EMER
- 89. INNER A/L HATCH - CL (per decal)
- 90. Go to step 11

SLM

TEMP 4-7d

OPCL/SLM/GEN C,19

H2O FREE IN CAB

1. CAB FAN (two) - OFF
2. IMU FAN (three) - OFF

CAUTION

Do not operate IMUs without
IMU FANS for more than 30 min

3. FLT CNTLR PWR (three) - OFF
4. cb DDU (six) - op
5. Minimize CRT use:
If CRT currently ON, turn OFF within
30 min. Otherwise, allow 3 min OFF
prior to each 1 min ON (1 hr max ON time)
6. Minimize ltg
7. Go to FREE FLUID DISPOSAL (IFM) to remove
free water

SLM

TEMP 4-7f

OPCL/ALL/GEN C,17

H2O TK QTY LOW AND DECR

SM 66 ENVIRONMENT

If only one TKC or D:

1. Go to MAL, ECLS, 6.5 1.1 >>
2. If PLBD open, FLASH EVAP CNTLR PRI A,B - OFF
3. H2O TK N2 ISOL vlv (two) - CL (pn1 M010W)
4. If only TKA, go to MAL, ECLS, 6.5 1.1 >>

NOTE

Audible vent and 'S66 H2O' ALERT
for WASTE PRESS + when perform step 5

5. SPLY H2O GN2 TK VENT vlv - VENT (ML26C)
✓TKA SPLY vlv - OP
6. When WASTE PRESS ~0 psig (1-2 min):
Go to MAL, ECLS, 6.5 1.1

EVAP OUT T HIGH

SM 88 APU/ENVIRON THERM
SM SYS SUMM 2

If temp high in only one loop, no action reqd
(snsr fail) >>

If PLBD open and RADS in use:

1. Go to MAL, ECLS, 6.4 1.1 >>

If PLBD closed or if PLBD open in RAD BYP:

2. FLASH EVAP CNTLR PRI A(B) - OFF
PRI B(A) - ON (wait 30 sec)
3. If EVAP OUT T decr (PRI A(B) cntl lost) >>

Cont next page

SLM

TEMP 4-8

OPCL/ALL/GEN C,17

If EVAP OUT T not decr:
 4. FLASH EVAP CNTLR PRI B(A) - OFF
 SEC - ON (Hi Load Evap ena)
 5. Minimize lgt (wait 30 sec)

If EVAP OUT T decr:
 If in deorb prep:
 6. ✓TACAN MODE (three) - OFF
 7. ✓RADAR ALTM (two) - OFF
 8. ✓MLS (three) - OFF
 9. TOP EVAP HTR NOZ (two) - OFF
 DUCT - OFF >>

If not in deorb prep >>

If EVAP OUT T not decr (Sec Hi Load failed):
 10. HI LOAD EVAP - OFF (Topping Evap ena)
 11. MSTR MADS PWR - OFF (wait 30 sec)

If EVAP OUT T decr:
 If in deorb prep:
 | 12. Go to LOSS OF HIGH LOAD EVAP (PWRDN) >>
 If not in deorb prep >>
 For deorb prep:
 13. Go to LOSS OF HIGH LOAD EVAP (PWRDN) >>.

If EVAP OUT T not decr (all FES lost):
 Establish RAD flow (CDR: step 14)
 If closed, open PLB doors ASAP (MS: perform
 steps 16 thru 19)

CDR:L1 14. RAD BYP VLV MODE (two) - AUTO
 CNTLR LOOP (two) - AUTO A(B)
 (wait 90 sec)
 BYP VLV tb (two) - RAD
 ✓RAD CNTLR OUT TEMP - NORM

Cont next page

OPCL/ALL/GEN C

H2O TK QTY
 EVAP OUT T HIGH

4-9

15. HI LOAD DUCT HTR - OFF
- TOP EVAP HTR NOZ (two) - OFF
- DUCT - OFF
- FLASH EVAP CNTLR SEC - OFF
- MS:R13L 16. PL BAY DR SYS 1,2 (two) - ENA
- SM 63 PL BAY DOORS
- AC POWER ON - ITEM 1 EXEC
- AUTO MODE SEL - ITEM 3 EXEC
- PBD SW BYP - ITEM 14 EXEC
- PBD OPEN - ITEM 15 EXEC
17. Monitor CRT for proper seq
- After doors open:
18. PBD STOP - ITEM 16 EXEC
- AC POWER OFF - ITEM 2 EXEC
19. PL BAY DR SYS 1,2 (two) - DISABLE
- For deorb prep:
20. Go to LOSS OF FES (PWRDN)

EVAP OUT T LOW

SM 88 APU/ENVIRON THERM
SM SYS SUMM 2

- If temp low in only one loop, N/A (snsr fail) >>
1. H2O PUMP LOOP 1,2 (two) - ON
 2. FLOW PROP VLV LOOP (two) - ICH (tb-ICH)
 3. Activate PL H2O LOOP(s) (if applicable)
- If FREON LOOP RAD OUT T LOW, go to FREON LOOP RAD OUT T LOW, step 5 >>
4. RAD CNTLR OUT T - HIGH
 5. FLASH EVAP CNTLR PRI A(B) - OFF
✓PRI B(A) - OFF
✓SEC - OFF
 6. ✓NH3 CNTLR (two) - OFF (wait 60 sec)
- If EVAP OUT T incr:
7. Go to MAL, ECLS, 6.4 1.2 >>
- If EVAP OUT T not incr:
8. FREON PUMP LOOP 2 - OFF
O2 SYS 2 SPLY VLV - CL (tb-CL)
 9. Go to MAL, ECLS, 6.4 1.2

OPCL/ALL/GEN C

4-11

EVAP OUT T LOW

H2O SPLY PRESS HIGH

SM 69 FUEL CELLS
SM 66 ENVIRONMENT

If multiple FC H2O LN T and FC H2O VLV T
converging or within 5 degF of each other:

1. ✓SPLY H2O TKA,TKB,TKC INLET (three) - OP
(tb-OP)

If H2O SPLY QTY B \geq 95:

2. SPLY H2O XOVR - OP (tb-OP)

If H2O SPLY PRESS decr or $<$ 40:

3. Go to MAL, ECLS, 6.5 1.3 >>

If H2O SPLY PRESS not decr or \geq 40:

4. RAD CNTLR OUT TEMP - HI
5. When EVAP OUT T \sim 50 (pn1 01),
then FLASH EVAP CNTLR PRI B - ON

6. Go to MAL, ECLS, 6.5 1.3 >>

If H2O SPLY QTY B $<$ 95:

7. Go to MAL, ECLS, 6.5 1.3 >>

If multiple FC H2O LN T and FC H2O VLV T not
converging or within 5 degF of each other:

8. Go to MAL, ECLS, 6.5 1.3

H2O SPLY PRESS LOW

SM 66 ENVIRONMENT

If H2O SPLY QTY A \leq 5:

1. SPLY H2O TKA INLET - CL (tb-CL)
2. H2O HTR - OFF (Galley)
3. H2O TK N2 ISOL VLV (two) - CL (pn1 M010W)
4. SPLY H2O GALLEY SPLY VLV - CL (tb-CL)
5. Go to MAL, ECLS, 6.5 1.4 >>

If H2O SPLY QTY A $>$ 5:

If H2O SPLY QTY A decr:

6. Go to H2O TK QTY LOW AND DECR >>

If H2O SPLY QTY A not decr:

7. Go to MAL, ECLS, 6.5 1.4

FREON FLOW LOW

SM 88 APU/ENVIRON THERM
SM SYS SUMM 2

1. Switch pumps in aff loop(s)
- If flow still low in only one loop:
 2. Go to MAL, ECLS, 6.4 1.3 >>
- If flow still low in both loops:
 3. FLOW PROP VLV LOOP 1,2 (two) - ICH (tb-ICH)
 - If not in OPS 2:
 - Prepare to deorb:
 4. FREON PUMP LOOP 1,2 (two) - OFF
 5. $\sqrt{O2}$ SYS 1,2 SPLY VLV (two) - OP (tb-OP)
 6. MSTR MADS PWR - OFF
 7. FC PURGE HTR - ON (pn1 R12)
VLV (three) - OP
 8. Go to LOSS OF 2 FREON LOOPS (PWRDN) >>
 - If in OPS 2:
 - If AFT cp FLOW in both loops < 200 lb/hr,
 - Prepare to deorb:
 9. If AFT cp FLOW < 100 lb/hr:
 - FREON PUMP LOOP 1,2 (two) - OFF
 10. $\sqrt{O2}$ SYS 1,2 SPLY VLV (two) - OP (tb-OP)
 11. MSTR MADS PWR - OFF
 12. FC PURGE HTR - ON
VLV (three) - OP
 13. Go to LOSS OF 2 FREON LOOPS (PWRDN) >>
 - If AFT cp FLOW in either loop > 200 lb/hr:
 14. Go to MAL, ECLS, 6.4 1.3

OPCL/ALL/GEN C,14

H2O SPLY P HIGH
H2O SPLY P LOW

4-13

FREON FLOW LOW

FREON LOOP RAD OUT T LOW

SM 88 APU/ENVIRON THERM
SM SYS SUMM 2

If EVAP OUT T not decr after 60 sec, N/A (snsr fail)>>

1. H2O PUMP LOOP 1,2 (two) - ON
2. ✓FLOW PROP VLV LOOP (two) - ICH (tb-ICH)
3. Activate PL H2O LOOP(s) (if applicable)
4. FLASH EVAP CNTLR PRI A(B) - OFF
 - ✓PRI B(A) - OFF
 - ✓SEC - OFF

5. RAD CNTLR OUT TEMP - HI
6. ✓Aff RAD BYP VLV MODE 1(2) - AUTO
 - CNTLR LOOP 1(2) - alt CNTLR

If aff RAD BYP VLV tb - BYP (90 sec), then RAD
and if RAD OUT T stabilizes ≥ 57 degF:

7. Go to MAL, ECLS, 6.4 1.4 >>

If aff RAD BYP VLV tb remains in RAD, and
RAD OUT T ≥ 57 degF after 90 sec:

8. Go to MAL, ECLS, 6.4 1.4 >>

If aff RAD BYP VLV tb - BYP (90 sec), then RAD
and if RAD OUT T stabilizes < 57 degF:

If EVAP OUT T ≤ 32 degF:

9. Aff RAD BYP VLV MODE 1(2) - MAN
 - MAN SEL 1(2) - BYP (3 sec)
10. Go to MAL, ECLS, 6.4 1.4 >>

If EVAP OUT T > 32 degF:

11. Go to MAL, ECLS, 6.4 1.4 >>

If aff RAD BYP VLV remains in RAD, and
RAD OUT T < 57 degF:

If EVAP OUT T ≤ 32 degF:

12. Aff RAD BYP VLV MODE 1(2) - MAN
 - MAN SEL 1(2) - BYP (3 sec)

If RAD BYP VLV tb - RAD:

13. Aff FREON PUMP LOOP 1(2) - OFF

If Freon Loop 1(2) deactivated:

14. 02 SYS 1(2) SPLY VLV - CL (tb-CL)

15. Go to MAL, ECLS, 6.4 1.4 >>

If RAD BYP VLV tb - BYP:

16. Go to MAL, ECLS, 6.4 1.4 >>

If EVAP OUT T > 32 degF:

17. Go to MAL, ECLS, 6.4 1.4

POST-FIRE CABIN CLEANUP
(Cabin and Av Bay Fires)

Continue from FIRE/SMOKE Cue Card:

NOTE

This procedure is to be performed simultaneously by two crewmembers

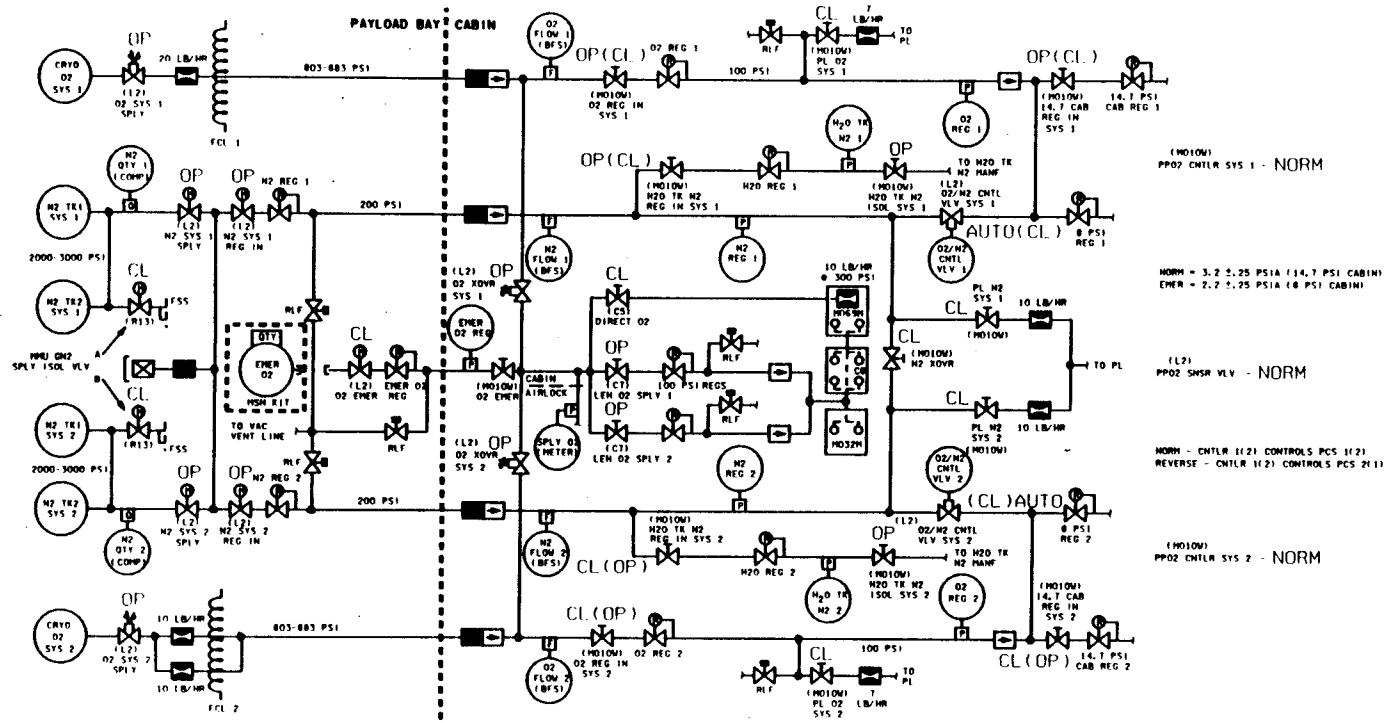
- CM1
1. CAB FAN A(B) - OFF (pn1 L1)
 2. Unstow/Install one ATCO can and one fresh LiOH canister (LiOH Box)
 3. CAB FAN A(B) - ON (pn1 L1)
 4. Cabin Temp CNTLR - OFF (pn1 L1)
Pin Cab Temp Cntl vlv - FULL COOL
(pn1 MD44F)
 5. MODE - WCS/EMU (WCS)
- CM2
6. Unstow CPA (pn1 MA9J) and select CPA - SCAN MODE
 7. Monitor cabin atmosphere in the vicinity of the fire and report results to MCC
 8. If AOS, ✓MCC for combination of LiOH and ATCO. Otherwise, retain current ATCO/LiOH combination
 9. Perform ECLS FRP-2 POST-FIRE CABIN CLEANUP (MAL)
- CM1
10. If Av Bay fire: Go to AV BAY FIRE (PWRDN)

OPCL/ALL/GEN C,20

**FREON LOOP RAD
OUTTLOW**

4-15 **POST-FIRE CLEANUP |
PRESS CNTL SCHEM (4-16)**

PRESSURE CONTROL SYSTEM
ORBIT



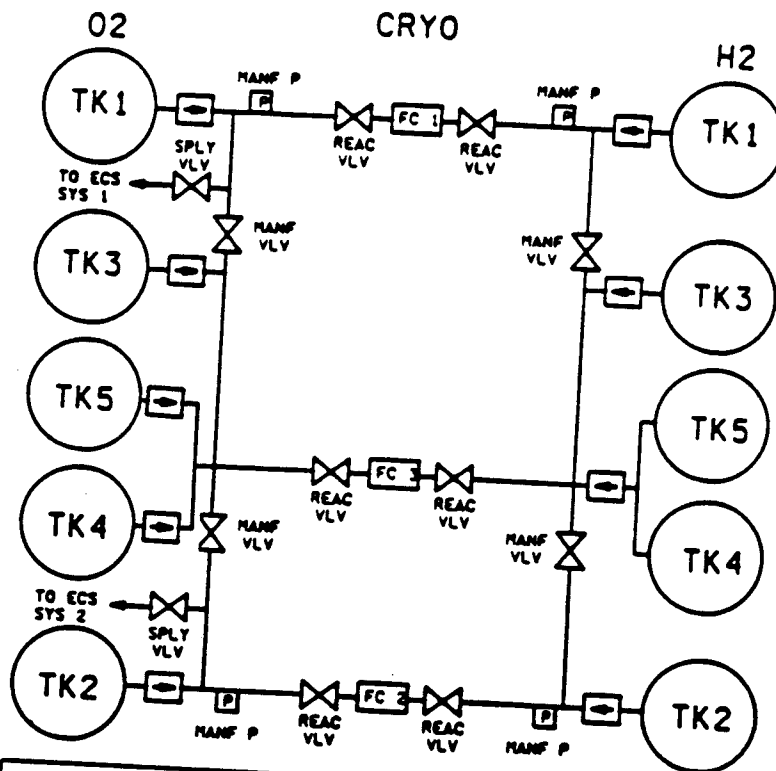
4-16

OPCL/ALL/GEN C,20

DATE 12/06/88

- (M010M) PPOZ CNTLR SYS 1 - NORM
- NORM - 3.2 ± 0.25 PSIA (14.7 PSI CABIN)
- EMER - 2.7 ± 0.25 PSIA (8 PSI CABIN)
- (L2) PPOZ SMR VLV - NORM
- NORM - CNTLR (1,2) CONTROLS PCS (1,2)
- REVERSE - CNTLR (1,2) CONTROLS PCS (2,1)
- (M010M) PPOZ CNTLR SYS 2 - NORM

185180418, SCH 1



O2/H2 HTR LOSS (3 OR 4 TK SETS)								
BUS LOSS	PAIRED				PAIRED			
	TK1		TK2		TK3		TK4	
	A	B	A	B	A	B	A	B
MMA DA1	A/M							
MNB DA2								
MNC DA3	AUTO	A/M	A/M	A/M	A/M	A/M	A/M	A/M
CNTL AB1		MAN			MAN			
AB2		A/M			A/M			
CNTL BC1			MAN				MAN	
BC2			A/M				A/M	
BC3				MAN				MAN
CNTL CA1	MAN					MAN		
CA2	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*	AUTO*	AUTO*
3AB								

*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK ARE NOT IN AUTO

A/M = AUTO AND MANUAL LOSS

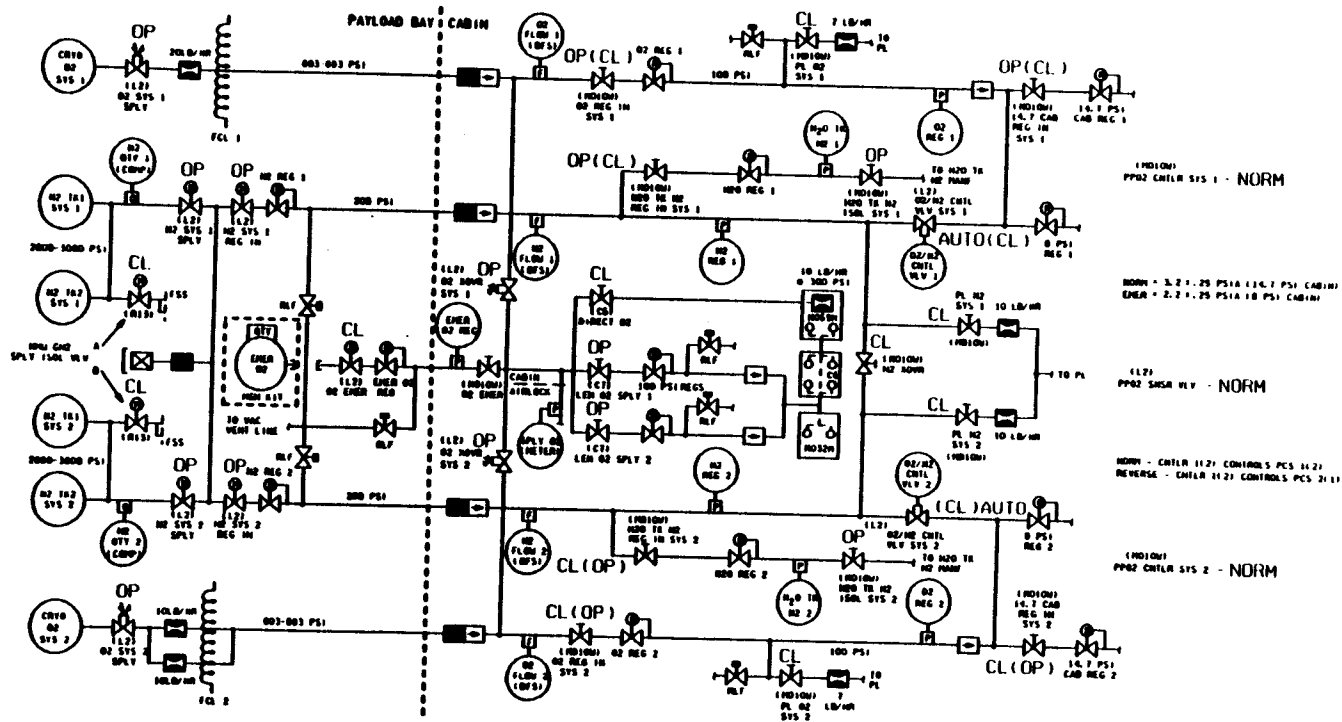
12/01/89

OPCL/ALL/GEN C,1

CRYO O2(H2) P/T HI, LEAK
PCS SCHEMATIC (Over) 4-17

CRYO SCHEM/3,4 TK HTR
5 TK HTR (Pg 4-19)

PRESSURE CONTROL SYSTEM
ORBIT



DATE 12/06/88

105100410, APR 82

4-18

OPCL/ALL/GEN C

02/H2 HTR LOSS (5 TK SETS ONLY)												
BUS LOSS	TK1		TK2		TK3		TK4			TK5		
	A	B	A	B	A	B	O2	H2A	H2B	O2	H2A	H2B
MNA DA1 MNB DA2 MNC DA3	A/M AUTO	A/M	AUTO A/M	A/M	A/M AUTO	A/M	AUTO A/M	AUTO A/M	A/M	A/M	AUTO A/M	A/M
CNTL AB1 AB2		MAN A/M			MAN A/M							
CNTL BC1 BC2 BC3			MAN A/M	MAN			MAN A/M	MAN A/M	MAN	MAN	MAN A/M	MAN
CNTL CA1 CA2 CA3	MAN A/M			A/M		MAN A/M			A/M	A/M		A/M
ESS 1BC 2CA 3AB	AUTO* AUTO	AUTO* AUTO	AUTO AUTO*	AUTO AUTO*	AUTO* AUTO	AUTO* AUTO	AUTO 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 TK 4/5

A/M = AUTO AND MANUAL LOSS

08/18/83

4-19

OPCL/ALL/GEN C

**CABIN ATMOSPHERE - O2(N2)
FLOW HIGH/CAB P LOW/dP/dT
(SL MODULE ACTIVATED)**

SM SYS SUMM 1

WARNING

If $-dP/dT$ is 0.55 psi/min (OSH), evacuate SL and close inner A/L hatch. Then inner A/L hatch Equalization vlv (two) - OFF

WARNING

If $-dP/dT$ EQ > 0.33 or PPO2 < 2.35, LES suit and helmet config reqd ($dP/dT \times 0.2 \approx$ PPO2 decay rate)

WARNING

If, after alarm, O2(N2) reading > 1.0 lb/hr, assume flow rate exceeds 5.0 lb/hr (OSH)

- SL F3H 1. If SL ASCS in control, CAB PRESS REG INLET vlv (two) - CL
If orbiter dP/dT positive or zero:
2. Go to O2(N2) FLOW +, 3.4b 2
(SL MAL, ASCS) >>
- M010W 3. If orbiter PCS in control, 14.7 CAB REG INLET vlv (two) - CL
If orbiter dP/dT positive or zero:
4. Go to O2(N2) FLOW +, 6.2a 4
(MAL, ECLS) >>
- SL F6D 5. CAB DEPRESS VLV - c1
If decay rate ($-dP/dT$) exceeds 0.33, evacuate SL and isolate SL module:
- TNL ADP 6. Close SL hatch
7. TNL ADAPTER SL HATCH Equalization vlv (two) - OFF

Cont next page

SLM

TEMP 4-21

OPCL/SLM/GEN C,8

8. TNL ADAPTER PL ISOL VLV - CL
If orbiter decay rate (-dP/dT) still
exceeds 0.33:

Utilize SL Atmosphere:

9. TNL ADAPTER SL HATCH Equalization
v1v (two) - EMER

10. Proceed to O2(N2) FLOW HIGH/CAB P
LOW/dP/dT, TEMP 4-2 >>

If orbiter dP/dT positive or zero:

R7 11. ✓CAB DEPRESS - SAFE
12. ✓ - CL (1ts OFF)

SM 223 S/L ATMOSPHERE

13. POS RLF VLV CL 1 - ITEM 2 EXEC (*),
pause

14. POS RLF VLV CL 2 - ITEM 4 EXEC (*)

If SL CAB PRESS 1,2 or SL PPO2 1,2,3
stable or incr:

15. ✓MCC for module recovery steps >>

If SL CAB PRESS 1,2 or SL PPO2 1,2,3 decr,
remove power from SL when SL press is <
13.8 psia and decr:

R7 16. O2 SPLY VLV - CL

R1 17. PL PRI MNB - OFF (tb-OFF)

18. FC3 - OFF (tb-OFF)

19. MNC - OFF (tb-OFF)

20. AUX - OFF >>

If orbiter decay rate (-dP/dT) between 0.00
and 0.33:

ORBITER LEAK ISOLATION

L2 21. CAB RELIEF A - CL (tb-CL), pause

22. B - CL (tb-CL)

23. ✓VENT ISOL - ctr (tb-bp)

24. ✓VENT - ctr (tb-bp)

ML31C 25. ✓VAC VENT ISOL VLV BUS SEL - MNA

26. CNTL - CL (tb-CL)

If orbiter dP/dT positive or zero:

27. Go to 6.2b 1 (MAL, ECLS) >>

Cont next page

SLM

TEMP 4-22

OPCL/SLM/GEN C,8

SL MODULE LEAK ISOLATION

SM 223 S/L ATMOSPHERE

- 28. POS RLF VLV CL 1 - ITEM 2 EXEC (*), pause
- 29. POS RLF VLV CL 2 - ITEM 4 EXEC (*)
- 30. If applicable, EXP VENT LINE BLEED
v1v 1 - c1 (see ECLSS Deltas to Nom
Config for pn1)
- SL F6D 31. EXP VENT v1v 1 - c1
- 32. LINE BLEED v1v 2 - c1
(see ECLSS Deltas to Nom Config for pn1)
- SL A5D 33. EXP VENT v1v 2 - c1 (Aft Upper
Feedthrough Plate)
- SL F6D 34. ✓CAB DEPRESS VLV - c1
If orbiter dP/dT positive or zero:
- 35. ✓MCC for recovery steps >>
- SL FD6 36. CAB DEPRESS VLV - op
- TNL ADP 37. Close SL hatch
- 38. TNL ADAPTER SL HATCH Equalization v1v
(two) - OFF
- 39. TNL ADAPTER PL ISOL VLV - CL
If orbiter dP/dT positive or zero, remove
power from SL when SL press is < 13.8 psia
and decr:
- R7 40. O2 SPLY VLV - CL
- R1 41. PL PRI MNB - OFF (tb-OFF)
- 42. FC3 - OFF (tb-OFF)
- 43. MNC - OFF (tb-OFF)
- 44. AUX - OFF >>
- 45. ✓All essential equip for Entry (LEs,
helmets, etc) removed from airlock

Cont next page

SLM

TEMP 4-23

OPCL/SLM/GEN C,8

AIRLOCK/TUNNEL ADAPTER LEAK ISOLATION

- 46. Inner A/L hatch - CL (per decal)
- 47. Inner A/L hatch Equalization vlv (two) - OFF

If orbiter dP/dT positive or zero:

- L2 48. CAB RELIEF A,B (two) - ENA (tb-ENA)
(if not leaking)
- MO10W 49. 14.7 CAB REG INLET SYS 1(SYS 2) vlv - OP
- 50. O2 REG INLET SYS 1(SYS 2) - OP
- ML31C 51. VAC VENT ISOL VLV CNTL - OP (tb-OP) >>

ORBITER LEAK

Utilize SL Atmosphere:

- TNL ADP 52. Inner A/L hatch - OP (per decal)
- 53. TNL ADAPTER SL HATCH Equalization vlv (two) - EMER
- 54. Inner A/L Equalization vlv (two) - EMER
(Vlvs remain in EMER for duration of flt)
- 55. Proceed to O2(N2) FLOW HIGH/CAB P LOW/
dP/dT, step 11 (ECLS, 4-4)

SLM

TEMP 4-24

OPCL/SLM/GEN C,8

ELECTRICAL POWER SYSTEM

EPS

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 3 Φs) BUS LOSS ACTION

1. Determine aff AC BUS:
FC1 & FREON PUMP 2B: AC1
FC2 & FREON PUMP 1B: AC2
FC3 & CAB FAN A: AC3
2. Aff FC - STOP
If AC3 aff:
 3. AV BAY 3 FAN B - OFF
A - ON
CAB FAN A - OFF
4. Isolate ΦB:
cb AC CONTR - c1
INV/AC BUS - OFF (tb-OFF)
If AC1(2,3) aff and AV BAY FAN 3(2,3) $\Delta P \geq 0.5$:
 5. Aff INV PWR - OFF (tb-OFF) (mtrs restarted)
cb AC CONTR - op
FC - START (10 sec or ΔP tb-gray)
 6. If AC3 aff, CAB FAN B - ON
 7. Go to aff BUS LOSS ACTION >>
8. Aff INV/AC BUS - ON (tb-ON)
cb AC CONTR - op
9. Repeat steps 4 thru 9 for ΦC, ΦA as reqd, then:
If AV BAY FAN 3(2,3) ΔP still < 0.5:
 10. Go to aff AC BUS (2 or 3 Φs) BUS LOSS ACTION

EPS

AC OVERLOAD

SM 67 ELECTRIC
SM SYS SUMM 1

If all AC VOLTS between 110 and 123
and AMPS < 14:

1. Go to MAL, EPS, 7.5 1.2 >>
2. Aff AC BUS SNSR - OFF

If single Φ :

3. Aff cb AC CONTR - c1
INV/AC BUS - ON (tb-ON)

If AC VOLTS < 110 or AC AMPS > 14 (OVLD):

4. Aff INV/AC BUS - OFF (tb-OFF)
INV PWR - OFF (tb-OFF)
cb AC CONTR - op

If other Φ volts < 110 or AMPS > 14:

5. Go to step 9
6. Aff AC BUS SNSR - AUTO TRIP
7. Go to aff BUS LOSS ACTION >>

If AC VOLTS, AMPS normal (snsr prob):

8. Go to MAL, EPS, 7.5 1.2 >>

If multi Φ (Bus short):

9. Aff cb AC CONTR (three) - c1
INV/AC BUS - OFF (tb-OFF)
INV PWR - OFF (tb-OFF)
cb AC CONTR (three) - op

10. Perform aff BUS LOSS ACTION, then:

11. Go to MAL, EPS, 7.5 1.2

OPCL/ALL/GEN C

3 Φ AC MTRS STOPPED 5-3

AC OVERLOAD

AC VOLTS

SM 67 ELECTRIC
SM SYS SUMM 1

1. If AC OVERLOAD alarm, go to AC OVERLOAD >>
If all AC VOLTS between 110 and 123:
 2. Go to MAL, EPS, 7.5 [1.1] >>
- If single Φ AC VOLTS > 123 or between 10 and 110
(Confirm with F9 meter):
 - If aff INV/AC BUS tb - ON (Inverter lost):
 3. Aff cb AC CONTR - c1
INV/AC BUS - OFF (tb-OFF)
INV PWR - OFF (tb-OFF)
cb AC CONTR - op
 4. If other Φ AC VOLTS < 110 or AC
AMPS > 14, go to step 8
 5. Perform aff BUS LOSS ACTION, then go to
MAL, EPS, 7.5 [1.1] >>
 - If aff INV/AC BUS tb - OFF (O/V, unannun OVLD, or
snsr prob):
 6. Perform aff BUS LOSS ACTION, then go to
MAL, EPS, 7.5 [1.1] >>
- If multi Φ AC VOLTS < 110:
 - If aff INV/AC BUS tb - ON:
 - If all AC AMPS < 1 (FPC Bus lost):
 7. Go to aff BUS LOSS ACTION >>
 - If any AC AMPS > 14 (Unannun OVLD):
 8. Aff cb AC CONTR (three) - c1
INV/AC BUS - OFF (tb-OFF)

Aff INV PWR - OFF (tb-OFF)
 cb AC CONTR (three) - op
 9. Perform aff BUS LOSS ACTION, then go
 to MAL, EPS, 7.5 1.1 >>
 If aff INV/AC BUS tb - OFF:
 10. Aff cb AC CONTR (three) - c1
 AC BUS SNSR - OFF
 INV/AC BUS - ON (tb-ON)
 If any AC AMPS > 14 (Unannun OVLD):
 11. Go to step 8
 If all AC AMPS < 14 (snsr prob):
 12. Aff AC BUS SNSR - MON
 cb AC CONTR (three) - op

CNTL BUS VOLTS LOW

SM SYS SUMM 1

1. ✓BUS LOSS ID
2. Perform BUS LOSS ACTION, CNTL, then:
 If pwr reqd (<3 sec) for crit function:
3. Hold crit function sw
4. For CNTL BUS AB(BC,CA) VOLTS LOW,
 CNTL BUS PWR MNA(MNB,MNC) - RESET

OPCL/ALL/GEN C

AC VOLTS

5-5

CNTL/BUS VOLTS LOW

ESS BUS VOLTS LOW**SM SYS SUMM 1**

If verified by F9 voltmeter:

1. (Aff) ESS BUS SOURCE MN - OFF,ON

If bus regained:

2. (Aff) FC - START (10 sec or ΔP tb-gray) >>

If bus not regained:

If cb MNB(C,A) MNA(B,C) CONTR - op

[pn1 015(016,014):B]:

3. cb ESS 1BC(2CA,3AB) MNA(B,C) CONTR - op
[pn1 013:A(C,E)]

4. cb MNB(C,A) MNA(B,C) CONTR - c1
[pn1 015(016,014):B]

5. Perform FC SHUTDN (Cue Card)
[FC/MN BUS A(B,C) and MN BUS TIE A(B,C)
tbs lost], then:

6. Go to aff BUS LOSS ACTION (ESS)

FC REACTANT VLV CLOSED**SM 69 FUEL CELLS****SM SYS SUMM 1**

1. FC REAC VLV (three) - OP (tb-OP
or hold 1 sec max)

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

If aff FC REAC O2(H2) FLOW \leq 1.1(0.2)| or if aff FC COOL P decr or $<$ 50 within 7 min:

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

If aff FC REAC O2(H2) FLOW $>$ 1.1(0.2)and if aff COOL P $>$ 50 and steady after 7 min:

4. (Aff) buses - untie if reqd

- Aff INV PWR - OFF (tb-OFF)
 cb AC CONTR (three) - op
9. Perform aff BUS LOSS ACTION, then go to MAL, EPS, 7.5 1.1 >>
- If aff INV/AC BUS tb - OFF:
10. Aff cb AC CONTR (three) - c1
 AC BUS SNSR - OFF
 INV/AC BUS - ON (tb-ON)
- If any AC AMPS > 14 (Unannun OVLD):
11. Go to step 8
- If all AC AMPS < 14 (snsr prob):
12. Aff AC BUS SNSR - MON
 cb AC CONTR (three) - op

CNTL BUS VOLTS LOW

SM SYS SUMM 1

1. ✓BUS LOSS ID
2. Perform BUS LOSS ACTION, CNTL, then:
 If pwr reqd (<3 sec) for crit function:
3. Hold crit function sw
4. For CNTL BUS AB(BC,CA) VOLTS LOW,
 CNTL BUS PWR MNA(MNB,MNC) - RESET

OPCL/ALL/GEN C

AC VOLTS

5-5

CNTL/BUS VOLTS LOW

ESS BUS VOLTS LOW

SM SYS SUMM 1

If verified by F9 voltmeter:

1. Aff ESS BUS SOURCE MN - OFF, ON

If bus regained:

2. Aff FC - START (10 sec or ΔP tb-gray) >>

If bus not regained:

If cb MNB(C,A) MNA(B,C) CONTR - op:

3. cb ESS 1BC(2CA,3AB) MNA(B,C) CONTR - op

4. MNB(C,A) MNA(B,C) CONTR - cl

5. Perform FC SHUTDN (Cue Card)
[FC/MN BUS A(B,C) and MN BUS TIE A(B,C)
tbs lost], then:

6. Go to aff BUS LOSS ACTION (ESS)

FC REACTANT VLV CLOSED

SM 69 FUEL CELLS
SM SYS SUMM 1

1. FC REAC VLV (three) - OP (tb-OP
or hold 1 sec max)
2. Perform BUS TIE (Cue Card), then:
If aff FC REAC O2(H2) FLOW \leq 1.1(0.2)
or if aff FC COOL P decr or $<$ 50 within 7 min:
 3. Go to aff FC SHUTDN (Cue Card) >>
- If aff FC REAC O2(H2) FLOW $>$ 1.1(0.2)
and if aff COOL P $>$ 50 and steady after 7 min:
 4. Aff buses - untie if reqd

FC COOLANT PUMP ΔP LOW

SM 69 FUEL CELLS
SM SYS SUMM 1

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

1. Go to 3Φ AC MOTORS STOPPED >>
2. Aff cb FC PUMP (three) - c1 (pn1 L4:C)
FC - START (10 sec or ΔP tb-gray)

If FC EXIT T > 170 and not decr, or H2 PUMP < 0.3 or
> 0.8, or RDY tb - bp (30 sec after START):

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

If FC H2 PUMP STATUS norm, FC EXIT T norm, and
RDY tb - gray (snsr fail)

FC COOL P

SM 69 FUEL CELLS
SM 66 ENVIRONMENT

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

If COOL P > 75, incr, and not 100 (H), or
COOL PUMP ΔP tb - bp/intermittent, or
STACK/EXIT T unstable, or
FC SS 1(2,3) ΔV ≥ 150, or
FC FLOW O2(H2) > 8.4(1.1):

2. Go to FC SAFING >>

If FC COOL P < 25 or > 75 and stdy:

3. Go to MAL, EPS, FC COOL P ++, 7.3 1.4 >>

If FC COOL P between 25 and 50:

If FC COOL P < (SPLY H2O TK P + 10):

4. Perform FC SHUTDN (Cue Card), then:

5. Go to MAL, EPS, FC COOL P ++, 7.3 1.4

OPCL/ALL/GEN C,6

ESS BUS VOLTS LOW
FC REACT VLV CL

5-7

FC COOL PUMP ΔP
FC COOL P

FC pH HIGH or H2O LINE pH HIGH

SM SYS SUMM 1
SM 69 FUEL CELLS

If FC1(2,3) pH +:

If aff FC SS 1(2,3) $\Delta V \geq 150$ or H2O LINE pH +:

1. Perform FC SAFING, then:
2. Go to FC/H2O LINE pH HIGH, MAL, EPS,
7.3 1.1 >>

If aff FC SS 1(2,3) $\Delta V < 150$ and no H2O LINE pH +:

3. Go to step 5

If H2O LINE pH +:

If any FC SS 1(2,3) $\Delta V \geq 150$ or FC1(2,3) pH +:

4. Go to step 1

If all FC SS 1(2,3) $\Delta V < 150$ and no FC1(2,3) pH +:

5. If Flash Evap ena:

FLASH EVAP CNTLR PRI A - OFF

PRI B - ON

SEC (two) - B SPLY, OFF

6. SPLY H2O TKA INLET - CL (tb-CL)

TKB OUTLET - CL (tb-CL)

7. Go to MAL, EPS, FC/H2O LINE pH HIGH,

7.3 1.1

FC1(2,3) H2 PUMP ↑↑

SM 69 FUEL CELLS
SM SYS SUMM 1

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

1. Go to 3Φ AC MOTORS STOPPED >>

If FC COOLANT PUMP ΔP tb - bp:

2. Go to FC COOLANT PUMP ΔP LOW >>

If FC H2 PUMP between 0.8 and 2.0 or between 3.0 and 4.6:

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

4. Go to MAL, EPS, 7.1 1.3 >>

If FC H2 PUMP < 0.2 or between 2.0 and 3.0 or > 4.6:

5. Note AC1(2,3) ΦA,B,C AMPS

6. Perform FC SHUTDN (Cue Card), then:

7. Go to MAL, EPS, 7.1 1.3 >>

2nd FC SHUTDN

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
4. Perform BUS TIE (Cue Card) to good FC/BUS, then:
5. ESS BUS SOURCE FC - OFF
6. FC/MN BUS - OFF
7. FC - STOP (COOL PUMP ΔP tb-bp or 1 sec)
8. FC REAC VLV - CL (tb-CL)
9. Go to LOSS OF 2nd FC (PWRDN)

OPCL/ALL/GEN C,17

FC (H2O LINE) ph HIGH 5-9

**FC H2 PUMP↑↑
2nd FC SHUTDN**

FC SAFING

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. Go to step 11

If FC not SHUTDN:

4. MSTR MADS PWR - OFF

If not already tied:

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

If ORB (Not D/O Prep) kW > 18:

6. MN BUS TIE (three) - ON (tb-ON)
7. ESS BUS SOURCE FC1(2,3) - OFF
8. FC/MN BUS - OFF (tb-OFF)
9. FC1(2,3) REAC - CL (O2,H2 tb-CL)
10. Perform LOSS OF 1 FC(2nd FC)(PWRDN), then:
11. When FC1(2,3) COOL P decr to < 15:
 12. FC1(2,3) - STOP (ΔP tb-bp or 1 sec)

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. INV/AC BUS - OFF (tb-OFF)
5. 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. INV PWR - ON (tb-ON)
9. INV/AC BUS - ON (tb-ON)
10. cb AC CONTR (three) - op
11. AC BUS SNSR - AUTO TRIP
12. If pwrn not reqd, CAB FAN A(B) - ON
13. GNC I/O RESET

FC SHUTDN (1st)

SM SYS SUMM 1

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

If pre OMS 2 or Entry:

1. MSTR MADS PWR - OFF

If not already tied:

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

If ORB (Not D/O Prep), kW > 18:

3. MN BUS TIE (three) - ON

4. ESS BUS SOURCE FC - OFF

FC/MN BUS - OFF

FC - STOP (COOL PUMP ΔP tb-bp or 1 sec)

5. FC REAC VLV - CL (tb-CL)

6. Go to LOSS OF 1 FC (PWRDN)

OPCL/ALL/GEN C

FC SAFING

5-11

BUS TIE/FC SHUTDN

**MN BUS UNDERVOLTS
FC VOLTS**

ISM 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
powered after untie:

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

If short eliminated and all MN BUSES
powered 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):

If a MN BUS not powered:

5. Perform BUS TIE, then:

6. Go to PL PWRDN (TEMP 10-87) >>

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 (Do not stop FC until
COOL P < 15 and STACK TEMP < 243) >>

If FC VOLTS \geq 32 (BUS SHORT):

DO NOT BUS TIE TO SHORTED BUS

10. Go to aff MN BUS LOSS ACTIONS >>

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 (TEMP 10-87), then:

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 >>

If second FC failure and aff MN BUS not recovered:

18. PL PRI (three) - OFF (tb-OFF)

19. Go to 2nd FC SHUTDN

OPCL/ALL/GEN C,14

MN BUS UVOLTS
FC VOLTS

5-13

FC DELTA V 1(2,3) (Over)
FC H2O RLF (5-15)/CRYO O2(H2)

FC DELTA V 1(2,3)

SM SYS SUMM 1
SM 69 FUEL CELLS

1. Perform BUS TIE (Cue Card), then:
If aff FC pH ↓ (H2O LINE pH ↓) or FC ΔV incr:
2. Perform FC SAFING, then:
 3. If pH ↓, go to MAL, EPS, 7.3 1.1 >>
- If no aff FC pH ↓ (H2O LINE pH ↓) and FC ΔV not incr:
4. Two min after bus tie, record ΔAMPS between aff and tied FC and monitor for 20 min
If change in ΔAMPS > 12 or FC ΔV incr:
 5. Go to FC SAFING >>
- If change in ΔAMPS ≤ 12 and FC ΔV not incr:
 6. Remain bus tied to monitor FC performance

FC H2O RLF NOZ TEMP ↑↑

SM 69 FUEL CELLS
SM 66 ENVIRONMENT

If H2O RLF NOZ T A and B < 150:
If more than 1 FC H2O LN T and H2O VLV T
converging or within 5 degF of each other (Mult
FCs Relieving):
If H2O SPLY PRESS ≥ 40:
1. Go to H2O SPLY PRESS HIGH >>
If H2O SPLY PRESS < 40:
2. Initiate preparations for next
PLS entry >>
If 1 FC H2O LN T and H2O VLV T converging or
within 5 degF of each other (Single FC
Relieving):
3. Go to BUS TIE (Cue Card) >>
If no FC H2O LN T and H2O VLV T converging
(HTR inop, NOZ frozen, or Switch Failure):
4. FC H2O RELIEF HTR - A AUTO(B AUTO)
(pn1 R12U) >>
If H2O RFL NOZ T A and B (both) > 425 (HTR fail on):
5. Go to MAL, EPS, 7.3 1.3

CRYO O2(H2) PRESS/TEMP HIGH

SM 68 CRYO SYSTEM
SM SYS SUMM 2

1. (Aff) O2(H2) TK HTR (two) - OFF
2. Go to MAL, EPS, 7.6 1.2

**CRYO O2(H2) LEAK
(3 or more tank sets flown)**

SM 68 CRYO SYSTEM
SM SYS SUMM 2

If only one TK aff and (P/TK P disagree or O2 TK 5 aff):

1. Go to MAL, EPS, 7.6 1.1 >>
2. Reconfig TK HTRS A,B - ON (not AUTO) in TK(s) with P < 740(190)

If all TK Ps in a common manf or the only TK P in an isolated manf < 740(190) and still decr:

3. O2(H2) MANF VLV TK 1, TK 2 (two) - CL
4. Reconfig TK HTRS A,B - AUTO in TK(s) with incr P
5. Perform aff MN BUS TIE, EPS (Cue Card), then:

If O2 TK 1(2) aff:

6. O2 SYS 1(2) SPLY vlv - CL, then:

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

7. O2 TK 1(2) HTRS A,B (two) - AUTO
MANF VLV TK 1, TK 2 (two) - OP >>

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

If aff TK P incr (FC leak):

9. O2(H2) MANF VLV TK 1, TK 2 (two) - OP (ASAP if FC3)

10. (Aff) TK HTRS A,B (two) - AUTO >>

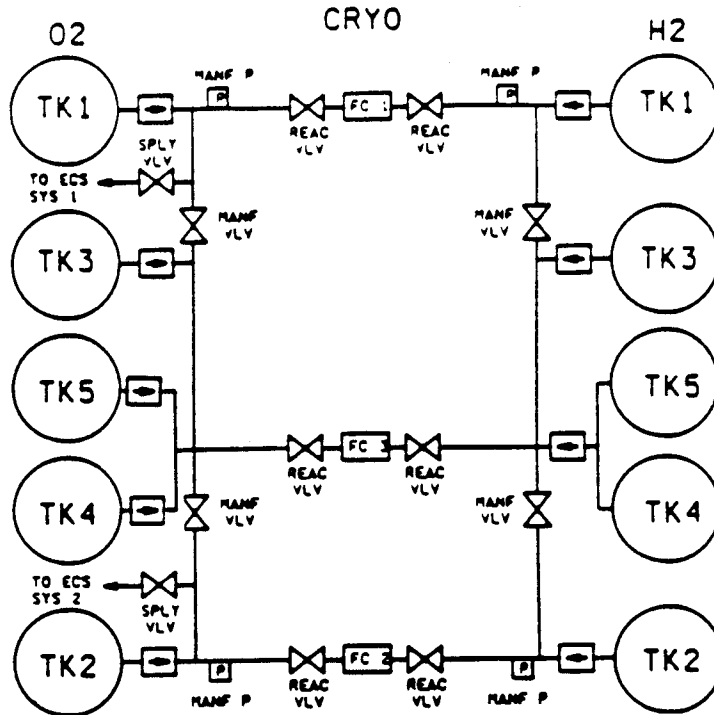
If aff TK P not incr within 2 min (MANF or TK leak):

Cont next page

11. (Aff) TK HTRS A,B (two) - OFF
If TK 1(2) aff and TK P/MANF P diverging (TK leak):
- 12. O2(H2) MANF VLV TK 1, TK 2 (two) - OP
 - 13. Go to MAL, EPS SSR-6, FC POWERUP >>
- If TK 3(4,5) aff or if TK P/MANF P tracking (MANF leak): >>
- If any TK P and connected MANF P diverging or $\Delta > 50$:
- 14. O2(H2) MANF VLV TK 1, TK 2 (two) - OP
 - 15. (Aff) TK HTRS A,B (two) - OFF (TK leak or blockage)
 - 16. (Other) TK HTRS - AUTO >>
- If neither of the above and all TK Ps now steady or incr (small leak or HTR fail):

<p><u>CAUTION</u> Do not allow P to exceed 920(260)</p>

17. Go to MAL, EPS, 7.6 1.1



O2/H2 HTR LOSS (3 OR 4 TK SETS)								
BUS LOSS	PAIRED				PAIRED			
	TK1		TK2		TK3		TK4	
	A	B	A	B	A	B	A	B
MMA DA1	A/M		AUTO	A/M	A/M	AUTO	A/M	A/M
MNB DA2	AUTO	A/M	A/M	A/M	AUTO	A/M	AUTO	A/M
MNC DA3								
CNTL AB1		MAN			MAN			
AB2		A/M			A/M			
CNTL BC1			MAN				MAN	
BC2			A/M	MAN			A/M	MAN
BC3								
CNTL CA1	MAN				MAN			
CA2	A/M			A/M	A/M			A/M
CA3								
ESS 1BC	AUTO*	AUTO*	AUTO	AUTO	AUTO*	AUTO*	AUTO	AUTO
2CA	AUTO	AUTO	AUTO*	AUTO*	AUTO	AUTO	AUTO*	AUTO*
3AB								

*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK ARE NOT IN AUTO

A/M = AUTO AND MANUAL LOSS

12/01/89

5-15c

OPCL/ALL/GEN C,14

02/H2 HTR LOSS (5 TK SETS ONLY)												
BUS LOSS	TK1		TK2		TK3		TK4 ←			→ TK5		
	A	B	A	B	A	B	O2	H2A	H2B	O2	H2A	H2B
MNA DA1 MNB DA2 MNC DA3	A/M AUTO		AUTO A/M	A/M	A/M AUTO	A/M	AUTO A/M	AUTO A/M	A/M	A/M	AUTO A/M	A/M
CNTL AB1 AB2		MAN A/M			MAN A/M							
CNTL BC1 BC2 BC3			MAN A/M	MAN			MAN A/M	MAN A/M	MAN	MAN	MAN A/M	MAN
CNTL CA1 CA2 CA3	MAN A/M			A/M		MAN A/M			A/M	A/M		A/M
ESS 1BC 2CA 3AB	AUTO* AUTO	AUTO* AUTO	AUTO AUTO*	AUTO AUTO*	AUTO* AUTO	AUTO* AUTO	AUTO AUTO*	AUTO AUTO*	AUTO AUTO*	AUTO AUTO*	AUTO AUTO*	AUTO AUTO*

5-15d

OPCL/ALL/GEN C,14

*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 TK 4/5

A/M = AUTO AND MANUAL LOSS

08/18/83

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	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	
C/W	AC VOLTAGE (AC X Lost)	I																	
	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)		IA						IB										
	OMS TVC (During OMS PRI GMBL)					L	L				L	L						R	R
	OMS TVC (During OMS SEC GMBL)					R	R												
	RCS JET (When Jet Commanded)		*							*				*					
DISP 67	DC AMPS XY = 0 (X: Fwd,Mid,Aft) (Y: A,B,C)	FA	MA			AA	AA	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	
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)							I											
L2	ATH OZ SYS X SPLY VLV tb - CL				I				2										
F6/FB	X LANDING GEAR tb - bp (X: L,R,Nose)							LN						RN					
F7	CRT X B tanks	I						2						3,4					
01	H2O PUMP OUT P X = 20 (Pump Loss)		IA						IB										
07	AFT X RCS He P Y tb - bp (X: Both,L,R) (Y: A,B)					BA	BA				RB	RB					LB	LB	
P	AFT L,R RCS MANF ISOL 5 tb - bp																*	*	
A	FWD RCS He P X tb - bp	A							B										
N	FWD RCS TR ISOL X tb - bp (X: 1/2,3/4/5)		3											1					
E	FWD RCS MANF ISOL X tb - bp		1							2				5	4				
L	LG HYD ISOL X (tb - OP)					1	1				2	2						3	
S	R13L RAD CNTL X tb - bp (X: Port,Stbd)			PS	P	S								PS	S	P		3	
	ABU RMS EE (except DERIGID) tbs - bp, MA LT - ON			*															
	ABL X RMS DPY/STO tb - bp (X: Port,Stbd)			P					P					P					
	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)			W	W				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.

DATE 03/27/89

5-16

OPCL/ALL/GEN C

MAIN DC BUS LOSS ID TABLE

INDICATION		MAIN A			MAIN B			MAIN C		
		O 1 4	O 1 4 A 8	R 1 5	M L 8 6 B	O 1 5	R 1 5	M L 8 6 B	O 1 6	R 1 5
C/W	CABIN ATM	•				•				
LIGHTS	FLOODS (L Seat, R Seat, CTR Cns1, MS, OS, PS) Floods (L,R Ovhd Cns1)		PS		LC	OS		RC	MS	
	MIDDECK FLOODS X (X: 1,2,3,4,5,6,7,8)	L			R					
	WMC, PHS FLOODS			18		26				34 57
COMM	All Voice via AUDIO CTR 2			W		F				
	ATU (ALL EXCEPT OV-102) PS,MS,MD,AL		MS			MD			•	
	ATU (OV-102 ONLY) PS,MS,MD CCU (CU), MD SMU (SM),AL,OS		MS OS CU			SM			PS AL 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 X INST PWR (X: L,R)	L				R				
	L2 CABIN RELIEF X tb - bp					A		B		
	01 ATM N2 SYS X SPLY, REG IN tb - bp	1				2				
	CAB dp/dt = 0.45	•				•				
	CAB PRESS = 0 psia	•				•				
	PP02 SNSR X = 0 psia	A				BC				
	03 RCS/OMS PRPLT QTY Disp Blanks									
	RI2L SPLY H2O TK X INLET tb - bp							•		
	SPLY H2O TK X OUTLET tb - bp				A		B			C
	SPLY H2O DUMP ISOL, B SPLY ISOL VLV tb - bp				B		C			A
	SPLY H2O DUMP, XOV, GALLEY SPLY VLV tb - bp						•			
	A8U RMS EE (6) plus BRAKES, SAFING, S/W STOP tbs - bp		•							•
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 03/05/85

5-17

OPCL/ALL/GEN C

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 15	M L 86 B	D A 2	FP & LC 2	M P C 2	F D	O 13 R 15	D A 3	FP & LC 3	M P C 3	F D	O 13	M L 86 B
C/W	MA, but no F7 C/W Lts	•				•												
	O2 PRESS										•	•						•
	H2 PRESS						•				•	•						•
	FUEL CELL REAC			•			•		•		•	•			•			
	FUEL CELL PUMP			•	•				•		•	•			•			
	PRIMARY C/W (Cannot be Reset)											•						
	BACKUP C/W (Cannot be Reset)											•						
F9 METER	Affected ESS VOLTS OFF Scale Lo	•			•						•							
SMI	Affected DC VOLTS ESS = 0	•									•							
COMM	A11 Voice via AUDIO CTR 1										•							
	X ATU,CCU,MIC (X: Cdr, PIt)	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							
P A N E L S	O2 O2,H2 TK X QTY = OK (X: 1,2,3,4)	24				2	4	1			1	3						3
	R1 FC/MM BUS X tb - OFF	A						B				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		2	3	3				3	
	O2,H2 MANF VLV TK X tbs - CL	1		1				2	2									
	FC X REAC tbs - CL	1		1				2	2			3		3				
	FC X RDY tb - bp	1		1	1			2	2	2		3		3	3			
	FC X COOL PUMP ΔP tb - bp	1		1	1			2	2	2		3		3	3			
A12 FC3 STRUCT RTN tb - OFF											•							

DATE 12/06/88

5-18

OPCL/ALL/GEN C

5-19

OPCL/ALL/GEN C,20

CNTL AB1

CRT 1 Blanks
(F8) - APU 1 FUEL QTY % inaccurate (Displays H2O Qty)
C/W - FREON LOOP if FES active (Pri B GPC)

CNTL AB2

L HUD lost
C/W - FREON LOOP if FES active (Pri B ON)

CNTL AB3

(O8) - FWD RCS TK ISOL 3/4/5 (tb-bp)
MANF ISOL 1 (tb-bp)
(L1) - FLOW PROP VLV LOOP 1 (tb-bp)

CNTL BC1

(L1) - RAD CNTLR BYP VLV MAN SEL 2 (tb-bp)
S-BD SYS 1 Comm
S-BD PL SYS 1
R HUD lost

CNTL BC2

CRT 2 Blanks
C/W - H2O LOOP (if Pump 1B ON)
S-BD SYS 2 Comm
S-BD PL SYS 2
(F8) - APU 2 FUEL QTY % inaccurate (Displays H2O Qty)

CNTL BC3

(O8) - FWD RCS MANF ISOL 2 (tb-bp)
C/W - H2O LOOP (if Pump 1B ON)

CNTL CA1

CRT 3 Blanks
C/W - FREON LOOP if FES active (Pri A GPC)
C/W - H2O LOOP (if LOOP 2 GPC)

CNTL CA2

C/W - FREON LOOP if FES active (Pri A ON)
CRT 4 Blanks

CNTL CA3

(F8) - APU 3 FUEL QTY % inaccurate (Displays H2O Qty)
(O8) - FWD RCS TK ISOL 1/2 (tb-bp)
MANF ISOL 3 (tb-bp)
4 (tb-bp)
(L1) - RAD CNTLR BYP VLV MAN SEL 1 (tb-bp)
FLOW PROP VLV LOOP 2 (tb-bp)

NOTE

If CNTL Bus Loss suspected, check **SM1** DC V CNTL for confirming cue

DATE 06/19/91

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AC1/
MNA

PROBLEM	PWRUP	
	LOW LEVEL (Group B)	MSN EXT (Group C)
EPS BUS LOSS	ALL FF&FA MDMs	ALL FF&FA MDMs

OPCL/ALL/GEN C

BUS LOSS ID (Pg 5-16) 5-21

BUS LOSS ACTION

AC1/
MNA

AC1 (2 or 3 ϕ s)

L1 Perform FC1 SHUTDN (Cue Card), then:
IMU FAN A - OFF
B(C) - ON
AV BAY 1 FAN A - OFF
B - ON
3 FAN A - ON
B - OFF
FREON PUMP LOOP 1 - B
2 - A
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.45

AC1 ϕ A

L4 cb UTIL PWR AC1 - op
06 LTG PNL L/CTR - OFF
08 R INST - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.46

AC1 ϕ B

06 LTG PNL L/OVHD - OFF
08 NUMERIC - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.47

AC1 ϕ C

07 \sqrt TACAN 1 MODE - OFF
L4 cb UTIL PWR AC1 - op
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.48

MNA DA1 (Entire Bus) (Includes AC1)

NOTE

UHF SPLX Hi Pwr Xmit lost

- 07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
Perform FC1 SHUTDN (Cue Card), then:
PL CAB - MNB
- L1 IMU FAN B(C) - ON
AV BAY 1 FAN B - ON
3 FAN A - ON
FREON PUMP LOOP 1 - B
2 - A
TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
- 06 ANNUN BUS SEL ACA 1 - MNB
- A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
- Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.1

MNA FPC1

Perform FC1 SHUTDN (Cue Card), then:
Perform AC1 (2 or 3Φs) (omit SSR-9 1.45),
then:
Go to MAL, EPS SSR-9 1.2

MNA FLC1

GNC 23 RCS ovrdr F1 MANF STAT - CL
Go to MAL, EPS SSR-9 1.5

MNA FMC1

If reqd for att control:
GNC 23 RCS ovrdr F1 MANF STAT - OP
Go to MAL, EPS SSR-9 1.7

MNA MPC1

L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
R1 PL CAB - MNB
Go to MAL, EPS SSR-9 1.3

MNA APC4

07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.4

MNA ALC1

07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.6

AC2/
MNB

MNA O14

06 ANNUN BUS SEL ACA 1 - MNB
Go to MAL, EPS SSR-9 1.9

MNA R15

NOTE
UHF SPLX Hi Pwr Xmit lost
Go to MAL, EPS SSR-9 1.8

AC2/
MNB

AC2 (2 or 3φs)

Perform FC2 SHUTDN (Cue Card), then:
L1 CAB FAN A - ON
B - OFF
IMU FAN A(C) - ON
B - OFF
AV BAY 1 FAN A - ON
B - OFF
2 FAN A - OFF
B - ON
FREON PUMP LOOP 1 - A
017:C SIG CONDR FREON A - AC3
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.49

AC2φA

08 LTG PNL R OVHD - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.50

AC2φB

017:C SIG CONDR FREON A - AC3
06 LTG INST OVHD - OFF
08 LTG PNL R - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.51

AC2φC

07 √TACAN 2 MODE - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.52

MNB DA2 (Entire Bus) (Includes AC2)

CAUTION

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

- 07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
Perform FC2 SHUTDN (Cue Card), then:
- L1 CAB FAN A - ON
IMU FAN A(C) - ON
AV BAY 1 FAN A - ON
2 FAN B - ON
FREON PUMP LOOP 1 - A
TOP EVAP HTR DUCT - A
IF HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
- 06 ANNUN BUS SEL ACA 1 - MNA
ACA 2/3 - MNC
- 017:C SIG CONDR FREON A - AC3
- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
- A1L If PL RF comm reqd:
S-BD PL PWR SYS - 2
CNTL - PNL,CMD
To reconfig PSP, ✓MCC
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.10

MNB FPC2

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

- Perform FC2 SHUTDN (Cue Card) then:
A1L If PL RF comm reqd:
 S-BD PL PWR SYS - 2
 CNTL - PNL,CMD
Perform AC2 (2 or 3 Φ s) (omit SSR-9 1.49),
then:
 To reconfig PSP, \checkmark MCC
 Go to MAL, EPS SSR-9 1.11

MNB FLC2

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

- GNC 23 RCS ovrđ F2 MANF STAT - CL
A1L If PL RF comm reqd:
 S-BD PL PWR SYS - 2
 CNTL - PNL,CMD
 To reconfig PSP, \checkmark MCC
 Go to MAL, EPS SSR-9 1.14

MNB FMC2

- If reqđ for att control:
GNC 23 RCS ovrđ F2 MANF STAT - OP
Go to MAL, EPS SSR-9 1.16

MNB MPC2

- L1 TOP EVAP HTR DUCT - A
 If HI LOAD EVAP ENA:
 HI LOAD DUCT HTR - A
A1L KU PWR - OFF
 CNTL - PNL
 Go to MAL, EPS SSR-9 1.12

MNB APC5

- 07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
- L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.13

AC3/
MNC

MNB ALC2

- 07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
- L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.15

MNB O15

- 06 ANNUN BUS SEL ACA 1 - MNA
2/3 - MNC
Go to MAL, EPS SSR-9 1.17

AC3 (2 or 3Φs)

AC3/
MNC

Perform FC3 SHUTDOWN (Cue Card), then:
L1 CAB FAN A - OFF
 B - ON
IMU FAN B(A) - ON
 C - OFF
H2O PUMP LOOP 1 - ON
 2 - GPC
AV BAY 2 FAN A - ON
 B - OFF
 3 FAN A - OFF
 B - ON
FREON PUMP LOOP 2 - B
017:C SIG CONDR FREON B - AC2
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.53

AC3ΦA

If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.54

AC3ΦB

017:C SIG CONDR FREON B - AC2
06 LTG INST L/CTR - OFF
R10 MS LTG PNL - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.55

AC3ΦC

07 ✓TACAN 3 MODE - OFF
A6 OS LTG PNL - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.56

MNC DA3 (Entire Bus) (Includes AC3)

- Perform FC3 SHUTDN (Cue Card), then:
- L1 CAB FAN B - ON
 - IMU FAN B(A) - ON
 - H2O PUMP LOOP 1 - ON
 - AV BAY 2 FAN A - ON
 - 3 FAN B - ON
 - FREON PUMP LOOP 2 - B
 - FLASH EVAP CNTLR PRI A - OFF
 - PRI B - ON
 - C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

- AUD CTR - 1
 - 06 ANNUN BUS SEL ACA 2/3 - MNB
 - 017:C SIG CONDR FREON B - AC2
 - A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
 - 3 - B AUTO
 - TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
- Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.18

MNC FPC3

C3 Perform FC3 SHUTDN (Cue Card), then:
S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

Perform AC3 (2 or 3 Φ s) (omit SSR-9 1.53),
then:
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.19

MNC FLC3

C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

GNC 23 RCS ovrđ F4 MANF STAT - CL
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.21

MNC APC6

L1 FLASH EVAP CNTLR PRI A - OFF
PRI B - ON
A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
Go to MAL, EPS SSR-9 1.20

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MNA

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PROBLEM	PWRUP	
	LOW LEVEL (Group B)	MSN EXT (Group C)
EPS BUS LOSS	ALL FF&FA MDMs	ALL FF&FA MDMs

34,41

OPCL/34,41/GEN C

BUS LOSS ID (Pg 5-16) TEMP 5-21 BUS LOSS ACTION

AC1/
MNA

AC1 (2 or 3 ϕ s)

L1 Perform FC1 SHUTDN (Cue Card), then:
IMU FAN A - OFF
B(C) - ON
AV BAY 1 FAN A - OFF
B - ON
3 FAN A - ON
B - OFF
FREON PUMP LOOP 1 - B
2 - A
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.45

AC1 ϕ A

L4 cb UTIL PWR AC1 - op
06 LTG PNL L/CTR - OFF
08 R INST - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.46

AC1 ϕ B

06 LTG PNL L/OVHD - OFF
08 NUMERIC - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.47

AC1 ϕ C

07 \checkmark TACAN 1 MODE - OFF
L4 cb UTIL PWR AC1 - op
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.48

MNA DA1 (Entire Bus) (Includes AC1)

NOTE

UHF SPLX Hi Pwr Xmit lost

- 07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
Perform FC1 SHUTDN (Cue Card), then:
PL CAB - MNB
- L1 IMU FAN B(C) - ON
AV BAY 1 FAN B - ON
3 FAN A - ON
FREON PUMP LOOP 1 - B
2 - A
TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
- C3 RTG PUMP - ALT
- 06 ANNUN BUS SEL ACA 1 - MNB
- A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
- R11U H2O LOOP HTR GSE LN B - ON
VLV PNL BLNKT B - ON
DUMP/ACCUM LN B - ON
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.1

34,41

TEMP 5-23 OPCL/34,41/GEN C

MNA FPC1

Perform FC1 SHUTDN (Cue Card), then:
Perform AC1 (2 or 3Φs) (omit SSR-9 1.45),
then:
Go to MAL, EPS SSR-9 1.2

MNA FLC1

GNC 23 RCS ovrd F1 MANF STAT - CL
Go to MAL, EPS SSR-9 1.5

MNA FMC1

If reqd for att control:
GNC 23 RCS ovrd F1 MANF STAT - OP
Go to MAL, EPS SSR-9 1.7

MNA MPC1

L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
R1 PL CAB - MNB
Go to MAL, EPS SSR-9 1.3

MNA APC4

07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.4

MNA ALC1

07 AFT L RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.6

AC2/
MNB

MNA O14

06 ANNUN BUS SEL ACA 1 - MNB
Go to MAL, EPS SSR-9 1.9

MNA R15

NOTE
UHF SPLX Hi Pwr Xmit lost
Go to MAL, EPS SSR-9 1.8

MNA R11&L12

C3 RTG PUMP - ALT
R11U H2O LOOP HTR GSE LN B - ON
VLV PNL BLNKT B - ON
DUMP/ACCUM LN B - ON

34,41

TEMP 5-25 OPCL/34,41/GEN C

AC2/
MNB

AC2 (2 or 3Φs)

Perform FC2 SHUTDN (Cue Card), then:
L1 CAB FAN A - ON
B - OFF
IMU FAN A(C) - ON
B - OFF
AV BAY 1 FAN A - ON
B - OFF
2 FAN A - OFF
B - ON
FREON PUMP LOOP 1 - A
017:C SIG CONDR FREON A - AC3
C3 ✓RTG PUMP - PRI
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.49

AC2ΦA

08 LTG PNL R OVHD - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.50

AC2ΦB

017:C SIG CONDR FREON A - AC3
06 LTG INST OVHD - OFF
08 LTG PNL R - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.51

AC2ΦC

07 ✓TACAN 2 MODE - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.52

34,41

TEMP 5-26 OPCL/34,41/GEN C

MNB DA2 (Entire Bus) (Includes AC2)

CAUTION

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

- 07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
Perform FC2 SHUTDN (Cue Card), then:
- L1 CAB FAN A - ON
IMU FAN A(C) - ON
AV BAY 1 FAN A - ON
2 FAN B - ON
FREON PUMP LOOP 1 - A
TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
- 06 ANNUN BUS SEL ACA 1 - MNA
ACA 2/3 - MNC
- 017:C SIG CONDR FREON A - AC3
- R11U ✓RTGCL H2O PUMP A - ON (tb-ON)
✓H2O LOOP, HTR GSE LN A - ON
✓VLV PNL BLNKT A - ON
✓DUMP/ACCUM LN A - ON
- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
- A1L If PL RF comm reqd:
S-BD PL PWR SYS - 2
CNTL - PNL,CMD
To reconfig PSP, ✓MCC
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.10

34,41

TEMP 5-27 OPCL/34,41/GEN C

MNB FPC2

CAUTION

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

- Perform FC2 SHUTDN (Cue Card) then:
A1L If PL RF comm reqd:
 S-BD PL PWR SYS - 2
 CNTL - PNL,CMD
Perform AC2 (2 or 3 Φ s) (omit SSR-9 1.49),
then:
 To reconfig PSP, \checkmark MCC
 Go to MAL, EPS SSR-9 1.11

MNB FLC2

CAUTION

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

- GNC 23 RCS ovr d F2 MANF STAT - CL
A1L If PL RF comm reqd:
 S-BD PL PWR SYS - 2
 CNTL - PNL,CMD
 To reconfig PSP, \checkmark MCC
 Go to MAL, EPS SSR-9 1.14

MNB FMC2

- If reqd for att control:
GNC 23 RCS ovr d F2 MANF STAT - OP
Go to MAL, EPS SSR-9 1.16

MNB MPC2

- L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
 HI LOAD DUCT HTR - A
A1L KU PWR - OFF
 CNTL - PNL
Go to MAL, EPS SSR-9 1.12

MNB APC5

07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.13

MNB ALC2

07 AFT R RCS MANF ISOL 5 - CL (tb-CL)
L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.15

AC3/
MNC

MNB O15

06 ANNUN BUS SEL ACA 1 - MNA
2/3 - MNC
Go to MAL, EPS SSR-9 1.17

MNB R11&L12

R11U ✓RTGCL H2O PUMP A - ON (tb-ON)
✓H2O LOOP HTR GSE LN A - ON
✓VLV PNL BLNKT A - ON
✓DUMP/ACCUM LN B - ON

34,41

TEMP 5-29 OPCL/34,41/GEN C

AC3 (2 or 3φs)

AC3/
MNC

Perform FC3 SHUTDN (Cue Card), then:
L1 CAB FAN A - OFF
 B - ON
IMU FAN B(A) - ON
 C - OFF
H2O PUMP LOOP 1 - ON
 2 - GPC
AV BAY 2 FAN A - ON
 B - OFF
 3 FAN A - OFF
 B - ON
FREON PUMP LOOP 2 - B
C3 RTG PUMP - ALT
017:C SIG CONDR FREON B - AC2
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.53

AC3φA

If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.54

AC3φB

017:C SIG CONDR FREON B - AC2
06 LTG INST L/CTR - OFF
R10 MS LTG PNL - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.55

AC3φC

07 ✓TACAN 3 MODE - OFF
A6 OS LTG PNL - OFF
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.56

34,41

TEMP 5-30 OPCL/34,41/GEN C

MNC DA3 (Entire Bus) (Includes AC3)

Perform FC3 SHUTDN (Cue Card), then:
L1 CAB FAN B - ON
IMU FAN B(A) - ON
H2O PUMP LOOP 1 - ON
AV BAY 2 FAN A - ON
3 FAN B - ON
FREON PUMP LOOP 2 - B
FLASH EVAP CNTLR PRI A - OFF
PRI B - ON
C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

AUD CTR - 1
RTG PUMP - ALT
06 ANNUN BUS SEL ACA 2/3 - MNB
017:C SIG CONDR FREON B - AC2
A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.18

34,41

TEMP 5-31 OPCL/34,41/GEN C

MNC FPC3

C3 Perform FC3 SHUTDN (Cue Card), then:
S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

Perform AC3 (2 or 3 ϕ s) (omit SSR-9 1.53),
then:
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.19

MNC FLC3

C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

GNC 23 RCS ovrđ F4 MANF STAT - CL
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.21

MNC APC6

L1 FLASH EVAP CNTLR PRI A - OFF
PRI B - ON
A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
Go to MAL, EPS SSR-9 1.20

MNCALC3

L1 FLASH EVAP CNTLR PRI A - OFF
PRI B - ON
A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B
(two) - AUTO
Go to MAL, EPS SSR-9 1.22

MNC O16

06 ANNUN BUS SEL ACA 2/3 - MNB
Go to MAL, EPS SSR-9 1.24

MNCR15

C3 AUD CTR - 1
Go to MAL, EPS SSR-9 1.23

CNTL

CNTLAB1

CAUTION
Do not sw S-BD PM CNTL to PNL
if PNL A1 encryption switches in
either 'T/R', 'RCV', or 'ALL'. Will
result in loss of all S-BD COMM

- L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
- A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
3 - A AUTO
TK/FU LINE/H2O SYS 1B,3A
(two) - AUTO
Go to MAL, EPS SSR-9 1.36

CNTL

CNTLAB2

- L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
GNC 23 RCS ovrđ F1 MANF STAT - CL
- A12 APU HTR GAS GEN/FUEL PUMP 1 - B AUTO
TK/FU LINE/H2O SYS 1B,3A
(two) - AUTO
Go to MAL, EPS SSR-9 1.37

CNTLAB3

NOTE
CDR's BFS ENGAGE capability lost

- L1 TOP EVAP HTR DUCT - B
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - B
If regđ for att control:
GNC 23 RCS ovrđ F1 MANF STAT - OP

Cont next page

- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
TK/FU LINE/H2O SYS 1B,3A (two) -
AUTO
- A6 If DAP MAN MODE reqd: Use aft station
If BFS ENGAGE reqd: Use PLT's RHC, then:
- 06 GPC MODE 1,2,4 (three) - STBY,HALT
BFS I/O RESET
- If no S-BD comm:
- C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

Go to MAL, EPS SSR-9 |1.38

CNTL BC1

CAUTION

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

- 07,08 RCS MANF ISOL 5 (three) - CL (tb-CL)
- L1 TOP EVAP HTR NOZ L - B AUTO
DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
- A12 APU HTR GAS GEN/FUEL PUMP 1 - A AUTO
2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
- A1L If PL RF comm reqd:
S-BD PL PWR SYS - 2
CNTL - PNL,CMD
To reconfig PSP, /MCC
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 |1.39

CNTL BC2

- 07,08 RCS MANF ISOL 5 (three) - CL (tb-CL)
L1 TOP EVAP HTR DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
C3 S-BD PM CNTL - PNL, then CMD

NOTE

If S-BD mode TDRS or STDN HI, xmit
may be delayed 140 sec for PA warmup.
Receive not affected

- A12 GNC 23 RCS ovrd F2 MANF STAT - CL
APU HTR GAS GEN/FUEL PUMP 2 - B AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
C3 If DAP MAN MODE reqd: Use fwd station
Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:
Go to MAL, EPS SSR-9 1.40

CNTL BC3

- L1 TOP EVAP HTR NOZ R - B AUTO
DUCT - A
If HI LOAD EVAP ENA:
HI LOAD DUCT HTR - A
If reqd for att control:
A12 GNC 23 RCS ovrd F2 MANF STAT - OP
APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
TK/FU LINE/H2O SYS 1A,2B (two) -
AUTO
A6 If DAP MAN MODE reqd: Use aft station
Go to MAL, EPS SSR-9 1.41

CNTL CA1

NOTE

GPC 3,5 - no BFS ENGAGE capability.
✓MCC for possible move of BFS FUNCTION

- A12 APU HTR GAS GEN/FUEL PUMP 2 - A AUTO
3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
Go to MAL, EPS SSR-9 1.42

CNTL CA2

- L1 FLASH EVAP CNTLR PRI A - OFF
PRI B - ON
GNC 23 RCS ovrd F3 MANF STAT - CL
A12 APU HTR GAS GEN/FUEL PUMP 3 - B AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
C3 If DAP MAN MODE reqd: Use fwd station
Go to MAL, EPS SSR-9 1.43

CNTL CA3

- GNC 23 RCS ovrd F4 MANF STAT - CL
A12 APU HTR GAS GEN/FUEL PUMP 3 - A AUTO
TK/FU LINE/H2O SYS 2A,3B (two) -
AUTO
Go to MAL, EPS SSR-9 1.44

ESS

ESS 1BC DA1 (Entire Bus)

NOTE

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

Perform FC1 SHUTDOWN (Cue Card), then:
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.25

ESS 1BC MPC1

Perform FC1 SHUTDOWN (Cue Card), then:
Go to MAL, EPS SSR-9 1.26

ESS 1BC FD

NOTE

GPC 1,4 lost if pwr cycled OFF or ON

Perform FC1 SHUTDOWN (Cue Card), then:
Go to MAL, EPS SSR-9 1.27

ESS

ESS 1BC O13&R15

NOTE

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

Go to MAL, EPS SSR-9 1.28

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 or ON

- C3 AUD CTR - 2
Perform FC2 SHUTDN (Cue Card), then:
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.29

ESS 2CA MPC2

Perform FC2 SHUTDN (Cue Card), then:
Go to MAL, EPS SSR-9 1.30

ESS 2CA FD

NOTE

GPC 2,5 lost if pwr cycled OFF or ON

Perform FC2 SHUTDN (Cue Card), then:
Go to MAL, EPS SSR-9 1.31

ESS 2CA O13&R15

NOTE

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

- C3 AUD CTR - 2
Go to MAL, EPS SSR-9 1.32

ESS 3AB DA3 (Entire Bus)

NOTE

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

Perform FC3 SHUTDN (Cue Card), then:
If the calling procedure is complete:
Go to MAL, EPS SSR-9 1.33

ESS 3AB MPC3

Perform FC3 SHUTDN (Cue Card), then:
Go to MAL, EPS SSR-9 1.34

ESS 3AB FD

NOTE

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

Perform FC3 SHUTDN (Cue Card), then:
Go to MAL, EPS SSR-9 1.35

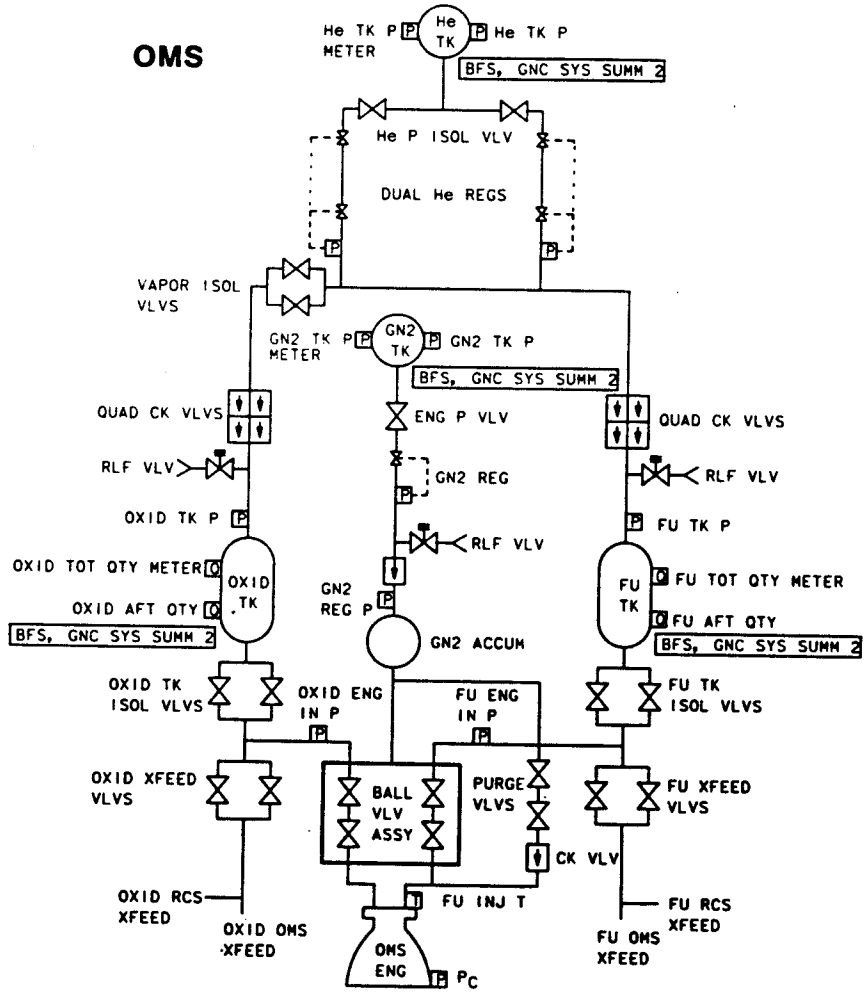
GUIDANCE, NAVIGATION, AND CONTROL

GNC

6-1

OPCL/ALL/GEN C

OMS



DATE 04/09/83

OMS

OMS SECURE

1. OMS ENG (two) - OFF
2. If OMS XFEED config:
Receiving OMS XFEED (two) - CL (tb-CL)
3. Aff OMS XFEED (two) - CL (tb-CL)
TK ISOL (two) - CL (tb-CL)
He PRESS/VAP ISOL (two) - CL

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

1. ✓Aff OMS He PRESS/VAP ISOL (two) - CL
2. L(R) OMS DUAL He REG failed open

XFEED: R OMS to L OMS GNC 23 RCS

NOTE

This procedure is only to be used preburn

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130, continue;
otherwise, ✓MCC >>
5. ✓R OMS TK ISOL (two) - OP (tb-OP)
L OMS TK ISOL (two) - CL (tb-CL)
L,R OMS XFEED B (two) - OP (tb-OP)
6. RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
7. DAP: as reqd

XFEED: L OMS to R OMS GNC 23 RCS

NOTE

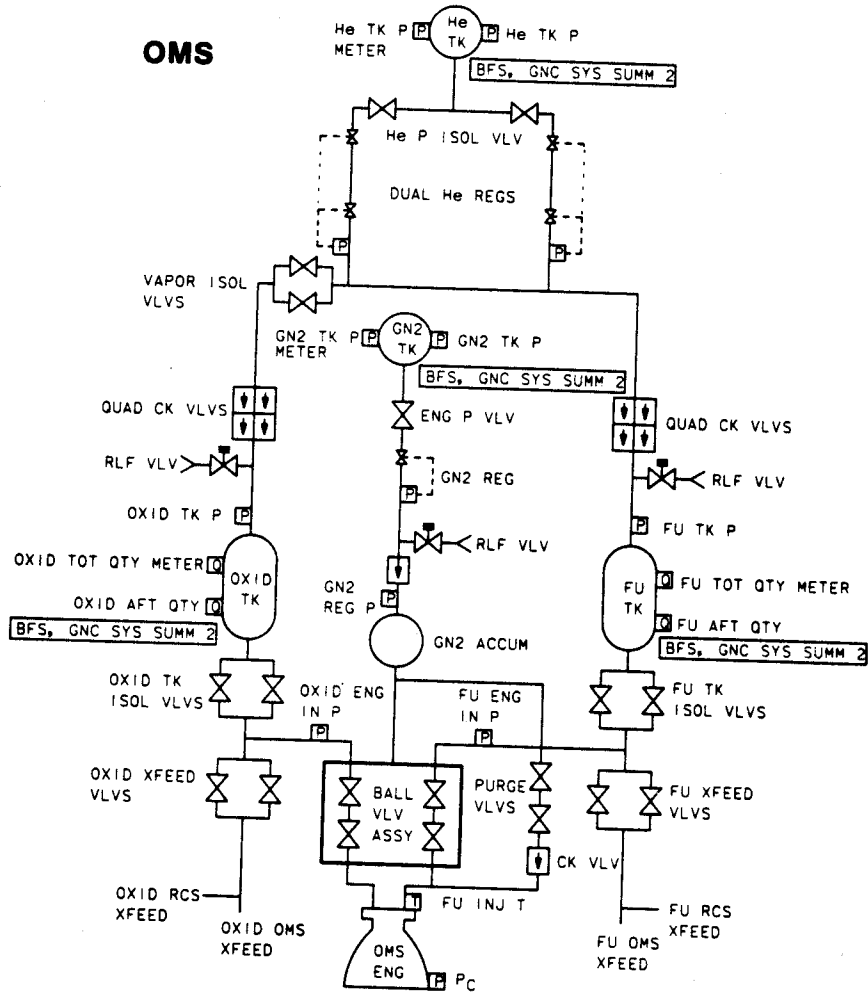
This procedure is only to be used preburn

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130, continue;
otherwise, ✓MCC >>

OMS

Cont next page

OMS



DATE 04/09/83

OMS

01-20

TEMP 7-1

OPCL/ALL/GEN C,17

OMS SECURE

1. OMS ENG (two) - OFF
2. If OMS XFEED config:
Receiving OMS XFEED (two) - CL (tb-CL)
3. (Aff) OMS XFEED (two) - CL (tb-CL)
TK ISOL (two) - CL (tb-CL)
He PRESS/VAP ISOL (two) - CL

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

1. ✓(Aff) OMS He PRESS/VAP ISOL (two) - CL
2. L(R) OMS DUAL He REG failed open

XFEED: R OMS to L OMS GNC 23 RCS

NOTE

This procedure is only to be used preburn

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130, continue;
otherwise, ✓MCC >>
5. ✓R OMS TK ISOL (two) - OP (tb-OP)
L OMS TK ISOL (two) - CL (tb-CL)
L,R OMS XFEED B (two) - OP (tb-OP)
6. RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
7. DAP: as reqd

XFEED: L OMS to R OMS GNC 23 RCS

NOTE

This procedure is only to be used preburn

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130, continue;
otherwise, ✓MCC >>

OMS

Cont next page

OI-20 |

TEMP 7-2

OPCL/ALL/GEN C,17

5. ✓L OMS TK ISOL (two) - OP (tb-OP)
 R OMS TK ISOL (two) - CL (tb-CL)
 L,R OMS XFEED B (two) - OP (tb-OP)
6. RCS XFEED (four) - CL (tb-CL)
 TK ISOL (six) - OP (tb-OP)
7. DAP: as reqd

XFEED RETURN: OMS

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

OMS N2 TK PRESS LOW

IGNC SYS SUMM 2

- ✓TK PRESS < 1200 or decr (meter & CRT):
 If meter and CRT disagree (inst prob):
 | Go to MAL, OMS, 11.1 1.1 >>
 If meter and CRT agree:
 1. ✓Aff OMS ENG - OFF
 2. Go to MAL, OMS, 11.1 1.1

OMS N2 REG PRESS LOW

IGNC SYS SUMM 2

1. ✓OMS ENG (two) - OFF
2. Go to MAL, OMS, 11.1 1.2

OMS N2 REG PRESS HIGH

IGNC SYS SUMM 2

1. ✓OMS ENG (two) - OFF
2. Go to MAL, OMS, 11.1 1.3

OPCL/ALL/GEN C

OMS SECURE/OMS TK P HI
XFEED:R OMS/L OMS 7-3

XFEED RETURN
OMS N2 TK/REG P

OMS TK P (FU or OX) LOW

IGNC SYS SUMM 2

✓With corresp ENG IN P

1. If ENG IN P disagrees:
Go to MAL, OMS, 11.1 11.5 >>

If aff OMS feeding OMS/RCS I'CONNECT:

If both OXID and FU TK P LOW:

2. Aff OMS He PRESS/VAP ISOL A - OP,
Wait 10 sec, then OMS He PRESS/VAP
ISOL A - CL
3. If TK P incr >>

If TK P not incr, aff OMS He PRESS/VAP
ISOL B - OP, Wait 10 sec, then
OMS He PRESS/VAP ISOL B - CL

4. If TK P incr,
| go to step 5
| If TK P still not incr,
| perform I'CONNECT RETURN, RCS, then
5. Go to MAL, OMS, 11.1 11.5 >>

If OXID or FU (not both) TK P LOW:

6. Secure RCS and OMS:
DAP: free drift
L,R RCS MANF ISOL (ten) - CL (tb-CL)
XFEED (four) - CL (tb-CL)
Aff OMS XFEED (two) - CL (tb-CL)
TK ISOL (two) - CL (tb-CL)
He PRESS/VAP ISOL (two) - CL

✓Single MANF (✓MANFP):

7. If leak found, return to desired config
except leave failed MANF closed >>

✓TK Leg (✓two MANFP):

8. If leak found, return to desired config
except leave failed TK ISOL (1/2 or 3/4/5)
MANFs, and corresponding XFEED vlvs closed.
If MANF 3/4/5 Leg leak, Go to LOSS OF
VERNIERS (ORB OPS, RCS) >>

Cont next page

5. ✓L OMS TK ISOL (two) - OP (tb-OP)
 R OMS TK ISOL (two) - CL (tb-CL)
 L,R OMS XFEED B (two) - OP (tb-OP)
6. RCS XFEED (four) - CL (tb-CL)
 TK ISOL (six) - OP (tb-OP)
7. DAP: as reqd

XFEED RETURN: OMS

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

OMS N2 TK PRESS LOW

IGNC SYS SUMM 2

✓TK PRESS < 1200 or decr (meter & CRT):

If meter and CRT disagree (inst prob):

| Go to MAL, OMS, 11.1 1.1 >>

If meter and CRT agree:

1. (Aff) ✓OMS ENG - OFF
2. Go to MAL, OMS, 11.1 1.1

OMS N2 REG PRESS LOW

IGNC SYS SUMM 2

1. ✓OMS ENG (two) - OFF
2. Go to MAL, OMS, 11.1 1.2

OMS N2 REG PRESS HIGH

IGNC SYS SUMM 2

1. ✓OMS ENG (two) - OFF
2. Go to MAL, OMS, 11.1 1.3

OI-20

OPCL/ALL/GEN C,17

OMS SECURE/OMS TK P HI
XFEED:R OMS/L OMS TEMP 7-3

XFEED RETURN
OMS N2 TK/REG P

OMS TK P (FU or OX) LOW

IGNC SYS SUMM 2

1. ✓With corresp ENG IN P
If ENG IN P disagrees:
 2. Go to MAL, OMS, 11.1 1.5 >>
- If aff OMS feeding OMS/RCS I'CNCT:
 - If both OXID and FU TK P LOW:
 3. (Aff) OMS He PRESS/VAP ISOL A - OP
(Wait 10 sec)
OMS He PRESS/VAP ISOL A - CL
 4. If TK P incr >>
 5. If TK P not incr:
 - (Aff) OMS He PRESS/VAP ISOL B - OP
(Wait 10 sec)
OMS He PRESS/VAP ISOL B - CL
 - If TK P incr
 6. Go to step 8
 - If TK P still not incr:
 7. Perform I'CNCT RETURN, RCS, then:
 8. Go to MAL, OMS, 11.1 1.5 >>
 - If OXID or FU (not both) TK P LOW:

Secure RCS and OMS:

 9. DAP: FREE
L,R RCS MANF ISOL (ten) - CL (tb-CL)
XFEED (four) - CL (tb-CL)
(Aff) OMS XFEED (two) - CL (tb-CL)
TK ISOL (two) - CL (tb-CL)
He PRESS/VAP ISOL (two) - CL

✓SINGLE MANF (✓MANF P)

 10. If leak found: Return to desired config except leave (aff) MANF closed >>

✓TK LEG (✓TWO MANF P)

 11. If leak found: Return to desired config except leave (aff) TK ISOL (1/2 or 3/4/5) MANFs, and corresponding XFEED vlvs closed
 12. If MANF 3/4/5 Leg leak: Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

Cont next page

OI-20

TEMP 7-4

OPCL/OI-20/GEN C,16

✓OMS TK and OMS INLET LINE (✓OMS TK P and OMS IN P)

9. If leak found:

- ✓L,R RCS He PRESS A(B) (two) - GPC (tb-OP)
- B(A) (two) - CL (tb-CL)
- TK ISOL (six) - OP (tb-OP)
- MANF ISOL (ten) - OP (tb-OP)

IGNC 23 RCS

OMS PRESS ENA - OFF; ITEM 7 EXEC

DAP: as reqd

If OMS PRPLT TK P decr, go to LEAKING OMS

[PRPLT/He BURN >>

If OMS IN P decr >>

✓XFEED Lines:

- 10. L(R) RCS XFEED 1/2 (one) - OP (tb-OP)
- ✓MANF 1/2 P decr

11. If decr, return to RCS straight feed:

L(R) RCS XFEED 1/2 (one) - CL (tb-CL)

L,R RCS TK ISOLs (six) - OP (tb-OP)

IGNC 23 RCS

OMS PRESS ENA - OFF; ITEM 7 EXEC

L(R) RCS MANF ISOL 1 (one) - OP (tb-OP)

Wait 2 sec, then open remaining nine

MANF ISOLs

Do not XFEED/I'CONNECT >>

If leak not found:

- 12. L(R) RCS XFEED 1/2 (one) - CL (tb-CL)

✓L,R RCS He PRESS A(B) (two) - GPC (tb-OP)

B(A) (two) - CL (tb-CL)

TK ISOL (six) - OP (tb-OP)

MANF ISOL 1,2,3,4 (eight) - OP (tb-OP)

OPCL/ALL/GEN C

OMS TK P (FU or OX) LOW 7-5

IGNC 23 RCS

OMS PRESS ENA - OFF; ITEM 7 EXEC

DAP: as reqd, NORMS only

13. Go to MAL, OMS, 11.1 1.5 >>

If aff OMS not feeding OMS/RCS I'CONNECT:

14. Perform OMS SECURE (Cue Card), then:

15. If OMS PRPLT TK P decr, go to LEAKING

OMS PRPLT/He BURN >>

16. If either OMS IN P decr >>

17. If leak not found:

Go to MAL, OMS, 11.1 1.5

OMS He TK P LOW

IGNC SYS SUMM 2

√He TK P < 1500 or decr abnormal (meter & CRT)

If meter and CRT disagree (inst prob), go to MAL, OMS,
11.1 1.6 >>

1. √OMS He PRESS/VAP ISOL (two) - CL

2. If He TK P still decr:

3. Aff OMS He PRESS/VAP ISOL (two) - OP

4. If not at max blowdown (QTY > 39%), go
to LEAKING OMS PRPLT/He BURN >>

5. If I'connect: Perform I'CONNECT RETURN, RCS

6. If OMS TK P FU/OX decr, go to OMS TK P

(FU or OX) LOW >>

7. If neither decr:

Go to MAL, OMS, 11.1 1.6

OMS TK and OMS INLET LINE (OMS TK P and OMS IN P)

If leak found:

13. ✓L,R RCS He PRESS A(B) (two) - GPC (tb-OP)
 B(A) (two) - CL (tb-CL)
 TK ISOL (six) - OP (tb-OP)
 MANF ISOL (ten) - OP (tb-OP)

IGNC 23 RCS

OMS PRESS ENA OFF - ITEM 7 EXEC

DAP: as reqd

14. If OMS PRPLT TK P decr, go to LEAKING OMS

| PRPLT/He BURN >>

15. If OMS IN P decr >>

✓XFEED LINES

16. L(R) RCS XFEED 1/2 (one) - OP (tb-OP)
 ✓MANF 1/2 P decr

If decr, return to RCS straight feed:

17. L(R) RCS XFEED 1/2 (one) - CL (tb-CL)
 L,R RCS TK ISOLs (six) - OP (tb-OP)

IGNC 23 RCS

OMS PRESS ENA OFF - ITEM 7 EXEC

L(R) RCS MANF ISOL 1 (one) - OP (tb-OP)

Wait 2 sec, then open remaining nine

MANF ISOLs

Do not XFEED/I'CNCT >>

If leak not found:

18. L(R) RCS XFEED 1/2 (one) - CL(tb-CL)
 ✓L,R RCS He PRESS A(B) (two) - GPC
 (tb-OP)
 B(A) (two) - CL
 (tb-CL)
 TK ISOL (six) - OP (tb-OP)
 MANF ISOL 1,2,3,4 (eight) -
 OP (tb-OP)

IGNC 23 RCS

OMS PRESS ENA OFF - ITEM 7 EXEC

DAP: as reqd, PRI only

19. Go to MAL OMS, 11.1 1.5 >>

Cont next page

OI-20

OPCL/OI-20/GEN C,16

OMS TK P (FU or OX) LOW TEMP 7-5

- If aff OMS not feeding OMS/RCS I'CNCT:
20. Perform OMS SECURE (Cue Card), then:
 21. If OMS PRPLT TK P decr, go to LEAKING
OMS PRPLT/He BURN >>
 22. If either OMS IN P decr >>
If leak not found:
 23. Go to MAL, OMS, 11.1 11.5

OMS He TK P LOW

IGNC SYS SUMM 21

1. ✓He TK P < 1500 or decr abnormal (meter & CRT)
 2. If meter and CRT disagree (inst prob), go to
MAL, OMS, 11.1 11.6 >>
 3. ✓OMS He PRESS/VAP ISOL (two) - CL
- If He TK P still decr:
4. (Aff) OMS He PRESS/VAP ISOL (two) - OP
 5. If not at max blowdown (QTY > 39%), go
to LEAKING OMS PRPLT/He BURN >>
 6. If I'cnct: Perform I'CNCT RETURN, RCS
- If OMS TK P FU/OX decr:
7. Go to OMS TK P (FU or OX) LOW >>
- If neither decr:
8. Go to MAL, OMS, 11.1 11.6

TEMP 7-6

01-20
OPCL/ALL/GEN C,17

LEAKING OMS PRPLT/He BURN

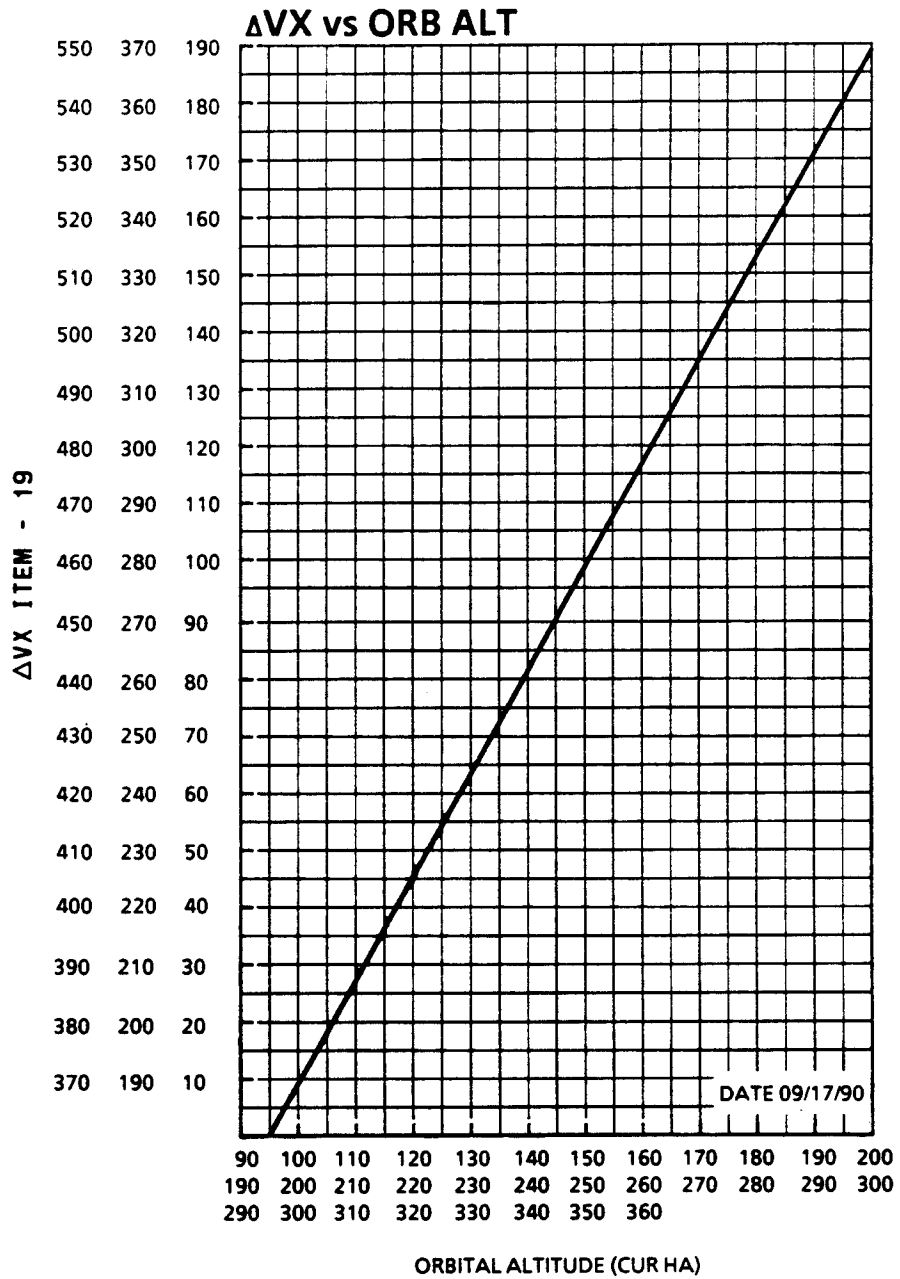
1. Install LEAKING OMS PRPLT/He BURN Cue Card and ON-ORBIT OMS BURN MONITOR Cue Card (C2 WEDGE)
 2. GNC, OPS 202 PRO
 3. IGNC XXXXX MNVR EXEC leaking OMS - sel, and determine out of plane or retrograde burn based on TIG (MCC or msg)
 4. GMBL CK sel sys
 5. Enter retrograde ($-\Delta V_X$) or out of plane (ΔV_Y) burn data on LEAKING OMS PRPLT/He BURN Cue Card from ΔV_X vs ORB ALT chart or LEAKING OMS He ΔV TABLE. If out of plane PRPLT LK burn, enter $\Delta V_Y \pm 500$
 6. Load burn data
LOAD - ITEM 22 EXEC (\sqrt{TGT} HP)
TIMER - ITEM 23 EXEC
- If OPS 2:
7. \sqrt{Pri} RJDs (eight) - ON
DAP: A(B)/AUTO/NORM
DAP TRANS: NORM/NORM/NORM
- If OPS 3: IGNC 23 RCS
8. L1A or L3A - dese1 (N/A He leak)
R1A or R3A - dese1
 9. Mnvr to burn att. When mnvr complete, update TIG if appropriate
- At TIG-4, perform OMS burn prep:
10. Leaking OMS TK ISOL (two) - OP (tb-OP)
 \sqrt{XFEED} (four) - CL (tb-CL)
He PRESS/VAP ISOL A - OP
wait 2 sec ... B - OP
 11. Perform burn using LEAKING OMS PRPLT/He BURN Cue Card, then postburn:
- If OPS 3:
12. IGNC 23 RCS
AFT jets - rese1 (N/A He leak)
 13. FLT CNTLR PWR (two) - OFF
 14. Aff OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - CL (tb-CL)
 15. GNC, OPS 201 PRO

OPCL/ALL/GEN C

OMS He TK P LOW

7-7

LK PRPLT BURN
 ΔV_X vs ORB ALT (Over)



LEAKING OMS PRPLT/He BURN

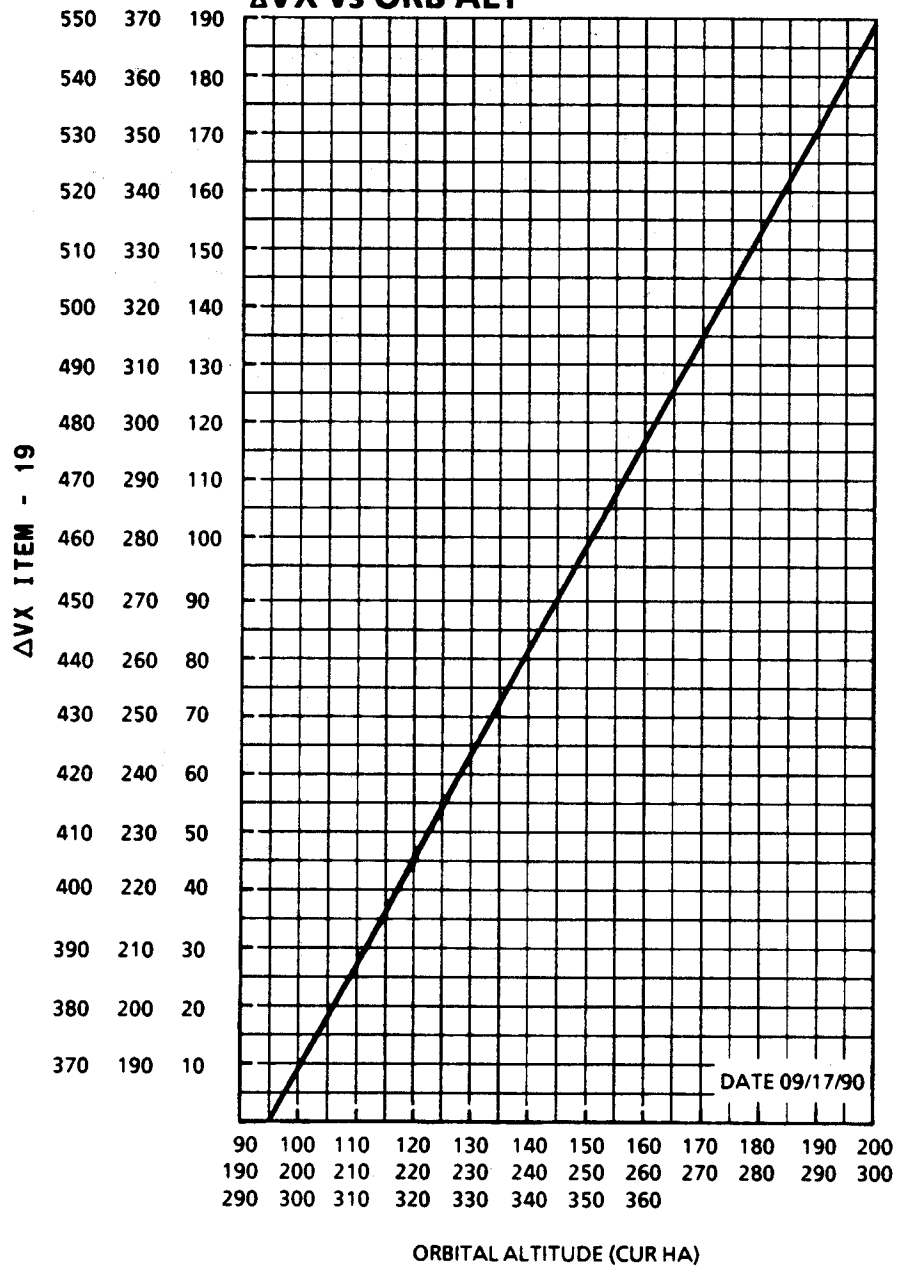
1. Install LEAKING OMS PRPLT/He BURN Cue Card and ON-ORBIT OMS BURN MONITOR Cue Card (C2 WEDGE)
 2. GNC, OPS 202 PRO
 3. IGNC XXXXX MNVR EXECI leaking OMS - sel, and determine out-of-plane or retrograde burn based on TIG (MCC or msg)
 4. GMBL CK sel sys
 5. Enter retrograde ($-\Delta VX$) or out-of-plane (ΔVY) burn data on LEAKING OMS PRPLT/He BURN Cue Card from ΔVX vs ORB ALT chart or LEAKING OMS He ΔV TABLE. If out-of-plane PRPLT LK burn, enter $\Delta VY \pm 500$
 6. Load burn data
LOAD - ITEM 22 EXEC (\checkmark TGT HP)
TIMER - ITEM 23 EXEC
- If OPS 2:
7. \checkmark Pri RJDs (eight) - ON
DAP: A(B)/AUTO/PRI
DAP TRANS: NORM/NORM/NORM
- If OPS 3: IGNC 23 RCSI
8. L1A or L3A - dese1 (N/A He leak)
R1A or R3A - dese1
 9. Mnvr to burn att. When mnvr complete, update TIG if appropriate
- At TIG-4, perform OMS burn prep:
10. Leaking OMS TK ISOL (two) - OP (tb-OP)
 \checkmark XFEED (four) - CL (tb-CL)
He PRESS/VAP ISOL A - OP
(wait 2 sec), B - OP
 11. Perform burn using LEAKING OMS PRPLT/He BURN Cue Card, then postburn:
- If OPS 3:
12. IGNC 23 RCSI
AFT jets - rese1 (N/A He leak)
 13. FLT CNTLR PWR (two) - OFF
 14. (Aff) OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - CL (tb-CL)
 15. GNC, OPS 201 PRO

OI-20

OPCL/OI-20/GEN C,16

**OMS He TK P LOW TEMP 7-7 LK PRPLT BURN
 ΔVX vs ORB ALT (Over)**

ΔVX vs ORB ALT



OI-20

TEMP 7-8

OPCL/ALL/GEN C,17

LEAKING OMS He ΔV TABLE

1. Pick ΔV from table to achieve MAX BLOWDOWN

Affected OMS % (QTY)	ΔV
95	352
90	320
85	289
80	257
75	226
70	195
65	164
60	133
55	102
50	71
45	40
40	10

If retrograde burn:

2. $\sqrt{\Delta V X}$ vs. ORB ALT

If ΔV from table $<$ $\Delta V X$ from chart:

3. Use $\Delta V X$ from table (Hp will be above 95 nm) $>>$

If ΔV from table $>$ $\Delta V X$ from chart:

4. Use $\Delta V X$ from chart to take Hp to 95 nm, then repeat procedure to burn out-of-plane to achieve max blowdown (39%)

LEAKING OMS He ΔV TABLE

1. Pick ΔV from table to achieve MAX BLOWDOWN

Affected OMS % (QTY)	ΔV
95	352
90	320
85	289
80	257
75	226
70	195
65	164
60	133
55	102
50	71
45	40
40	10

If retrograde burn:

2. ΔV vs. ORB ALT

If ΔV from table < ΔV from chart:

3. Use ΔV from table (Hp will be above 95 nm) >>

If ΔV from table > ΔV from chart:

4. Use ΔV from chart to take Hp to 95 nm, then repeat procedure to burn out-of-plane to achieve max blowdown (39%)

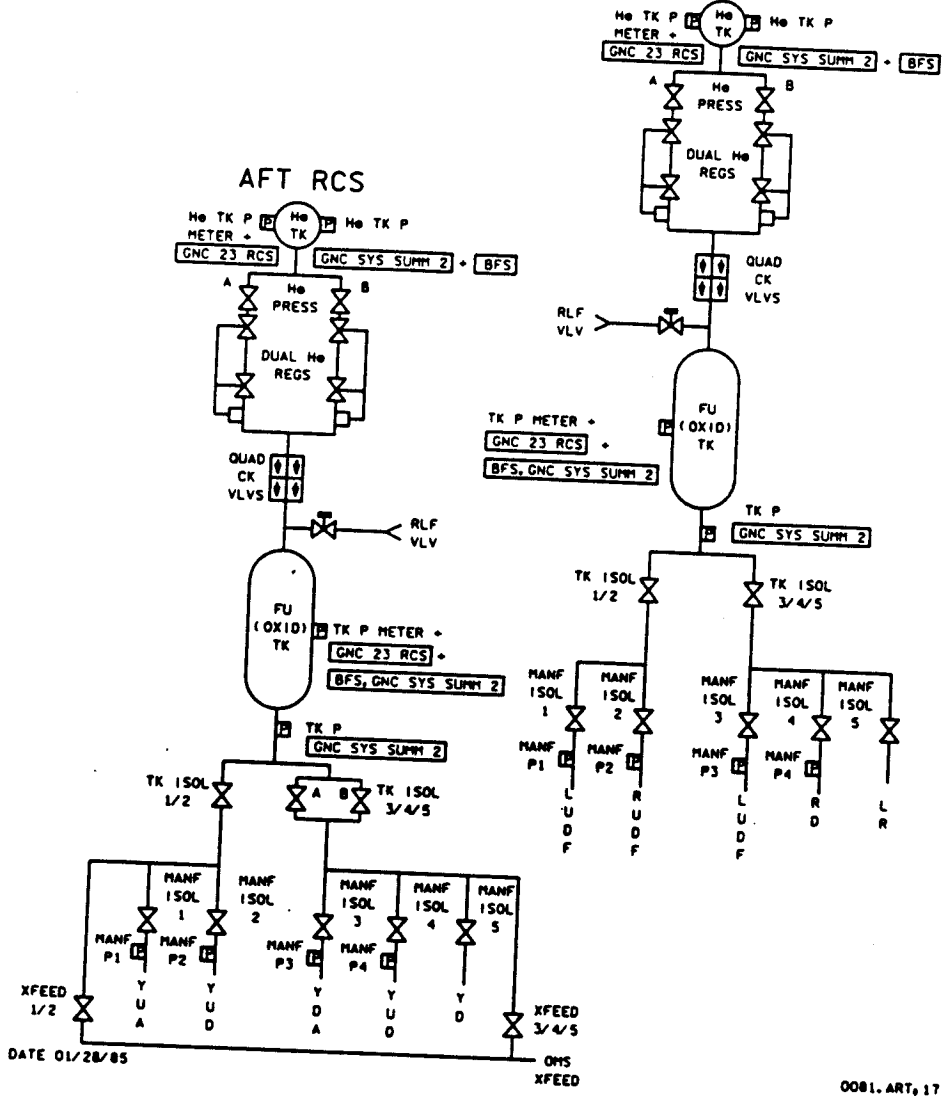
OI-20 |

TEMP 7-9

OPCL/ALL/GEN C,17

RCS

FWD 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) >>

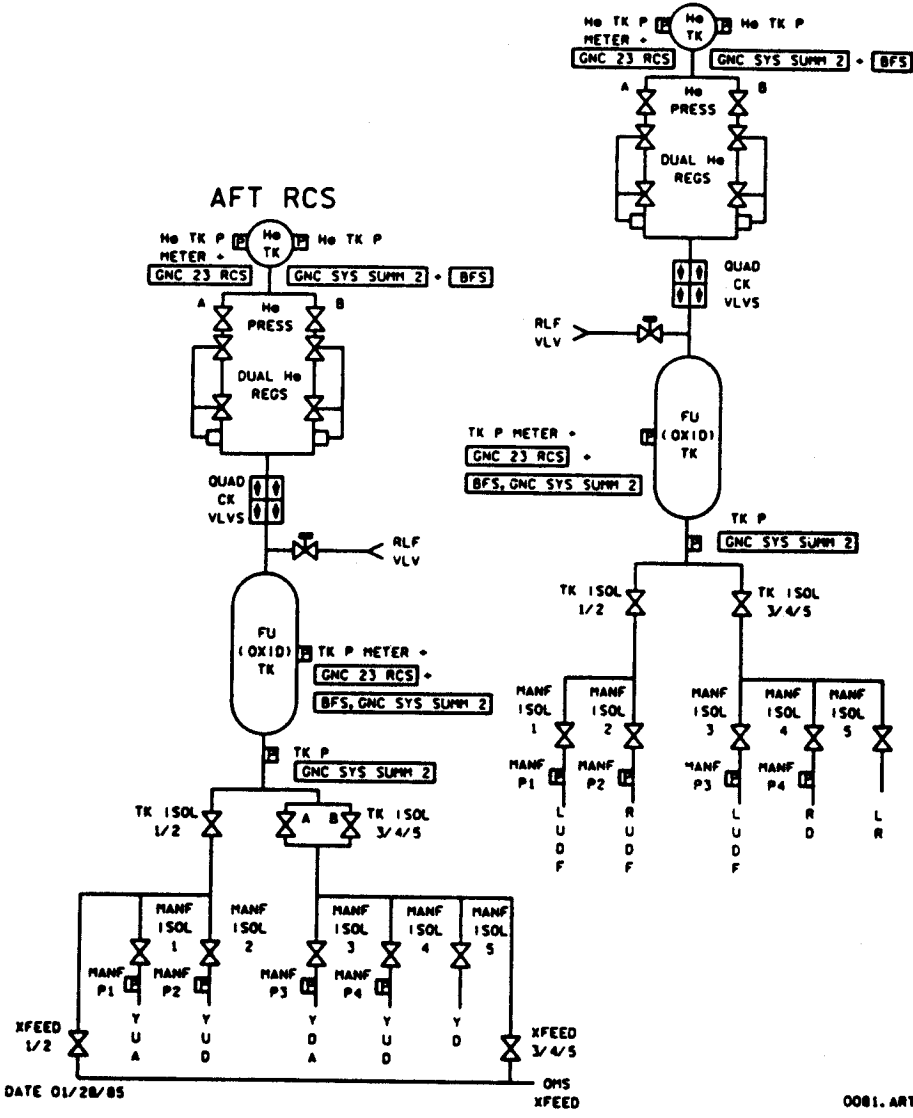
If receiving XFEED or OMS/RCS I'CONNECT:

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

RCS

RCS

FWD RCS



TEMP 8-1

01-20 |
OPCL/ALL/GEN C,17

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)

RCS

TEMP 8-2

01-20 |
OPCL/ALL/GEN C,17

I'CONNECT: L OMS to RCS

IGNC 23 RCS

1. DAP: free drift
2. L,R RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
3. If RCS MANF P(OX and FU) > 130 continue;
otherwise, check with MCC and >>
4. ✓L OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - OP (tb-OP)
✓R OMS XFEED (two) - CL (tb-CL)
L OMS XFEED A - CL (tb-CL)
B - OP (tb-OP)
5. OMS PRESS ENA, L OMS - ITEM 5 EXEC
6. DAP: as reqd

NOTE

Gauging not avail in OPS 3

I'CONNECT: R OMS to RCS

IGNC 23 RCS

1. DAP: free drift
2. L,R RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
3. If RCS MANF P(OX and FU) > 130 continue;
otherwise, check with MCC and >>
4. ✓R OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - OP (tb-OP)
✓L OMS XFEED (two) - CL (tb-CL)
R OMS XFEED A - CL (tb-CL)
B - OP (tb-OP)
5. OMS PRESS ENA, R OMS - ITEM 6 EXEC
6. DAP: as reqd

NOTE

Gauging not avail in OPS 3

OPCL/ALL/GEN C

RCS SECURE

8-3

I'CONNECT: OMS to RCS

**I'CONNECT SWITCH:
From L to R OMS FEED**

IGNC 23 RCSI

1. DAP: free drift
2. L OMS XFEED B - CL (tb-CL)
R OMS XFEED B - OP (tb-OP)
3. OMS PRESS ENA, OFF - ITEM 7 EXEC
R OMS - ITEM 6 EXEC
4. DAP: as reqd

**I'CONNECT SWITCH:
From R to L OMS FEED**

IGNC 23 RCSI

1. DAP: free drift
2. R OMS XFEED B - CL (tb-CL)
L OMS XFEED B - OP (tb-OP)
3. OMS PRESS ENA, OFF - ITEM 7 EXEC
L OMS - ITEM 5 EXEC
4. DAP: as reqd

I'CONNECT RETURN (OPS 2,3)

IGNC 23 RCSI

1. DAP: free drift
2. OMS PRESS ENA, OFF - ITEM 7 EXEC
3. ✓ OMS TK ISOL (four) - OP (tb-OP)
XFEED (four) - CL (tb-CL)
4. L,R RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
5. DAP: as reqd

I'CNCT: L OMS to RCS

IGNC 23 RCS

1. DAP: FREE
2. L,R RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
3. If RCS MANF P(OX and FU) > 130 continue;
otherwise, √MCC and >>
4. √L OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - OP (tb-OP)
√R OMS XFEED (two) - CL (tb-CL)
L OMS XFEED A - CL (tb-CL)
B - OP (tb-OP)
5. OMS PRESS ENA L OMS - ITEM 5 EXEC
6. DAP: as reqd

NOTE

Gauging not avail in OPS 3

I'CNCT: R OMS to RCS

IGNC 23 RCS

1. DAP: FREE
2. L,R RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
3. If RCS MANF P(OX and FU) > 130 continue;
otherwise, √MCC and >>
4. √R OMS He PRESS/VAP ISOL (two) - CL
TK ISOL (two) - OP (tb-OP)
√L OMS XFEED (two) - CL (tb-CL)
R OMS XFEED A - CL (tb-CL)
B - OP (tb-OP)
5. OMS PRESS ENA R OMS - ITEM 6 EXEC
6. DAP: as reqd

NOTE

Gauging not avail in OPS 3

OI-20

OPCL/OI-20/GEN C,16

RCS SECURE

TEMP 8-3

I'CNCT: OMS to RCS

**I'CNCT TK SWITCH:
From L to R OMS FEED**

GNC 23 RCS

1. DAP: FREE
2. L OMS XFEED B - CL (tb-CL)
R OMS XFEED B - OP (tb-OP)
3. OMS PRESS ENA OFF - ITEM 7 EXEC
R OMS - ITEM 6 EXEC
4. DAP: as reqd

**I'CNCT TK SWITCH:
From R to L OMS FEED**

GNC 23 RCS

1. DAP: FREE
2. R OMS XFEED B - CL (tb-CL)
L OMS XFEED B - OP (tb-OP)
3. OMS PRESS ENA OFF - ITEM 7 EXEC
L OMS - ITEM 5 EXEC
4. DAP: as reqd

I'CNCT RETURN (OPS 2,3)

GNC 23 RCS

1. DAP: free drift
2. OMS PRESS ENA OFF - ITEM 7 EXEC
3. ✓ OMS TK ISOL (four) - OP (tb-OP)
XFEED (four) - CL (tb-CL)
4. L,R RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
5. DAP: as reqd

OI-20

TEMP 8-4

OPCL/OI-20/GEN C,17

XFEED: R RCS to L RCS

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130,
continue; Otherwise, ✓MCC >>
5. R RCS
✓He PRESS A(B) - GPC (tb-OP)
✓B(A) - CL (tb-CL)
TK ISOL (three) - OP (tb-OP)
6. MSTR RCS XFEED - FEED FROM R
7. DAP: as reqd

XFEED: L RCS to R RCS

1. DAP: free drift
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130,
continue; otherwise, ✓MCC >>
5. L RCS
✓He PRESS A(B) - GPC (tb-OP)
✓B(A) - CL (tb-CL)
TK ISOL (three) - OP (tb-OP)
6. MSTR RCS XFEED - FEED FROM L
7. DAP: as reqd

XFEED RETURN: RCS

1. DAP: free drift
2. MSTR RCS XFEED - OFF
3. AFT L,R RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
✓He PRESS A(B) (two) - GPC (tb-OP)
✓B(A) (two) - CL (tb-CL)
4. DAP: as reqd

OPCL/ALL/GEN C

I'CNECT SW
I'CNECT RETURN

8-5

XFEED: RCS to RCS
XFEED RETURN

RCS RM LOSS

IGNC 23 RCS

If vernier jets:

If loss of FAIL OFF detection:

1. Resel >>

If BCE BYP (B or D), MDM fail, or loss of LK detection:

If only L5L and/or R5R aff:

2. Desel aff jet >>

If any Down Firing Vernier aff:

3. Aff MANF 5 - CL (tb-CL)
4. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

If primary jets:

If loss of FAIL OFF or LK detection:

5. If att control still avail, desel aff jet(s)
6. DES INH twice (reprioritize, reset RM)
7. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS) >>

If loss of FAIL ON detection:

8. If att control still avail, ovrđ STAT closed for all MANFs on aff RJD and aff RJD - OFF
9. DES INH twice (reprioritize, reset RM)
10. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS) >>

If BCE BYP (B or D), or MDM fail:

11. If att control still avail, leave STAT closed for all MANFs on aff RJD and aff RJD - OFF
12. DES INH twice (reprioritize, reset RM)
13. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS)

RM DLMA MANF

1. Aff MANF - GPC
Go to MAL, RCS, 10.1 1.17

XFEED: R RCS to L RCS

1. DAP: FREE
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130,
continue; Otherwise, ✓MCC >>
5. R RCS
✓He PRESS A(B) - GPC (tb-OP)
✓B(A) - CL (tb-CL)
TK ISOL (three) - OP (tb-OP)
6. MSTR RCS XFEED - FEED FROM R
7. DAP: as reqd

XFEED: L RCS to R RCS

1. DAP: FREE
2. ✓L,R OMS XFEED (four) - CL (tb-CL)
3. RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
4. If RCS MANF P (OX and FU) > 130,
continue; otherwise, ✓MCC >>
5. L RCS
✓He PRESS A(B) - GPC (tb-OP)
✓B(A) - CL (tb-CL)
TK ISOL (three) - OP (tb-OP)
6. MSTR RCS XFEED - FEED FROM L
7. DAP: as reqd

XFEED RETURN: RCS

1. DAP: FREE
2. MSTR RCS XFEED - OFF
3. AFT L,R RCS XFEED (four) - CL (tb-CL)
TK ISOL (six) - OP (tb-OP)
✓He PRESS A(B) (two) - GPC (tb-OP)
✓B(A) (two) - CL (tb-CL)
4. DAP: as reqd

I'CNCT SW
I'CNCT RETURN

TEMP 8-5

01-20

OPCL/OI-20/GEN C,16
XFEED: RCS to RCS
XFEED RETURN

RCS RM LOSS

IGNC 23 RCS

If vernier jets:

If loss of FAIL OFF detection:

1. Resel >>

If BCE BYP (B or D), MDM fail, or loss of LK detection:

If only L5L and/or R5R aff:

2. Desel aff jet >>

If any Down Firing Vernier aff:

3. (Aff) MANF 5 - CL (tb-CL)

4. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

If primary jets:

If loss of FAIL OFF or LK detection:

5. If att control still avail, desel aff jet(s)

6. DES INH twice (reprioritize, reset RM)

7. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS) >>

If loss of FAIL ON detection:

8. If att control still avail, ovrd STAT closed for all MANFs on aff RJD and aff RJD - OFF

9. DES INH twice (reprioritize, reset RM)

10. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS) >>

If BCE BYP (B or D), or MDM fail:

11. If att control still avail, leave STAT closed for all MANFs on aff RJD and aff RJD - OFF

12. DES INH twice (reprioritize, reset RM)

13. At seat ingress, go to AFT(FWD) RCS RM LOSS (ENT PKT, RCS)

RM DLMA MANF

1. (Aff) MANF - GPC

2. Go to MAL, RCS, 10.1 1.17

01-20

TEMP 8-6

OPCL/ALL/GEN C,17

RCS TK P LOW (FU or OX)

IGNC SYS SUMM 2

✓FU(OX) He P (CRT & METER)

If decr:

1. Go to RCS LEAK ISOL, step 1 >>

If not decr:

2. Aff RCS He PRESS A(B) - CL (tb-CL)
B(A) - OP (tb-OP), then
GPC (tb-OP)

3. Go to MAL, RCS, 10.1 1.5

RCS TK P HIGH (FU or OX)

IGNC 23 RCS

1. Aff RCS He PRESS (two) - CL (tb-CL)

2. Go to MAL, RCS, 10.1 1.6

RCS JET FAIL (ON)

IGNC 23 RCS

1. Aff MANF ISOL - CL (tb-CL)

2. Go to MAL, RCS, 10.1 1.1

RCS JET FAIL (LEAK)

IGNC 23 RCS

If RCS FU and OX qty diverging:

1. Aff MANF ISOL - CL (tb-CL)

2. Go to MAL, RCS, 10.1 1.2

RCS JET FAIL (OFF)

IGNC 23 RCS

1. Go to MAL, RCS, 10.1 1.3

OPCL/ALL/GEN C

**RCS RM LOSS
RM DLMA MANF**

8-7

**RCS TK P (FU or OX)
RCS JET FAIL**

RCS LEAK ISOL

IGNC SYS SUMM 2

If FU or OX TK P high:

1. Go to RCS TK P (FU or OX) HIGH >>

If FU or OX TK P normal:

2. ✓FU(OX) He P (CRT and meter) decr
3. DAP: free drift

After procedure complete:

4. If not LOSS OF VERNIS, DAP as reqd

Secure RCS

5. Perform aff RCS SECURE, then:
If aff RCS receiving XFEED/I'CNCT:
6. Go to step 10

✓Single MANF

If only one MANF P decr:

7. Return to normal config except leave leaking
MANF closed >>

✓PRPLT TK leg (two MANF P)

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

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

If MANF 3/4/5 decr:

9. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

Cont next page

RCS TK P LOW (FU or OX)

IGNC SYS SUMM 2

1. ✓FU(OX) He P (CRT & METER)

If decr:

2. Go to RCS LEAK ISOL, step 1 >>

If not decr:

3. (Aff) RCS He PRESS A(B) - CL (tb-CL)
B(A) - OP (tb-OP),
GPC (tb-OP)
4. Go to MAL, RCS, 10.1 1.5

RCS TK P HIGH (FU or OX)

IGNC 23 RCS

1. (Aff) RCS He PRESS (two) - CL (tb-CL)
2. Go to MAL, RCS, 10.1 1.6

RCS JET FAIL (ON)

IGNC 23 RCS

1. (Aff) MANF ISOL - CL (tb-CL)
2. Go to MAL, RCS, 10.1 1.1

RCS JET FAIL (LEAK)

IGNC 23 RCS

If RCS FU and OX qty diverging:

1. (Aff) MANF ISOL - CL (tb-CL)
2. Go to MAL, RCS, 10.1 1.2

RCS JET FAIL (OFF)

IGNC 23 RCS

1. Go to MAL, RCS, 10.1 1.3

**RCS RM LOSS
RM DLMA MANF**

TEMP 8-7

01-20
OPCL/ALL/GEN C,17
**RCS TK P (FU or OX)
RCS JET FAIL**

RCS LEAK ISOL

IGNC SYS SUMM 21

If FU or OX TK P high:

1. Go to RCS TK P HIGH (FU or OX) >>

If FU or OX TK P normal:

2. ✓FU(OX) He P (CRT and meter) decr

3. DAP: FREE

After procedure complete:

4. If not LOSS OF VERNIS, DAP: as reqd

SECURE RCS

5. Perform aff RCS SECURE, then:

If aff RCS receiving XFEED/I'CNCT:

6. Go to step 10

✓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 MAN 3,4 P decr:

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

If MANF 3/4/5 decr:

9. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

Cont next page

OI-20 |

TEMP 8-8

OPCL/OI-20/GEN C,16

✓He TK

10. If He P decr:
 11. ✓MCC for use of LEAKING RCS PRPLT/He BURN, MAL, RCS SSR-5
- If no COMM or burn not performed:
- If AFT RCS:
12. Perform XFEED from leaking RCS, then:
When He TK P < 456:
 13. Go to I'CNCT: L(R) OMS to RCS >>
- If FWD RCS:
14. Return to normal config
When He TK P < 456:
 15. FWD RCS He PRESS (two) - CL (tb-CL)
When PRPLT TK P < 190:
 16. Perform RCS SECURE (FWD), then:
 17. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>
- If burn performed:
- If AFT RCS >>
- If FWD RCS:
- When PRPLT TK P < 190:
 18. Perform RCS SECURE (FWD), then:
 19. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

✓PRPLT TK

- If PRPLT TK P decr:
20. Perform LEAKING RCS PRPLT/He BURN (MAL, RCS SSR-5) >>

✓He Leg

21. (Aff) He PRESS A,B - OP (tb-OP)
- If He P decr:
- If AFT RCS:
22. (Aff) He PRESS A,B - CL (tb-CL)
 23. Perform I'CNCT: L(R) OMS to RCS, then:
 24. (Aff) MANFs (all) - OP (tb-OP)
- Prior to deorb TIG:
25. Return to RCS straight feed
 26. (Aff) He PRESS A,B - CL (tb-CL)
Cycle He PRESS A(B) to maintain PRPLT TK
P 200-245, repress to 245 at C&W limit
(200 psia)

Cont next page OPCL/ALL/GEN C,14

RCS LK ISOL

8-9

When He TK P < 456:

27. Perform I'CNCT: L(R) OMS to RCS,
then:

At EI:

28. Perform XFEED: L(R) RCS to R(L) RCS

>>

If FWD RCS:

29. Return to normal config

30. (Aff) He PRESS A,B - CL (tb-CL)

Cycle He PRESS A(B) to maintain PRPLT TK P

200-245, repress to 245 at C&W limit (200 psia)

When He TK P < 456:

IGNC 23 RCS

31. Ovrdr FWD MANFs STAT - CL

32. Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:

Prior to deorb:

33. Ovrdr FWD MANFs STAT - OP

When He TK P < 190:

34. Go to RCS SECURE >>

If XFEED, \sqrt{XFEED} lines ($\sqrt{L(R)}$ RCS MANF 1,2 P)

35. L(R) RCS XFEED 1/2 - OP (tb-OP)

If L(R) MANF 1,2 P decr:

36. L(R) RCS XFEED 1/2 - CL (tb-CL)

TK ISOL 1/2 - OP (tb-OP)

MANF ISOL 1 - OP (tb-OP)

37. Wait 2 sec, then remaining MANF ISOL - OP

(tb-OP)

38. Complete return to straight feed

39. Do not XFEED/I'CNCT >>

$\sqrt{MANF 5}$

If leak not found above:

40. Reconfig system as reqd

41. (Aff) MANF ISOL 5 (two) - CL, then

- GPC (tb-CL)

42. Perform LOSS OF VERNIERS (ORB OPS, RCS),

then:

43. Go to MAL, RCS, 10.1 1.4

✓He TK

10. If He P decr:
 11. ✓MCC for use of LEAKING RCS PRPLT/He BURN, MAL, RCS SSR-5
- If no COMM or burn not performed:
- If AFT RCS:
12. Perform XFEED from leaking RCS, then:
When He TK P < 456:
 13. Go to I'CNCT: L(R) OMS to RCS >>
- If FWD RCS:
14. Return to normal config
When He TK P < 456:
 15. FWD RCS He PRESS (two) - CL (tb-CL)
When PRPLT TK P < 190:
 16. Perform RCS SECURE (FWD), then:
 17. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>
- If burn performed:
- If AFT RCS >>
- If FWD RCS:
- When PRPLT TK P < 190:
 18. Perform RCS SECURE (FWD), then:
 19. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

✓PRPLT TK

- If PRPLT TK P decr:
20. Perform LEAKING RCS PRPLT/He BURN (MAL, RCS SSR-5) >>

✓He Leg

21. (Aff) He PRESS A,B - OP (tb-OP)
- If He P decr:
- If AFT RCS:
22. (Aff) He PRESS A,B - CL (tb-CL)
 23. Perform I'CNCT: L(R) OMS to RCS, then:
 24. (Aff) MANFs (all) - OP (tb-OP)
- Prior to deorb TIG:
25. Return to RCS straight feed
 26. (Aff) He PRESS A,B - CL (tb-CL)
- Cycle He PRESS A(B) to maintain PRPLT TK P 200-245, repress to 245 at C&W limit (200 psia)

01-20

Cont next page

OPCL/ALL/GEN C,17

RCS LK ISOL

TEMP 8-9

When He TK P < 456:

27. Perform I'CNCT: L(R) OMS to RCS,
then:

At EI:

28. Perform XFEED: L(R) RCS to R(L) RCS

>>

If FWD RCS:

29. Return to normal config

30. (Aff) He PRESS A,B - CL (tb-CL)

Cycle He PRESS A(B) to maintain PRPLT TK P

200-245, repress to 245 at C&W limit (200 psia)

When He TK P < 456:

GNC 23 RCS

31. Ovrdr FWD MANFs STAT - CL

32. Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:

Prior to deorb:

33. Ovrdr FWD MANFs STAT - OP

When He TK P < 190:

34. Go to RCS SECURE >>

If XFEED, ✓XFEED lines (✓L(R) RCS MANF 1,2 P)

35. L(R) RCS XFEED 1/2 - OP (tb-OP)

If L(R) MANF 1,2 P decr:

36. L(R) RCS XFEED 1/2 - CL (tb-CL)

TK ISOL 1/2 - OP (tb-OP)

MANF ISOL 1 - OP (tb-OP)

37. Wait 2 sec, then remaining MANF ISOL - OP

(tb-OP)

38. Complete return to straight feed

39. Do not XFEED/I'CNCT >>

✓MANF 5

If leak not found above:

40. Reconfig system as reqd

41. (Aff) MANF ISOL 5 (two) - CL, then

- GPC (tb-CL)

42. Perform LOSS OF VERNIERS (ORB OPS, RCS),
then:

43. Go to MAL, RCS, 10.1 I.4

OI-20

TEMP 8-10

OPCL/ALL/GEN C,17

MPS

MAIN PROPULSION SYSTEM

9-1

OPCL/ALL/GEN C

MPS C/W

MPS

1. MPS PNEU He ISOL - OP
2. PRPLT FILL/DRAIN LH2 OUTBD - OP
LO2 OUTBD - OP
3. CDR INST PWR - FLT/MPS
4. Go to MAL, MPS, 12.1 1.1

PWRDN

LOSS OF 2 CAB FANS.....	10-2
2 H2O LOOPS (CONUS TIG < 2.5 hr).TEMP	10-7
(CONUS TIG > 2.5 hr).....	10-21
CAB PRESS.....TEMP	10-33
HI LOAD EVAP.....	10-39
1 FREON LOOP.....	10-41
1 FC.....	10-45
2nd FC ON-ORBIT (TIG < 4 hr)TEMP	10-47
(TIG > 4 hr)TEMP	10-51
2 FREON LOOPS.....	10-55
FES.....	10-75
AV BAY FIRE.....	10-79
PL PWRDN.....TEMP	10-87

PWRDN

LOSS OF 2 CAB FANS

PWRDN

MS1,2 1. Perform MS PWRDN on 10-5, ASAP

NOTE

Normal CO2 removal and humidity control is lost. Wipe off any visible moisture with towel.

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

C3 2. MSTR MADS PWR - OFF

3. Minimize ltg

C2 4. CRT1,2,3 PWR (three) - OFF

F6,F8 5. ✓INST PWR (two) - OFF

F7,F8 6. ✓FLT CNTLR PWR (two) - OFF

If FLT CNTLR PWR not reqd:

014,015, 7. cb DDU L,R,AFT (six) - op

016:E

L1 8. CAB FAN A,B (two) - OFF

TEMP CNTLR - OFF

9. HUMIDITY SEP A,B (two) - OFF

10. Use one SPOC

W1-10 11. Install Window Shades or mnvr to tail sun att

GNC UNIV PTG

TGT ID - ITEM 8 +4 EXEC

BODY VECT - ITEM 14 +5 EXEC

P - ITEM 15 +184 EXEC

Y - ITEM 16 +0 EXEC

OM - blank (MCC-provided if reqd)

DAP: A/AUTO/VERN

START TRK - ITEM 19 EXEC

12. Minimize CRT ON time. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF for every 1 min ON (1 hr max ON time). Save 1 FWD CRT for entry. Use CRT 4 if possible

Cont next page

NOTE

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity.

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

13. Go to LOSS OF 2 CAB FANS (DEORB PREP, CONTINGENCY DELTAS) and perform at next PLS opportunity. Expedite NOMINAL DEORBIT PREP procedure if time-to-TIG < 3.5 hr

MS PULLOUT PAGE

MS1: Perform PLB EQUIP PWRDN (10-6)
MS2: Perform MS PWRDN ASAP

MS PWRDN

1. Minimize ltg
- 014:B 2. cb MNA EVENT TIMER AFT - op
:C SMOKE DETN L/R FLT DK - op
- 015:B 3. MNB OI H2O BYP LOOP 2 SNSR - op
MSN TIMER AFT - op
- 016:C 4. MNC SMOKE DETN CAB - op
- L4:J 5. AC3 Φ A SIG CONDR HUM SEP - op
- A6U 6. ANNUN BUS SEL - OFF
- A13 7. OS AUD SPKR PWR - OFF
- Food Warmer - OFF or, if GALLEY installed: |
- GALLEY 8. DC PWR BUS A,B (two) - OFF
- MA73C:G 9. cb AC3 GALLEY FAN (three) - op
- ML86B:B 10. cb MNA GALLEY OVEN - op
MNB GALLEY H2O HTR - OFF
- If RMS powered down:
- A3 11. MON 1,2 PWR (two) - OFF
- A7U 12. TV PWR CNTL - PNL
CONTR UNIT - OFF
- A7U 13. VID OUT MON 1,2 pb (two) - off
- 019 14. TV PWR - OFF
- R11L 15. VTR PWR - OFF
(L12 if OV102)
- M058F 16. TV PWR - OFF
- If not reqd:
- R12L 17. CRT4 PWR - OFF
- A6U 18. FLT CNTLR PWR - OFF

**LOSS OF 2 CAB FANS
ON-ORBIT
MS PAGE**

10-5

OPCL/ALL/GEN C

PLB EQUIP PWRDN

1. Perform PL SAFING (TEMP 12-2), then:

<p><u>CAUTION</u> If stow problem occurs with either RMS and/or KU-BD ANT, perform aff system <u>QUICK RESPONSE JETTISON</u> (CONT DEORB)</p>

If RMS:

2. Perform RMS PWRDN (PDRS OPS), then:

If KU-BD ANT deployed:

3. Perform KU-BD ANT STOW (ORB OPS,
COMM/INST), then:

If radiators deployed:

4. Go to RAD STOW/DEPLOY (ORB OPS, ECLS)

**LOSS OF 2 CAB FANS
ON-ORBIT
MS PAGE**

10-6

OPCL/ALL/GEN C,13

LOSS OF 2 H2O LOOPS (CONUS TIG < 2.5 hr)

- If CONUS deorb TIG available > 45 min but ≤ 2.5 hr:
1. Sel TIG, then proceed with the pwrnd, otherwise:
 2. Go to LOSS OF 2 H2O LOOPS (CONUS TIG > 2.5 hr)
- >>

NOTES

- This procedure requires > 45 min.
- Loss of H2O loop cooling aff both water and air cooled equipment.
- 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 (10 min MAX)
- Tear out COMM pages from this procedure and use until touchdown

TIME CRITICAL PROCEDURES (execute simo)

3. Have MS perform MS OVHD PNL PWRDN (10-15) and FLUID LOADING PREP, etc (10-16) ASAP
4. Have second MS perform COMM PWRDN (10-17) ASAP
5. Have a third MS perform MCA CONFIG (10-13) and PLB EQUIP PWRDN (10-13) ASAP
6. Go to CDR AND PLT PWRDN ASAP

CDR AND PLT PWRDN

- C3 7. ✓MSTR MADS PWR - OFF
 8. Minimize ltg
 9. Use only one CRT and one SPOC
- F7,F8,A6 10. FLT CNTLR PWR (three) - OFF, use one as reqd
- F6/F8 11. INST PWR (two) - OFF, use one as reqd
07 12. ✓TACAN MODE (three) - OFF
08 13. ✓RADAR ALTM (two) - OFF
 14. ✓MLS (three) - OFF

Cont next page

OI-8D |

TEMP A10-7

OPCL/ALL/GEN C,17

- L1 15. ✓H2O PUMP LOOP (two) - OFF (one ON if any flow)
- 16. HUMIDITY SEP (two) - OFF (one ON if either H2O pump ON)
- 17. CAB FAN (two) - OFF
TEMP CNTLR - OFF
- 18. FREON PUMP LOOP 1 - OFF
2 - B
- ✓FLOW PROP VLV LOOP (two) - ICH (tb-ICH)
- L2 19. O2 SYS 1 SPLY - CL (tb-CL)
- 20. Reassign strings to GPC 1 in MC 2

GNC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC

Modify MC 2 per table---->

GNC, OPS 201 PRO

- O6 21. GPC MODE 2 - STBY (tb-bp)

- HALT

PWR 2 - OFF

✓MODE 3,5 (two) - HALT

✓PWR 3,5 (two) - OFF

✓OUTPUT 5 - NORM

- L1 22. AV BAY 1 FAN A - ON

B - OFF

2,3 FAN A,B

(four) - OFF

- 23. IMU FAN A - ON

B - OFF

✓C - OFF

For any fwd CRT that is OFF:

- 24. GPC/CRT1/X EXEC
- R2 25. HYD CIRC PUMP (three) - OFF

When RMS is stowed or jettisoned by MS:

GNC 20 DAP CONFIG

- C3 26. ✓DAP A1,B1 except sel JET OPT P,Y +3
(TAIL ONLY)

DAP: A/AUTO/NORM

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

Cont next page

OI-8D

TEMP A10-8

OPCL/OI-8D/GEN C,15

LOSS OF 2 H2O LOOPS (CONUS TIG < 2.5 hr)

If CONUS deorb TIG available > 45 min but ≤ 2.5 hr:

1. Sel TIG, then proceed with the pwrn, otherwise:
2. Go to LOSS OF 2 H2O LOOPS (CONUS TIG > 2.5 hr)

>>

NOTES

- This procedure requires > 45 min.
- Loss of H2O loop cooling aff both water and air cooled equipment.
- 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 (10 min MAX)
- Tear out COMM pages from this procedure and use until touchdown

TIME CRITICAL PROCEDURES (execute simo)

3. Have MS perform MS OVHD PNL PWRDN (10-15) and FLUID LOADING PREP, etc (10-16) ASAP
4. Have second MS perform COMM PWRDN (10-17) ASAP
5. Have a third MS perform MCA CONFIG (10-13) and PLB EQUIP PWRDN (10-13) ASAP
6. Go to CDR AND PLT PWRDN ASAP

CDR AND PLT PWRDN

- | | |
|----------|--|
| C3 | 7. ✓MSTR MADS PWR - OFF |
| | 8. Minimize ltg |
| | 9. Use only one CRT and one SPOC |
| F7,F8,A6 | 10. FLT CNTLR PWR (three) - OFF, use one as reqd |
| F6/F8 | 11. INST PWR (two) - OFF, use one as reqd |
| 07 | 12. ✓TACAN MODE (three) - OFF |
| 08 | 13. ✓RADAR ALTM (two) - OFF |
| | 14. ✓MLS (three) - OFF |

Cont next page

OI-8F |

TEMP B10-7

OPCL/ALL/GEN C,17

- L1 15. ✓H2O PUMP LOOP (two) - OFF (one ON if any flow)
- 16. HUMIDITY SEP (two) - OFF (one ON if either H2O pump ON)
- 17. CAB FAN (two) - OFF
TEMP CNTLR - OFF
- 18. FREON PUMP LOOP 1 - OFF
2 - B
- L2 19. ✓FLOW PROP VLV LOOP (two) - ICH (tb-ICH)
- 20. O2 SYS 1 SPLY - CL (tb-CL)
- 20. Reassign strings to GPC 1 in MC 2

GNC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC
 Modify MC 2 per table---->
 GNC, OPS 201 PRO

- O6 21. GPC MODE 2 - STBY (tb-bp)
- HALT
✓MODE 3,5 (two) - HALT
✓OUTPUT 5 - NORM
- L1 22. AV BAY 1 FAN A - ON
B - OFF
2,3 FAN A,B
(four) - OFF
- 23. IMU FAN A - ON
B - OFF
✓C - OFF

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

For any fwd CRT that is OFF:

- 24. GPC/CRT1/X EXEC
- R2 25. HYD CIRC PUMP (three) - OFF
- When RMS is stowed or jettisoned by MS:

GNC 20 DAP CONFIG

- C3 26. ✓DAP A1,B1 except sel JET OPT P,Y +3
(TAIL ONLY)
- DAP: A/AUTO/NORM

Cont next page

OI-8F

TEMP B10-8 .OPCL/OI-8F/GEN C,15

LOSS OF 2 H2O LOOPS (CONUS TIG < 2.5 hr)

If CONUS deorb TIG available > 45 min but ≤ 2.5 hr:

1. Sel TIG, then proceed with the pwrn, otherwise:
2. Go to LOSS OF 2 H2O LOOPS (CONUS TIG > 2.5 hr)

>>

NOTES

- This procedure requires > 45 min.
- Loss of H2O loop cooling aff both water and air cooled equipment.
- 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 (10 min MAX)
- Tear out COMM pages from this procedure and use until touchdown

TIME CRITICAL PROCEDURES (execute simo)

3. Have MS perform MS OVHD PNL PWRDN, 10-15 and FLUID LOADING PREP, etc, 10-16, ASAP
4. Have second MS perform COMM PWRDN, 10-17, ASAP
5. Have a third MS perform MCA CONFIG, 10-13, and PLB EQUIP PWRDN, 10-13, ASAP
6. Go to CDR AND PLT PWRDN ASAP

CDR AND PLT PWRDN

- | | |
|----------|--|
| C3 | 7. ✓MSTR MADS PWR - OFF |
| | 8. Minimize lgt |
| | 9. Use only one CRT and one SPOC |
| F7,F8,A6 | 10. FLT CNTLR PWR (three) - OFF, use one as reqd |
| F6/F8 | 11. INST PWR (two) - OFF, use one as reqd |
| 07 | 12. ✓TACAN MODE (three) - OFF |
| 08 | 13. ✓RADAR ALTM (two) - OFF |
| | 14. ✓MLS (three) - OFF |

Cont next page

OI-20 |

TEMP C10-7

OPCL/ALL/GEN C,20

- L1 15. ✓H2O PUMP LOOP (two) - OFF (one ON if any flow)
 16. HUMIDITY SEP (two) - OFF (one ON if either H2O pump ON)
 17. CAB FAN (two) - OFF
 TEMP CNTLR - OFF
 18. FREON PUMP LOOP 1 - OFF
 2 - B
 ✓FLOW PROP VLV LOOP (two) - ICH (tb-ICH)
 L2 19. O2 SYS 1 SPLY - CL (tb-CL)
 20. Reassign strings to GPC 1 in MC 2

GNC 0 GPC MEMORY

- CONFIG - ITEM 1 +2 EXEC
 Modify MC 2 per table----->
 GNC, OPS 201 PRO
 06 21. GPC MODE 2 - STBY (tb-bp)
 - HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)
 ✓MODE 3,5 (two) - HALT
 ✓OUTPUT 5 - NORM
 L1 22. AV BAY 1 FAN A - ON
 B - OFF
 2,3 FAN A,B
 (four) - OFF
 23. IMU FAN A - ON
 B - OFF
 ✓C - OFF

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

- For any fwd CRT that is OFF:
 24. GPC/CRT1/X EXEC
 R2 25. HYD CIRC PUMP (three) - OFF
 When RMS is stowed or jettisoned by MS:
 26. ✓DAP A,B set to A1,B1 except sel
 JET OPT P,Y +3 (TAIL ONLY)
 C3 DAP: A/AUTO/PRI

Cont next page

OI-20

When MS begins PLBD CLOSURE,
Perform BYPASS RADS/FES ACT:

- L1 27. HI LOAD DUCT HTR - A/B
 ✓TOP EVAP HTR NOZ L,R (two) - B AUTO
 ✓DUCT - B
- R12L 28. SPLY H2O XOVR VLV - OP (tb-OP)
- L1 29. FLASH EVAP CNTLR PRI B(A) - ON
 HI LOAD EVAP - ENA
30. RAD BYP VLV MODE 1,2 (two) - MAN
 MAN SEL 1,2 (two) - BYP
 (in 3 sec, ✓tb-BYP)
31. CNTLR LOOP 1,2 (two) - OFF
 After 1 min, ✓EVAP OUT T -39°F
32. Mnvr to tail sun att:
 GNC UNIV PTG
 TGT ID - ITEM 8 +4 EXEC
 BODY VECT - ITEM 14 +5 EXEC
 P - ITEM 15 +184 EXEC
 Y - ITEM 16 +0 EXEC
 OM - blank (MCC-provided if reqd)
 START TRK - ITEM 19 EXEC
- C3 33. C/W MODE - ACK

NOTE

For F7 lights, hold F2
or F4 MA in

If time to TIG < 50 min:

| 34. Go to step 49

If time to TIG > 50 min, continue:

GNC 21 IMU ALIGN

- 014:A, 35. IMU 1,3 (two) - desel, then
015:A, 36. - OFF
- 06 37. MDM FF1,3,4 (three) - OFF
38. ✓DAP: TAIL ONLY

Cont next page

- 08 39. FWD RCS MANF ISOL 1,2,3,4 (four) - CL
(tb-CL)
- 014:F 40. RJDF 1B F1 LOGIC - OFF
DRIVER - OFF
- 015:F 1A F2 DRIVER - OFF
LOGIC - OFF
- 016:F 2A F3,2B F4 DRIVER (two) - OFF
F4/F5 LOGIC (two) - OFF
MANF L5/F5/R5 DRIVER - OFF
- F6,F8, 41. DATA BUS (three) - 3
A6U
- L4:J 42. cb AC3 Φ A SIG CONDR HUM SEP - op
:P AC2,3 Φ A LG SNSR 1,2 (two) - op

CAUTION
Do not perform SM GPC DEACT
until PLBDs are closed

SM 1 DPS UTILITY

- C3 43. UL CNTL ENA - ITEM 36 EXEC
- C2 44. UPLK - GPC BLK
- 06 45. CRT1,2,3 MAJ FUNC - GNC
- 46. GPC MODE 4 - STBY (tb-bp), HALT
PWR 4 - OFF

GNC 0 GPC MEMORY

- CONFIG - ITEM 1 +2 EXEC
- Assign PL 1/2 to GPC 1
- GNC, OPS 201 PRO
- MDM PL1,2 (two) - OFF
- L1 47. Cycle CAB FAN A(B) - ON(7 min)/OFF(1 hr)
(to control PPC02)
- 48. Perform 10.2 PSIA CAB DEPRESS/REPRESS,
10-11, then:
- 49. \checkmark MS OVHD PNL PWRDN complete

Cont next page

51. Cycle CRTs. If CRT PWR ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (1 hr max ON TIME). Save at least 1 fwd CRT for entry
52. Limit operation of each GPC (1 hr max ON time). If reqd, restring to GPC 2, turn GPC 1 OFF, turn AV BAY 2 FAN A ON, turn AV BAY 1 FAN OFF, and wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB PREP (CONT DEORB)

NOTE

Possible cab air OVBD RLF due to loss of cab cooling.

Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn an MMU ON, wait 34 sec, try transaction, turn the MMU OFF again.

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity. Delay donning LES as late as possible but prior to EI (CDR last)

At TIG-30 min:

53. Go to LOSS OF 2 H2O LOOPS DEORB PREP (CONT DEORB) >>

10.2 PSIA CAB DEPRESS/REPRESS

CAB SETUP:

- | | |
|----------|--|
| MS
L2 | <ol style="list-style-type: none"> 1. Unstow C EVA 2. ✓O2 SYS 1 SPLY - CL (tb-CL)
 ✓2 SPLY - OP (tb-OP)
 ✓XOVR SYS 1 - CL
 2 - OP 3. ✓N2 SYS 1,2 REG INLET (two) - OP (tb-OP)
 O2/N2 CNTLR VLV SYS 1 - OP (N2)
 2 - CL (O2) |
|----------|--|

Cont next page

51. Cycle CRTs. If CRT PWR ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (1 hr max ON TIME). Save at least 1 fwd CRT for entry
52. Limit operation of each GPC (1 hr max ON time). If reqd, restrng to GPC 2, take GPC 1 to HALT, turn AV BAY 2 FAN A ON, turn AV BAY 1 FAN OFF, and wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB)

NOTE

Possible cab air OVBD RLF due to loss of cab cooling.

Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn MMU 1 ON, wait 34 sec, try transaction, turn MMU 1 OFF again.

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity. Delay donning LES as late as possible but prior to EI (CDR last)

At TIG-30 min:

53. Go to LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB) >>

10.2 PSIA CAB DEPRESS/REPRESS

CAB SETUP:

- | | |
|----|---|
| MS | 1. Unstow C EVA |
| L2 | 2. ✓O2 SYS 1 SPLY - CL (tb-CL) |
| | ✓2 SPLY - OP (tb-OP) |
| | ✓XOVR SYS 1 - CL |
| | 2 - OP |
| | 3. ✓N2 SYS REG INLET (two) - OP (tb-OP) |
| | O2/N2 CNTLR VLV SYS 1 - OP (N2) |
| | 2 - CL (O2) |

Cont next page

OI-8F |

TEMP B10-11 OPCL/OI-8F/GEN C,15

- ML31C 4. √VAC VENT ISOL VLV BUS SEL - MNA
√CNTL - OP (tb-OP)
√NOZ HTR - ON
- MO10W 5. 14.7 CAB REG INLET SYS 1 - CL
2 - OP
√O2 REG INLET SYS 1 - CL
√2 - OP
- INNER HATCH 6. OPEN and STOW HATCH
- AW82B 7. Use a flashlight in A/L if reqd
015:B 8. AIRLK DEPRESS vlv cap - vent, remove
01 9. cb MNB OI SIG CONDR OF 2/3 A - c1
10. During depress, use gauges to monitor CAB PRESS and PPO2

CAB DEPRESS:

11. Perform CABIN DEPRESS TO 10.2 PSI
(C EVA, 10.2 PSI CABIN, 6-4, 6-5),
then:

CAB REPRESS:

WARNING
Terminate ALL WCS and LES Helmet
usage during cab repress to 14.7
psia

- MO10W 12. 14.7 CAB REG INLET SYS 1,2 (two) - OP
L2 13. √O2/N2 CNTLR VLV SYS 1 - OP (N2)
2 - AUTO (O2/N2)
- L1 14. CAB FAN A(B) - ON
01 15. Verify cab in NORMAL CAB P, PPO2
operating limits, then:
- 015:B 16. cb MNB OI SIG CONDR OF 2/3 A - op
L1 17. CAB FAN A(B) - OFF
18. Config A/L: back out of steps 6
through 8
19. Stow C EVA

51. Cycle CRTs. If CRT PWR ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (1 hr max ON TIME). Save at least 1 fwd CRT for entry
52. Limit operation of each GPC (1 hr max ON time). If reqd, restring to GPC 2, turn GPC 1 OFF, turn AV BAY 2 FAN A ON, turn AV BAY 1 FAN OFF, and wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB)

NOTE

Possible cab air OVBD RLF due to loss of cab cooling.

Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn an MMU ON, wait 34 sec, try transaction, turn the MMU OFF again.

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity. Delay donning LES as late as possible but prior to EI (CDR last)

At TIG-30 min:

53. Go to LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB) >>

10.2 PSIA CAB DEPRESS/REPRESS

CAB SETUP:

- | | |
|----|---|
| MS | 1. Unstow C EVA |
| L2 | 2. ✓O2 SYS 1 SPLY - CL (tb-CL) |
| | ✓2 SPLY - OP (tb-OP) |
| | ✓XOVR SYS 1 - CL |
| | 2 - OP |
| | 3. ✓N2 SYS REG INLET (two) - OP (tb-OP) |
| | O2/N2 CNTLR VLV SYS 1 - OP (N2) |
| | 2 - CL (O2) |

Cont next page

OI-8D |

TEMP A10-11 OPCL/OI-8D/GEN C,15

- ML31C 4. ✓VAC VENT ISOL VLV BUS SEL - MNA
 ✓CNTL - OP (tb-OP)
 ✓NOZ HTR - ON
- MO10W 5. 14.7 CAB REG INLET SYS 1 - CL
 2 - OP
 ✓O2 REG INLET SYS 1 - CL
 ✓2 - OP
- INNER 6. OPEN and STOW HATCH
 HATCH
7. Use a flashlight in A/L if reqd
- AW82B 8. AIRLK DEPRESS vlv cap - vent, remove
- 015:B 9. cb MNB OI SIG CONDR OF 2/3 A - cl
- 01 10. During depress, use gauges to monitor
 CAB PRESS and PPO2

CAB DEPRESS:

11. Perform CABIN DEPRESS TO 10.2 PSI
 (C EVA, 10.2 PSI CABIN, 6-4, 6-5),
 then:

CAB REPRESS:

WARNING
 Terminate ALL WCS and LES Helmet
 usage during cab repress to 14.7
 psia

- MO10W 12. 14.7 CAB REG INLET SYS 1,2 (two) - OP
- L2 13. ✓O2/N2 CNTLR VLV SYS 1 - OP (N2)
 2 - AUTO (O2/N2)
- L1 14. CAB FAN A(B) - ON
- 01 15. Verify cab in NORMAL CAB P, PPO2
 operating limits, then:
- 015:B 16. cb MNB OI SIG CONDR OF 2/3 A - op
- L1 17. CAB FAN A(B) - OFF
18. Config A/L: back out of steps 6
 through 8
19. Stow C EVA

0I-8D |

51. Cycle CRTs. If CRT PWR ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (1 hr max ON TIME). Save at least 1 fwd CRT for entry
52. Limit operation of each GPC (1 hr max ON time). If reqd, restring to GPC 2, take GPC 1 to HALT, turn AV BAY 2 FAN A ON, turn AV BAY 1 FAN OFF, and wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB)

NOTE

Possible cab air OVBD RLF due to loss of cab cooling.

Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn MMU 1 ON, wait 34 sec, try transaction, turn MMU 1 OFF again.

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity. Delay donning LES as late as possible but prior to EI (CDR last)

At TIG-30 min:

53. Go to LOSS OF 2 H2O LOOPS DEORB PREP/ENTRY (CONT DEORB) >>

10.2 PSIA CAB DEPRESS/REPRESS

CAB SETUP:

- | | |
|----|---|
| MS | 1. Unstow C EVA |
| L2 | 2. ✓O2 SYS 1 SPLY - CL (tb-CL) |
| | ✓2 SPLY - OP (tb-OP) |
| | ✓XOVR SYS 1 - CL |
| | 2 - OP |
| | 3. ✓N2 SYS REG INLET (two) - OP (tb-OP) |
| | O2/N2 CNTLR VLV SYS 1 - OP (N2) |
| | 2 - CL (O2) |

Cont next page

OI-8F |

TEMP B10-11 OPCL/OI-8F/GEN C,15

- ML31C 4. ✓VAC VENT ISOL VLV BUS SEL - MNA
 ✓CNTL - OP (tb-OP)
 ✓NOZ HTR - ON
- MO10W 5. 14.7 CAB REG INLET SYS 1 - CL
 2 - OP
 ✓O2 REG INLET SYS 1 - CL
 ✓2 - OP
- INNER HATCH 6. OPEN and STOW HATCH
7. Use a flashlight in A/L if reqd
- AW82B 8. AIRLK DEPRESS vlv cap - vent, remove
- 015:B 9. cb MNB OI SIG CONDR OF 2/3 A - c1
- 01 10. During depress, use gauges to monitor
 CAB PRESS and PPO2

CAB DEPRESS:

11. Perform CABIN DEPRESS TO 10.2 PSI
 (C EVA, 10.2 PSI CABIN, 6-4, 6-5),
 then:

CAB REPRESS:

WARNING

Terminate ALL WCS and LES Helmet
usage during cab repress to 14.7
psia

- MO10W 12. 14.7 CAB REG INLET SYS 1,2 (two) - OP
- L2 13. ✓O2/N2 CNTLR VLV SYS 1 - OP (N2)
 2 - AUTO (O2/N2)
- L1 14. CAB FAN A(B) - ON
- 01 15. Verify cab in NORMAL CAB P, PPO2
 operating limits, then:
- 015:B 16. cb MNB OI SIG CONDR OF 2/3 A - op
- L1 17. CAB FAN A(B) - OFF
18. Config A/L: back out of steps 6
 through 8
19. Stow C EVA

OI-8F

TEMP B10-12

OPCL/ALL/GEN C,17

50. Cycle CRTs. If CRT PWR ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (1 hr max ON TIME). Save at least 1 fwd CRT for entry
51. Limit operation of each GPC (1 hr max ON time). If reqd, restring to GPC 2, take GPC 1 to HALT, turn AV BAY 2 FAN A ON, turn AV BAY 1 FAN OFF, and wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB PREP/ ENTRY (CONT DEORB)

NOTE

Possible cab air OVBD RLF due to loss of cab cooling.

Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn MMU 1 ON, wait 34 sec, try transaction, turn MMU 1 OFF again.

Use HRA and LES Helmet as needed to provide relief during periods of high cab temp and humidity. Delay donning LES as late as possible but prior to EI (CDR last)

At TIG-30 min:

52. Go to LOSS OF 2 H2O LOOPS DEORB PREP/ ENTRY (CONT DEORB) >>

10.2 PSIA CAB DEPRESS/REPRESS

CAB SETUP:

- | | |
|----|---|
| MS | 1. Unstow EVA C/L |
| L2 | 2. ✓O2 SYS 1 SPLY - CL (tb-CL) |
| | ✓2 SPLY - OP (tb-OP) |
| | ✓XOVR SYS 1 - CL |
| | 2 - OP |
| | 3. ✓N2 SYS REG INLET (two) - OP (tb-OP) |
| | O2/N2 CNTLR VLV SYS 1 - OP (N2) |
| | 2 - CL (O2) |

Cont next page

OI-20

TEMP C10-11

OPCL/OI-20/GEN C,20

- ML31C 4. \checkmark VAC VENT ISOL VLV BUS SEL - MNA
 - \checkmark CNTL - OP (tb-OP)
- MO10W 5. 14.7 CAB REG INLET SYS 1 - CL
 - 2 - OP \checkmark O2 REG INLET SYS 1 - CL
 - 2 - OP
- INNER HATCH 6. OPEN and STOW HATCH
- 7. Use a flashlight in A/L if reqd
- AW82B 8. AIRLK DEPRESS vlv cap - vent, remove
- 015:B 9. cb MNB OI SIG CONDR OF 2/3 A - c1
- 01 10. During depress, use gauges to monitor CAB PRESS and PPO2

CAB DEPRESS:

- 11. Perform CABIN DEPRESS TO 10.2 PSI (EVA C/L, 10.2 PSI CABIN) 2-6, 2-7, then:

NOTE

If time to TIG \leq 30 min, begin cabin repress immediately, regardless of current cabin pressure

CAB REPRESS:

WARNING

Terminate ALL WCS and LES Helmet usage during cab repress to 14.7 psia

- MO10W 12. 14.7 CAB REG INLET SYS 1,2 (two) - OP
- L2 13. \checkmark O2/N2 CNTLR VLV SYS 1 - OP (N2)
 - 2 - AUTO (O2/N2)

Cont next page

OI-20

TEMP C10-12 OPCL/OI-20/GEN C,20

- L1 14. CAB FAN A(B) - ON
- 01 15. Verify cab in NORMAL CAB P,PP02
operating limits, then:
- 015:B 16. cb MNB OI SIG CONDR OF 2/3 A - op
- L1 17. CAB FAN A(B) - OFF
- 18. If time to TIG > 1 hr, repeat steps 2
thru 18
- 19. Config A/L: back out of steps 6
through 8
- 20. Stow EVA C/L

OI-20

TEMP C10-12a OPCL/OI-20/GEN C,20

If PLBDs closed:
MA73C:A,B | 21. MCA LOGIC MNA,B,C (fourteen) - OFF
 | 22. Perform PL SAFING, TEMP 12-2, then:
If PLBDs open, perform the following:

MCA CONFIG (Execute ASAP)

MA73C:A,B 1. MCA LOGIC MNA,B,C (fourteen) - OFF
 2. For the PLB EQUIP PWRDN,
 use the following MCA config:
 MCA LOGIC MNA MID 1,3 (two) - ON
 MNB MID 2,3,4 (three) - ON
 MNC MID 2,4 (two) - ON

CAUTION
Do not perform MCA switch configs
in the PLB EQUIP PWRDN

PLB EQUIP PWRDN (Execute ASAP)

1. Perform PL SAFING, TEMP 12-2, then:

CAUTION
If stow problem occurs with either RMS
and/or KU-BD ANT, perform aff system
QUICK RESPONSE JETTISON (CONT DEORB)

If RMS:

2. Perform RMS PWRDN (PDRS OPS), then:

If KU-BD ANT deployed:

3. Perform KU-BD ANT STOW (ORB OPS,
COMM/INST), then:

If radiators deployed:

4. Perform RAD STOW/DEPLOY (ORB OPS,
ECLS)

014,015, 5. ✓Pri RJD LOGIC,DRIVERS (sixteen) - ON

016:F

6. Inform CDR: RMS is stowed(jettisoned)

Cont next page

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE**

10-13

OPCL/ALL/GEN C,20

PLBD CLOSURE

- 06 1. Inform CDR: Beginning PLBD CLOSURE
2. MDM PL1,2 (two) - ON
3. SM I/O RESET
SM PL BAY DOORS
- R13L 4. SM, OPS 202 PRO - close PLBD ASAP
CRT 5. PL BAY DR SYS (two) - ENA
6. AC POWER ON - ITEM 1 EXEC
AUTO MODE SEL - ITEM 3 EXEC
PBD SW BYPASS - ITEM 14 EXEC
CLOSE - ITEM 17 EXEC
- If 'S63 PLB SEQ FAIL' msg during door closure
and aft latches for that door are not 'CL':
7. ✓Door scallop on or below tgt line
before continuing in MAN mode,
otherwise:
8. Perform MAL, MECH SSR-2,
CONTINGENCY PLBD CLOSURE, then:
- CRT 9. After PLBD closed:
PBD STOP - ITEM 16 EXEC
AC POWER OFF - ITEM 2 EXEC
R13L PL BAY DR SYS (two) - DISABLE
R12L CRT4 PWR - OFF
- MA73C 10. ✓PL BAY flood (all) - OFF
11. MCA LOGIC MNA,B,C (fourteen) - OFF
12. Report to CDR: PLBDs closed

LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE

10-14

OPCL/ALL/GEN C,13

MS OVHD PNL PWRDN

1. Minimize lgt on Aft Flt Deck
- 013:A 2. cb ESS IBC MTU A - op
:C 2CA C/W B - op
- 014:A 3. ✓BRAKES MNA - OFF
:B 4. cb MNA OI SIG CONDR OF 1/4 A - op
MDM OF 1/2 A, 3/4 A (two) - op
H2O BYP LOOP 1 SNSR - op
EVENT TIMER AFT - op
:E ✓ADTA 1 - op
DDU L,AFT (two) - op
:F 5. MMU 1 - OFF
- 015:A 6. ✓BRAKES MNB - OFF
:B 7. cb MNB OI SIG CONDR OF 1/4 B, 2/3 A
(two) - op
MDM OF 1/2 B - op
H2O BYP LOOP 2 SNSR - op
MSN TIMER AFT - op
:E ✓ADTA 2 - op
DDU L,R (two) - op
:F 8. MMU 2 - OFF
- 016:A 9. ✓BRAKES MNC - OFF
:B 10. cb MNB OI SIG CONDR OF 2/3 B - op
MDM OF 3/4 B - op
:E ✓ADTA 3,4 (two) - op
DDU R,AFT (two) - op
11. Inform CDR: MS OVHD PNL PWRDN complete

LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE

10-15

OPCL/ALL/GEN C

FLUID LOADING PREP

1. If Galley: OVEN/RHS - AUTO
 2. If H2O DISP: H2O DISPENSER PWR pb - ON
 3. Unstow, fill 4 water containers (per crewmember) with 8 oz. of water each.
Stow temporarily near seat
 4. Unstow 8 salt tablets (per crewmember).
Stow temporarily in Flt Suit pocket
- If Galley:
5. OVEN/RHS - OFF
 6. ✓H2O HTRS - OFF
 7. ✓OVEN FAN - OFF
 8. Oven door launch strap - snap closed
- If H2O DISP:
9. H2O DISPENSER PWR pb - OFF
 10. ✓FOOD WARMER - OFF
 11. cb UTIL PWR A11/A15/MO30F - op
 12. Stow Personal Hygiene Hose

016:C

FLUID LOADING

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

FDF Config

UNSTOW: ENT, ENT PKT, Deorb Burn Cards,
ENT Cue Cards

Cab Config

Stow loose equipment, Backup SPOC
Remove and stow side hatch UV filter (except 102),
locking device, and pyro box safing pin
Tape foot loops in egress routes
Remove and stow Window Shades
(if not needed for cab T control)

WCS Deact

WCS Foot Restraints - up, locked
ML31C VAC VENT ISOL VLV CNTL - CL (tb-CL)

Install seats

Pole setup

ESCAPE POLE STOWAGE/SETUP (Cue Card)
Prep LES for donning in LOSS OF 2 H2O LOOPS DEORBIT
PREP (CONT DEORB)

✓Minimum 1tg on Middeck

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE**

Cont next page

10-16

OPCL/ALL/GEN C

MS: Perform COMM PWRDN ASAP. Contact MCC at first available AOS using COMM POWERUP procedures

NOTE

This procedure powers off ALL ground comm.
Keep this page until touchdown

COMM PWRDN

- | | | |
|-----|-----|--|
| A1L | 1. | S-BD PM ANT SW ELEC - OFF
PRE AMP - OFF
PWR AMPL STBY - OFF
OPER - OFF
MODE - STDN LO
XPNDR - OFF |
| | 2. | NSP PWR - OFF
ENCRYPTION PWR - OFF (Encrypt OFF
rest of flt)
MODE - SEL
SEL - BYP |
| C3 | 3. | S-BD PM CNTL - PNL |
| | 4. | OI PCMMU PWR - OFF
FORMAT - FXD |
| | 5. | AUD CTR - OFF (pwr up as reqd for ICOM
audio) |
| 05 | 6. | L AUD PWR - AUD |
| 06 | 7. | UHF MODE - OFF |
| 09 | 8. | R AUD PWR - AUD |
| A1L | 9. | ✓S-BD PL CNTL - PNL
✓PWR SYS - OFF |
| A1R | 10. | PL DATA INTLVR PWR - OFF |
| | 11. | OPS RCDRS PWR 1,2 (two) - OFF |
| | 12. | S-BD FM CNTL - PNL
PWR - OFF |
| | 13. | PL RCDR PWR - OFF |
| A3 | 14. | MON 1,2 PWR (two) - OFF |
| A7U | 15. | TV PWR CONTR UNIT - OFF |

Cont next page

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE**

10-17

OPCL/ALL/GEN C

NOTE

KEEP THIS PAGE UNTIL TOUCHDOWN

- R11L 16. VTR PWR - OFF
 - R15:B 17. cb MNA,MNC GCILC (two) - op
 - :D 18. TV (fifteen) - op
 - :E 19. RMS TV (six) - op
 - L9,R10 20. PS,MS AUD PWR (two) - OFF
 - M042F 21. MIDDECK AUD SPKR PWR - OFF
- If after TIG-10 min:
- 22. Go to AFT PANEL CONFIG FOR ENTRY COMM,
9-3 (CONT DEORB, LOSS OF 2 H2O LOOPS
DEORB PREP)

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE :**

10-18

OPCL/ALL/GEN C

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

COMM POWERUP (If Comm reqd prior to landing site coverage)

Power up audio system
C3 1. AUD CTR - 1
05 √L AUD PWR - AUD
09 √R AUD PWR - AUD
If UHF avail, config for UHF comm (voice only):
06 2. UHF MODE - SPLX
√SPLX PWR AMP - ON
3. After comm with MCC complete, go to
COMM PWRDN
If UHF site unavail or if MCC requests data
(Config for GSTDN(SGLS) S-BD):
C3 4. √S-BD PM CNTL - PNL
A1L ANT SW ELEC - 2
MODE - STDN LO(SGLS)
XPNDR - 2
5. NSP PWR - 2
√DATA RATE XMIT - HI
RCV - LO
CODING XMIT - OFF
RCV - OFF
√UPLK DATA - S-BD
C3/F9 6. Sel best S-BD PM ANT
If MCC requests data:
014:B 7. cb MNA OI MDM OF 1/2 A, 3/4 A
(two) - c1
C3 8. OI PCMMU PWR - 1
06 9. MDM PL2 - ON
10. BFS, GNC I/O RESET
At end of data transmission:
014:B 11. cb MNA OI MDM OF 1/2 A, 3/4 A
(two) - op
If not reqd for PLBD CLOSURE:
06 12. MDM PL2 - OFF
13. After comm/data complete, Go to
COMM PWRDN >>

Cont next page

LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUSTIG <2.5 hr)
MS PAGE

10-19

OPCL/ALL/GEN C,15

NOTE

KEEP THIS PAGE UNTIL TOUCHDOWN

If UHF site and GSTDN unavailable and comm/data critical:
Config for TDRS S-BD

CAUTION

This is a High Pwr Mode. On-time should be limited to 10 min max due to Pwr Amp Thermal constraints. A 3-min delay occurs before Pwr Amp comes on. Uplink not aff. Proceed with sel of best ant

- A1L 14. S-BD PM CNTL - PNL
ANT SW ELEC - 2
PRE AMP - 2
PWR AMP OPER - 2
MODE - TDRS DATA
XPNDR - 2
15. NSP PWR - 2
✓DATA RATE XMIT - HI
✓RCV - LO
CODING XMIT - ON
RCV - ON
✓UPLK DATA - S-BD
- C3/F9 Sel best S-BD PM ANT
If MCC requests data:
- 014:B 16. cb MNA OI MDM OF 1/2 A, 3/4 A
(two) - c1
- C3 OI PCMMU PWR - 1
06 MDM PL2 - ON
BFS, GNC I/O RESET
- At end of data transmission:
- 014:B 17. cb MNA OI MDM OF 1/2 A, 3/4 A
(two) - op
- If not reqd for PLBD CLOSURE:
- 06 18. MDM PL2 - OFF
19. After comm/data complete, Go to
COMM PWRDN

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG <2.5 hr)
MS PAGE**

10-20

OPCL/ALL/GEN C,2

LOSS OF 2 H2O LOOPS (CONUS TIG > 2.5 hr)

NOTES

- Loss of water loop cooling aff both water and air cooled equipment.
- 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
- Call the ground at every available UHF site
- Tear out COMM pages from this procedure and use until touchdown

If CONUS TIG available > 45 min but ≤ 2.5 hr:

1. Go to LOSS OF 2 H2O LOOPS (CONUS TIG < 2.5 hr), 10-7 >>

TIME CRITICAL PROCEDURES (execute simo)

2. Have MS perform MS OVHD PNL PWRDN (10-28) ASAP
3. Have second MS perform MCA CONFIG (10-27) and PLB EQUIP PWRDN (10-27) ASAP
4. Have PLT proceed with CDR AND PLT PWRDN ASAP
5. Establish comm plan with MCC, then have MS3 perform COMM PWRDN (10-29) ASAP (Delay 10 min max)

Cont next page

10-21

OPCL/ALL/GEN C

CDR AND PLT PWRDN

- C3 6. MSTR MADS PWR - OFF
- 7. Minimize ltg
- 8. Use only one CRT and SPOC
- F6,F7,F8 9. Use one FLT CNTLR and INST PWR when reqd
- 07 10. ✓TACAN MODE (three) - OFF
- 08 11. ✓RADAR ALTM (two) - OFF
- 12. ✓MLS (three) - OFF
- L1 13. ✓H2O PUMP LOOP 1,2 (two) - OFF
- If any flow in Loop 1(2):
- 14. H2O PUMP LOOP 1(2) - ON
- Minimize bypass
- If H2O PUMP LOOP 1 - ON, A(B):
- MA73C:A 15. ✓MCA LOGIC MNA FWD 1 - ON
- (MNB FWD 2 - ON)
- L1 16. ✓HUMIDITY SEP (two) - OFF (one ON
- if either H2O pump ON)
- 17. CAB FAN (two) - OFF
- TEMP CNTLR - OFF
- 18. ✓FLOW PROP VLV LOOP tb (two) - ICH
- 19. FREON PUMP LOOP 1 - OFF
- 2 - B
- L2 20. 02 SYS 1 SPLY - CL (tb-CL)
- L4:J 21. cb AC3 ϕ A SIG CONDR HUM SEP - op
- :P 22. AC2,3 ϕ A LG SNSR (two) - op
- 23. Config DAPs A1,B1 with these exceptions:

GNC 20 DAP CONFIG

- (A) ITEM 2 +1.00 EXEC
- ITEM 8 +3.00 EXEC
- ITEM 12 +3 EXEC
- ITEM 13 +3 EXEC
- (B) ITEM 16 +0.20 EXEC
- ITEM 22 +1.00 EXEC
- ITEM 26 +3 EXEC
- ITEM 27 +3 EXEC

Cont next page

LOSS OF 2 H2O LOOPS (CONUS TIG > 2.5 hr)

NOTES

- Loss of water loop cooling aff both water and air cooled equipment.
- 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
- Call the ground at every available UHF site
- Tear out COMM pages from this procedure and use until touchdown

If CONUS TIG available > 45 min but ≤ 2.5 hr:

1. Go to LOSS OF 2 H2O LOOPS (CONUS TIG < 2.5 hr), 10-7 >>

TIME CRITICAL PROCEDURES (execute simo)

2. Have MS perform MS OVHD PNL PWRDN (10-28) ASAP
3. Have second MS perform MCA CONFIG (10-27) and PLB EQUIP PWRDN (10-27) ASAP
4. Have PLT proceed with CDR AND PLT PWRDN ASAP
5. Establish comm plan with MCC, then have MS3 perform COMM PWRDN (10-29) ASAP (Delay 10 min max)

Cont next page

01-20 |

TEMP 10-21

OPCL/ALL/GEN C,17

CDR AND PLT PWRDN

- C3 6. MSTR MADS PWR - OFF
- 7. Minimize ltg
- 8. Use only one CRT and SPOC
- F6,F7,F8 9. Use one FLT CNTLR and INST PWR when reqd
- 07 10. ✓TACAN MODE (three) - OFF
- 08 11. ✓RADAR ALTM (two) - OFF
- 12. ✓MLS (three) - OFF
- L1 13. ✓H2O PUMP LOOP 1,2 (two) - OFF
- If any flow in Loop 1(2):
- 14. H2O PUMP LOOP 1(2) - ON
- Minimize bypass
- If H2O PUMP LOOP 1 - ON, A(B):
- MA73C:A 15. ✓MCA LOGIC MNA FWD 1 - ON
- (MNB FWD 2 - ON)
- L1 16. ✓HUMIDITY SEP (two) - OFF (one ON
- if either H2O pump ON)
- 17. CAB FAN (two) - OFF
- TEMP CNTLR - OFF
- 18. ✓FLOW PROP VLV LOOP tb (two) - ICH
- 19. FREON PUMP LOOP 1 - OFF
- 2 - B
- L2 20. 02 SYS 1 SPLY - CL (tb-CL)
- L4:J 21. cb AC3 ϕ A SIG CONDR HUM SEP - op
- :P 22. AC2,3 ϕ A LG SNSR (two) - op
- 23. Change DAP A,B to A1,B1 with these
- exceptions:
- (A) ITEM 2 +1.00 EXEC
- ITEM 8 +3.00 EXEC
- ITEM 12 +3 EXEC
- ITEM 13 +3 EXEC
- (B) ITEM 16 +0.20 EXEC
- ITEM 22 +1.00 EXEC
- ITEM 26 +3 EXEC
- ITEM 27 +3 EXEC

Cont next page

OI-20 |

TEMP 10-22 OPCL/OI-20/GEN C,16

CAUTION

Do not mnvr on PRCS until MS has completed RMS stow. If RMS config is compatible with VRCS, mnvr may be started with VRCS. When RMS stow complete, use PRCS

24. Mnvr to tail sun att

GNC UNIV PTG

- ✓TGT ID - ITEM 8 +4 EXEC
- BODY VECT - ITEM 14 +5 EXEC
- P - ITEM 15 +225 EXEC
- Y - ITEM 16 +0 EXEC
- OM - blank (MCC-provided if reqd)

DAP: A/AUTO/NORM

START TRK - ITEM 19 EXEC (CUR - *)

✓ERR TOT - ITEM 23 (*)

25. Establish free drift

✓Att mnvr complete

cb MNB DDU R - op

DAP: B/AUTO/NORM

ADI ATT - INRTL

DAP ROT: PULSE/PULSE/PULSE (wait 30 sec)

DAP: B/MAN/NORM

26. HYD CIRC PUMP (three) - ON
(to prevent MN BUS O/V)

CRT

F8
015:E

C3

R2

WARNING

Do not unpower all IMUs and FF MDMs. IMU 2 and MDM FF2 will be left powered unless otherwise directed by MCC

GNC 21 IMU ALIGN

27. IMU 1,3 (two) - desel, then
- OFF

28. MDM FF1,3,4 (three) - OFF
PL1,2 (two) - OFF

014:A,
016:A
06

Cont next page

29. Record N2 Qty

SM 66 ENVIRONMENT

Qty 1 + Qty 2 =

014:B cb MNA OI MDM OF 1/2 A, 3/4 A (two) - op
015:B MNB OI MDM OF 1/2 B - op
016:B MNC OI MDM OF 3/4 B - op

014:F 30. MMU 1 - OFF

06 31. GPC MODE 4 - STBY (tb-bp)
- RUN-(tb-RUN)
OUTPUT 4 - NORM (tb-gray)

32. GNC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC

Modify MC 2 per table --->

GNC, OPS 201 PRO
GNC, OPS 000 PRO

	IF DUAL G2 OPS	IF SINGLE G2 OPS
CONFIG GPC	2 12040	2 10040
STR 1	1	1
2	2	1
3	2	4
4	4	4
PL 1/2	1	1
CRT 1	1	1
2	2	1
3	4	4
4	0	0
L 1	0	0
2	0	0
MM 1	1	1
2	4	4

06 33. GPC MODE 1,2,4 (three) - STBY (tb-bp)

- HALT

PWR 1,2,4 (three) - OFF

34. ✓MODE 3,5 (two) - HALT

✓PWR 3,5 (two) - OFF

35. Record MET from watch ___/___:___

C2,R12L 36. ✓CRT PWR (four) - OFF

Cont next page

CAUTION

Do not mnvr on PRCS until MS has completed RMS stow. If RMS config is compatible with VRCS, mnvr may be started with VRCS. When RMS stow complete, use PRCS

Mnvr to tail sun att:

24. **GNC UNIV PTG**

- ✓TGT ID - ITEM 8 +4 EXEC
- BODY VECT - ITEM 14 +5 EXEC
- P - ITEM 15 +225 EXEC
- Y - ITEM 16 +0 EXEC
- OM - blank (MCC-provided if reqd)

CRT DAP: A/AUTO/PRI
START TRK - ITEM 19 EXEC (CUR - *)
✓ERR TOT - ITEM 23 (*)

Establish free drift:

F8 25. ✓Att mnvr complete
015:E cb MNB DDU R - op
DAP: B/AUTO/PRI
ADI ATT - INRTL (wait 30 sec)
DAP: FREE

R2 26. HYD CIRC PUMP (three) - ON
(to prevent MN BUS O/V)

WARNING

Do not unpower all IMUs and FF MDMs. IMU 2 and MDM FF2 will be left powered unless otherwise directed by MCC

GNC 21 IMU ALIGN

- 27. IMU 1,3 (two) - dese1
- OFF
- 28. MDM FF1,3,4 (three) - OFF
PL1,2 (two) - OFF

014:A,
016:A
06

Cont next page

OI-20 |

TEMP 10-23

OPCL/OI-20/GEN C,16

29. Record N2 Qty

SM 66 ENVIRONMENT

Qty 1 + Qty 2 = _____

014:B
015:B
016:B
014:F
06

cb MNA OI MDM OF 1/2 A, 3/4 A (two) - op
MNB OI MDM OF 1/2 B - op
MNC OI MDM OF 3/4 B - op

30. MMU 1 - OFF

31. GPC MODE 4 - STBY (tb-bp)
- RUN (tb-RUN)
OUTPUT 4 - NORM (tb-gray)

32. **GNC 0 GPC MEMORY**

CONFIG - ITEM 1 +2 EXEC

Modify MC 2 per table --->

GNC, OPS 201 PRO
GNC, OPS 000 PRO

	IF DUAL G2 OPS	IF SINGLE G2 OPS
CONFIG GPC	2 12040	2 10040
STR 1	1	1
2	2	1
3	2	4
4	4	4
PL 1/2	1	1
CRT 1	1	1
2	2	1
3	4	4
4	0	0
L 1	0	0
2	0	0
MM 1	1	1
2	4	4

06 33. GPC MODE 1,2,4 (three) - STBY (tb-bp)

- HALT
- STBY (tb-RUN)
- HALT (tb-bp)

PWR 1,2,4 (three) - OFF

34. ✓MODE 3,5 (two) - HALT

✓PWR 3,5 (two) - OFF

C2,R12L 35. Record MET from watch ___/___:___

36. ✓CRT PWR (four) - OFF

Cont next page

01-20

TEMP 10-24

OPCL/ALL/GEN C,20

- L1 37. AV BAY FANS (six) - OFF
- 38. IMU FAN A - ON
 - B - OFF
 - ✓C - OFF
- 08 39. FWD RCS MANF ISOL 1,2,3,4 (four) - CL (tb-CL)
- 014,015, 40. ✓RJDA LOGIC,DRIVER (eight) - ON
- 016:F
- 016:F RJDF LOGIC,DRIVER (eight) - OFF
- C3 RJD MANF L5/F5/R5 DRIVER - OFF
- 41. C/W MODE - ACK

NOTE

For F7 lights, hold F2 or F4 MA in

- W1-10 42. Install Window Shades
- 43. ✓MS OVHD PNL PWRDN, COMM PWRDN, and PLB EQUIP PWRDN complete
- 44. Record N2 Qty and GPC off time in LOSS OF 2 H2O LOOPS TIG > 2.5 (CONT DEORB)
- 45. Go to LOSS OF 2 H2O LOOPS TIG > 2.5 (CONT DEORB)

MCA CONFIG (Execute ASAP)

- L1 If H2O PUMP LOOP 1 (two) - ON, A(B):
MA73C:A 1. Leave MCA LOGIC MNA FWD 1 - ON
(MNB FWD 2 - ON) in
next step
MA73C:A, 2. MCA LOGIC MNA,B,C (fourteen) - OFF
B
3. For the PLB EQUIP PWRDN, use the
following MCA config:
MCA LOGIC MNA MID 1,3 (two) - ON
MNB MID 2,3,4 (three) - ON
MNC MID 2,4 (two) - ON

CAUTION

Retain this MCA switch config until
step 6 of the PLB EQUIP PWRDN.
Disregard MCA switch throws in the
PL SAFING, RAD STOW/DEPLOY, KU-BD
ANT STOW, and RMS POWERDN procedure

PLB EQUIP PWRDN (Execute ASAP)

1. Perform PL SAFING (TEMP 12-2), then:

CAUTION

If stow problem occurs with either RMS
and/or KU-BD ANT, perform aff system
QUICK RESPONSE JETTISON (CONT DEORB)

If RMS:

2. Perform RMS PWRDN (PDRS OPS), then:

If KU-BD ANT deployed:

3. Perform KU-BD ANT STOW (ORB OPS,
COMM/INST), then:

If radiators deployed:

4. Perform RAD STOW/DEPLOY (ORB OPS,
ECLS)

5. Inform CDR: RMS stowed(jettisoned)

- MA73C:A, 6. MCA LOGIC MNA MID 1,3 (two) - OFF
B MNB MID 2,3,4 (three) - OFF
MNC MID 2,4 (two) - OFF

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MS PAGE**

10-27

OPCL/ALL/GEN C,13

MS OVHD PNL PWRDN

1. Set wrist watches as accurately as possible to MET (set one to GMT). The MET may be used for deorbit burn execution. Record GMT day of year _____
- 013:A 2. cb ESS 1BC MTU A - op
:C 2CA C/W B - op
:E MTU B - op
3AB GPC STAT - op
- 014:A 3. ✓BRAKES MNA - OFF
:B 4. cb MNA OI SIG CONDR OF 1/4 A - op
H2O BYP LOOP 1 SNSR - op
MSN TIMER FWD - op
EVENT TIMER AFT - op
:C SMOKE DETN L/R FLT DK - op
:E ✓ADTA 1 - op
DDU L,AFT (two) - op
- 015:A 5. ✓BRAKES MNB - OFF
:B 6. cb MNB OI SIG CONDR OF 1/4 B - op
2/3 A - op
H2O BYP LOOP 2 SNSR - op
MSN TIMER AFT - op
:E ✓ADTA 2 - op
DDU L - op
- :F 7. MMU 2 - OFF
- 016:A 8. ✓BRAKES MNC - OFF
:B 9. cb MNC OI SIG CONDR OF 2/3 B - op
:E ✓ADTA 3,4 (two) - op
DDU R,AFT (two) - op, then:
10. Inform CDR: MS OVHD PNL PWRDN complete
11. Assist other MS with completion of PLB EQUIP PWRDN (10-27)

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MS PAGE**

10-28

OPCL/ALL/GEN C,6

MS: After comm plan established with MCC, perform
COMM PWRDN ASAP (delay 10 min max). Use these
COMM pages until TOUCHDOWN

CAUTION
TDRS OR STDN - HI AOS may be limited
to 10 min (power amp will overheat)

NOTE
This procedure powers off ALL ground comm

COMM PWRDN

- A1L 1. S-BD PM ANT SW ELEC - OFF
 PRE AMP - OFF
 PWR AMPL STBY - OFF
 OPER - OFF
 MODE - STDN LO
 XPNDR - OFF
2. NSP PWR - OFF
 ENCRYPTION PWR - OFF (Encryp OFF
 rest of flt)
 MODE - SEL
 SEL - BYP
- C3 3. S-BD PM CNTL - PNL

- NOTE
Ensure CDR has recorded N2 quantities
before powering down PCMMU. Other
steps may be performed
4. OI PCMMU PWR - OFF
 FORMAT - FXD
5. AUD CTR - OFF (turn ON as reqd for ICOM
 audio)

Cont next page

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MS PAGE**

10-29

OPCL/ALL/GEN C,6

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

- 05 6. L AUD PWR - OFF (turn ON as reqd for ICOM audio)
- 06 7. UHF MODE - OFF
- 09 8. R AUD PWR - OFF (turn ON as reqd for ICOM audio)
- A1L 9. ✓S-BD PL CNTL - PNL
✓PWR SYS - OFF
- A1R 10. PL DATA INTLVR PWR - OFF
- 11. OPS RCDRS PWR (two) - OFF
- 12. S-BD FM CNTL - PNL
PWR - OFF
- A3 13. PL RCDR PWR - OFF
- A7U 14. MON 1,2 PWR (two) - OFF
- R11L 15. TV PWR CONTR UNIT - OFF
- R15:B 16. VTR PWR - OFF
- :D 17. cb MNA, MNC GCILC (two) - op
TV (fourteen) - op
MNB CCTV ADU - op
RMS TV (six) - op
- :E 18. PS, MS AUD PWR (two) - OFF
- L9, R10 19. MIDDECK AUD SPKR PWR - OFF
- MO42F 20. Call the ground at every available UHF site per COMM POWERUP (10-31) and voice down the cab temp, crew body temps, and words to indicate the severity of the cab humidity

If MCC request data on cab environ or AV bays:

- 21. Perform CABIN ENVIRONMENT MONITOR (CONT DEORB, LOSS OF 2 H2O LOOPS TIG > 2.5), then:

If after TIG-10 min:

- 22. Perform AFT PNL CONFIG FOR ENTRY COMM (CONT DEORB, LOSS OF 2 H2O LOOPS DEORB PREP)

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MS PAGE**

10-30

OPCL/ALL/GEN C,6

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

COMM POWERUP (If Comm reqd prior to landing site coverage)

- Power up audio system
- C3 1. AUD CTR - 1
 - 05 L AUD PWR - AUD
 - 09 R AUD PWR - AUD
- If UHF avail, config for UHF comm (voice only)
- 06 2. UHF MODE - SPLX
 - ✓SPLX PWR AMP - ON
 - 3. After Comm with MCC complete, Go to COMM PWRDN >>
- If UHF site unavail or if MCC requests data (Config for GSTDN (SGLS) S-BD):
- C3 4. ✓S-BD PM CNTL - PNL
 - ALL ANT SW ELEC - 2
 - MODE - STDN LO(SGLS)
 - XPNDR - 2
 - 5. NSP PWR - 2
 - ✓DATA RATE XMIT - HI
 - ✓RCV - LO
 - CODING XMIT - OFF
 - RCV - OFF
 - ✓UPLK DATA - S-BD
 - C3/F9 6. Sel best S-BD PM ANT
- If MCC requests data:
- 014:B 7. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - c1
 - C3 8. OI PCMMU PWR - 1
 - 06 9. MDM PL2 - ON
 - 10. BFS, GNC I/O RESET
- At end of data transmission:
- 014:B 11. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - op
- If not reqd for PLBD CLOSURE:
- 06 12. MDM PL2 - OFF
 - 13. After comm/data complete, Go to COMM PWRDN >>

Cont next page

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MS PAGE**

10-31

OPCL/ALL/GEN C,15

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

If UHF site and GSTDN unavail and comm/data critical:
Config for TDRS S-BD during AOA

CAUTION

This is a High Power Mode. On-time should be limited to 10 min max due to Pwr Amp Thermal constraints. A 3-min delay occurs before Pwr Amp comes on. Uplink not aff. Proceed with sel of best S-BD PM ANT

- C3 14. ✓S-BD PM CNTL - PNL
- A1L ANT SW ELEC - 2
- PRE AMP - 2
- PWR AMPL OPER - 2
- MODE - TDRS DATA
- XPNDR - 2

- 15. NSP PWR - 2
- ✓DATA RATE XMIT - HI
- ✓RCV - LO
- CODING XMIT - ON
- RCV - ON
- ✓UPLK DATA - S-BD

- C3/F9 16. Sel best S-BD PM ANT
- If MCC requests data:
- 014:B 17. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - c1
- C3 18. OI PCMMU PWR - 1
- 06 19. MDM PL2 - ON
- 20. BFS, GNC I/O RESET
- At end of data transmission:
- 014:B 21. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - op
- If not reqd for PLBD CLOSURE:
- 06 22. MDM PL2 - OFF

- 23. After comm/data complete, Go to COMM PWRDN

**LOSS OF 2 H2O LOOPS
ON-ORBIT
(CONUS TIG > 2.5 hr)
MSG PAGE**

10-32

OPCL/ALL/GEN C,15

LOSS OF CAB PRESS

CDR, MS1, and MS2: Perform procedures on 10-35
PLT: Perform following pwrn

NOTE

If $dP/dT < .4$ cab press will stabilize at 8 psia

- C3
1. MSTR MADS - OFF
 2. Minimize ltg
 3. Use one CRT (CRT4 preferable)
 4. Use one SPOC, INST PWR, and FLT CNTLR PWR as reqd
- If FLT CNTLR PWR not reqd:
- 014,015, 5. cb DDU L,R,AFT (six) - op
016:E
- 07 6. TACAN MODE (three) - OFF
08 7. MLS (three) - OFF
 RADAR ALTM (two) - OFF
- L1 8. CAB TEMP CNTLR - OFF
9. HUMIDITY SEP (two) - OFF
10. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
11. FLOW PROP VLV LOOP tb (two) - ICH
If FES not ena:
If EVAP OUT T 41 to 47 degF,
12. RAD CNTLR OUT TEMP - HI
When EVAP OUT T > 50 degF:
13. FLASH EVAP CNTLR PRI A(B) - ON,
then immediately:
14. RAD CNTLR OUT TEMP - NORM
If EVAP OUT T < 41 or > 47 degF,
15. FLASH EVAP CNTLR PRI A(B) - ON
- L2 16. ANTISKID - OFF
NWS - OFF
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op

Cont next page

If orbit 2,3 deorbit:

18. Use DEORB PREP/ENTRY DELTAS PULLOUT (10-37), then go to LAUNCH DAY ORBIT 2(3) (CONT DEORB) >>

If not orbit 2,3 deorbit, and time to TIG < 2 hr 40 min:

19. Go to EMERGENCY (CONT DEORB) >>

If time to TIG > 2 hr 40 min:

W1-W10 20. Install Window Shades (ten) or mnvr to tail sun att:

GNC UNIV PTG

TGT ID - ITEM 8 +4 EXEC
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +184 EXEC
Y - ITEM 16 +0 EXEC
OM - blank (MCC-provided if reqd)
DAP: A/AUTO/VERN
START TRK - ITEM 19 EXEC

If time to TIG < 4 hrs:

21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hrs:

If currently in single G2 GPC OPS:

22. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

23. Reassign strings to GPC 2 in MC 2

GPC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ----->
DOWNLIST GPC -
ITEM 44 +2 EXEC
GNC, OPS 201 PRO
GPC MODE 1 - STBY (tb-bp)
- HALT
PWR 1 - OFF
MODE 3,5 (two) - HALT (tb-bp)
PWR 3,5 (two) - OFF

Table with 3 columns: CONFIG GPC, 2, 02000. Rows include STR 1-4, PL 1/2, CRT 1-4, L 1-2, MM 1-2.

CRT 06

24. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)

LOSS OF CAB PRESS

CDR, MS1, MS2 Perform procedures on 10-35
PLT Perform following pwrn

NOTE

If $dP/dT < .4$ cab press will stabilize at 8 psia

- C3
1. MSTR MADS - OFF
 2. Minimize ltg
 3. Use one CRT (CRT4 preferable)
 4. Use one SPOC, INST PWR, and FLT CNTLR PWR as reqd
- If FLT CNTLR PWR not reqd:
- 014,015, 5. cb DDU L,R,AFT (six) - op
016:E
- 07 6. ✓TACAN MODE (three) - OFF
- 08 7. ✓MLS (three) - OFF
✓RADAR ALTM (two) - OFF
- L1 8. CAB TEMP CNTLR - OFF
9. HUMIDITY SEP (two) - OFF
10. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
11. ✓FLOW PROP VLV LOOP tb (two) - ICH
- If FES not ena:
- If EVAP OUT T 41 to 47 degF,
12. RAD CNTLR OUT TEMP - HI
When EVAP OUT T > 50 degF:
13. FLASH EVAP CNTLR PRI A(B) - ON,
then immediately:
14. RAD CNTLR OUT TEMP - NORM
- If EVAP OUT T < 41 or > 47 degF:
15. FLASH EVAP CNTLR PRI A(B) - ON
- L2 16. ANTISKID - OFF
NWS - OFF
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op

Cont next page

OI-8D |

TEMP A10-33

OPCL/ALL/GEN C,17

If orbit 2,3 deorbit:

18. Use DEORB PREP/ENTRY DELTAS PULLOUT (10-37), then go to LAUNCH DAY DEORBIT PREP (ORBIT 2 or ORBIT 3) (CONT DEORB) >>

If not orbit 2,3 deorbit, and time to TIG < 2 hr 40 min:

19. Go to EMERGENCY DEORBIT PREP/ENTRY (CONT DEORB) >>

If time to TIG > 2 hr 40 min:

W1-W10

20. Install Window Shades (ten) or mnvr to tail sun att:

GNC UNIV PTG

TGT ID - ITEM 8 +4 EXEC
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +184 EXEC
Y - ITEM 16 +0 EXEC
OM - blank (MCC-provided if reqd)
DAP: A/AUTO/VERN
START TRK - ITEM 19 EXEC

If time to TIG < 4 hrs:

21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hrs:

If currently in single G2 GPC OPS:

22. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

23. Reassign strings to GPC 2 in MC 2

GPC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ----->
DOWNLIST GPC -
ITEM 44 +2 EXEC
GNC, OPS 201 PRO
GPC MODE 1 - STBY (tb-bp)

- HALT
PWR 1 - OFF
MODE 3,5 (two) - HALT
(tb-bp)

PWR 3,5 (two) - OFF

24. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)

CRT
06

CONFIG GPC	2 02000
STR 1	2
2	2
3	2
4	2
PL 1/2	0
CRT 1	2
2	2
3	0
4	2
L 1	0
2	0
MM 1	2
2	2

01-8D

LOSS OF CAB PRESS

CDR, MS1, MS2 Perform procedures on 10-35
PLT Perform following pwrn

NOTE

If $dP/dT < .4$ cab press will stabilize at 8 psia

- C3
1. MSTR MADS - OFF
 2. Minimize lgt
 3. Use one CRT (CRT4 preferable)
 4. Use one SPOC, INST PWR, and FLT CNTLR PWR as reqd
- If FLT CNTLR PWR not reqd:
- 014,015, 5. cb DDU L,R,AFT (six) - op
016:E
- 07 6. \checkmark TACAN MODE (three) - OFF
- 08 7. \checkmark MLS (three) - OFF
 \checkmark RADAR ALTM (two) - OFF
- L1 8. CAB TEMP CNTLR - OFF
9. HUMIDITY SEP (two) - OFF
10. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
11. \checkmark FLOW PROP VLV LOOP tb (two) - ICH
- If FES not ena:
- If EVAP OUT T 41 to 47 degF,
12. RAD CNTLR OUT TEMP - HI
When EVAP OUT T > 50 degF:
13. FLASH EVAP CNTLR PRI A(B) - ON,
then immediately:
14. RAD CNTLR OUT TEMP - NORM
- If EVAP OUT T < 41 or > 47 degF:
15. FLASH EVAP CNTLR PRI A(B) - ON
- L2 16. ANTISKID - OFF
NWS - OFF
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op

Cont next page

01-8F

TEMP B10-33

OPCL/ALL/GEN C,17

If orbit 2,3 deorbit:
 18. Use DEORB PREP/ENTRY DELTAS PULLOUT (10-37), then go to LAUNCH DAY DEORB PREP (ORBIT 2 or ORBIT 3) (CONT DEORB) >>

If not orbit 2,3 deorbit, and time to TIG < 2 hr 40 min:

19. Go to EMERGENCY DEORB PREP/ENTRY (CONT DEORB) >>

If time to TIG > 2 hr 40 min:

W1-W10 20. Install Window Shades (ten) or mnvr to tail sun att:

GNC UNIV PTG

- TGT ID - ITEM 8 +4 EXEC
- BODY VECT - ITEM 14 +5 EXEC
- P - ITEM 15 +184 EXEC
- Y - ITEM 16 +0 EXEC
- OM - blank (MCC-provided if reqd)
- DAP: A/AUTO/VERN
- START TRK - ITEM 19 EXEC

If time to TIG < 4 hrs:

21. Go to 8 PSI DEORB PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hrs:

If currently in single G2 GPC OPS:

22. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

23. Reassign strings to GPC 2 in MC 2

GPC 0 GPC MEMORY

- CONFIG - ITEM 1 +2 EXEC
- Modify MC 2 per table ----->
- DOWNLIST GPC -
- ITEM 44 +2 EXEC
- GNC, OPS 201 PRO
- GPC MODE 1 - STBY (tb-bp)
- HALT
- PWR 1 - OFF
- MODE 3,5 (two) - HALT (tb-bp)

CONFIG GPC	2	02000
STR 1	2	
2	2	
3	2	
4	2	
PL 1/2	0	
CRT 1	2	
2	2	
3	0	
4	2	
L 1	0	
2	0	
MM 1	2	
2	2	

CRT 06

24. Go to 8 PSI DEORB PREP (DEORB PREP, CONTINGENCY DELTAS)

OI-8F

LOSS OF CAB PRESS

CDR, MS1, MS2 Perform procedures on 10-35
PLT Perform following pwrn

NOTE

If $dP/dT < .4$ cab press will stabilize at 8 psia

- C3
1. MSTR MADS - OFF
 2. Minimize ltg
 3. Use one CRT (CRT4 preferable)
 4. Use one SPOC, INST PWR, and FLT CNTLR PWR as reqd
- If FLT CNTLR PWR not reqd:
- 014,015, 016:E
5. cb DDU L,R,AFT (six) - op
- 07
6. \checkmark TACAN MODE (three) - OFF
- 08
7. \checkmark MLS (three) - OFF
 - \checkmark RADAR ALTM (two) - OFF
- L1
8. CAB TEMP CNTLR - OFF
 9. HUMIDITY SEP (two) - OFF
 10. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
 11. \checkmark FLOW PROP VLV LOOP tb (two) - ICH
- If FES not ena:
- If EVAP OUT T 41 to 47 degF,
12. RAD CNTLR OUT TEMP - HI
When EVAP OUT T > 50 degF:
 13. FLASH EVAP CNTLR PRI A(B) - ON,
then immediately:
 14. RAD CNTLR OUT TEMP - NORM
- If EVAP OUT T < 41 or > 47 degF:
15. FLASH EVAP CNTLR PRI A(B) - ON
- L2
16. ANTISKID - OFF
NWS - OFF
- L4:L
17. cb CAB T CNTLR 1,2 (two) - op

Cont next page

01-20 |

TEMP C10-33

OPCL/ALL/GEN C,20

If orbit 2,3 deorbit:

18. Use DEORB PREP/ENTRY DELTAS PULLOUT (10-37), then go to LAUNCH DAY DEORBIT PREP (ORBIT 2 or ORBIT 3) (CONT DEORB) >>

If not orbit 2,3 deorbit, and time to TIG < 2 hr 40 min:

19. Go to EMERGENCY DEORBIT PREP/ENTRY (CONT DEORB) >>

If time to TIG > 2 hr 40 min:

W1-W10

20. Install Window Shades (ten) or mnvr to tail sun att:

GNC UNIV PTG

TGT ID - ITEM 8 +4 EXEC
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +184 EXEC
Y - ITEM 16 +0 EXEC
OM - blank (MCC-provided if reqd)
DAP: A/AUTO/VERN
START TRK - ITEM 19 EXEC

If time to TIG < 4 hrs:

21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hrs:

If currently in single G2 GPC OPS:

22. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

23. Reassign strings to GPC 2 in MC 2

GPC 0 GPC MEMORY

CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table----->
DOWNLIST GPC -
ITEM 44 +2 EXEC
GNC, OPS 201 PRO
GPC MODE 1 - STBY (tb-bp)
- HALT
- STBY (tb-RUN)
- HALT (tb-bp)
PWR 1 - OFF
/MODE 3,5 (two) - HALT (tb-bp)

CONFIG GPC	2	02000
STR 1	2	
2	2	
3	2	
4	2	
PL 1/2	0	
CRT 1	2	
2	2	
3	0	
4	2	
L 1	0	
2	0	
MM 1	2	
2	2	

CRT 06

24. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)

OI-20

MS PWRDN

- CDR,MS1 Perform PLB EQUIP PWRDN (below)
MS2 Perform remaining pwrdn
- 014,015, 1. cb MNA,MNB,MNC ADTA (four) - op
016:E
016:E 2. cb MNC RCS/OMS PRPLT QTY GAUGE - op
If TIG > 2 hr 40 min:
019 3. TV PWR - OFF
014:B 4. cb MNA EVENT TIMER AFT - op
015:B 5. MNB MSN TIMER AFT - op
A7U 6. TV PWR CNTL - PNL
CONTR UNIT - OFF
A13 7. OS AUD SPKR PWR - OFF
L9 8. AUD PWR - OFF
R11L 9. VTR PWR - OFF
(L12 on OV102)
M042F 10. MIDDECK SPKR AUD SPKR PWR - OFF
M058F 11. TV PWR - OFF
When RMS powered down:
A3 12. MON PWR (two) - OFF
R15:E 13. cb STBD,PORT RMS TV (six) - op
MD44F 14. Pin Cab Temp Cntl vlv - FULL COOL
stow linkage >>

PLB EQUIP PWRDN

- If orbit 2,3 deorbit or time to TIG < 2 hr
40 min: >>
15. Perform PL SAFING (TEMP 12-2), then:

CAUTION
If stow problem occurs with either RMS
and/or KU-BD ANT, perform aff system
QUICK RESPONSE JETTISON (CONT DEORB)

- If RMS:
16. Perform RMS PWRDN (PDRS OPS), then:

Cont next page

LOSS OF CAB PRESS
(CONUS TIG > 2.5 hr)
MS PAGE

10-35

OPCL/ALL/GEN C,13

If KU-BD ANT deployed:

17. Perform KU-BD ANT STOW (ORB OPS,
COMM/INST), then:

If radiators deployed:

18. Go to RAD STOW/DEPLOY (ORB OPS, ECLS)

LOSS OF CAB PRESS
(CONUS TIG > 2.5 hr)
MS PAGE

10-36

OPCL/ALL/GEN C,13

LOSS OF CAB PRESS

CDR, MS1, and MS2: Perform procedures on 10-35
PLT: Perform following pwrn

NOTE

If $dP/dT < .4$ cab press will stabilize at 8 psia

- C3
1. MSTR MADS - OFF
 2. Minimize ltg
 3. Use one CRT (CRT4 preferable)
 4. Use one SPOC, INST PWR, and FLT CNTLR PWR as reqd
- If FLT CNTLR PWR not reqd:
- 014,015,
016:E
5. cb DDU L,R,AFT (six) - op
- 07
6. ✓TACAN MODE (three) - OFF
- 08
7. ✓MLS (three) - OFF
 - ✓RADAR ALTM (two) - OFF
- L1
8. CAB TEMP CNTLR - OFF
 9. HUMIDITY SEP (two) - OFF
 10. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
 11. ✓FLOW PROP VLV LOOP tb (two) - ICH
- If FES not ena:
- If EVAP OUT T 41 to 47 degF,
12. RAD CNTLR OUT TEMP - HI
- When EVAP OUT T > 50 degF:
13. FLASH EVAP CNTLR PRI A(B) - ON, then immediately:
 14. RAD CNTLR OUT TEMP - NORM
- If EVAP OUT T < 41 or > 47 degF,
15. FLASH EVAP CNTLR PRI A(B) - ON
- L2
16. ANTISKID - OFF
 - NWS - OFF
- L4:L
17. cb CAB T CNTLR 1,2 (two) - op

Cont next page

If orbit 2,3 deorbit:
 18. Use DEORB PREP/ENTRY DELTAS PULLOUT (10-37), then go to LAUNCH DAY ORBIT 2(3) (CONT DEORB) >>

If not orbit 2,3 deorbit, and time to TIG < 2 hr 40 min:

19. Go to EMERGENCY (CONT DEORB) >>

If time to TIG > 2 hr 40 min:

W1-W10 20. Install Window Shades (ten) or mnvr to tail sun att:

GNC UNIV PTG

TGT ID - ITEM 8 +4 EXEC
 BODY VECT - ITEM 14 +5 EXEC
 P - ITEM 15 +184 EXEC
 Y - ITEM 16 +0 EXEC
 OM - blank (MCC-provided if reqd)
 DAP: A/AUTO/VERN
 START TRK - ITEM 19 EXEC

If time to TIG < 4 hrs:

21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hrs:

If currently in single G2 GPC OPS:

22. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

23. Reassign strings to GPC 2 in MC 2

GPC 0 GPC MEMORY

CRT

CONFIG - ITEM 1 +2 EXEC
 Modify MC 2 per table----->
 ITEM 44 +2 EXEC
 GNC, OPS 201 PRO
 DAP: A/AUTO/VERN
 GPC MODE 1 - STBY
 (tb-bp)
 - HALT
 PWR 1 - OFF
 MODE 3,5 (two) - HALT
 (tb-bp)
 PWR 3,5 (two) - OFF

06

CONFIG GPC	2 02000
STR 1	2
2	2
3	2
4	2
PL 1/2	0
CRT 1	2
2	2
3	0
4	2
L 1	0
2	0
MM 1	2
2	2

24. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)

MS PWRDN

CDR,MS1: Perform PLB EQUIP PWRDN (below)
MS2: Perform remaining pwrdn

- 014,015, 1. cb ADTA (four) - op
016:E
016:E 2. RCS/OMS PRPLT QTY GAUGE - op
If TIG > 2 hr 40 min:
019 3. TV PWR - OFF
014:B 4. cb MNA EVENT TIMER AFT - op
015:B 5. MNB MSN TIMER AFT - op
A7U 6. TV PWR CNTL - PNL
CONTR UNIT - OFF
A13 7. OS AUD SPKR PWR - OFF
L9 8. PS AUD PWR - OFF
R11L 9. VTR PWR - OFF
(L12 on OV102)
M042F 10. MIDDECK AUD SPKR PWR - OFF
M058F 11. TV PWR - OFF
When RMS powered down:
A3 12. MON 1,2 PWR (two) - OFF
R13:E 13. cb RMS TV (six) - op
MD44F 14. Pin Cab Temp Cntl vlv - FULL COOL
stow linkage

PLB EQUIP PWRDN

1. Perform PL SAFING (TEMP 12-2), then:
2. Perform RMS POWERDN (PDRS OPS), then:
If a stow problem occurs:
 3. Perform QUICK RESPONSE JETTISON (CONT DEORB) after KU-BD ANT STOW, then:
4. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:
If a stow problem occurs:
 5. Perform QUICK RESPONSE JETTISON (CONT DEORB), then:
- If radiators deployed:
 6. Perform RAD STOW/DEPLOY (ORB OPS, ECLS)

LOSS OF CAB PRESS
ON-ORBIT
MS PAGE

10-35

OPCL/ALL/GEN C

DEORB PREP/ENTRY DELTAS PULLOUT PAGE

NOTE

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

NOTE

Single fault tolerance used for most cabin air cooled equipment. Additional LRUs may be activated if required and if CAB PRESS stable \geq 8 psia

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

1. Minimize use of CRTs, FLT CNTLR PWR, DDUs, INST PWR, Use one SPOC

If rev 2:

2. pg 1-8, BLK [3], 'APU HTRS-'
Use one INST PWR
Do not power TACANS

If rev 3:

3. pg 2-11, in BLK [11], 'PRE INGRESS-'
Do not power MLS, TACANS
Use one INST PWR

4. In ENT SW LIST/VER, do not activate pwrn items

Deltas to ENT, DEORBIT BURN

At TIG-4:

5. Use two CRTs for deorbit burn
- 014,015, 016:E, F7,F8 6. cb DDU L,R (four) - c1, then
7. L,R FLT CNTLR PWR (two) - ON

Deltas to ENT, POSTBURN:

8. Use one CRT
- F7,F8 9. L,R FLT CNTLR PWR (two) - OFF
- 014, 10. cb DDU L (two) - op
- 015:E 11. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

Cont next page

Deltas to ENTRY MANEUVERS (Cue Card):

At EI:

- 12. Use only two CRTs
- 014, 13. cb DDU L (two) - c1
- 015:E
- F7 14. L FLT CNTLR PWR - ON
- F6 15. INST PWR - FLT
- 014,015, 16. cb ADTA 1,2,3 (three) - c1
- 016:E

BFS, GNC I/O RESET

At V=15K:

If CAB P < 8 psia:

- 17. Delete NAVAIDS callout

If CAB P ≥ 8 psia:

- 18. Activate all TACANS, RAs, MLSs

GNC I/O RESET

Disregard subs NAVAID callout deltas

At V=10K:

- 07 19. TACAN 2,3 MODE (two) - GPC

At M=2.7:

- 20. Use two HUD, MLS, and RA as reqd

- 21. GNC I/O RESET

At M=0.9:

- L2 22. ANTISKID - ON
- F8 23. NWS - GPC
- 24. R INST PWR - ON

LOSS OF HI LOAD EVAP

NOTE

MAL, ECLS SSR-2, FES CORE FLUSH should be performed if core icing is suspected. If unsuccessful, then perform pwrn prior to RAD BYPASS at TIG-2:50 during deorb prep. If already in DEORB PREP, perform pwrn and review activities already performed for changes

- C3 1. ✓MSTR MADS PWR - OFF
2. Minimize ltg
3. Use one CRT, FLT CNTLR PWR, INST PWR, and SPOC as reqd
- 07 4. Perform PL PWRDN (TEMP 10-87), then:
08 5. ✓TACAN MODE (three) - OFF
6. ✓RADAR ALTM (two) - OFF
L1 7. ✓MLS (three) - OFF
8. ✓FLOW PROP VLV LOOP tb (two) - ICH
A3 9. ✓HI LOAD DUCT HTR - OFF
10. TV MON (two) - OFF
014,015, 11. If FLT CNTLR PWR not reqd:
016:E 11. cb DDU L,R,AFT (six) - op
12. Reset EVAP OUT T C&W upper limit (ch 107,117) to 2.15V (70 deg). Change B/U C&W parameter, 0631207, 0631407 upper limit to 70
- P&I to DEORB PREP, NOMINAL DEORBIT PREP
if not already performed:
At TIG-2:50, Prior to RAD BYP,
L1 13. H2O LOOP 2(1) BYP MODE - MAN.
MAN - DECR (hold 30 sec)
- RAD BYPASS/FES C/O (ORB OPS, ECLS):
Delete steps 5 thru 8 (SEC FES C/O)
At TIG-2:20 in DED DISP ENT CONFIG:
14. Do not power NAV/LDG AIDS, ADTAs
Power DDU's, FLT CNTLR PWR, INST PWR only as reqd
- At TIG-1:35, ENT SWITCH LIST/VERIF:
15. Do not power TACANS
Delete BRAKE/ANTISKID ACT
16. Go to LOSS OF HI LOAD DEORBIT (ENTRY) pullout page (ENT PKT, PWRDN)

Cont next page

P&I ENT, DEORBIT BURN:

At TIG-10:

- 014,015,
016:E
17. cb DDU L,R (four) - c1
 18. Use two CRTs, FLT CNTLR PWR, and INST PWR for burn

At TIG-5:

- L1
19. TOP EVAP HTR NOZ (two) - OFF
DUCT - OFF

P&I ENT, POSTBURN:

- F7,F8
014,015:E
20. L,R FLT CNTLR PWR (two) - OFF
 21. cb DDU L (two) - op (save for entry)
 22. Use one CRT
 23. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

P&I to ENTRY MANEUVERS (Cue Card)

At EI:

- 014,015:E
F7
F6
24. cb DDU L (two) - c1
 25. L FLT CNTLR PWR - ON
 26. INST PWR - FLT
 27. Use two CRTs
 28. BRAKES (three) - ON
- 014,015,
016:A
:E
29. cb ADTA 1,2,3 (three) - c1
 30. GNC I/O RESET
 31. NWS - GPC
 32. ANTISKID - ON

At V=15K:

- 07
33. Delete NAVAIDS callout
 34. TACAN MODE 2,3 (two) - GPC

At M=2.7:

35. Use two HUD, MLS, and RA
36. GNC I/O RESET

At M=0.9:

- F8
37. R INST PWR - ON

P&I to EVAP OUT TEMP HIGH (Cue Card)

Replace entire procedure with:

'If EVAP OUT T HIGH:

PRE EI:

- L1
38. RAD BYP VLV MODE (two) - AUTO
 39. CNTLR LOOP (two) - AUTO A(B)

POST EI:

40. H2O PUMP LOOP 1 - ON
41. NH3 CNTLR A(B) - SEC/ON'

LOSS OF 1 FREON LOOP

MS: Perform MS PWRDN (10-42)

- C3
 - 1. MSTR MADS PWR - OFF
 - 2. Minimize ltg
 - 3. Use one CRT, FLT CNTLR PWR, INST PWR, and SPOC, as reqd
- 014,015,
016:E
 - If FLT CNTLR PWR not reqd:
 - 4. cb DDU L,R,AFT (six) - op
 - 5. Perform PL PWRDN (TEMP 10-87), if reqd, then:
- L1
 - 6. ✓FLOW PROP VLV LOOP tb (two) - ICH
 - 7. H2O LOOP 2(1) BYP MODE - MAN
MAN - DECR (30 sec)
 - If FES not activated:
 - 8. Perform TOPPING FES STARTUP (ORB OPS, ECLS), then:
 - If prior to DEORB PREP:
 - If GPC 2 ON:
 - 9. Perform SINGLE G2 GPC OPS (ORB OPS, DPS), then:
 - 10. MMU 2 - OFF
 - 11. Mnvr to shade windows from sun or install Window Shades
- 015:F
W1-W10
 - | |
|---------------|
| SM SYS SUMM 1 |
|---------------|
 - 12. ✓kW, If >14 kW, perform PRIOR PWRDN (numbered) (except FES and one SPOC) until ≤14 kW, then
 - 13. Use DEORB/ENTRY DELTAS PULLOUT PAGE (10-43) for changes to DEORB PREP and ENT >>
- If in DEORB PREP:
 - F7,F8
 - 14. ✓FLT CNTLR PWR (two) - OFF
 - F6,F8
 - 15. ✓INST PWR (two) - OFF
 - 07
 - 16. Use one CRT
 - 08
 - 17. TACAN MODE (three) - OFF
 - 18. RADAR ALTM (two) - OFF
 - L2
 - 19. MLS (three) - OFF
 - 20. ANTISKID - OFF
NWS - OFF
 - 21. Continue with DEORB PREP; use DEORB/ENTRY DELTAS PULLOUT PAGE (10-43) for changes

MS PWRDN

- R15:D
:E
A3
014,015,
016:A
:E
1. Minimize lgt on Aft Flt Deck and middeck
 2. cb TV (fifteen) - op
 3. MNA,MNB RMS TV (six) - op
 4. MON 1,2 PWR (two) - OFF
If in DEORB PREP:
 5. BRAKES (three) - OFF
 6. cb ADTA (four) - op

DEORB/ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD. USE TO LANDING

NOTE

Incorporate the following changes or remove these pages for use with the indicated checklist/cue card

Perform NOMINAL DEORBIT PREP (DEORB PREP) with the following contingency deltas to the procedure

Deltas to DEORB PREP:

1. Use one CRT, FLT CNTLR PWR, INST PWR, DDU, and SPOC, only as reqd
2. Minimize ltg
3. Minimize sun in cab if possible

If rev 3 deorb, deltas to CONT DEORB,
LAUNCH DAY ORBIT 2(3):

Pg 2-11, BLK 11, 'PRE INGRESS-'

4. Do not power MLS, TACANS
Use one INST PWR

If nominal deorb prep,

DELTAS to DEORB PREP, NOMINAL DEORBIT PREP:

5. Verify steps 14 through 21 (10-41),
MS: step 5,6 (10-42)

Pg 1-12, BLK 10, 'DED DISP-'

6. Do not power ADTAs, TACANS
Add: Power NAV/LDG AIDS per
ENTRY MANEUVERS Cue Card
Minimize INST PWR use

Pg FS 1-16,

7. Do not power LRUs powered down in
steps 14 through 21 (10-41)
(MS, steps 5,6 (10-42))

Deltas to ENT, DEORBIT BURN:

8. Maintain window shading att until TIG-15

At TIG-15:

9. Remove window shades if installed

Cont next page

LOSS OF 1 FREON LOOP 10-43

OPCL/ALL/GEN C

- At TIG-10:
- 014,015,
016:E
10. cb DDU L,R (four) - c1
 11. Use two CRTs, two FLT CNTLR PWR for burn
- Deltas to ENT, POSTBURN:
- F7,F8
014,
015:E
12. L,R FLT CNTLR PWR (two) - OFF
 13. cb DDU L (two) - op
 14. Use one CRT
 15. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
- Deltas to ENTRY MANEUVERS (Cue Card):
- At EI:
- 014,
015:E
F7
16. cb DDU L (two) - c1
 17. L FLT CNTLR PWR - ON
 18. Use two CRTs
 19. BRAKES MNA,B,C - ON
- 014,015,
016:A
:E
- L2
- 07
- cb ADTA 1,2,3 (three) - c1
GNC I/O RESET
ANTISKID - ON
NWS - ON
- At V=15K:
20. Delete NAVAIDS callout
TACAN MODE (two) - GPC
- At V=12K:
21. Perform RAD FLOW in unfailed loop
- At M=2.7:
22. Use two HUD, MLS, and RA
GNC I/O RESET
- F8
- At M=0.9:
23. R INST PWR - ON
- P&I to ENT, POST LDG:
24. If EVAP OUT T high and incr:
 25. Go to EMER PWRDN Cue Card (ENT PKT, PWRDN)
- P&I to EVAP OUT TEMP HIGH (Cue Card):
26. If EVAP OUT T HIGH and incr:
 27. If loop 1(2) lost:
- L1
28. H2O PUMP LOOP (two) - ON
 29. NH3 A(B) - OFF
B(A) - SEC/ON

LOSS OF 1 FREON LOOP 10-44

OPCL/ALL/GEN C

LOSS OF 1 FC

- If before deorb prep:
1. ✓CAB FAN A(B) - ON
- If total Orb kW > 18:
2. Perform PRIOR PWRDN, GROUP 1,2 (except FES), then:
 3. Cont thru GROUP 3 until Orb kW < 18 then:
- R1 If any FC AMPS > 330 or ΔAMPS > 100:
4. MN BUS TIE (three) - ON, then:
- If 3 MN buses tied:
- If FC 1 or 2 failed:
5. MN BUS TIE C - OFF
- If FC 3 failed:
6. Perform PRIOR PWRDN, GROUP 3 as reqd to maintain PRI PL < 5 kW, then:
 7. PL PRI MNB - ON
MNC - OFF
FC3 - OFF
 8. MN BUS TIE B - OFF, then:
- If any FC AMPS still > 330 or ΔAMPS > 100:
9. Perform MAL, EPS SSR-8, then:
10. Go to step 20
- If in deorb prep:
11. Minimize ltg
 12. Use only two CRTs, one INST PWR, DDU, and FLT CNTLR PWR as reqd
- 07 13. TACAN MODE (three) - OFF
- 08 14. RADAR ALTM (two) - OFF
15. MLS (three) - OFF
- L1 16. ✓CAB FAN A(B) - ON
- R15:D 17. cb TV (fifteen) - op
- :E RMS TV (six) - op
- A3 18. MON 1,2 PWR (two) - OFF
- A11 19. CRYO TK HTRS (four) - OFF
20. Make FDF P&I changes as given (next page), then as time permits reconfig C/W limits per MAL, EPS SSR-3 1

Cont next page

FDF changes:

P&I ENT, DEORBIT BURN:

'TIG-5

- L1 21. TOP EVAP HTR NOZ (two) - OFF
DUCT - OFF
HI LOAD DUCT HTR - OFF
HUMIDITY SEP (two) - OFF
- L2 FLASH EVAP FDLN HTR SPLY(two) - OFF'

P&I EPS procedures in this book:

22. FC REACTANT VLV CLOSED
Delete step 4; Change step 2 to read:
'If aff FC/MN bus tied and COOL
P > 40:
2. MAIN BUS TIE (three) - ON
(ASAP)
Aff MAIN BUS TIE (one) - OFF
(ASAP)'
23. FC COOL P: Delete step 1
24. BUS TIE, steps 1,7: Delete '(A to...A)'
25. FC1(2,3) H2 PUMP +: Replace step 3
with:
'If aff FC/MN bus tied:
3. MAIN BUS TIE (three) - ON
Aff MAIN BUS TIE (one) - OFF'
26. FC SAFING: Replace steps 5,6 with:
'If aff FC/MN bus tied:
5. MAIN BUS TIE (three) - ON
6. Aff MAIN BUS TIE (one) - OFF'
27. FC H2O RLF NOZ TEMP ++:
Replace step 3 with:
'If aff FC/MN bus tied:
3. MAIN BUS TIE (three) - ON
Aff MAIN BUS TIE (one) - OFF'
28. FC DELTA V 1(2,3):
Delete step 1
Add 'MN BUS TIE (three) - ON, then'
to beginning of step 4, and change
step 6 to: 'Return to nominal bus
tie config'
29. Perform ENT PKT, PWRDN, LOSS OF 1 FC,
steps 11-16, then:
If in deorb prep:
30. Go/return to DEORB PREP, NOMINAL
DEORBIT PREP >>
31. P&I FLT PLN at 10 min prior to 'Go to
DEORB PREP,' add: 'perform steps
11-20, LOSS OF 1 FC (ORB PKT, PWRDN)'

LOSS OF 2nd FC ON-ORBIT (TIG < 4 hr)

If REV 2,3 DEORBIT:

1. Go to LOSS OF 2nd FC (ASC PKT, PWRDN) >>
2. If TIG < 1.5 hr: Sel new TIG > 1.5 hr
(This pwrdn and the Deorbit Prep require 1.5 hr)

NOTE

Do NOT perform BUS LOSS ACTIONS unless bus shorted (step 26 regains bus)

- * FC capability is ~10 kW for *
- * sustained operations, ~13 kW for short *
- * duration (~4 hrs), ~16 kW for contin- *
- * gency situations (~15 min). Purge FC *
- * at 430 amps or less *

- MS
C3
3. Perform AFT PNL PWRDN (10-49) immediately
 4. ✓MSTR MADS PWR - OFF
 5. Minimize ltg
 6. Use only two CRTs, one INST PWR, DDU, SPOC, and FLT CNTLR PWR as reqd
- 07
08
7. ✓TACAN MODE (three) - OFF
 8. ✓RADAR ALTM (two) - OFF
 9. ✓MLS (three) - OFF
- 06
- If GPC 2 on:
10. GNC 0 GPC MEMORY
CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table----->
 11. For any CRT that is OFF:
GPC/CRT1/X EXEC
 12. ✓DOWNLIST GPC - ITEM 44 -1
GNC, OPS 201 PRO
 13. GPC MODE 2 - STBY (tb-bp)
- HALT
PWR 2 - OFF
 14. ✓MODE 3,5 (two) - HALT
(tb-bp)
PWR 3,5 (two) - OFF
- 015:F
R4
15. ✓MMU 2 - OFF
 16. ✓MPS ENG CNTLR HTR
(three) - OFF

CONFIG GPC	2 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

Cont next page

OI-8D

TEMP A10-47

OPCL/OI-8D/GEN C,15

GNC 20 DAP CONFIG

- 17. Sel JET OPT 3
Sel NORMAL JETS
- 07 18. AFT L,R RCS MANF 4 (two) - CL
- 014,015, 19. RJDF DRIVER (four) - OFF
- 016:F LOGIC (four) - OFF
- 06 20. MDM FF4 - OFF
- 014:F 21. RJDA 2A DRIVER - OFF
LOGIC - OFF
- L1 22. ✓FLOW PROP VLV LOOP tb (two) - ICH
If no MANF leak:
R1 23. ✓O2,H2 MANF VLVS (four) - OP
TK1 HTR B - AUTO (MNA or
MNB +)
or TK2 HTR B - AUTO (MNC or
NO MN BUS +)
then all others OFF
If MANF leak:
24. ✓O2/H2 HTR LOSS TABLE, ECLS
Sel one htr in one O2,H2 TK
- R2 25. HYD CIRC PUMP (three) - OFF
- L4:L 26. cb CAB T CNTLR 1,2 (two) - op
If not MN BUS SHORT:
27. Tie three MN BUSES, EPS, BUS TIE (Cue
Card), then:
L1 28. Post BUS TIE config check:
✓CAB FAN A(B) - ON
- 29. Perform RCS, RCS SECURE (FWD RCS only),
then:
30. Perform MAL, EPS SSR-3 **1**, then:
31. Go to LOSS OF 2 FC (CONT DEORB). Refer
to Activities Priority Table for
activities to be performed in the CONT
DEORB

OI-8D

TEMP A10-48

OPCL/ALL/GEN C,17

LOSS OF 2nd FC ON-ORBIT (TIG < 4 hr)

If REV 2,3 DEORBIT:

1. Go to LOSS OF 2nd FC (ASC PKT, PWRDN) >>
2. If TIG < 1.5 hr: Sel new TIG > 1.5 hr
(This pwrnd and the Deorbit Prep require 1.5 hr)

NOTE

Do NOT perform BUS LOSS ACTIONS unless bus shorted (step 26 regains bus)

- * FC capability is ~10 kW for *
- * sustained operations, ~13 kW for short *
- * duration (~4 hrs), ~16 kW for contin- *
- * gency situations (~15 min). Purge FC *
- * at 430 amps or less *

- MS 3. Perform AFT PNL PWRDN (10-49) immediately
- C3 4. ✓MSTR MADS PWR - OFF
5. Minimize ltg
6. Use only two CRTs, one INST PWR, DDU, SPOC, and FLT CNTLR PWR as reqd
- 07 7. ✓TACAN MODE (three) - OFF
- 08 8. ✓RADAR ALTM (two) - OFF
9. ✓MLS (three) - OFF
- 06 If GPC 2 on:
10. GNC 0 GPC MEMORY
CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table---->
11. For any CRT that is OFF:
GPC/CRT1/X EXEC
12. ✓DOWNLIST GPC - ITEM 44 -1
GNC, OPS 201 PRO
- CRT 13. GPC MODE 2 - STBY (tb-bp)
- HALT
PWR 2 - OFF
14. ✓MODE 3,5 (two) - HALT
(tb-bp)
PWR 3 - OFF
- 015:F 15. ✓MMU 2 - OFF
- R4 16. ✓MPS ENG CNTLR HTR
(three) - OFF

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

Cont next page

OI-8F

GNC 20 DAP CONFIG

- 17. Sel JET OPT 3
Sel NORMAL JETS
- 07 18. AFT L,R RCS MANF 4 (two) - CL
- 014,015, 19. RJDF DRIVER (four) - OFF
- 016:F LOGIC (four) - OFF
- 06 20. MDM FF4 - OFF
- 014:F 21. RJDA 2A DRIVER - OFF
LOGIC - OFF
- L1 22. ✓FLOW PROP VLV LOOP tb (two) - ICH
If no MANF leak:
 - R1 23. ✓O2,H2 MANF VLVS (four) - OP
TK1 HTR B - AUTO (MNA or
MNB +)
or TK2 HTR B - AUTO (MNC or
NO MN BUS +)
then all others OFF
 - If MANF leak:
 - 24. ✓O2/H2 HTR LOSS TABLE, ECLS
Sel one htr in one O2,H2 TK
 - 25. HYD CIRC PUMP (three) - OFF
- R2 26. cb CAB T CNTLR 1,2 (two) - op
- L4:L If not MN BUS SHORT:
 - 27. Tie three MN BUSES, EPS, BUS TIE (Cue
Card), then:
 - L1 28. Post BUS TIE config check:
✓CAB FAN A(B) - ON
 - 29. Perform RCS, RCS SECURE (FWD RCS only),
then:
 - 30. Perform MAL, EPS SSR-3 **1**, then:
 - 31. Go to LOSS OF 2 FC (CONT DEORB). Refer
to Activities Priority Table for
activities to be performed in the CONT
DEORB

01-8F

TEMP B10-48

OPCL/ALL/GEN C,17

AFT PNL PWRDN

- A1R 1. PL RCDR PWR - OFF
OPS RCDRS PWR (two) - OFF
- A11 2. CRYO TANK HTRS (four) - OFF
- A12 3. APU HTR LUBE OIL LINE (three) - OFF
- 4. HYD HTR (eight) - OFF
- A14 5. RCS/OMS HTR FWD RCS - OFF
JET (five) - OFF
- 6. Perform PL SAFING (TEMP 12-2), then:

CAUTION

If stow problem occurs with either RMS and/or KU-BD ANT, perform aff system QUICK RESPONSE JETTISON (CONT DEORB)

If RMS:

- 7. Perform RMS PWRDN (PDRS OPS), then:

If KU-BD ANT deployed:

- 8. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:

If radiators deployed:

- 9. Perform RAD STOW/DEPLOY (ORB OPS, ECLS)

- A3 10. MON 1,2 PWR (two) - OFF

- R15:D 11. cb TV (fifteen) - op
- :E RMS TV (six) - op

If MMU is powered:

- ML86B:D 12. cb MNA MMU PORT HTR A - op
STBD HTR A - op
MNB MMU PORT HTR B - op
STBD HTR B - op

- MD44F 13. Pin Cab Temp Cnt1 vlv - FULL COOL position

LOSS OF 2nd FC
ON-ORBIT (TIG < 4 hr)
MS PAGE

10-49

OPCL/ALL/GEN C,13

LOSS OF 2nd FC ON-ORBIT (TIG > 4 hr)

NOTE

Do NOT perform BUS LOSS ACTIONS unless bus shorted (step 8 regains bus)

- * FC capability is ~10 kW for sustained *
- * operations, ~13 kW for short duration *
- * (~4 hrs), ~16 kW for contingency *
- * situations (~15 min). Purge FC at *
- * 430 amps or less *

C3

1. MS: Perform MS OVHD AND AFT
PNL PWRDN (10-53) immediately

2. ✓MSTR MADS PWR - OFF

GNC 21 IMU ALIGN

3. IMU 1,2 (two) - dese1

If GPC 2 on:

GNC 0 GPC MEMORY

4. CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ---->

✓ITEM 44 -1

GNC, OPS 201 PRO

5. For any CRT that is OFF:

GPC/CRT1/X EXEC

O6

6. GPC MODE 2 - STBY (tb-bp)

- HALT

PWR 2 - OFF

✓MODE 3,5 (two) - HALT

(tb-bp)

✓PWR 3,5 (two) - OFF

O15:F

7. MMU 2 - OFF

If not MN bus short, tie

3 MN Buses:

8. BUS TIE (EPS), 5-11

9. Minimize ltg

10. Use one CRT, INST PWR, DDU, SPOC, and
FLT CNTLR PWR as reqd

CONFIG GPC	2 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

Cont next page

- 07 11. ✓TACAN MODE (three) - OFF
- 08 12. ✓RADAR ALTM (two) - OFF
- 13. ✓MLS (three) - OFF
- L1 14. ✓FLOW PROP VLV LOOP tb (two) - ICH
- 15. AV BAY 2 FAN A,B (two) - OFF
- 16. ✓CAB FAN A(B) - ON
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op
- 18. Perform GG FREE DRIFT, ATT ID B (ORB OPS, RCS) (mnvr in PRIMARY, establish drift in VERN), then:
- 19. Set event timer for 30 min (for FES duct htr deact)
- 08 20. Perform RCS, RCS SECURE (for all RCS) then:
- 014,015, 21. RJD DRIVER (nine) - OFF
- 016:F
- 06 22. MDM FF1,2,4 (three) - OFF
- FA1,2,3,4 (four) - OFF
- L1 23. TOP EVAP HTR NOZ L,R (two) - OFF
- 24. ✓HI LOAD DUCT HTR - OFF
- R1 If no MANF leak:
 - 25. ✓O2,H2 MANF VLVS (four) - OP
 - TK1 HTR B - AUTO (MNA or MNB +)
 - or TK2 HTR B - AUTO (MNC or NO MN BUS +)
 - then all others OFF
- If MANF leak:
 - 26. ✓O2/H2 HTR LOSS TABLE, ECLS
 - Set one htr in one O2,H2 TK
- R2 27. BLR CNTLR/HTR (three) - OFF
- 28. HYD CIRC PUMP (three) - OFF
- R4 29. ✓MPS ENG CNTLR HTR L,CTR,R (three) - OFF
- MA73C:A, 30. MCA LOGIC (fourteen) - OFF
- B
- If H2O LOOP 2 failed:
 - :A 31. MCA LOGIC FWD 2 - ON
 - 30 minutes after FES deact:
 - L1 32. TOP EVAP HTR DUCT - OFF
 - 33. Perform MAL, EPS SSR-3, then:
 - 34. Go to LOSS OF 2 FC (CONT DEORB)

LOSS OF 2nd FC ON-ORBIT (TIG > 4 hr)

NOTE

Do NOT perform BUS LOSS ACTIONS unless bus shorted (step 8 regains bus)

- * FC capability is ~10 kW for sustained *
- * operations, ~13 kW for short duration *
- * (~4 hrs), ~16 kW for contingency *
- * situations (~15 min). Purge FC at *
- * 430 amps or less *

MS 1. Perform MS OVHD AND AFT
PNL PWRDN (10-53) immediately

C3 2. ✓MSTR MADS PWR - OFF

GNC 21 IMU ALIGN

3. IMU 1,2 (two) - desel

If GPC 2 on:

GNC 0 GPC MEMORY

4. CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ---->

CRT ✓DOWNLIST GPC - ITEM 44 -1
GNC, OPS 201 PRO

5. For any CRT that is OFF:
GPC/CRT1/X EXEC

O6 6. GPC MODE 2 - STBY (tb-bp)

- HALT

PWR 2 - OFF

✓MODE 3,5 (two) - HALT
(tb-bp)

✓PWR 3,5 (two) - OFF

O15:F 7. MMU 2 - OFF

If not MN bus short, tie

3 MN Buses:

8. BUS TIE (EPS), 5-11

9. Minimize ltg

10. Use one CRT, INST PWR, DDU, SPOC, and
FLT CNTLR PWR as reqd

CONFIG GPC	2 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

Cont next page

OI-8D

TEMP A10-51 OPCL/OI-8D/GEN C,15

- 07 11. ✓TACAN MODE (three) - OFF
- 08 12. ✓RADAR ALTM (two) - OFF
13. ✓MLS (three) - OFF
- L1 14. ✓FLOW PROP VLV LOOP tb (two) - ICH
15. AV BAY 2 FAN A,B (two) - OFF
16. ✓CAB FAN A(B) - ON
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op
18. Perform GG FREE DRIFT, ATT ID B (ORB OPS, RCS) (mnvr in PRIMARY, establish drift in VERN), then:
19. Set event timer for 30 min (for FES duct htr deact)
- 08 20. Perform RCS, RCS SECURE (for all RCS) then:
- 014,015, 21. RJD DRIVER (nine) - OFF
- 016:F
- 06 22. LOGIC (eight) - OFF
- MDM FF1,2,4 (three) - OFF
- FA1,2,3,4 (four) - OFF
- L1 23. TOP EVAP HTR NOZ L,R (two) - OFF
24. ✓HI LOAD DUCT HTR - OFF
- If no MANF leak:
- R1 25. ✓O2,H2 MANF VLVS (four) - OP
- TK1 HTR B - AUTO (MNA or MNB +)
- or TK2 HTR B - AUTO (MNC or NO MN BUS +)
- then all others OFF
- If MANF leak:
26. ✓O2/H2 HTR LOSS TABLE, ECLS
- Set one htr in one O2,H2 TK
- R2 27. BLR CNTLR/HTR (three) - OFF
28. HYD CIRC PUMP (three) - OFF
- R4 29. ✓MPS ENG CNTLR HTR L,CTR,R (three) - OFF
- MA73C:A, 30. MCA LOGIC (fourteen) - OFF
- B
- If H2O LOOP 2 failed:
- :A 31. MCA LOGIC FWD 2 - ON
- 30 minutes after FES deact:
- L1 32. TOP EVAP HTR DUCT - OFF
33. Perform MAL, EPS SSR-3, then:
34. Go to LOSS OF 2 FC (CONT DEORB)

OI-8D

TEMP A10-52

OPCL/ALL/GEN C,17

LOSS OF 2nd FC ON-ORBIT (TIG > 4 hr)

NOTE

Do NOT perform BUS LOSS ACTIONS unless bus shorted (step 8 regains bus)

- * FC capability is ~10 kW for sustained *
- * operations, ~13 kW for short duration *
- * (~4 hrs), ~16 kW for contingency *
- * situations (~15 min). Purge FC at *
- * 430 amps or less *

- MS 1. Perform MS OVHD AND AFT
PNL PWRDN (10-53) immediately
- C3 2. ✓MSTR MADS PWR - OFF
GNC 21 IMU ALIGN
3. IMU 1,2 (two) - desel
If GPC 2 on:
GNC 0 GPC MEMORY
4. CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ---->
- CRT ✓DOWNLIST GPC - ITEM 44 -1
GNC, OPS 201 PRO
5. For any CRT that is OFF:
GPC/CRT1/X EXEC
- O6 6. GPC MODE 2 - STBY (tb-bp)
- HALT
PWR 2 - OFF
✓MODE 3,5 (two) - HALT
(tb-bp)
✓PWR 3 - OFF
- O15:F 7. MMU 2 - OFF
If not MN bus short, tie
3 MN Buses:
8. BUS TIE (EPS), 5-11
9. Minimize Itg
10. Use one CRT, INST PWR, DDU, SPOC, and
FLT CNTLR PWR as reqd

CONFIG GPC	2 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

Cont next page

OI-8F

TEMP B10-51

OPCL/OI-8F/GEN C,15

- 07 11. ✓TACAN MODE (three) - OFF
- 08 12. ✓RADAR ALTM (two) - OFF
- 13. ✓MLS (three) - OFF
- L1 14. ✓FLOW PROP VLV LOOP tb (two) - ICH
- 15. AV BAY 2 FAN A,B (two) - OFF
- 16. ✓CAB FAN A(B) - ON
- L4:L 17. cb CAB T CNTLR 1,2 (two) - op
- 18. Perform GG FREE DRIFT, ATT ID B (ORB OPS, RCS) (mvr in PRIMARY, establish drift in VERN), then:
- 19. Set event timer for 30 min (for FES duct htr deact)
- 08 20. Perform RCS, RCS SECURE (for all RCS) then:
- 014,015, 21. RJD DRIVER (nine) - OFF
- 016:F
- 06 22. MDM FF1,2,4 (three) - OFF
- FA1,2,3,4 (four) - OFF
- L1 23. TOP EVAP HTR NOZ L,R (two) - OFF
- 24. ✓HI LOAD DUCT HTR - OFF
- If no MANF leak:
- R1 25. ✓O2,H2 MANF VLVS (four) - OP
- TK1 HTR B - AUTO (MNA or MNB +)
- or TK2 HTR B - AUTO (MNC or NO MN BUS +)
- then all others OFF
- If MANF leak:
- 26. ✓O2/H2 HTR LOSS TABLE, ECLS
- Sel one htr in one O2,H2 TK
- R2 27. BLR CNTLR/HTR (three) - OFF
- 28. HYD CIRC PUMP (three) - OFF
- R4 29. ✓MPS ENG CNTLR HTR L,CTR,R (three) - OFF
- MA73C:A, 30. MCA LOGIC (fourteen) - OFF
- B
- If H2O LOOP 2 failed:
- :A 31. MCA LOGIC FWD 2 - ON
- 30 minutes after FES deact:
- L1 32. TOP EVAP HTR DUCT - OFF
- 33. Perform MAL, EPS SSR-3, then:
- 34. Go to LOSS OF 2 FC (CONT DEORB)

OI-8F |

TEMP B10-52

OPCL/ALL/GEN C,17

MS OVHD AND AFT PNL PWRDN

- 014:A 1. IMU 1 - OFF (confirm IMU dese1)
- 015:A 2. 2 - OFF (confirm IMU dese1)
- 016:E 3. cb MNC RCS/OMS PRPLT QTY GAUGE - op
- R15:D 4. TV (fifteen) - op
- A1R 5. OPS RCDRS PWR (two) - OFF
- 6. PL RCDR PWR - OFF
- A11 7. CRYO TK HTRS (four) - OFF
- A12 8. APU HTR LUBE OIL LINE (three) - OFF
- 9. HYD HTR (eight) - OFF
- A14 10. RCS/OMS HTR FWD RCS JET 1,2,3,4(four) - OFF
- ML31C 11. VAC VENT NOZ HTR - OFF
- ML86B:A 12. cb MNA H2O LINE HTR A - op
- 13. MNB H2O LINE HTR B - op
- If MMU is powered:
- :D 14. cb MNA MMU PORT HTR A - op
- STBD HTR A - op
- MNB MMU PORT HTR B - op
- STBD HTR B - op
- MD44F 15. Pin Cab Temp Cntl vlv - FULL COOL position
- 16. Perform PL SAFING (TEMP 12-2), then:

CAUTION
If stow problem occurs with either RMS and/or KU-BD ANT, perform aff system QUICK RESPONSE JETTISON (CONT DEORB)

- If RMS:
- 17. Perform RMS PWRDN (PDRS OPS), then:
- If KU-BD ANT deployed:
- 18. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:
- If radiators deployed:
- 19. Perform RAD STOW/DEPLOY (ORB OPS, ECLS)
- 014:F 20. MMU 1 - OFF
- R15:E 21. cb RMS TV (six) - op
- A3 22. MON PWR (two) - OFF

**LOSS OF 2nd FC
ON-ORBIT (TIG > 4 hr)
MS PAGE**

10-53

OPCL/ALL/GEN C,13

LOSS OF 2 FREON LOOPS

WARNING

- FC purge must be started and loads powered down ASAP
- If all 3 FCs remain running orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP. This assumes the 3 FCs are powered down to a total level of 8 kW immediately and are continuously purged
- If 2 FCs are shut down for ON-ORBIT WAIT, max orbiter lifetime from time of failure is expected to be > 120 min
- Earliest possible landing is reqd

NOTES

- Failure assumed to occur after GO for On-orbit and before Deorbit TIG-2:05
- Comm procedures (10-71 thru 10-74) should be used throughout this procedure and CONT DEORB
- Preferred COMM Config is:
 - A. UHF only
 - B. GSTDN S-BD (If reqd)
 - C. Use TDRS only if mandatory

Cont next page

TIME CRITICAL PROCEDURES

1. If in OPS 1, Go to LOSS OF 2 FREON LOOPS (POST OMS-2) (ASC PKT, PWRDN) >>
2. Have MS exec RAD STOW, KU-BD ANT STOW, and PLBD CLOSE (10-63,64) ASAP
3. Have second MS exec RMS STOW and MS OVHD AND AFT PNL CONFIG (10-65 thru 10-68) ASAP
4. Have third MS exec COMM PWRDN (10-71);
Delay 10 min max if AOS

Perform following steps ASAP:

5. Write down MET of failure of 2nd FCL:
 / : :
 C3 6. MSTR MADS PWR - OFF
 MS:R12U 7. ✓FC PURGE HTR - ON
 8. ✓VLVS 1,2,3 (three) - OP
 9. Minimize ltg
 CRTX 10. Use only one fwd CRT (Save CRT3 for entry)
 11. Use only one SPOC
 F6/F8 12. ✓INST PWR (two) - OFF
 F7/F8 13. ✓FLT CNTLR PWR (two) - OFF
 06 14. Config GPC 1 to MC 2

GNC 0 GPC MEMORY

15. CONFIG - ITEM 1 +2 EXEC
 If not GNC 201, then:
 GNC, OPS 201 PRO
 Modify MC 2 per table----->

CONFIG	1	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

NOTE

The following must be an OPS mode recall:
 GNC, OPS 201 PRO

16. For any CRT that is OFF:
 GPC, CRT1/X EXEC
- C3 17. ✓BFC CRT DISP - OFF

Cont next page

- 06 18. GPC MODE 2,3 (two) - STBY (tb-bp), HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)
 PWR 2,3 (two) - OFF
 MODE 5 - STBY (tb-RUN)
 - HALT (tb-bp)
 OUTPUT 5 - NORM
 PWR 5 - OFF

PLT:

- 07 19. ✓TACAN MODE (three) - OFF
 08 20. ✓RADAR ALTM (two) - OFF
 21. ✓MLS (three) - OFF
 C3 22. FCS CH (four) - AUTO
 R4 23. ✓MPS ENG CNTLR HTR L,CTR,R (three) - OFF
 MANF PRESS LO2,LH2 (two) - CL
 R2 24. ✓HYD CIRC PUMP (three) - OFF
 25. MPS He ISOL B L - CL
 PNEU L ENG He XOVR - CL
 26. Go to step 49

CDR:

- L1 27. HUMIDITY SEP A,B (two) - OFF
 28. IMU FAN A - ON
 B,C (two) - OFF
 29. H2O PUMP LOOP 1 - A
 - ON
 LOOP 1 BYP MODE - MAN
 MAN - DECR (30 sec)
 PUMP LOOP 2 - OFF
 MD44F 30. Cab Temp Cntl vlv - pin to FULL COOL
 L1 31. CAB FAN A,B (two) - OFF
 32. AV BAY 1B,2,3 FAN A,B (five) - OFF
 1 FAN A - ON
 33. FREON PUMP LOOP 1,2 (two) - OFF (one-ON,
 if any flow)
 34. RAD CNTLR LOOP 1,2 (two) - OFF
 35. ✓NH3 CNTLR A,B (two) - OFF
 If no FREON PUMPS ON, then:
 L2 36. O2 SYS 1,2 SPLY (two) - OP (tb-OP)
 L1 37. FLASH EVAP CNTLR PRI A,B (two) - OFF
 TOP EVAP HTR NOZ (two) - OFF
 DUCT - OFF
 38. HI LOAD DUCT HTR - OFF

Cont next page

- L2 | 39. FLASH EVAP FDLN HTR SPLY(two) - OFF
 If one FREON PUMP ON, then:
 L1 40. FLASH EVAP CNTLR PRI A - ON
 41. TOP EVAP HTR NOZ (two) - OFF
 ✓DUCT - ON
 42. ✓HI LOAD DUCT HTR - ON
 L2 43. FLASH EVAP FDLN HTR B SPLY - OFF
 44. ANTISKID - OFF
 45. NWS - OFF
 06 46. STAR TRKR PWR -Y,-Z (two) - OFF
 47. ANNUN BUS SEL ACA 2/3 - OFF
 GNC 21 IMU ALIGN
 014, 48. IMU 1,2 (two) - desel, then
 015:A - OFF

CAUTION
 Do not perform steps 49 thru
 55 until PLBDs are closed

- C2 49. CRT MAJ FUNC (three) - GNC
 06 50. GPC MODE 4 - STBY (tb-bp)
 - HALT
 PWR 4 - OFF
 GNC 0 GPC MEMORY
 51. CONFIG - ITEM 1 +2 EXEC
 52. Assign PL1/2 to GPC 1 (Provides Up1k Path)
 53. GNC, OPS 201 PRO
 54. All CRTs - OFF (Use CRT1 as reqd until CONT
 DEORB Proc, 3 min OFF for
 each min ON)
 55. DAP: free drift
 56. MDM FF1,4 (two) - OFF
 FA1,4 (two) - OFF
 F6 57. CDR disp - green dot
 08 58. FWD RCS MANF ISOL 1,2,3,4 (four) - CL
 (tb-CL)

Cont next page

- 06 18. GPC MODE 2,3 (two) - STBY (tb-bp), HALT
 - STBY (tb-RUN)
 - HALT (tb-bp)
 PWR 2,3 (two) - OFF
 MODE 5 - STBY (tb-RUN)
 - HALT (tb-bp)
 OUTPUT 5 - NORM
 PWR 5 - OFF

PLT:

- 07 19. ✓TACAN MODE (three) - OFF
 08 20. ✓RADAR ALTM (two) - OFF
 21. ✓MLS (three) - OFF
 C3 22. FCS CH (four) - AUTO
 R4 23. ✓MPS ENG CNTLR HTR L,CTR,R (three) - OFF
 MANF PRESS LO2,LH2 (two) - CL
 R2 24. ✓HYD CIRC PUMP (three) - OFF
 25. MPS He ISOL B L - CL
 PNEU L ENG He XOVR - CL
 26. Go to step 49

CDR:

- L1 27. HUMIDITY SEP A,B (two) - OFF
 28. IMU FAN A - ON
 B,C (two) - OFF
 29. H2O PUMP LOOP 1 - A
 - ON
 LOOP 1 BYP MODE - MAN
 MAN - DECR (30 sec)
 PUMP LOOP 2 - OFF
 MD44F 30. Cab Temp Cntl vlv - pin to FULL COOL
 L1 31. CAB FAN A,B (two) - OFF
 32. AV BAY 1B,2,3 FAN A,B (five) - OFF
 1 FAN A - ON
 33. FREON PUMP LOOP 1,2 (two) - OFF (one-ON,
 if any flow)
 34. RAD CNTLR LOOP 1,2 (two) - OFF
 35. ✓NH3 CNTLR A,B (two) - OFF
 If no FREON PUMPS ON, then:
 L2 36. O2 SYS 1,2 SPLY (two) - OP (tb-OP)
 L1 37. FLASH EVAP CNTLR PRI A,B (two) - OFF
 TOP EVAP HTR NOZ (two) - OFF
 DUCT - OFF
 38. HI LOAD DUCT HTR - OFF

Cont next page

OI-20

TEMP 10-57 OPCL/OI-20/GEN C,20

- L2 39. FLASH EVAP FDLN HTR SPLY(two) - OFF
- If one FREON PUMP ON:
- L1 40. FLASH EVAP CNTRLR PRI A - ON
- 41. TOP EVAP HTR NOZ (two) - OFF
√DUCT - ON
- L2 42. √HI LOAD DUCT HTR - ON
- 43. FLASH EVAP FDLN HTR B SPLY - OFF
- 44. ANTISKID - OFF
- 45. NWS - OFF
- 06 46. STAR TRKR PWR -Y,-Z (two) - OFF
- 47. ANNUN BUS SEL ACA 2/3 - OFF
- GNC 21 IMU ALIGN**
- 014, 48. IMU 1,2 (two) - dese1
015:A - OFF

CAUTION
 Do not perform steps 49 thru
 55 until PLBDs are closed

- C2 49. CRT MAJ FUNC (three) - GNC
- 06 50. GPC MODE 4 - STBY (tb-bp)
- HALT
PWR 4 - OFF
- GNC 0 GPC MEMORY**
- 51. CONFIG - ITEM 1 +2 EXEC
- 52. Assign PL1/2 to GPC 1 (Provides Up1k Path)
- 53. GNC, OPS 201 PRO
- 54. All CRTs - OFF (Use CRT1 as reqd until CONT
DEORB Proc, 3 min OFF for
each min ON)
- 55. DAP: FREE
- 56. MDM FF1,4 (two) - OFF
FA1,4 (two) - OFF
- F6 57. CDR disp - green dot
- 08 58. FWD RCS MANF ISOL 1,2,3,4 (four) - CL
(tb-CL)

Cont next page

01-20 |

TEMP 10-58 OPCL/OI-20/GEN C,16

PWR OFF ALL RJD LOGIC AND DRIVERS

- 014:F 59. RJDA 1A,2A LOGIC,DRIVERS (four) - OFF
RJDF 1B LOGIC,DRIVER (two) - OFF
015:F RJDA 1B LOGIC,DRIVER (two) - OFF
RJDF 1A F2 LOGIC,DRIVER (two) - OFF
016:F RJDA 2B LOGIC,DRIVER (two) - OFF
RJDF 2A,2B LOGIC,DRIVER (four) - OFF
RJD MANF L5/F5/R5 DRIVER - OFF
60. Set ELS TIG (Use SPOC or WX TPR MSG):
Selected TIG ____:____:____ MET
(-) Present TIME ____:____:____ MET
(=) Time to TIG ____:____:____

- R1 If time to TIG \leq 40 min, NO On-Orbit Wait reqd:
61. MN BUS TIE (three) - ON
62. Go to step 77
If time to TIG $>$ 40 min, On-Orbit Wait reqd:
63. Disconnect and shut down two FCs
for On-Orbit Wait:

NOTE

UHF only available w/FC2,3 shut down

DO NOT BUS TIE

- R1 64. ESS BUS SOURCE FC2,3 (two) - OFF
65. FC/MN BUS B,C (two) - OFF
66. FC2,3 - STOP
67. AC BUS SNSR 2,3 (two) - OFF
68. cb AC CONTR AC2,3 (six) - cl
69. INV/AC BUS 2,3 (two) - OFF
70. INV PWR 2,3 (two) - OFF
71. cb AC CONTR AC2,3 (six) - op
R12U 72. FC PURGE VLVS 2,3 (two) - CL
R15:B 73. cb MNA GCILC - op

WARNING

Limit operation of GPC 1 to 1 hr. If reqd, restring to GPC 2 and power down GPC 1

Cont next page

10-59

OPCL/ALL/GEN C

If FC1 on:
 014:B | 74. cb MNA SIG CONDR OF 1/4 A - c1
 If FC2 on:
 015:B | 75. cb MNB SIG CONDR OF 2/3 A - c1
 If FC3 on:
 016:B | 76. cb MNC SIG CONDR OF 2/3 B - c1

WARNING

Monitor FC performance. If FC STK T \geq 250° or FC V \leq 27, go immediately to ON-ORBIT WAIT BACKOUT (CONT DEORB, LOSS OF 2 FREON LOOPS). Restart FCs immediately and perform the remaining ON-ORBIT WAIT BACKOUT at specified times

If PL MDMs not currently being used for comm:
 77. \checkmark PLBDs are closed, then:
 06 \checkmark MDM PL1,2 (two) - OFF
 L4:J 78. cb AC3 Φ A SIG CONDR HUM SEP - op
 Φ B SIG CONDR IMU FAN - op
 :K 79. AC1 Φ A H2O CNTLR 2 - op
 :L CAB T CNTLR 2 - op
 Φ B AV BAY 2 S/C - op
 80. AC2 Φ A CAB T CNTLR 1 - op
 Φ B AV BAY 3 S/C - op
 R1 81. \checkmark O2,H2 MANF VLV TK1,2 (four) - op
 TK2 HTRS A,B (four) - OFF
 TK1,3 HTRS A,B (eight) - AUTO
 If O2 TK1(3) QTY < 80%, then:
 82. O2 TK1,3 HTR A (two) - OFF
 R2 83. BLR CNTLR/HTR 2 - OFF
 PWR 2 - OFF
 If no On-Orbit Wait (2 FC not shut down):
 84. Go to ENTRY CONFIG (CONT DEORB, LOSS OF 2 FREON LOOPS) >>
 If proceeding with On-Orbit Wait (2 FC SHUTDN):
 06 85. MDM FA1,2,3,4 (four) - OFF
 FF1,2,4 (three) - OFF
 L4:P 86. cb AC2,3 Φ A LG SNSR 1,2 (two) - op

Cont next page

- W1-10 87. Install Window Shades (remove as reqd
to monitor att or control cab temp)

NOTE

Cycle CRTs. If ON at loss of cooling,
turn OFF within 30 min. Allow 3 min
OFF for each 1 min ON (1 hr max ON time)

88. Continue monitoring FC and go to ON-ORBIT
WAIT BACKOUT (CONT DEORB, LOSS OF 2
FREON LOOPS) >>

MS PULLOUT PAGE

MS Execute ASAP

- R12U
1. FC PURGE HTR - ON
VLVS (three) - OP
 2. Minimize lgt on Aft Flt Deck

NOTE

For the following RAD STOW, KU-BAND ANT STOW, and PLBD CLOSE procedures, use the following MCA config. Disregard MCA switch throws in other procedures until PLB doors closed

3. MCA LOGIC CONFIG
- MA73C:A, ✓all MCA LOGIC (fourteen) - ON
- B
- :A 4. MNA FWD 1 - ON
MNB FWD 2 - OFF
MID 1 - OFF
MNC FWD 3 - OFF
- :B MNA AFT 1 - OFF
MNB AFT 2 - OFF
MID 3 - OFF
MNC AFT 3 - OFF

CAUTION

If stow problem occurs with KU-BD ANT, perform QUICK RESPONSE JETTISON (CONT DEORB)

If KU-BD ANT deployed:

5. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:

If radiators deployed:

6. Perform RAD STOW/DEPLOY (ORB OPS, ECLS)

Cont next page

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE**

10-63

OPCL/ALL/GEN C,13

PLBD CLOSE

- O6 1. ✓MDM PL1,2 (two) - ON
SM I/O RESET
2. ✓PL SAFING complete
3. ✓No obstructions (Ku ANT, RMS, RAD, etc.)
SM PL BAY DOORS
- R13L 4. SM, OPS 202 PRO - close PLBD ASAP
5. PL BAY DR SYS 1,2 (two) - ENA
6. AC POWER ON - ITEM 1 EXEC
AUTO MODE SEL - ITEM 3 EXEC
PBD SW BYPASS - ITEM 14 EXEC
CLOSE - ITEM 17 EXEC
- If 'S63 PLB SEQ FAIL' msg during door closure
and aft latches for that door are not 'CL':
7. ✓Door scallop on or below tgt line
before continuing in MAN mode,
otherwise:
8. Perform MAL, MECH SSR-2,
CONTINGENCY PLBD CLOSURE, then:
9. PBD STOP - ITEM 16 EXEC
- R12L 10. AC POWER OFF - ITEM 2 EXEC
- R13L 11. CRT4 PWR - OFF
12. PL BAY DR SYS (two) - DISABLE
✓PL BAY flood (all) - OFF
- MA73C:A, 13. All MCA LOGIC sw except MNA FWD 1
B (thirteen) - OFF
:A ✓MCA LOGIC MNA FWD 1 - ON
14. Report to CDR: RMS, KU-BD ANT, and RADS
stowed; PLBD closed
15. Go to FLUID LOADING PREP (10-69) and
continue

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE**

10-64

OPCL/ALL/GEN C,13

RMS STOW

NOTE

For the following RMS STOW use the following MCA config. Disregard MCA switch throws in other procedures until PLB doors closed

MA73C:A,1. ✓MCA LOGIC MNA MID 1 - ON
B ✓MID 3 - ON
✓MNB MID 2 - ON
✓4 - ON
✓MNC MID 2 - ON
✓4 - ON

2. Perform PL SAFING (TEMP 12-2), then:

CAUTION

If stow problem occurs with RMS, perform QUICK RESPONSE JETTISON (CONT DEORB)

If RMS:

3. Perform RMS POWERDN (PDRS OPS), then:

MS OVHD AND AFT PNL CONFIG

013:A 1. cb ESS 1BC C/W A - op
:B CRYO QTY O2,H2 TK2 (two) - op
:C 2CA C/W B - op
MTU B - op
:E 3AB GPC STAT - op
014:A 2. ✓BRAKES MNA - OFF
3. ✓RGA 1 - OFF
:B 4. cb MNA OI SIG CONDR OF 1/4 A - op
OM 1/2 A - op
MDM OF 1/2 A - op
3/4 A - op
H2O BYP LOOP 1 SNSR- op
MSN TIMER FWD - op
EVENT TIMER AFT - op

Cont next page

LOSS OF 2 FREON LOOPS

ON-ORBIT

MS PAGE

10-65

OPCL/ALL/GEN C,13

014:C 5. cb MNA UTIL PWR 019/M052J - op
 :D FREON RAD CNTLR 1,2 (two) - op
 GPS PRE AMPL UC,LC (two) - op
 02/N2 CNTLR 1 - op (leave c1 if
 PCS 1 active)
 CAB VENT - op
 ISOL - op
 :E ✓ADTA 1 - op
 ✓ACCEL 1 - op
 DDU L,AFT (two) - op
 :F 6. MMU 1 - OFF
 7. ASA 1 - OFF
 015:A 8. ✓BRAKES MNB - OFF
 9. ✓RGA 2 - OFF
 4 - OFF
 :B 10. cb MNB OI MDM OF 1/2 B - op
 H2O BYP LOOP 2 SNSR - op
 MSN TIMER AFT - op
 EVENT TIMER FWD - op
 :C UTIL PWR F1/M013Q - op
 :D FREON RAD CNTLR 1,2 (two) - op
 02/N2 CNTLR 2 - op (leave c1 if
 PCS 2 active)
 :E ADTA 2 - op
 ACCEL 2 - op
 DDU L,R (two) - op
 :F 11. MMU 2 - OFF
 12. ASA 2 - OFF
 13. ACCEL 4 - OFF
 016:A 14. ✓BRAKES MNC - OFF
 15. ✓RGA 3 - OFF
 :B 16. cb MNC OI SIG CONDR OF 2/3 B - op
 MDM OF 3/4 B - op
 AUX TIMING BUFF - op

Cont next page

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE

10-66

OPCL/ALL/GEN C,13

- 016:C 17. cb MNC CRYO O2 HTR TK2 SNSR 1 - op
 UTIL PWR A11/A15/MO30F - op
 If no Galley,
 18. Leave cl until FLUID LOADING PREP on
 10-69 complete)
19. cb MNC ANNUN AFT ACA 4/5 - op
 :D GPS PRE AMPL UC,LC (two) - op
 O2 EMER - op
 :E ADTA 3,4 (two) - op
 DDU R,AFT (two) - op
 RCS/OMS PRPLT QTY GAUGE - op
 :F 20. ASA 3,4 (two) - OFF
 21. ACCEL 3 - OFF
- 017:A 22. ATVC (four) - OFF
 :B 23. ✓EIU (three) - OFF
 :C 24. SIG CONDR FREON A,B (two) - OFF
 :D OA 1/2/3 - OFF
 25. MDM OA 1/2/3 - OFF
 26. MEC 1 - OFF (2 sec), then
 2 - OFF
- 019 27. TV PWR - OFF
 28. COAS PWR - OFF
- A11 29. CRYO TK4 HTR O2,H2 A,B (four) - OFF
 A12 30. APU HTR GAS GEN/FUEL PUMP 2 - OFF
 LUBE OIL LINE 1,2,3 (three) - OFF
 TK/FU LINE/H2O/SYS
 1B, 2A, 2B, 3A (four) - OFF
 1A, 3B (two) - AUTO
31. HYD HTR (eight) - OFF
 A13 32. OS AUD SPKR PWR - OFF
 A14 33. RCS/OMS HTR FWD RCS - OFF
 L,R POD (four) - OFF
 OMS CRSFD LINES (two) - OFF
 FWD RCS JET (five) - OFF
 AFT RCS JET (five) - OFF
- A6U 34. FLT CNTLR PWR - OFF
 35. ANNUN BUS SEL - OFF

Cont next page

**LOSS OF 2 FREON LOOPS
 ON-ORBIT
 MS PAGE**

10-67

OPCL/ALL/GEN C,13

R15:D 36. cb TV (fifteen) - op
 :E RMS TV (six) - op
 L9,R10 37. PS,MS AUD PWR (two) - OFF
 38. Minimize Middeck ltg
 ML31C 39. VAC VENT NOZ HTR - OFF
 ML86B:A 40. cb MNB H2O LINE HTR B - op
 If MMU is powered:
 :D 41. cb MMU PORT HTR A - op
 STBD HTR A - op
 PORT HTR B - op
 STBD HTR B - op
 MO39M 42. MIDDECK COMM CCU PWR - OFF
 MO42F SPKR AUD PWR - OFF
 If no GALLEY, go to step 50
 GALLEY 43. OVEN/RHS - OFF
 H2O HTRS - OFF
 ✓OVEN FAN - OFF
 44. Go to step 52
 45. FOOD WARMER - OFF
 46. H2O DISPENSER PWR pb - OFF
 MD44F 47. Pin Cab Temp Cntl vlv - FULL COOL
 MO13Q 48. All middeck lts off

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE

10-68

OPCL/ALL/GEN C,13

FLUID LOADING PREP

If Galley:

1. OVEN/RHS - AUTO

If no Galley:

2. H2O DISPENSER PWR pb - ON
3. Unstow, fill 4 water containers (per crewmember) with 8 oz. of water each. Stow temporarily near seat
4. Unstow 8 salt tablets (per crewmember). Stow temporarily in Flt Suit pocket

If Galley:

5. OVEN/RHS - OFF
✓H2O HTRS - OFF
✓OVEN FAN - OFF
Oven door launch strap - snap closed

If no Galley:

6. H2O DISPENSER PWR pb - OFF
✓FOOD WARMER - OFF

016:C

cb MNC UTIL PWR A11/A15/M030F - op

7. Stow Personal Hygiene Hose

FLUID LOADING

At TIG-1:00 (or as soon as time permits thereafter), begin Fluid Loading 32 oz. water with salt over next 1.5 hours (2 salt tablets per 8 oz.)

FDF Config

1. Unstow: ENT, ENT PKT, ENT Cue Cards
2. Use DEORBIT BURN MONITOR and ENTRY MANEUVERS Cue Card (CONT DEORB, LOSS OF 2 FREON LOOPS)

Cab Config

1. Stow loose equipment
- After Deorbit Targeting complete:
2. Stow Backup SPOC
 3. Remove and stow Side hatch UV filter (except 102), locking device, and pyro box safing pin
 4. Tape foot loops in egress routes
 5. Remove and stow Window Shades (if not needed for cab T control)

Cont next page

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE**

10-69

OPCL/ALL/GEN C

WCS Deact

WCS 1. Foot Restraints - up, locked
ML31C 2. VAC VENT ISOL VLV CNTL - CL (tb-CL)

Pole Setup

ESCAPE POLE STOWAGE/SETUP (Cue Card)

Seat Installation

✓Minimum 1tg on Middeck
Unstow CONT DEORB, LOSS OF TWO FREON LOOPS;
perform MS PAGE procedures

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE**

10-70

OPCL/ALL/GEN C

The COMM PWRDN and POWERUP procedures on this and following pages should be used until Touchdown

COMM PWRDN

MS: Power down Comm ASAP after comm with MCC no longer reqd. Delay 10 min max if AOS. Use COMM POWERUP (10-73) if MCC Comm reqd. Comm will be powered on entry by AFT PNL CONFIG FOR ENTRY COMM (CONT DEORB, LOSS OF 2 FREON LOOPS) and special ENTRY MANEUVERS Cue Card

- A1L 1. S-BD PM ANT SW ELEC - OFF
 - PRE AMP - OFF
 - PWR AMPL STBY - OFF
 - OPER - OFF
 - MODE - STDN LO
 - XPNDR - OFF
- 2. NSP PWR - OFF
 - ENCRYPTION PWR - OFF (Encrypt disabled rest of flt)
 - MODE - SEL
 - SEL - BYP
- C3 3. S-BD PM CNTL - PNL, then CMD
 - OI PCMMU FORMAT - FXD
 - PWR - OFF
 - AUD CTR - OFF (pwr up as reqd for cockpit audio)
- A1L 4. ✓S-BD PL CNTL - PNL
 - ✓PWR SYS - OFF
 - PL DATA INTLVR PWR - OFF
- A1R 5. OPS RCDRS PWR 1,2 (two) - OFF
 - S-BD FM CNTL - PNL
 - PWR - OFF
 - PL RCDR PWR - OFF
- A3 6. MON 1,2 PWR (two) - OFF
- A7U 7. TV PWR CONTR UNIT - OFF
- 06 8. UHF MODE - OFF
- 9. MDM PL1, PL2 (two) - OFF
- R11L 10. VTR PWR - OFF
- R15:B 11. cb MNA, MNC GCILC (two) - op
 - If after TIG-10:
 - 12. Perform AFT PNL CONFIG FOR ENTRY COMM (CONT DEORB, LOSS OF 2 FREON LOOPS)

LOSS OF 2 FREON LOOPS

ON-ORBIT

MS COMM PAGE

10-71

OPCL/ALL/GEN C

COMM POWERUP (If Comm reqd prior to landing site coverage)

- Power up audio system
- C3 1. AUD CTR - 1
 - 05 ✓L AUD PWR - AUD
 - 09 ✓R AUD PWR - AUD
- If UHF avail, config for UHF comm (voice only)
- 06 2. UHF MODE - SPLX
 - ✓SPLX PWR AMP - ON
 - 3. After comm with MCC complete, Go to COMM PWRDN
- If UHF site unavail or if MCC requests data (Config for GSTDN(SGLS) S-BD):
- C3 4. ✓S-BD PM CNTL - PNL
 - ALL ANT SW ELEC - 2
 - MODE - STDN LO(SGLS)
 - XPNDR - 2
 - 5. NSP PWR - 2
 - DATA RATE XMIT - HI
 - RCV - LO
 - CODING XMIT - OFF
 - RCV - OFF
 - ✓UPLK DATA - S-BD
 - C3/F9 6. Sel best S-BD PM ANT
- If MCC requests data:
- 014:B 7. cb MNA OI MDM OF 1/2 A,3/4 A (two) - c1
 - 017:D 8. SIG CONDR OA 1/2/3 - ON
 - 9. MDM OA 1/2/3 - ON
 - C3 10. OI PCMMU PWR - 1
 - 06 11. MDM PL2 - ON
 - 12 GNC I/O RESET
- At end of data transmission:
- 014:B 13. cb MNA OI MDM OF 1/2 A,3/4 A (two) - op
 - 017:D 14. SIG CONDR OA 1/2/3 - OFF
 - 15. MDM OA 1/2/3 - OFF

Cont next page

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS COMM PAGE**

10-73

OPCL/ALL/GEN C

16. After comm/data complete, Go to COMM
PWRDN

If UHF site and GSTDN unavail and comm/data
critical:
Config for TDRS S-BD

CAUTION

This is a High Pwr Mode. On-time should be
limited to 10 min max due to Pwr Amp Thermal
constraints. A 3-min delay occurs before
Pwr Amp comes on. Uplink not aff. Proceed
with sel of best S-BD PM ANT

C3
A1L

17. ✓S-BD PM CNTL - PNL
18. ✓ANT SW ELEC - 2
✓PRE AMP - 2
✓PWR AMPL OPER - 2
MODE - TDRS DATA
✓XPNDR - 2

19. ✓NSP PWR - 2
✓DATA RATE XMIT - HI
RCV - LO
CODING XMIT - ON
RCV - ON
✓UPLK DATA - S-BD

C3/F9

20. Sel best S-BD PM ANT

If MCC requests data:

014:B 21. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - c1
017:D 22. SIG CONDR OA 1/2/3 - ON
23. MDM OA 1/2/3 - ON
C3 24. OI PCMMU PWR - 1
06 25. MDM PL2 - ON
26. GNC I/O RESET

At end of data transmission:

014:B 27. cb MNA OI MDM OF 1/2 A, 3/4 A (two) - op
017:D 28. SIG CONDR OA 1/2/3 - OFF
29. MDM OA 1/2/3 - OFF
30. After comm/data complete, Go to COMM
PWRDN

**LOSS OF 2 FREON LOOPS
ON-ORBIT
MS COMM PAGE**

10-74

OPCL/ALL/GEN C

LOSS OF FES

MS: Perform MS PWRDN (10-77) immediately

- C3 1. ✓MSTR MADS PWR - OFF
- 2. ✓Minimize ltg
- 3. Use one CRT, FLT CNTLR PWR, INSTR PWR, and one SPOC only as reqd
- If FLT CNTLR PWR not reqd:
- 014, 015, 016:E 4. cb DDU L,R,AFT (six) - op
- 07 5. ✓TACAN MODE (three) - OFF
- 08 6. ✓RADAR ALTM (two) - OFF
- 7. ✓MLS (three) - OFF
- 8. Perform PL PWRDN (TEMP 10-87), then: |
- L1 9. CAB TEMP CNTLR - OFF
- 10. H2O LOOP 2 BYP MODE - MAN
MAN - DECR (hold 30 sec)
- PUMP LOOP 1 (two) - OFF, B
- 11. ✓FLOW PROP VLV LOOP tb (two) - ICH
- 12. ✓TOP EVAP HTR NOZ L,R (two) - OFF
✓DUCT - OFF
- L2 13. ✓HI LOAD DUCT HTR - OFF
- 14. NWS - OFF
- 15. ANTISKID - OFF
- L4:L 16. cb CAB T CNTLR 1,2 (two) - op
- R2 17. BLR CNTLR/HTR (three) - OFF
- R4 18. ✓MPS ENG CNTLR HTR (three) - OFF
- 19. MMU 2 deact:
- SM 1 DPS UTILITY
- ✓MMU ASSIGN 1 SM - ITEM 3 EXEC, then
- MMU 2 - OFF
- 015:F If IMU ALIGN not reqd, mnvr to tail sun att: |
- GNC UNIV PTG
- 20. TGT ID - ITEM 8 +4 EXEC
- BODY VECT - ITEM 14 +5 EXEC
- P - ITEM 15 +184 EXEC
- Y - ITEM 16 +0 EXEC
- OM - ITEM 17 +90 EXEC ($\beta < 0$)
+270 EXEC ($\beta > 0$)
- START TRK - ITEM 19 EXEC

Cont next page

21. Verify MS pwrn activities complete,
then:
22. For deorbit prep, Go to LOSS OF FES
(CONT DEORB) >>

MS PULLOUT PAGE

MS2: Deploy rads, RAD STOW/DEPLOY (ORB OPS, ECLS)
MS1: Perform pwrn below

MS PWRDN

1. Minimize ltg
- 014, 2. ✓BRAKES (three) - OFF
- 015,
- 016:A
- :E 3. ✓cb ADTA (four) - op
- 014:B 4. MSN TIMER FWD - op
EVENT TIMER AFT - op
- 015:B 5. MSN TIMER AFT - op
EVENT TIMER FWD - op
- A1R 6. PL RCDR PWR - OFF
- A1L 7. DATA INTLVR PWR - OFF
- A12 8. APU HTR LUBE OIL LINE (three) - OFF
9. HYD HTR (eight) - OFF
- A14 10. RCS/OMS HTR FWD RCS - OFF
L,R POD (four) - OFF
OMS CRSFD LINES (two) - OFF
- R15:D 11. cb TV (fifteen) - op
- :E RMS TV (six) - op
- A3 12. MON 1,2 PWR (two) - OFF
- ML31C 13. VAC VENT NOZ HTR - OFF
- If Manned Mnvr Unit is powered:
- ML86B:D 14. cb MNA,MNB STBD HTR A,B (two) - op
PORT HTR A,B (two) - op
- MD44F 15. Pin Cab Temp Cntl vlv - FULL COOL

LOSS OF FES
ON-ORBIT
MS COMM PAGE

10-77

OPCL/ALL/GEN C

AV BAY FIRE

AV BAY 1

NOTE

While performing procedure, note any cbs open.

Equipment still powered in Av Bay following pwrn:

FPCA 1
FLCA 1
IMU FANS

If no active GNC GPC, perform FD GPC ACTIVATE (DPS) concurrent with remainder of this procedure

- R1 1. cb AC CONTR AC1 Φ A, Φ B, Φ C (three) - c1
- 2. INV/AC BUS 1 - OFF (tb-OFF)
INV PWR 1 - OFF (tb-OFF)
- 3. cb AC CONTR AC1 Φ A, Φ B, Φ C (three) - op.
- 4. Perform FC1 SHUTDN, except PWRDN (EPS)
(Cue Card), then:
- L1 5. AV BAY 1 FAN A,B (two) - OFF
- 6. IMU FAN B,C (two) - ON
A - OFF
- L2 7. \checkmark ANTISKID - OFF
- C3 8. AUD CTR - OFF (1(2) as reqd for COMM)
- 9. BFC CRT DISP - ON
- O6 10. GPC PWR 5 - ON
 \checkmark OUTPUT 5 - NORM
MODE 5 - STBY (tb-RUN), RUN
- 11. 4 - STBY (tb-bp), HALT
PWR 4 - OFF

If FD GPC ACTIVATE (DPS) performed, go to step 14

If single G2 GPC OPS,

- 12. Perform DUAL G2 GPC OPS (ORB OPS, DPS), then:

If/when in dual GPC OPS:

- 13. Reassign strings to GPC 2 in MC 2

GNC 0 GPC MEMORY

Cont next page

10-79

OPCL/ALL/GEN C

- CONFIG - ITEM 1 +2 EXEC
 Modify MC 2 per table ----->
- | | |
|--------|-------|
| CONFIG | 2 |
| GPC | 02000 |
| STR | 1 2 |
| | 2 2 |
| | 3 2 |
| | 4 2 |
| PL 1/2 | 0 |
| CRT | 1 2 |
| | 2 2 |
| | 3 0 |
| | 4 2 |
| L | 1 0 |
| | 2 0 |
| MM | 1 2 |
| | 2 2 |
- 06 CRT 14. GPC MODE 1 - STBY (tb-bp)
 - HALT
 - PWR 1 - OFF
 - 15. MDM FF1 - OFF
 - PL1 - OFF
 - 07 16. ✓TACAN 1 MODE - OFF
 - 08 17. ✓RADAR ALTM 1 - OFF
 - 18. ✓MLS 1 - OFF
 - 013:A 19. cb ESS 1BC AC1 SNSR - op
 - :E 3AB GPC STAT - op
 - 014:A 20. ✓BRAKES MNA - OFF
 - :B 21. cb MNA OI SIG CONDR OF 1/4 A - op
 - MDM OF 1/2 A - op
 - :E RADAR ALTM 1 - op
 - MLS 1 - op
 - ✓ADTA 1 - op
 - ✓ACCEL 1 - op
 - :F 22. MMU 1 - OFF
 - 23. RJDF 1B F1 LOGIC - OFF
 - DRIVER - OFF
 - 015:B 24. cb MNB OI SIG CONDR OF 1/4 B - op
 - MDM OF 1/2 B - op
 - :F 25. RJDF 1A F2 LOGIC - OFF
 - DRIVER - OFF
 - 26. ✓ACCEL 4 - OFF
 - 016:A 27. ✓BRAKES MNC - OFF
 - :E 28. ✓cb MNC ADTA 3 - op
 - A1R 29. PL RCDR PWR - OFF
 - A1L DATA INTLVR PWR - OFF
 - 30. S-BD PL CNTL - PNL, then CMD
 - C3 31. ✓OI PCMMU FORMAT - FXD
 - PWR - 2
 - ISM 62 PCMMU/PL COMM
 - 32. PCMMU I/O RESET PCM - ITEM 5 EXEC (*)
 - MA73C:A33. MCA LOGIC MNA FWD 1 - OFF
 - AW18H 34. PWR/BATT CHGR EMU 1,2 BUS SEL (two) - OFF

Cont next page

- A12 35. HYD CIRC PUMP PWR 1 - MNB
 - 2 - MNC
 - 3 - MNA
- A14 36. RCS/OMS HTR OMS CRSFD LINES - A AUTO
 - B AUTO
- L4:G 37. cb AC2 Φ A, Φ B, Φ C AV BAY 1 FAN B (three) - op
 - :P AC1 Φ C TACAN 1 - op
- L1 P&I MAL, EPS SSR-9 |1.45|
 - 38. \checkmark IMU FAN B,C (two) - ON
 - 39. \checkmark AV BAY 1 FAN A,B (two) - OFF
 - 40. Perform MAL, EPS SSR-9 |1.45|, then:
 - 41. Perform LOAD PCMMU FORMAT (ORB OPS FS, COMM/INST), then:
 - 42. Perform IGNC 23 RCS actions only, per MAL, COMM SSR-20, then:
 - 43. Reassign SM into GPC 3, per MAL, DPS SSR-4
 - 06 44. GPC MODE 5 - HALT
 - PWR 5 - OFF
 - 45. Perform MAL, ECLS SSR-12 (Checkout and Recovery), then:
- At next PLS opportunity:
 - 46. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)

Cont next page

AV BAY 2

NOTE

While performing procedure, note any cbs open.

Equipment still powered in Av Bay following pwrn:

- FPCA 2
- FLCA 2
- BFC 3A (When GPC 3 is powered)

- R1 1. cb AC CONTR AC2 Φ A, Φ B, Φ C (three) - c1
- 2. INV/AC BUS 2 - OFF (tb-OFF)
- INV PWR 2 - OFF (tb-OFF)
- 3. cb AC CONTR AC2 Φ A, Φ B, Φ C (three) - op
- 4. Perform FC2 SHUTDN, except PWRDN (EPS) (Cue Card), then:
- L1 5. IMU FAN A,C (two) - ON
- B - OFF
- 6. AV BAY 2 FAN A,B (two) - OFF
- L2 7. ANTISKID - OFF
- C3 8. OI PCMMU PWR - 1
- 9. S-BD PM CNTL - PNL, then CMD
- 06 10. Reassign strings to GPC 1 in MC 2

GNC 0 GPC MEMORY

- CRT CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per table ----->
- 06 11. GPC MODE 2 - STBY (tb-bp)
- HALT
- PWR 2 - OFF
- MODE 5 - HALT
- OUTPUT 5 - NORM
- PWR 5 - OFF
- 12. MDM FF2,FF4 (two) - OFF
- PL2 - OFF
- 07 13. TACAN 2 MODE - OFF
- 08 14. RADAR ALTM 2 - OFF
- 15. MLS 2,3 (two) - OFF
- 013:C 16. cb ESS 2CA AC2 SNSR - op
- 014:B 17. MNA OI MDM OF 1/2 A - op

CONFIG GPC	2	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

Cont next page

- 015:A 18. ✓BRAKES MNB - OFF
 :B 19. cb MNB OI SIG CONDR OF 2/3 A - op
 MDM OF 1/2 B - op
 :E RADAR ALTM 2 - op
 MLS 2 - op
 ✓ADTA 2 - op
 ✓ACCEL 2 - op
 :F 20. MMU 2 - OFF
 |GNC 20 DAP CONFIG| - sel tail only
 21. JET OPT - ITEM 12,26 +3 EXEC
 ITEM 13,27 +3 EXEC
 22. DAP: NORM
 016:A 23. ✓BRAKES MNC - OFF
 :B 24. cb MNC OI SIG CONDR OF 2/3 B - op
 :E MLS 3 - op
 ✓ADTA 4 - op
 :F 25. RJDF 2A F3 LOGIC - OFF
 DRIVER - OFF
 2B F4/F5 LOGIC - OFF
 F4 DRIVER - OFF
 26. ✓ACCEL 3 - OFF
 27. RJD MANF L5/F5/R5 DRIVER - OFF
 AIR 28. OPS RCDRS PWR 1 - OFF
 2 - OFF
 A1L 29. S-BD PL PWR SYS - OFF
 CNTL - PNL, then CMD
 A14 30. RCS/OMS HTR OMS CRSFD LINES - A AUTO
 - B AUTO
 MA73C:A31. MCA LOGIC MNB FWD 2 - OFF
 L4:H 32. cb AC3 Φ A, Φ B, Φ C AV BAY 2 FAN B (three) - op
 :P 33. AC2 Φ C TACAN 2 - op
 P&I MAL, EPS SSR-9 |1.49|
 L1 34. ✓IMU FAN A,C (two) - ON
 35. ✓AV BAY 2 FAN A,B (two) - OFF
 36. Perform MAL, EPS SSR-9 |1.49|, then:
 37. Perform |GNC 23 RCS| actions only, per MAL,
 COMM SSR-18, then:
 38. Reassign BFS into GPC 3, per MAL, DPS SSR-7
 39. Perform MAL, ECLS SSR-12 (Checkout and
 Recovery), then:
 At next PLS opportunity:
 40. Go to AV BAY FIRE (DEORB PREP,
 CONTINGENCY DELTAS)

AV BAY 3A

NOTE

While performing procedure, note any cbs open.

Equipment still powered in Av Bay following pwrn:

FPCA 3
FLCA 3
Active COMM System Equipment
S-BD PRE-AMP stby (alt sys)

- R1 1. cb AC CONTR AC3 Φ A, Φ B, Φ C (three) - c1
2. INV/AC BUS 3 - OFF (tb-OFF)
INV PWR 3 - OFF (tb-OFF)
3. cb AC CONTR AC3 Φ A, Φ B, Φ C (three) - op
4. Perform FC3 SHUTDN, except PWRDN (EPS)
(Cue Card), then:
- L1 5. AV BAY 3 FAN A,B (two) - OFF
6. IMU FAN A,B (two) - ON
C - OFF
- 06 7. GPC MODE 3 - HALT
OUTPUT 3 - NORM
PWR 3 - OFF
8. MDM FF3 - OFF
- 07 9. TACAN 3 MODE - OFF
- 013:A 10. cb ESS 1BC C/W A - op
:C 2CA C/W B - op
:E 3AB AC3 SNSR - op
- 014:B 11. MNA OI MDM OF 3/4 A - op
015:B 12. MNB OI SIG CONDR OF 2/3 A - op
016:B 13. MNC OI MDM OF 3/4 B - op
SIG CONDR OF 2/3 B - op
14. Perform LOSS OF VERNIERS (ORB OPS, RCS)
while continuing with pwrn
If Comm not working:
- C3 15. S-BD PM CNTL - PNL, then CMD
If Comm still not working:
- A1L 16. S-BD PL CNTL - PNL
PWR SYS - OFF
17. PL DATA INTLVR PWR - OFF

Cont next page

- C3
A1L
18. S-BD PM CNTL - PNL
 ANT SW ELEC - OFF
 PRE AMP - OFF
 PWR AMPL STBY - OFF
 OPER - OFF
 XPNDR - OFF
19. NSP PWR - OFF
 ENCRYPTION PWR - OFF
- A14 20. RCS/OMS HTR OMS CRSFD LINES - A AUTO
 - B AUTO
- MA73C:A21. MCA LOGIC MNC FWD 3 - OFF

NOTE

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

- If Command capability essential,
- C3
L4:H
:P
L1
22. S-BD PM CNTL - PNL, then CMD
23. cb AC1 Φ A, Φ B, Φ C AV BAY 3 FAN B (three) - op
24. AC3 Φ C TACAN 3 - op
 P&I MAL, EPS SSR-9 1.53
25. \checkmark IMU FAN A, B (two) - ON
26. \checkmark AV BAY 3 FAN A, B (two) - OFF
27. Perform MAL, EPS SSR-9 1.53, then:
28. Perform IGNC 23 RCS actions only, per MAL, COMM SSR-18, then:
29. Perform MAL, ECLS SSR-12 (Checkout and Recovery), then:
- At next PLS opportunity:
30. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	4	C (PP3A on MCC call)
FES (ON ORBIT)	8	C
FES (DEORBIT PREP)	8	C
MN BUS UNDERVOLTS/FC VOLTS	6	N/A
	14	N/A

ACTION

NOTE

PP3A only accessed by MCC call. Appropriate steps TBD by MCC

	PRIORITY PWRDN 3A (PP3A)	PWRUP
	If IUS DOWNLINK ON, go to step 4	
L11L	1. Send CIU CMD 33, 12C11 Downlink on A. No CIU CMD feedback (✓CMD REP - 12B110)	
L12U	2. ✓IUS RF ANT ENA tb - gray ✓DSBL tb - bp	
	If IUS RF ANT EN tb - bp:	
	3. cb IUS SW PWR - c1 ANT TB PWR - c1 IUS RF ANT E/D - ENA (mom) cb IUS SW PWR - op	
L10	4. CIU PWR - OFF	ON
R1	5. CMD PATH ENA - HDLN	
PGSC	6. PL CAB - OFF	ON
	7. [ALT]/[CNTL]/[ESC] Follow Prompts	
M013Q	DC UTIL PWR MNB - OFF	ON
M052J	DC UTIL PWR MNA - OFF	ON
M052J	8. AC UTIL PWR AC1 - OFF	ON

	PRIORITY PWRDN 3B (PP3B)	PWRUP
	Go to <u>PL SAFING</u> (TEMP 12-2)	N/A

	C PWRDN	PWRUP
	1. Perform RTG EARLY PURGE (IUS DPY, <u>CONT OPS</u>)	N/A
R11U	2. If FES (DEORBIT PREP), then: RTGCL H2O PUMP A,B (two) - OFF	N/A

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PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	4	C
FES	8	N/A
MN BUS UNDERVOLTS/FC VOLTS (PERM)	6	D
(TEMP)	14	D,E

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TEMP E10-87

OPCL/31/GEN C,3

ACTION

NOTE

PP3A only accessed by MCC call. Appropriate steps TBD by MCC.

Perform steps listed below until reqd load reduction achieved

	PRIORITY PWRDN 3A (PP3A)	PWRUP
	If IMAX filming:	
L15	1. Camr pwr - OFF	Perform IMAX activation (P/TV C/L)
MO52J	2. AC UTIL PWR AC1 - OFF	
MO13Q	AC3 - OFF	
A15	AC3 - OFF	
	If ICBC activated:	
GAPC	3. Relay 08 - H to L 01 - H to L 00 - H to L	Perform ICBC activation (P/TV C/L)
	If HST pre-umb sep:	
L12U	4. cb ST SW PWR - c1	/MCC
	5. ESS/MN SW ENA - ON (tb-gray)	
	If HST on ESS BUS EXT PWR:	
	6. ESS BUS INT PWR - ON (tb-UP)	
	ESS BUS EXT PWR - OFF (tb-bp)	
	7. FHST SHUTTER - OP (tb-bp)	
	8. RSU HTR PWR - OFF (tb-bp)	
	If HST on MN BUS EXT PWR:	
	9. MN BUS INT PWR - ON	
	MN BUS EXT PWR - OFF (tb-bp)	
	10. ESS/MN SW ENA - OFF (tb-bp)	
	11. cb ST SW PWR - op	
R1	12. PL PRI MNC,MNB,FC3 (three) - OFF	
	13. PL CAB - OFF	

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ACTION

	PRIORITY PWRDN 3B (PP3B)	PWRUP
MO13Q	1. DC UTIL PWR MNB - OFF	N/A

	C PWRDN	PWRUP
	If HST on MN BUS EXT PWR:	
L12U	1. MN BUS EXT PWR - OFF (tb-bp)	ON (tb-gray)
	2. ✓PL PRI MNC - ON	ON
	3. FHST SHUTTER - CL (tb-gray)	OP (tb-bp)
	4. RSU HTR PWR - ON (tb-gray)	OFF (tb-bp)

	D PWRDN	PWRUP
	If HST on ESS BUS EXT PWR:	
L12U	1. cb ST SW PWR - c1	c1
	2. ESS/MN SW ENA - ON (tb-gray)	ON (tb-gray)
	3. ESS BUS INT PWR - ON (tb-UP)	OFF (tb-bp)
	EXT PWR - OFF	ON (tb-gray)
	4. ESS/MN SW ENA - OFF (tb-bp)	OFF (tb-bp)
	5. FHST SHUTTER - OP	CL (tb-gray)
	6. RSU HTR PWR - OFF	ON (tb-gray)
	7. cb ST SW PWR - op	op

WARNING
 ICBC may have unrecoverable film jam if MN BUS was lost or interrupted during filming

	E PWRDN	PWRUP
GAPC	1. Relay 08 - H to L	✓MCC
	2. 01 - H to L	
	3. 00 - H to L	

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PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	5	A
FES (ON ORBIT)	8	N/A
(DEORBIT PREP)	8	N/A
MN BUS UNDERVOLTS/FC VOLTS	6 14	B C

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TEMP F10-87

OPCL/35/GEN C,4

ACTION

A PWRDN		PWRUP
MO52J	1. DC UTIL PWR MNA - OFF If GSFC POCC cmd available: 2. Inform GSFC POCC to perform BBXRT and TAPS deact 3. When BBXRT deact complete, go to step 4 (MCC call) If GSFC POCC cmd not available: 4. TAPS GMBL PWR - DSBL (tb-gray) BBXRT PWR BUS 1 - OFF (tb-bp) 2 - OFF (tb-bp) SPOC AVIONICS - OFF (tb-bp)	N/A
L12R	Ignore DDS FSMs in following step 5. PWR DDU KB - OFF KB PWR - OFF	
L11	6. EXC JAC PAGE	
DDU	ITEM 95E (Shuts down all ASTRO experiments), then: 7. Perform IPS DEACT (SL IPS OPS), then: 8. Deactivate Spacelab per SL CONTINGENCY DEACT (SL ACT/ DEACT)	
L14	9. SS RAU PWR 1,2 (two) - OFF	
B PWRDN		PWRUP
L12R	1. TAPS GMBL PWR - DSBL (tb-gray) 2. BBXRT PWR BUS 1 - OFF (tb-bp) 2 - OFF (tb-bp) 3. SPOC AVIONICS - OFF (tb-bp) 4. BBXRT VLV E1/E2 - CL 5. ✓VLV E1 STAT tb - bp,gray (<2 sec) ✓E2 STAT tb - bp,gray (<2 sec) 6. BBXRT VLV E1R/E2R - CL 7. ✓VLV E1R STAT tb - bp,gray (<2 sec) ✓E2R STAT tb - bp,gray (<2 sec) 8. Go to SPACELAB EMERGENCY DEACTIVATION (Cue Card)	N/A

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ACTION

	C PWRDN	PWRUP
L12R	<ol style="list-style-type: none"> 1. Perform SLP MAL, <u>EPS</u> SSR-2, steps 1 thru 10, then: 2. BBXRT PWR BUS 1 - OFF (tb-bp) 2 - OFF (tb-bp) 3. SPOC AVIONICS - OFF 4. Return to MN BUS UNDERVOLTS/FC VOLTS. When complete: 5. Perform remainder of SLP MAL, <u>EPS</u> SSR-2, then: 6. SPOC AVIONICS - ON (tb-gray) 7. Notify GSFC POCC to perform BBXRT and TAPS deact, then: 8. When BBXRT deact complete (MCC call): 9. BBXRT PWR BUS 1 - ON (tb-UP) 2 - ON (tb-UP) 	N/A

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Go to PL PWRDN - ORBIT
(DOD PL OPS, PL PWRDN/SAFING)

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TEMP G10-87

OPCL/38/GEN C,6

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	5	PP3A only
1 FUEL CELL	3	PP3A,B as reqd
	6	A
FES (ON ORBIT)	8	N/A
FES (DEORBIT PREP)	8	B
MN BUS UNDERVOLTS/FC VOLTS	6	C
	14	D
OTHER	G3	PP3A,B as reqd

PRIORITY PWRDN GROUP 3A

PNL	GRP 3A	A PWRDN	PWRUP
L14		*1. Minimize SL/Tunnel ltg 2. ✓PWR DDU KB - OFF ✓KB PWR - OFF	ON, as reqd ON, as reqd
R10		*3. Go to power saving mode on DDU: DISP DUR MIN - 1	N/A
A1R		If HDRR operational:	
A7L		4. PL RCDR PWR - OFF	ON, as reqd
C3		5. ACIP HTR - OFF	
L12L		6. MSTR OEX PWR - OFF OARE PWR - OFF cb OARE PWR AUX A (two) - op	
		*7. Perform PRIORITYZED PAYLOAD DEACTIVATION - Recoverable (PFDF, PL SYS HDBK, PROC)	✓MCC
A7U		8. TV PWR CONTR UNIT - OFF CNTL - PNL	✓MCC
		SM 214 S/L COMM	
		9. HDRR PWR OFF - ITEM 20 EXEC ()	✓MCC
CRT		*10. HRM PWR OFF - ITEM 8 EXEC (*)	✓MCC
		SM 213 S/L EXP RAUS	
		*11. NOP and PWR OFF all EXP RAUs	✓MCC
		SM 210 S/L DPA	
		12. EXC PWR OFF - ITEM 31 EXEC () Ignore 'S62 BCE BYP' PL msg	✓MCC
		13. I/O UNIT EXP PWR OFF - ITEM 13 EXEC ()	
		SM 211 S/L DPS PERIPHERAL	
		14. MMU PWR OFF - ITEM 43 EXEC ()	✓MCC
		If addl pwrdn reqd: 15. Perform PRIORITY PWRDN GROUP 3B	

PRIORITY PWRDN GROUP 3B

PNL	GRP 3B	PWRDN	PWRUP
		1. Perform PRIORITYZED PAYLOAD DEACTIVATION - Nonrecoverable (PFDF, PL SYS HDBK, PROC)	N/A
		2. Go to <u>PL SAFING</u>	N/A

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PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	4	C (PP3A on MCC call)
FES (ON ORBIT)	8	N/A
FES (DEORBIT PREP)	8	C
MN BUS UNDERVOLTS/FC VOLTS	6	N/A
	14	N/A

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TEMP 110-87

OPCL/41/GEN C,9

ACTION

NOTE

PP3A only accessed by MCC call. Appropriate steps will be determined by MCC

PRIORITY PWRDN 3A (PP3A)		PWRUP
L11L	If IUS DOWNLINK not ON, go to step 4 1. Send CIU CMD 33, 12C11 Downlink on A. No CIU CMD feedback (CMD REP - 12B110)	
L12U	2. ✓ IUS ANT ENA tb - gray ✓ DSBL tb - bp If IUS ANT ENA tb - bp: 3. cb IUS SW PWR - c1 ANT TB PWR - c1 IUS ANT E/D - ENA (mom) cb IUS SW PWR - op	
L11L	4. CIU PWR - OFF	ON
L10	5. CMD PATH ENA - HDLN	
VCS DISP UNIT	6. PWR - OFF	ON
A7L	VCS PWR - OFF	ON
R1	7. PL CAB - OFF	ON
PRIORITY PWRDN 3B (PP3B)		PWRUP
Go to <u>PL SAFING</u> (TEMP 12-2)		N/A
C PWRDN		PWRUP
	1. Perform RTG EARLY PURGE (IUS DPY, CONT OPS)	N/A
R11U	2. If FES (DEORBIT PREP), then: H2O PUMP A,B (two) - OFF	N/A

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TEMP I10-88

OPCL/41/GEN C,9

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	4	C
FES	8	N/A
MN BUS UNDERVOLTS/FC VOLTS (Perm)	6	D
(Temp)	14	D

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TEMP J10-87

OPCL/37/GEN C,10

ACTION

	C PWRDN	PWRUP*
	1. Perform RADIATION DOSE DISTRIBUTION, CONFIGURATION II (MED C/L FS, <u>STS-37 MED DSOs</u>)	
L12UR	If prior to GRO PWRUP: 2. AESE CONV CMD 5-8 SEC - change posn On MCC call (NO-GO for deploy),	On MCC call, perform GRO QUICK DEPLOY using AESE CONV CMD 5-8 SEC sw (GRO DPY, <u>CONT OPS</u>)
L12UL	3. AESE CONV CMD 1-4 SEC - change posn	
R1	4. PL PRI MNC - OFF	
	If DPLY day/checkout and GRO pwr'd:	
L12UR	5. Perform IN BAY C/O PART II, step 3 (leave batts on) (GRO DPY, <u>IN BAY C/O</u>)	On MCC call, perform GRO QUICK DEPLOY using AESE CONV CMD 5-8 SEC sw (GRO DPY, <u>CONT OPS</u>)
L12UL	6. AESE CONV CMD 5-8 SEC - change posn On MCC call,	
L12UL	7. AESE CONV CMD 1-4 SEC - change posn	
R1	8. PL PRI MNC - OFF	

*If powerdown downgraded, pwr up GRO, take to BYP mode, and disconnect batts

	D PWRDN	PWRUP
L12UR	1. AESE HTRS - DSBL 2. Perform SSR-2 PL PRI BUS RECOVERY (PL SYS, <u>GRO SSRs</u>)	Included in SSR

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TEMP J10-88

OPCL/37/GEN C,10

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	5	PP3A
FES (ON ORBIT)	8	N/A
FES (DEORBIT PREP)	8	A
MN BUS UNDERVOLTS/FC VOLTS	6	N/A
	14	N/A

ACTION

	A PWRDN	PWRUP
R1	1. PL PRI MNC - OFF (tb-OFF)	N/A

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ACTION		PWRUP
PRIORITY	PWRDN 3A (PP3A)	
	If MPEC DEPLOY in progress:	✓MCC
	If door in motion:	
	1. Allow door to complete travel (90 sec)	
L12LL	2. ✓NSI ARM - OFF (tb-bp)	
	3. ✓PWR - OFF (tb-bp)	
	4. ✓KIT PWR - OFF	
	5. ✓PL AFT MNB - OFF	
	6. ✓MNC - OFF	
L12UR	If CIV controller powered:	
	7. ✓CIV REL MODE - MAN	
	8. PWR CNTLR - OFF	✓MCC
	✓OPS tb - bp	
	If SPAS powered:	
	If cover open:	
	9. Perform SPAS CRYO COVER CLOSE (PL OPS, <u>SYS OPS - NOM</u>)	✓MCC
	10. Perform AIS SAFING ABORT-1; GIMBAL - INBAY OR DEPLOY (PL OPS, <u>DPY EXP OPS NOM</u>)	
	11. Wait 3 min before proceeding to allow AIS to finish safing	
	12. Perform SPAS SENSOR DEACTIVATION (PL OPS, <u>SYS OPS - NOM</u>)	
	If SPAS on external power:	
	13. <u>SM 210 SPAS INIT</u> POWER CRYO EL OFF - ITEM 26 (*,CMD 151)	
	If PSP RF config:	
	14. Perform <u>PSP HARDLINE/ RF CONFIG</u> , step 1 (Cue Card)	
	15. GSFC POCC will command STP-1 to a survival level	

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TEMP K10-88

OPCL/39/GEN C,16

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	4	PP3A on MCC call
FES (ON-ORBIT)	8	N/A
FES (DEORBIT PREP)	8	N/A
MN BUS UNDERVOLTS/FC VOLTS (Perm)	6	N/A
(Temp)	14	N/A

ACTION

NOTE

PP3A only accessed by MCC call.
Appropriate steps TBD by MCC

PRIORITY PWRDN 3A (PP3A)	PWRUP
<p>If LBNP in progress:</p> <p>MO13Q 1. DC UTIL PWR MNB - OFF</p> <p>MO52J 2. AC UTIL PWR AC1 - OFF</p> <p>WCS 3. VAC VLV - CL</p> <p>LBNPD 4. Recompress LBNPD chamber by breaking waist seal Egress from LBNPD</p> <p>WCS 5. Disconnect LBNPD vac hose from VAC VLV QD Replace cap on VAC VLV QD VAC VLV - OP</p> <p>If PGSC on: F1 6. DC UTIL PWR MNB - OFF</p> <p>If DTO 1208 on: A15/ MO13Q 7. AC UTIL PWR AC3 - OFF MF43C 8. SAMS DATA RCRD - OFF</p> <p>9. Log MET ___/___:___:___</p> <p>10. ✓SAMS DATA lt - off (may take 1 min)</p> <p style="padding-left: 40px;">* If SAMS DATA lt on, *</p> <p style="padding-left: 40px;">* Cycle DATA RCRD sw. *</p> <p style="padding-left: 40px;">* Wait 1 min, proceed *</p> <p>11. Wait 1 min after SAMS DATA lt extinguishes SAMS PWR - OFF</p> <p>12. Log MET ___/___:___:___</p> <p>MO30F 13. DC UTIL PWR MNC - OFF</p> <p>If OCTW in progress:</p> <p>R11L 14. VTR pb - STOP PWR - OFF</p> <p>A6L 15. OCTW SIG PROC - OFF</p> <p>A11 16. DC UTIL PWR MNC - OFF</p> <p>O19 17. TV PWR - OFF</p>	<p><u>Test Prep.</u> (MED, <u>IN-FLIGHT</u> <u>LOWER BODY</u> <u>NEGATIVE</u> <u>PRESSURE</u>)</p> <p>ON</p> <p>ON</p> <p><u>RECOVERY FROM</u> <u>TEMPORARY</u> <u>POWERDOWN (PL</u> <u>OPS, SAMS)</u></p> <p>ON</p> <p>ON</p> <p>ON</p> <p>ON</p>

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TEMP L10-88

OPCL/43/GEN C,20

ACTION

A PWRDN		PWRUP
SM 208 S/L SS DC PWR		
If SL MN BUS load < 5.0 kW >> If MCC/MSFC POCC available: <ol style="list-style-type: none"> 1. ✓MCC to reduce PRI PL BUS loads >> If MCC/MSFC POCC not available for more than 15 min: <ol style="list-style-type: none"> 2. Perform steps in PP3A with * until SL MN BUS load < 5.0 		✓MCC ✓MCC
B PWRDN		PWRUP
R1	1. PL PRI MNC,FC3,MNB (three) - OFF (tb-OFF) CAB - OFF AUX - OFF	N/A N/A N/A
A7L	2. ACIP HTR - OFF Unpower Middeck PLs:	N/A
MF71H/ MF71K	3. cb AEM MN BREAKER (two) - op	N/A
M013Q	4. DC UTIL PWR MNB - OFF	N/A
A1R	5. PL RCDR PWR - OFF	N/A
C PWRDN		PWRUP
ICMS/ R1J	1. ✓PWR EMER - ON 2. ✓SL EMER 1t #6 - ON 3. Perform EARLY PAYLOAD DEACT (PFDf, PL SYS HDBK, PROC) 4. Go to <u>SL EXPEDITED EGRESS</u> (Cue Card)	N/A

Cont next page
TEMP H10-89

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OPCL/40/GEN C,18

ACTION

D PWRDN	PWRUP
<ol style="list-style-type: none">1. Perform PAYLOAD POWER FAILURE steps as reqd (PFD, PL SYS HDBK, <u>PROC</u>)2. Perform CONTROLLED REPOWER, <u>EPS</u> SSR-2, steps 1-10 (SL MAL)3. Return to MN BUS UNDERVOLTS/FC VOLTS, then:4. Perform CONTROLLED REPOWER, <u>EPS</u> SSR-2, and execute steps 17 thru completion (SL MAL) <p>On MCC GO:</p> <ol style="list-style-type: none">5. Go to PAYLOAD POWER FAILURE RECOVERY, steps as reqd (PFD, PL SYS HDBK, <u>PROC</u>)	

PRIORITY PWRDN 3A (PP3A)	PWRUP
If 2 good freon loops: 16. Mnv'r to nose forward, -ZLV attitude, TG = 2, BV = 3, OM = 180	✓MCC
17. Perform AFP-675 PPO3A (675 OPS, <u>CONTINGENCY</u> <u>P-675 POWERDOWN</u>)	✓MCC
If MCC not available for > 15 min:	
18. Perform STP-1 DEACTIVATION (PL OPS, <u>STP-1</u>)	✓MCC
19. Perform <u>PSP HARDLINE/</u> <u>RF CONFIG</u> , step 2 (Cue Card)	

ACTION

	PRIORITY PWRDN 3B (PP3B)	PWRUP
L12LL	If MPEC not deployed: 1. ✓NSI ARM - OFF (tb-bp) 2. ✓PWR - OFF (tb-bp) 3. ✓KIT PWR - OFF 4. ✓PL AFT MNB - OFF 5. ✓MNC - OFF	✓MCC
SPASP	If any CRO subsatellite not deployed: 6. ✓LNCHR SEL A,B,C (two) - RESET 7. ✓tb (three) - bp 8. ✓DPLY SEL PREARM - NO-OP (tb-bp) 9. ✓ARM - NO-OP (tb-bp) 10. ✓DPLY - NO-OP (tb-bp) 11. ✓EXEC - OFF	✓MCC
	If SPAS deployed, or berthed and not powered: 12. Go to step 24	
	If SPAS unberthed: If SPAS RF commanding available:	
	13. <u>SM 210 SPAS INIT</u> POWER L3TV STBY ON - ITEM 19 EXEC (*,CMD 186)	✓MCC
	14. <u>SM 214 SPAS SYSTEMS</u> ✓L3TV WID,NAR TX V (two): < 20.0	
	15. <u>SM 210 SPAS INIT</u> POWER L3TV STBY OFF - ITEM 20 EXEC (*,CMD 187)	
	16. POWER XMTR OFF - ITEM 14 EXEC (CMD 171)	
	17. Perform SPAS BERTH (<u>PDRS OPS, SPAS RETRIEVE</u>)	

Cont next page

ACTION

PRIORITY PWRDN 3A (PP3A)		PWRUP
If IUS downlink on, go to step 20		
L11L	18. Send CIU CMD 33, 12C11 Downlink on A. No CIU CMD feedback (CMD REP - 12B110)	
L12U	19. ✓ IUS ANT ENA tb - gray ✓ DSBL tb - bp * If IUS ANT ENA tb - bp: * * cb IUS SW PWR - c1 * * ANT TB PWR - c1 * * IUS ANT E/D - ENA (mom) * * cb IUS SW PWR - op *	
L11L	20. CIU PWR - OFF	ON
L10	21. CMD PATH ENA - HDLN	
L12U	22. cb PL TIMING BUFFER - op	c1
PRIORITY PWRDN 3B (PP3B)		PWRUP
1. Go to <u>PL SAFING</u> , TEMP 12-2		N/A

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TEMP L10-89

OPCL/43/GEN C,20

PRIORITY PWRDN PROCEDURES
(And Mission Specific Pwrdns)

1. Letter coded priority pwrdns are for mission specific operations.
Group A (normal) is standard switch list config for on-orbit operations.
Group B (LOW LEVEL) and Group C (MSN EXT) are specialized pwrdns.
Group B (with A) comprises a nonstandard avionics config to be used nominally on power-critical missions (e.g., Spacelab) not normally involving payload deploys, rendezvous, proximity or RMS operations.
Group C (with A) will be implemented, if reqd, during mission extension days.

PRIOR
PWRDN

Activities not consistent with Group B and C Pwrdns are:

LOW LEVEL CONFIG (Group B) MISSION EXT (Group C)

- | | |
|--|--------------------|
| a. OMS BURNS | a. OMS BURNS |
| b. FCS CHECKOUT | b. FCS CHECKOUT |
| c. NOMINAL OPS
TRANSITIONS
(i.e., not reqd
for troubleshooting) | c. OPS TRANSITIONS |
| d. DEORB PREP | d. CIRC PUMP OPS |
| e. DTOs | e. APU OPS |
| | f. PLBD OPS |
| | g. KU BAND OPS |
| | h. PAYLOAD OPS |
| | i. DEORB PREP |
| | j. DTOs |

Powerup for any of the activities listed above will be accomplished using the B or C Pwrdns in reverse order.

2. Numbered priority pwrdn procedures are for contingency use, and are listed according to operational criticality, higher numbers resulting in greater power reduction. Usage of any numbered pwrdn assumes sequential inclusion of all lower numbered procedures.

3. The loads for the major power users are presented below.
4. Use PWRUP column to back out of numbered priority pwrdns.

PRIOR
PWRDN

<u>Equipment</u>	<u>dc Watts</u> (Avg)	<u>Pnl</u>
MADS - ASCENT/ENTRY	305	C3
- ORBIT	128	
Ltg pnl (L OVHD, L CTR)	654	06
Ltg pnl (R OVHD, R)	396	08
Inst ltg (L/CTR, OVHD)	108	06
Inst ltg (R)	63	08
GPC	653	06
CRT/DEU	285	C3
INST PWR	149	F6,F8
FLT CNTLR PWR	10	F7,F8
ADI/DDU	129	014,015, 016:E
TACAN - SEARCH	213	07
- TRACK	192	
MLS	55	014,015, 016:E
RA	23	08
HUD	245	F3
IMU - OFF	119	014,15, 016:E
- STBY	55	
Freon Loop Pump	467	L1
H2O Loop Pump	258	L1
FES HTRS - (FES OFF)	222	L1
- (FES ON)	600	
ACIP htr	50	A7U

PRIORITY PWRDN GROUP A

PNL	GRP A	PWRDN (normal)	PWRUP
014,15, 16:A :E C3		Nominal on-orbit config: 1. Lights - OFF except when needed 2. BRAKES (three) - OFF 3. cb ADTA (four) - op If ASA - ON: 4. Sequence FCS CH (four) - OFF rapidly, then: 5. ASA (four) - OFF	①
014,15, 16:F 017:A :B :D 07 08 014,15, 16:E L1 L2 F6,F8 F7,F8		6. ATVC (four) - OFF 7. EIU (three) - OFF 8. MEC (two) - OFF 9. TACAN MODE (three) - OFF 10. RADAR ALTM (two) - OFF 11. MLS (three) - OFF 12. HI LOAD DUCT HTR - OFF 13. ANTISKID - OFF 14. INST PWR (two) - OFF 15. FLT CNTLR PWR (two) - OFF (F6,F8 on 102)	
A12		16. APU HTR TK/FU LINE/H2O SYS: One set - AUTO, one set - OFF	
06		17. GPC MODE 3 - STBY (tb-bp) - HALT (tb-bp) - STBY (tb-RUN) - HALT (tb-bp) 5 - STBY (tb-RUN) - HALT (tb-bp) PWR 3,5 (two) - OFF	
014,15, 16:A 014, 015:E 015, 016:F		18. GPC PWR 2 - as reqd ③ 19. RGA (four) - OFF 20. cb AA 1,2 (two) - op 21. AA 4,3 (two) - OFF	②
		Cont next page	

① As reqd per other FDF documents

② Powerup GPC 2 (DUAL G2 GPC OPS) as reqd per FLT PLN

③ If GPC 2 not reqd, perform SINGLE G2 GPC OPS (ORB OPS, DPS)

PNL	GRP A PWRDN (Cont) (normal)	PWRUP
F3 R4:I 014,15, 16:E	22. HUD PWR (two) - OFF 23. MPS ENG CNTLR HTR (three) - OFF 24. ADI/DDUs - one ON for crew awake - all OFF for crew sleep (six cbs) 25. CRT - three ON for crew awake - three OFF, one in STBY for crew single-shift sleep	 (4) (4)

(4) Other(s) ON as reqd |

PRIORITY PWRDN GROUP B

PNL	GRP B	PWRDN (LOW LEVEL)	PWRUP
		1. Turn off all lights except Middeck lights 6,7,8 (no lts for single-shift sleep, one for split-shift sleep)	As reqd
		2. Galley (WATER_HTRS and OVEN FAN) (two) - OFF (3)	ON (3)
014,15, 16:E		3. All ADI/DDU cbs (six) - op	c1
		4. Use only one CRT - STBY (single-shift sleep) - ON (otherwise)	ON
		If GPC 2 - ON:	(2)
		5. Perform SINGLE G2 GPC OPS (ORB OPS, DPS), then:	
015:F		6. MMU 2 - OFF (1 of 2 off)	ON
		7. <u>GNC 21 IMU ALIGN</u> IMU 2 - STBY (ITEM 2 EXEC)	(1)
A14		8. RCS/OMS HTRS L POD (two) - A AUTO, B OFF R POD (two) - A AUTO, B OFF	MCC call
R11U A1R		9. ✓STV ADU PWR - OFF (4) 10. S-BAND FM PWR - OFF CNTL - PNL, then CMD	ON 1
06		11. UHF MODE - OFF 12. MDM FF2,4 (two) - OFF FA4 - OFF	SPLX ON ON (5)
014,15, 16:F		13. PRI RJDs DRIVER, LOGIC (sixteen) - OFF Cont next page	ON

- (1) Recover IMU 2 (MAL, GNC FRP-3)
- (2) If reqd, go to DUAL G2 GPC OPS (ORB OPS, DPS) (For SL flts, DUAL G2 GPC OPS should be delayed until reqd in DEORB PREP)
- (3) Insert drink package to keep pump from cycling; drink package will be removed if repowering the Galley
- (4) Cycle as reqd
- (5) GNC I/O RESET

PNL	GRP B	PWRDN (Cont) (LOW LEVEL)	PWRUP
014,15, 16:F	14. Use only one SPOC in Orbiter cabin		
	15. TAGS - MCC will command as reqd (max 2 hr ON/day) ⑥		
C3	16. MSTR MADS - OFF (cycle ON as reqd per FLT PLN)		N/A
	If applicable: Cycle ON only when reqd:		As reqd
	17. SL Tunnel Light		
	18. SL Subsystem DDS		
	19. Video Analog Switch		
	20. KU-BAND SYS - MCC will CMD as reqd (STBY, if LOS > 30 min)		ON

- ⑥ 2 hr/day TAGS usage supports Orbiter ops only. PL ops may require additional TAGS usage

PRIORITY PWRDN GROUP C

PNL	GRP C	PWRDN (MSN EXT)	PWRUP
		1. Perform PRIORITY PWRDN GROUP 1,2, and 3A, then:	
		2. Turn off all lights except two Middeck lts (use no lts for single-shift sleep or split-shift sleep)	
		3. Galley (WATER HTRS and OVEN FAN) (two) - OFF ①	ON ①
		4. Use only one CRT; for split-shift sleep: cycle ON (max 10 min/hr)	
014,15, 16:E		5. PRI RJDs DRIVER, LOGIC (sixteen) - OFF	ON
06		6. MDM PL2 - OFF	ON ③
A14		7. RCS/OMS HTRS L POD (two) - A AUTO, B OFF R POD (two) - A AUTO, B OFF	MCC call
A1L		8. PL DATA INTLVR PWR - OFF S-BD PL PWR SYS - OFF CNTL - PNL, then CMD	MCC call 1 PNL then CMD
A1R		9. S-BD FM PWR - OFF CNTL - PNL, then CMD	1 PNL then CMD
R11U 06		10. STV ADU PWR - OFF ②	ON
		11. UHF MODE - OFF	SPLX
		12. KU-BAND SYS - MCC will command as reqd (max 2 hr ON/day)	
		13. All ADI/DDU cbs (six) - op	
014,15, 16:E		14. Recorders: OPS 2 - OFF	c1
A1R		1 - RCD (dump 1 hr/day)	RCD RCD
		PL - OFF	
TAGS		15. TAGS PWR - MCC will command as reqd (max 2 hr ON/day)	N/A

- ① Insert drink package to keep pump from cycling; drink package will be removed if repowering the Galley
- ② Cycle as reqd, 2 hr/day max
- ③ SM I/O RESET

PRIORITY PWRDN GROUP 1

PNL	GRP 1 PWRDN	PWRUP
015:F	1. Minimize ltg 2. Use only one CRT If GPC 2 - ON: 3. Perform SINGLE G2 GPC OPS (ORB OPS, <u>DPS</u>), then: 4. MMU 2 OFF - (1 of 2 off) 5. GNC 21 IMU ALIGN IMU 2 STBY - ITEM 2 EXEC	② ON ①

① Recover IMU 2 (MAL, GNC FRP-3)

② If reqd, go to DUAL G2 GPC OPS (ORB OPS, DPS)

PRIORITY PWRDN GROUP 2

PNL	GRP 2 PWRDN	PWRUP
06	1. STAR TRKR PWR (two) - OFF	As reqd ON ②
	2. MDM FF2,4 (two) - OFF FA4 - OFF	
C3 L1	3. MSTR MADS PWR - OFF	ON One ON OFF ① Two ON ON
	4. FLASH EVAP CNTLR PRI (two) - OFF SEC - OFF	
	TOP EVAP HTR NOZ (two) - OFF DUCT - OFF	
A8L	5. PORT RMS HTR - OFF	
	NOTE If PORT TEMP C/W (1t, MA): Within 30 min, HTR - AUTO Wait until 1t - off, then HTR - OFF; repeat as reqd	
	6. SPOC PWR (one) - OFF	ON

① SEC CNTLR ON only if both primary controllers failed. Both NOZ & DUCT HTR ON 30 min prior to FLASH EVAP PWRUP

② GNC I/O RESET

PRIORITY PWRDN GROUP 3

Perform PL PWRDN (TEMP 10-87)

Priority Pwrn 3A (PP3A) contains recoverable PL ops pwrn steps. Priority Pwrn 3B (PP3B) is a total PL pwrn that may cause PL ops to be nonrecoverable

PRIORITY PWRDN GROUP 4

PNL	GRP 4 PWRDN	PWRUP
L4:L	1. Food Warmer - OFF or Galley (OVEN/RHS, WATER HTRS, and OVEN FAN) (three) - OFF If RMS is powered: 2. Perform <u>RMS PWRDN</u> (PDRS OPS), then: 3. cb AC 1 Φ B AV BAY 2 S/C - op	ON MCC call c1

PRIORITY PWRDN GROUP 5

PNL	GRP 5 PWRDN	PWRUP
015:A	1. IMU 2 - OFF (1 of 3)	①
	2. <u>GNC 20 DAP CONFIG</u> JET OPT 3 - sel DAP: X/AUTO/NORM	②
08 A1R	3. FWD RCS MANF ISOL 1-4 (four) - CL If OPS RCDRS 2 MODE tb - RCD: 4. PWR 1 - OFF If OPS RCDRS 2 MODE tb - bp and 1 MODE tb - RCD:	③ ON
06 A14	5. PWR 2 - OFF 6. MDM PL2 - OFF 7. RCS/OMS HTR FWD RCS JET 1-4 (four) - OFF	ON ON ④ AUTO
014,15, 16 014:C 015:C	8. FWD RJDs DRIVER, LOGIC (eight) - OFF 9. cb UTIL PWR 019/M052J - op F1/M013Q - op	ON c1 c1
R15:C	10. Perform KU-BD ANT STOW (ORB OPS, <u>COMM/INST</u>), then: 11. cb MNB KU ANT HTR - op	⑤ c1

- ① Recover IMU 2 (MAL, GNC FRP-3)
- ② At MCC call, sel JET OPT 1 (cont PWRUP until AOS)
- ③ For PWRUP, perform STAGED REPRESS, MAL, RCS SSR-4
- ④ SM I/O RESET
- ⑤ Perform KU-BD ANT DEPLOY (ORB OPS, COMM/INST)

PRIORITY PWRDN GROUP 3A

PNL	GRP 3A	PWRDN	PWRUP
	PART A (PWRDN for PRI PL MNB source use) SM 208 S/L SS DC PWR If SL MN BUS kW < 3.8 kW >> If MCC/GSFC POCC cmd available: 1. ✓MCC to reduce PRI PL BUS loads >> If MCC/GSFC POCC cmd not available for more than 15 min: 2. B BXRT PWR BUS 2 - OFF (tb-bp) >>		✓MCC ✓MCC
MO52J	PART B (PWRDN for Orbiter Systems Failures) 1. DC UTIL PWR MNA - OFF		✓MCC
R12	2. ✓MCC to reduce B BXRT PWR load		✓MCC
L11	3. PWR DDU KB - OFF KB PWR - OFF		ON, as reqd
A1R	4. Go to power saving mode on DDU: DISP DUR MIN - I		N/A
L11	If HDRR operational: 5. PL RCDR PWR - OFF		ON, as reqd
A7U	6. ✓MCC for selected steps of PAYLOAD EARLY DEORBIT PREP (PL SYSTEMS HANDBOOK) and IPS DEACT (SL IPS OPS)		✓MCC
CRT	7. PWR DDU KB - OFF KB PWR - OFF		✓MCC
	8. TV PWR CONTR UNIT - OFF CNTL - PNL		✓MCC
	SM 214 S/L COMM		✓MCC
	9. HDRR PWR OFF - ITEM 20 EXEC (*)		✓MCC
	10. HRM PWR OFF - ITEM 8 EXEC (*)		✓MCC
	SM 213 S/L EXP RAUS		✓MCC
	11. NOP and PWR OFF all EXP RAUs		✓MCC
	SM 210 S/L DPA		✓MCC
	12. EXC PWR OFF - ITEM 31 EXEC (*) Ignore 'S62 BCE BYP' PL msg I/O UNIT EXP PWR OFF - ITEM 13 EXEC (*)		✓MCC
	SM 211 S/L DPS PERIPHERAL		✓MCC
	13. MMU PWR OFF - ITEM 43 EXEC (*) If addl pwrdn still reqd: 14. Perform PRIORITY PWRDN GROUP 3B		

PRIORITY PWRDN GROUP 3B

PNL	GRP 3A	PWRDN	PWRUP
	1. Go to PL SAFING		N/A

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PRIORITY PWRDN GROUP 4

PNL	GRP 4 PWRDN	PWRUP
L4:L	1. Food Warmer - OFF or Galley (OVEN/RHS, WATER HTRS, and OVEN FAN) (three) - OFF If RMS is powered: 2. Perform <u>RMS PWRDN</u> (PDRS OPS), then: 3. cb AC 1 ΦB AV BAY 2 S/C - op	ON MCC call c1

PRIORITY PWRDN GROUP 5

PNL	GRP 5 PWRDN	PWRUP
015:A	1. IMU 2 - OFF (1 of 3)	①
	2. <u>GNC 20 DAP CONFIG</u> JET OPT 3 - sel DAP: X/AUTO/NORM	②
08 AIR	3. FWD RCS MANF ISOL 1-4 (four) - CL If OPS RCDRS 2 MODE tb - RCD: 4. PWR 1 - OFF If OPS RCDRS 2 MODE tb - bp and 1 MODE tb - RCD:	③ ON
06 A14	5. PWR 2 - OFF 6. MDM PL2 - OFF 7. RCS/OMS HTR FWD RCS JET 1-4 (four) - OFF	ON ON ④ AUTO
014,15, 16 014:C 015:C	8. FWD RJDs DRIVER, LOGIC (eight) - OFF 9. cb UTIL PWR 019/M052J - op F1/M013Q - op	ON c1 c1
R15:C	10. Perform <u>KU-BD ANT STOW</u> (ORB OPS, <u>COMM/INST</u>), then: 11. cb MNB KU ANT HTR - op	⑤ c1

- ① Recover IMU 2 (MAL, GNC FRP-3)
- ② At MCC call, sel JET OPT 1 (cont PWRUP until AOS)
- ③ For PWRUP, perform STAGED REPRESS, MAL, RCS SSR-4
- ④ SM I/O RESET
- ⑤ Perform KU-BD ANT DEPLOY (ORB OPS, COMM/INST)

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PRIORITY PWRDN GROUP 3A

PNL	GRP 3A	PWRDN	PWRUP
	PART A (PWRDN for PRI PL MNB source use) <u>SM 208 S/L SS DC PWR</u> If SL MN BUS load < 5.0 kW >> If MCC/MSFC POCC available: 1. ✓MCC to reduce PRI PL BUS loads >> If MCC/MSFC POCC not available for more than 15 min: 2. Perform steps below with * until SL MN BUS load < 5.0		✓MCC ✓MCC
L14	PART B (PWRDN for Orbiter Systems Failures) *1. Minimize SL/Tunnel ltg 2. ✓PWR DDU KB - OFF ✓KB PWR - OFF		ON, as reqd ON, as reqd
R10	*3. Go to power saving mode on DDU: DISP DUR MIN - 1		N/A
A1R	If HDRR operational: 4. PL RCDR PWR - OFF *5. Perform PAYLOAD DEACTIVATION - PP3A (PFDF, PL SYS HDBK, PROC)		ON, as reqd
A7U	6. TV PWR CONTR UNIT - OFF CNTL - PNL		✓MCC
CRT	<u>SM 214 S/L COMM</u> *7. HDRR PWR OFF - ITEM 20 EXEC (*) *8. HRM PWR OFF - ITEM 8 EXEC (*)		✓MCC ✓MCC
	<u>SM 213 S/L EXP RAUS</u> *9. NOP and PWR OFF all EXP RAUS		✓MCC
	<u>SM 210 S/L DPA</u> *10. EXC PWR OFF - ITEM 31 EXEC (*) Ignore 'S62 BCE BYP' PL msg		✓MCC
	11. I/O UNIT EXP PWR OFF - ITEM 13 EXEC () <u>SM 211 S/L DPS PERIPHERAL</u> *12. MMU PWR OFF - ITEM 43 EXEC (*)		✓MCC
	If addl pwrdsn reqd: 13. Perform PRIORITY PWRDN GROUP 3B		

PRIORITY PWRDN GROUP 3B

PNL	GRP 3B	PWRDN	PWRUP
	1. Perform PAYLOAD DEACTIVATION - PP3B (PFDF, PL SYS HDBK, PROC) 2. Go to <u>PL SAFING</u>		N/A

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PRIORITY PWRDN GROUP 4

PNL	GRP 4 PWRDN	PWRUP
L4:L	1. Food Warmer - OFF or Galley (OVEN/RHS, WATER HTRS, and OVEN FAN) (three) - OFF If RMS is powered: 2. Perform <u>RMS PWRDN</u> (PDRS OPS), then: 3. cb AC 1 ΦB AV BAY 2 S/C - op	ON MCC call c1

PRIORITY PWRDN GROUP 5

PNL	GRP 5 PWRDN	PWRUP
015:A	1. IMU 2 - OFF (1 of 3)	①
08 A1R	2. <u>GNC 20 DAP CONFIG</u> JET OPT 3 - sel DAP: X/AUTO/NORM	②
06 A14	3. FWD RCS MANF ISOL 1-4 (four) - CL If OPS RCDRS 2 MODE tb - RCD: 4. PWR 1 - OFF If OPS RCDRS 2 MODE tb - bp and 1 MODE tb - RCD:	③ ON
06 A14	5. PWR 2 - OFF	ON
014,15,16	6. MDM PL2 - OFF	ON ④
014:C	7. RCS/OMS HTR FWD RCS JET 1-4 (four) - OFF	AUTO
015:C	8. FWD RJDs DRIVER, LOGIC (eight) - OFF	ON
R15:C	9. cb UTIL PWR 019/M052J - op F1/M013Q - op	c1
	10. Perform KU-BD ANT STOW (ORB OPS, <u>COMM/INST</u>), then:	⑤
	11. cb MNB KU ANT HTR - op	c1

- ① Recover IMU 2 (MAL, GNC FRP-3)
- ② At MCC call, sel JET OPT 1 (cont PWRUP until AOS)
- ③ For PWRUP, perform STAGED REPRESS, MAL, RCS SSR-4
- ④ SM I/O RESET
- ⑤ Perform KU-BD ANT DEPLOY (ORB OPS, COMM/INST)

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PRIORITY PWRDN GROUP 6

PNL	GRP 6	PWRDN	PWRUP
014:A	1.	IMU 1 - OFF (2 of 3 off)	①
015:D	2.	cb O2/N2 CNTLR 2 - op	c1
016:E	3.	RCS/OMS PRPLT QTY GAUGE - op	c1
L4:L	4.	AC1 ΦA CAB T CNTLR 2 - op	c1
		AC2 ΦA CAB T CNTLR 1 - op	c1
		(if desired, pin CAB T CNTLRS)	
R2	5.	BLR CNTLR/HTR (three) - OFF	A
A12	6.	APU HTR LUBE OIL LINE (three) - OFF	B AUTO
		HYD HTR A (four) - OFF	✓OFF
		B (four) - OFF	AUTO
	7.	RCS/OMS HTR OMS CRSFD LINES (two) - OFF	ON
A14	8.	VAC VENT NOZ HTR - OFF	As reqd
	9.	cb MNA H2O LINE HTR A - op	c1 ③
ML31C		MNB H2O LINE HTR B - op	c1 ③
ML86B:A		If MMU is powered:	
	10.	cb MNA MMU PORT HTR A - op	
		STBD HTR A - op	
:D		MNB MMU PORT HTR B - op	
		STBD HTR B - op	
	11.	MCA LOGIC MNA,B,C: MID 1,2,3,4 (eight) - OFF	ON
MA73C	12.	ANNUN BUS SEL - OFF	MNC
A6U	13.	cb TV C AFT BAY CAMR HTR - op	c1
R15:D		/PAN-TILT HTR - op	c1
		A FWD BAY CAMR HTR - op	c1
		/PAN-TILT HTR - op	c1
		B TV B KEEL/EVA CAMR HTR - op	c1
		/PAN-TILT HTR - op	c1
	14.	cb RMS PORT RMS TV CAMR HTR - op	c1
		/PAN-TILT HTR - op	c1
:E		D STBD RMS TV CAMR HTR - op	c1
		/PAN-TILT HTR - op	c1
	15.	Go to MAL, <u>ECLS</u> SSR-11, FES FEEDLINE PURGE	②

- ① Recover IMU 1 (MAL, GNC FRP-3)
- ② For PWRUP, go to MAL, ECLS SSR-4
- ③ One of two reqd

PRIORITY PWRDN GROUP 7

PNL	GRP 7	PWRDN	PWRUP
013:D	1.	A11 CRYO cbs (four) - op	c1
014:C	2.	cb CRYO 02 HTR TK1 SNSR 1 - op	c1
:F	3.	MMU 1 - OFF (2 of 2 off)	ON
016:C	4.	cb CRYO 02 HTR TK1 SNSR 2 - op	c1
L4:K	5.	AC1 ϕ A H2O CNTLR 2 - op	c1
L1	6.	FREON PUMP LOOP 2 - OFF	ON
		RAD CNTLR LOOP 2 - OFF	A
L2		02 SYS 2 SPLY - CL (tb-CL)	OP
			(tb-OP)
R1	7.	02 TK1,2,3 HTRS A (three) - OFF	AUTO
		TK1,3 HTRS B (two) - OFF	AUTO
		H2 TK1,2,3 HTRS A (three) - OFF	AUTO
		TK1,3 HTRS B (two) - OFF	AUTO
		If Primary Jets Only Option:	
		8. Go to step 17	
		If Vernier Jets Only Option:	
		9. Go to step 27	
		If Gravity Gradient Option:	①
	10.	Perform GG FREE DRIFT, ATT ID B (ORB OPS, RCS) steps 1,2 (Do not sel Low Z), then:	
014,15, 16:F	11.	A11 RJD DRIVER and LOGIC (seventeen) - OFF	②
	12.	Perform RCS SECURE (FWD,AFT), RCS, then:	
06	13.	MDM FF1 - OFF	ON
		FA1,2,3 (three) - OFF	ON
MA73C	14.	MCA LOGIC MNA,B,C:	
		FWD 1,2,3 (three) - OFF	ON
		AFT 1,2,3 (three) - OFF	ON
A14	15.	RCS/OMS HTR FWD RCS - OFF	AUTO
		FWD RCS JET (five) - OFF	AUTO
		AFT RCS JET (five) - OFF	AUTO
	16.	Go to step 31	
		Cont next page	

- ① Perform GG FREE DRIFT (ORB OPS, RCS), step 3
- ② Perform STAGE REPRESS (FRCS only), MAL, RCS SSR-4
 $\sqrt{L,R}$ MANF P > 130 prior to MANF ISOL - OP

PNL	GRP 7	PWRDN (Cont)	PWRUP
06	17.	Perform XFEED: L RCS to R RCS, RCS, then:	
	18.	<u>GNC 23 RCS</u> Ovrdr L,R,1,3,4,5 STAT - CL	OP
	19.	MDM FA2 - OFF FF1 - OFF	ON (3)
014:F	20.	<u>GNC 20 DAP CONFIG</u> - ✓JET OPT 3	
	21.	RJDA 1A L2/R2 LOGIC - ON DRIVER - ON	ON
014,15, 16:F	22.	Remaining RJD DRIVER and LOGIC (fifteen) - OFF	ON
07	23.	AFT L,R RCS MANF ISOL 5 (two) - CL	OP
08	24.	FWD RCS MANF ISOL 5 (one) - CL	CL
A14	25.	RCS/OMS HTR FWD RCS - OFF JET (five) - OFF	AUTO
		AFT RCS JET 1,3,4,5 (four) - OFF	AUTO
06	26.	Go to step 31	
	27.	MDM FA3 - OFF FF1 - OFF	
016:F	28.	✓Vern RJD - ON	ON
014,15, 16:F	29.	Pri RJDs DRIVER and LOGIC (sixteen) - OFF	ON
A14	30.	RCS/OMS HTR FWD RCS - OFF FWD RCS JET 1,2,3,4 (four) - OFF	AUTO
		AFT RCS JET 1,2,3,4 (four) - OFF	AUTO
A11	31.	CRYO TK HTR (four) - OFF	AUTO
ML86B:F	32.	cb CRYO 02 HTR SNSR (four) - op	MCC call c1
:G	33.	A11 cbs - op	MCC call

Cont next page

(3) GNC I/O RESET

PNL	GRP 7 PWRDN (Cont)	PWRUP
R1	<p>If 3 good FCs, place FC2 in standby per the following:</p> <p>34. MN BUS TIE A,B (two) - ON (tb-ON) FC/MN BUS B - OFF (tb-OFF) ESS BUS SOURCE FC2 - OFF FC2 - STOP (tb-bp) cb AC CONTR (three) - c1 INV PWR 2 - OFF (tb-OFF) INV/AC BUS 2 - OFF (tb-OFF)</p> <p>35. Perform AC2 BUS LOSS ACTIONS (EPS) ONLY, then:</p> <p>36. Use only aft ADI, aft FLT CNTLR PWR, and CRT4</p>	<p>④</p> <p>As reqd</p>

- ④ Perform AC2 PWRUP (MAL, EPS SSR-5), then:
Perform FUEL CELL PWRUP (MAL, EPS SSR-6), then:
MN BUS TIE A,B (two) - OFF (tb-OFF)

PL SAFING

PL
SAFING

34

TEMP A12-1

OPCL/34/GEN C

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS (CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL SAFING

PL
SAFING

	<p>If pre-IUS/GLL UMB SEP, 1. Perform RESTOW IUS (UMB ATTACHED) (IUS DPY, <u>CONT OPS</u>)</p> <p>2. Go to step 7</p> <p>If post-IUS/GLL UMB SEP, 3. Perform IUS EMERGENCY DEPLOY (IUS DPY, <u>CONT OPS</u>) Use Min Sep for OMS Burn</p> <p>4. Perform CLOSEOUT (IUS DPY, <u>POSTDEPLOY OPS</u>)</p> <p>5. Go to step 7</p> <p>If after POSTDEPLOY SEPARATION MNVR, 6. Complete CLOSEOUT (IUS DPY, <u>POSTDEPLOY OPS</u>)</p>
R11U	7. RTGCL H2O PUMP A,B (two) - OFF (not reqd for LOSS OF 2 CAB FANS)
MO10W	8. PL N2 SYS 1(SYS 2) vlv - CL
R1	9. PL PRI MNC - OFF (tb-OFF) /FC3 - OFF (tb-OFF) /MNB - OFF (tb-OFF)
APC	10. RELAY 07 - L Wait for SSBVU MDA to close, then: RELAY 99 - L
MO13Q	11. DC UTIL PWR MNB - OFF MNA - OFF
R1	12. PL CAB - OFF
MO52J	13. AC UTIL PWR AC1 - OFF

34

PL SAFING

PL
SAFING

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS (CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

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PL SAFING

PL
SAFING

	<p>If pre-grapple: 1. N/A</p> <p>If HST to be re-grappled:</p>
R13L A6U	<p>2. PL BAY MECH PWR SYS (two) - ON</p> <p>3. RETEN PL SEL - 1</p> <p style="padding-left: 40px;">LOGIC PWR SYS (two) - ON</p> <p style="padding-left: 40px;">✓LAT 1,2,3,4 tb (four) - REL</p> <p style="padding-left: 40px;">✓RDY 1,2,4 tb (three) - gray</p> <p>4. LAT 3 - LAT (tb-LAT), 60 sec max - OFF</p> <p style="padding-left: 40px;">2,4 - LAT (tb-LAT), 60 sec max - OFF</p> <p style="padding-left: 40px;">1 - LAT (tb-LAT), 60 sec max - OFF</p>
R13L	<p>5. LOGIC PWR SYS (two) - OFF</p> <p>6. BAY MECH PWR SYS (two) - OFF</p> <p>If HST to be released:</p>
MO52J MO13Q	<p>7. Perform HST RELEASE (HST DPY C/L, CONT OPS), then:</p> <p>8. AC UTIL PWR AC1 - OFF</p> <p>9. AC UTIL PWR AC3 - OFF</p> <p>10. DC UTIL PWR MNB - OFF</p>
A15 L15 GAPC	<p>11. AC UTIL PWR AC3 - OFF</p> <p>12. Camr pwr - OFF</p> <p>13. Relay 08 - H to L 01 - H to L 00 - H to L</p>
R1	<p>14. PL PRI MNC,MNB,FC3 (three) - OFF</p> <p>15. CAB - OFF</p>

PL SAFING

PL
SAFING

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS (CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

35 |

PL SAFING

PL
SAFING

- M052J 1. DC UTIL PWR MNA - OFF
- If LOSS OF CAB PRESS:
 - If time to TIG > 4 hr and CAB P > 14.5
 - If GSFC POCC cmd available:
 - 2. Inform GSFC POCC to perform BBXRT and TAPS deact
 - 3. When BBXRT deact complete, go to step 4 (MCC call)
 - If GSFC POCC cmd not available:
 - 4. TAPS GMBL PWR - DSBL (tb-gray)
 - 5. BBXRT PWR BUS 1 - OFF (tb-bp)
2 - OFF (tb-bp)
 - 6. SPOC AVIONICS - OFF (tb-bp)
 - 7. BBXRT VLV E1/E2 - CL
 - 8. ✓VLV E1 STAT tb - bp,gray (<2 sec)
✓E2 STAT tb - bp,gray (<2 sec)
 - 9. BBXRT VLV E1R/E2R - CL
 - 10. ✓VLV E1R STAT tb - bp,gray (<2 sec)
✓E2R STAT tb - bp,gray (<2 sec)
 - Ignore DDS FSMs in following step
 - 11. PWR DDU KB - OFF
KB PWR - OFF
 - 12. **EXC JAC PAGE**
ITEM 95E (Shuts down all ASTRO experiments), then:
 - 13. Perform IPS DEACT (SL IPS OPS), then:
 - 14. Deactivate Spacelab per SL CONTINGENCY DEACT (SL ACT/DEACT)
 - 15. SS RAU PWR 1,2 (two) - OFF
 - 16. PL PRI MNC - OFF (tb-OFF)
 - 17. CAB PL - OFF >>
- If time to TIG < 4 hr or CAB P < 14.5 and decr:
 - 18. Go to step 19

L12R

L11

DDU

L14
R1

PL SAFING

PL
SAFING

38 |

TEMP G12-1

OPCL/38/GEN C,6

PL
SAFING

Go to PL SAFING - ORBIT
(DOD PL OPS, PL PWRDN/SAFING)

38 |

TEMP G12-2

OPCL/38/GEN C,6

PL SAFING

PL
SAFING

TEMP H12-1

40

OPCL/40/GEN C,12

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS (CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	15 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL
SAFING

PL SAFING

	Deactivate SL:
	1. Perform <u>SL EXPEDITED EGRESS</u> (Cue Card)
R1	2. PL PRI MNC,FC3,MNB (three) - OFF (tb-OFF)
	AUX - OFF
	Unpower Middeck PLs:
MF28E/ MF28G	3. R/F PWR - OFF
MF71H/ MF71K	4. cb AEM PWR BREAKER (two) - op
MO13Q	5. DC UTIL PWR MNB - OFF
	6. Perform <u>UMS STOW</u> (Cue Card)

40

TEMP H12-2

OPCL/40/GEN C,18

PL SAFING

PL
SAFING

TEMP H12-1

40
OPCL/40/GEN C,12

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS		
(CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL SAFING

PL
SAFING

	1. Perform <u>SPACELAB EXPEDITED EGRESS</u> (Cue Card)
R1	2. PL PRI MNC,FC3,MNB (three) - OFF (tb-OFF) AUX - OFF CAB - OFF Unpower Middeck PLs:
M052J	3. AC UTIL PWR AC1 - OFF
M013Q	4. DC UTIL PWR MNB - OFF
	5. Perform UMS STOW (Cue Card), then:
	6. Go to PUP 200 DEACTIVATION (PFDf, MPE PROC C/L)

PL SAFING

PL
SAFING

41

TEMP I12-1

OPCL/41/GEN C,9

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS (CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL SAFING

PL
SAFING

	If pre-US/ULS UMB SEP,	
	1. Perform RESTOW IUS (UMB ATTACHED) (IUS DPY, <u>CONT OPS</u>)	
	2. Go to step 7	
	If post-US/ULS UMB SEP,	
	3. Perform IUS EMERGENCY DEPLOY (IUS DPY, <u>CONT OPS</u>)	
	Use Min Sep for OMS Burn	
	4. Perform CLOSEOUT (IUS DPY, <u>POSTDEPLOY OPS</u>)	
	5. Go to step 7	
	If after POSTDEPLOY SEPARATION MNVR,	
	6. Complete CLOSEOUT (IUS DPY, <u>POSTDEPLOY OPS</u>)	
R11U	7. H2O PUMP A,B (two) - OFF (not reqd for LOSS OF 2 CAB FANS)	
M010W	8. PL N2 SYS 1,SYS 2 vlv - CL	
R1	9. PRI MNC - OFF (tb-OFF) ✓FC3 - OFF (tb-OFF) ✓MNB - OFF (tb-OFF)	
	10. CAB - OFF	
APC	11. RELAY 07 - L Wait for SSBUV MDA to close, then: RELAY 99 - L	
M013Q	12. DC UTIL PWR MNB - OFF	
M052J	13. MNA - OFF	

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PL SAFING

PL
SAFING

TEMP J12-1

37
OPCL/37/GEN C,10

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS		
(CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC ON ORBIT		
(TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL SAFING

PL
SAFING

	If pre-SURS release,
	1. Perform GRO RAPID SAFING/POWERDOWN (GRO DPY, <u>CONT OPS</u>)
	If post-SURS release,
	2. Perform GRO QUICK DEPLOY (GRO DPY, <u>CONT OPS</u>)
MO13Q	3. DC UTIL PWR MNB - OFF
MO30F	4. MNC - OFF
R1	5. PL PRI MNC, FC3, MNB - OFF
	6. CAB - OFF

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PL SAFING

PL
SAFING

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS		
(CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

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PL SAFING

PL
SAFING

- L12LL 1. ✓NSI ARM - OFF (tb-bp)
 2. ✓PWR - OFF (tb-bp)
 3. ✓KIT PWR - OFF
 4. ✓PL AFT MNB - OFF
 5. ✓MNC - OFF
- SPASP 6. ✓LNCHR SEL A,B,C (two) - RESET
 7. ✓tb (three) - bp
 8. ✓DPLY SEL PREARM - NO-OP (tb-bp)
 9. ✓ARM - NO-OP (tb-bp)
 10. ✓DPLY - NO-OP (tb-bp)
 11. ✓EXEC - OFF
- If SPAS deployed, or berthed and not powered:
 12. Go to step 34
- If SPAS unberthed:
 If outside V-guides:
 13. Perform SPAS UNBERTH, step 7
 (PDRS OPS, SPAS DEPLOY), then:
 14. Perform SPAS MNVR TO RELEASE, step 2
 (PDRS OPS, SPAS DEPLOY), then:
 15. Perform SPAS RELEASE, step 5
 (PDRS OPS, SPAS DEPLOY), then:
 16. Go to step 34
- If inside V-guides:
 If SPAS RF commanding available
 17. SM 210 SPAS INIT
 POWER L3TV STBY ON - ITEM 19 EXEC
 (*,CMD 186)
 18. SM 214 SPAS SYSTEMS
 ✓L3TV WID,NAR
 TX V (two): < 20.0
 19. SM 210 SPAS INIT
 POWER L3TV STBY OFF - ITEM 20 EXEC
 (*,CMD 187)
 20. POWER XMTR OFF - ITEM 14 EXEC
 (CMD 171)
 21. Perform SPAS BERTH (PDRS OPS,
SPAS RETRIEVE)
 22. Go to step 26

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PL SAFING

PL
SAFING

PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS	1 (10-13)	PL SAFING
(CONUS TIG < 2.5 hr)	1 (10-27)	PL SAFING
(CONUS TIG > 2.5 hr)		
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

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PL SAFING

If IUS deployed and payloads stowed for deorbit,
perform MIDDECK PL SAFING, step 1 only

Begin FLIGHT DECK and MIDDECK PL SAFING simo

FLIGHT DECK PL SAFING

If IUS DEPLOY CLOSEOUT complete:

1. Go to step 9

If before IUS RELEASE UMBILICALS:

2. Perform RESTOW IUS (UMB ATTACHED)
(IUS DPY, CONT OPS)
3. Go to step 9

If after IUS RELEASE UMBILICALS but before
SEP MNVR:

4. Perform IUS EMERGENCY DEPLOY
(IUS DPY, CONT OPS)
5. Use Min Sep for OMS Burn
6. Perform CLOSEOUT (IUS DPY,
POST DEPLOY OPS)
7. Go to step 9

If after POST DEPLOY SEPARATION MNVR:

8. Complete CLOSEOUT (IUS DPY,
POST DEPLOY OPS)
9. PL PRI MNC - OFF (tb-OFF)
 ✓FC3 - OFF (tb-OFF)
 ✓MNB - OFF (tb-OFF)
 CAB - OFF

If SSBV MDA closed:

10. Go to step 12
11. RELAY 07 - L
 Wait for SSBV MDA to close, then:
 12. RELAY 99 - L
 Enter <E> twice
 Stow APC

Cont next page

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TEMP L12-2

OPCL/43/GEN C,20

PL
SAFING

R1

APC

If other loss:

- | | | |
|------|-----|---|
| L12R | 19. | BBXRT PWR BUS 1 - OFF (tb-bp) |
| | | 2 - OFF (tb-bp) |
| | 20. | SPOC AVIONICS - OFF (tb-bp) |
| DDU | 21. | <u>EXC JAC PAGE</u> |
| | | ITEM 95E (Shuts down all ASTRO
experiments) |
| | 22. | Go to SPACELAB EMERGENCY DEACTIVATION
(Cue Card) |

23. SM 210 SPAS INIT
POWER L3TV STBY ON - ITEM 19 EXEC
(*,CMD 186)
24. SM 214 SPAS SYSTEMS
✓L3TV WID,NAR
TX V (two): < 20.0
25. SM 210 SPAS INIT
POWER L3TV STBY OFF - ITEM 20 EXEC
(*,CMD 187)
- L12UR 26. ✓cb SW PWR - c1
27. SPAS PNL ACTV - ON (tb-gray)
28. ✓BATT C - OFF (tb-bp)
29. ✓A/B - OFF
✓A,B tb (two) - bp
30. PWR MODE - INTL (tb-bp)
31. EXT PWR - OFF (tb-bp)
32. PNL ACTV - OFF (tb-bp)
33. cb SW PWR - op
- NOTE
Expect SM ALERT and
'S62 PDI DECOM FAIL'
- R1 34. PL PRI (three) - OFF
35. CAB - OFF
36. AUX - OFF
- MF57K 37. ✓RME-III stowed
38. ✓CLOUDS-1A stowed

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FLIGHT DECK PL SAFING (Cont)

- If OCTW in progress:
 - A11 13. DC UTIL PWR MNC - OFF
 - R11L 14. VTR pb - STOP
 - 019 15. TV PWR - OFF

- If DTO 1208 on:
 - A15 16. AC UTIL PWR AC3 - OFF

- If PGSC on:
 - F1 17. DC UTIL PWR MNB - OFF

 - 18. Stow OCTW, APE, DTO 1208, PGSC

MIDDECK PL SAFING

WARNING
SAMS disks are hot.
Do not remove

- M030F 1. DC UTIL PWR MNC - OFF
M052J 2. MNB - OFF

If LBNPD temp stowed:

3. Go to step 9

- M013Q 4. DC UTIL PWR MNB - OFF
M052J 5. AC UTIL PWR AC1 - OFF
WCS 6. VAC VLV - CL
LBNPD 7. Recompress LBNPD chamber by breaking
waist seal
Egress from LBNPD
WCS 8. Disconnect LBNPD vac hose from
VAC VLV QD
Replace cap on VAC VLV QD
VAC VLV - OP
9. Disassemble LBNPD
Stow LBNPD, AFE, accessories

If DTO 1208 on:

- M013Q 10. AC UTIL PWR AC3 - OFF
Stow DTO 1208

11. Stow without further deact:
IPMP
BIMDA
SSCE

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PL PWRDN

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
HI LOAD EVAP	4	N/A
1 FREON LOOP	5	PP3A
FES (ON ORBIT)	8	N/A
FES (DEORBIT PREP)	8	C
MN BUS UNDERVOLTS/FC VOLTS	6	N/A
	14	N/A

ACTION

	C PWRDN	PWRUP
R1	1. PL PRI MNC - OFF (tb-OFF)	N/A

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TEMP K10-87

OPCL/39/GEN C,13

ACTION

	PRIORITY PWRDN 3A (PP3A)	PWRUP
	If MPEC DEPLOY in progress: If door in motion: 1. Allow door to complete travel (90 sec)	√MCC
SSP	2. √NSI ARM - OFF (tb-bp) 3. √PWR - OFF (tb-bp) 4. √KIT PWR - OFF 5. √PL AFT MNB - OFF 6. √MNC - OFF	
	If SPAS operating RF and MCC available: 7. On MCC call, S-BD PL PSP CMD OUTPUT - UMB 8. GSFS POCC will command STP-1 to a survival level 9. On MCC call, S-BD PL PSP CMD OUTPUT - INTRG	
SSP	If CIV controller powered: 10. √CIV REL MODE - MAN 11. PWR CNTLR - OFF √OPS tb - bp	√MCC
	If SPAS powered: If cover open: 12. Perform SPAS CRYO COVER CLOSE (PL OPS, <u>SYSTEM OPS - NOMINAL</u>)	√MCC
	13. Perform SPAS SENSOR DEACTIVATION (PL OPS, <u>SYSTEM OPS - NOMINAL</u>)	
	If SPAS on external power: 14. <u>SM 210 SPAS INIT</u> POWER CRYO EL OFF - ITEM 26 (*,CMD 151)	
	15. Mnvr to nose forward, -ZLV attitude, TG = 2, BV = 3, OM = 180	

Cont next page

	PRIORITY PWRDN 3A (PP3A)	PWRUP
	16. Perform AFP 675 PP3A (AFP-675 PL OPS, <u>CONTINGENCY PAYLOAD</u> <u>POWERDOWN</u>)	✓MCC
	If steps 7,8, and 9 not performed and MCC not available:	
SSP	17. STP-1 AV PWR - OFF(mom) (tb-bp)	ON
	18. EXP PWR - OFF(mom) (tb-bp)	ON

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TEMP K10-89

OPCL/39/GEN C,13

PL SAFING

PL
SAFING

PROCEDURE	STEP	ACTION
PWRDN FOR LOSS OF:		
2 CAB FANS	1 (10-6)	PL SAFING
2 H2O LOOPS		
(CONUS TIG < 2.5 hr)	1 (10-13)	PL SAFING
(CONUS TIG > 2.5 hr)	1 (10-27)	PL SAFING
CAB PRESS	1 (10-35)	PL SAFING
2nd FC (TIG < 4 hr)	6 (10-49)	PL SAFING
(TIG > 4 hr)	16 (10-53)	PL SAFING
2 FREON LOOPS	2 (10-65)	PL SAFING

PL SAFING

PL
SAFING

- | | |
|-------|---|
| SSP | 1. ✓NSI ARM - OFF (tb-bp) |
| | 2. ✓PWR - OFF (tb-bp) |
| | 3. ✓KIT PWR - OFF |
| | 4. ✓PL AFT MNB - OFF |
| | 5. ✓MNC - OFF |
| SPASP | 6. ✓LNCHR SEL A,B,C (two) - RESET |
| | 7. ✓tb (three) - bp |
| | 8. ✓DPLY SEL PREARM - NO-OP (tb-bp) |
| | 9. ✓ARM - NO-OP (tb-bp) |
| | 10. ✓DPLY - NO-OP (tb-bp) |
| | 11. ✓EXEC - OFF |
| | If SPAS deployed, or berthed and not powered: |
| | 12. Go to step 31 |
| | If SPAS unberthed: |
| | If outside V-guides: |
| | 13. Perform SPAS UNBERTH, step 7
(PDRS OPS, SPAS DEPLOY), then: |
| | 14. Perform SPAS MNVR TO RELEASE, step 2
(PDRS OPS, SPAS DEPLOY), then: |
| | 15. Perform SPAS RELEASE, step 5
(PDRS OPS, SPAS DEPLOY), then: |
| | 16. Go to step 31 |
| | If inside V-guides: |
| | If SPAS RF commanding available |
| | 17. <u>SM 210 SPAS INIT</u>
POWER L3TV STBY ON - ITEM 19 EXEC
(*,CMD 186) |
| | 18. OFF - ITEM 20 EXEC
(*,CMD 187) |
| | 19. XMTR OFF - ITEM 14 EXEC
(CMD 171) |
| | 20. Perform SPAS BERTH (PDRS OPS,
SPAS RETRIEVE) |
| | 21. <u>SM 210 SPAS INIT</u>
POWER L3TV STBY ON - ITEM 19 EXEC
(*,CMD 186) |
| | 22. OFF - ITEM 20 EXEC
(*,CMD 187) |
| SSP | 23. cb SW PWR - c1 |

- 24. SPAS PNL ACTV - ON (tb-gray)
- 25. ✓BATT C - OFF (tb-bp)
- 26. ✓A/B - OFF
- ✓A,B tb (two) - bp
- 27. PWR MODE - INTL (tb-bp)
- 28. EXT PWR - OFF (tb-bp)
- 29. PNL ACTV - OFF (tb-bp)
- 30. cb SW PWR - op
- 31. Configure AFP-675 mechanical systems
for entry (TBD)
- R1 32. PL PRI (three) - OFF
- 33. CAB - OFF
- 34. AUX - OFF
- MF57K 35. ✓RME-III stowed
- 36. ✓CLOUDS-1A stowed

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TEMP K12-3

OPCL/39/GEN C,13