Orbit Pocket Checklist

Mission Operations Directorate
Operations Division

Generic, Rev M
October 18, 2006

NOTE
For STS-116 and subsequent flights

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

Verify this is the correct version for the pending operation (training, simulation or flight).
Electronic copies of FDF books are available. URL: http://mod.jsc.nasa.gov/do3/FDF/index.html
PCN-10 (May 15, 2009) Sheet 1 of 1

List of Implemented Change Requests (482s):
OPCL-0520

Incorporate the following:
1. Replace v thru viii
2. Replace A4-1 thru B4-2 (4 pages)
3. Replace A10-73 thru A10-82
4. Replace B10-81 and B10-82

NOTE
For STS-127 and subsequent flights

Prepared by: Mary Lea Smith
Publication Manager

Approved by: [Signature]
Manager, Flight Procedures

Accepted by: [Signature]
FDF Manager

Encl: 20 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

MULTI-1833  OPCL-506

Incorporate the following:
1. Replace v thru x
2. Replace 3-1 and 3-2
3. Replace 8-7 and 8-8

NOTE
For STS-119 and subsequent flights

Prepared by: Carol H. Pierce
Publication Manager

Approved by: Manager, Shuttle Procedures Management

Accepted by: FDF Manager

Encl: 10 pages

File this PCN immediately behind the front cover as a permanent record
PCN-8 (Oct 14, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):
MULTI-1829

Incorporate the following:
1. Replace v and vi
2. Replace 3-7 and 3-8

NOTE
For STS-126 and subsequent flights

Prepared by: [Signature]
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
DF Manager

Encl: 4 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

MULTI-1821  OPCL-0504
            OPCL-0505

Incorporate the following:
1. Replace v and vi
2. Replace 3-5 and 3-6
3. Replace 4-3 and 4-4, 4-21 and 4-22

Prepared by:  Mary Ellen Lucero
               Publication Manager

Approved by:  Michael Johnson
              Manager, Shuttle Procedures Management

Accepted by:   Michael [Signature]
               FDF Manager

Encl: 8 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

MULTI-1813
MULTI-1818
OPCL-0503

Incorporate the following:

1. Replace v thru viii
2. Replace 3-9 and 3-10
5. Replace 11-9 and 11-10

Prepared by: Mary Ellen Dunn
Publication Manager

Approved by: George Vaughan
Manager, Shuttle Procedures Management

Accepted by: Mary Gaspar
FDF Manager

Encl: 36 pages

File this PCN immediately behind the front cover as a permanent record
PCN-5 (Jan 15, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):

MULTI-1812A    OPCL-0502
MULTI-1814

Incorporate the following:
1. Replace v thru x, xiii and xiv
2. Replace 4-13 and 4-14, 4-17 and 4-18
3. Replace A6-1 thru B6-4 (8 pages)

Prepared by: Mary Ellen Brown
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
FDF Manager

Encl: 20 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

MULTI-1803

Incorporate the following:

1. Replace v and vi
2. Replace 4-13 and 4-14
   Delete TEMP 4-13 and TEMP 4-14

NOTE
For STS-120 and subsequent flights

Prepared by: Mary Ellen Price
Publication Manager

Approved by: John Johnson
Manager, Shuttle Procedures Management

Accepted by: Michael Shaw
FDF Manager

Encl: 4 pages

File this PCN immediately behind the front cover as a permanent record
PCN-3 (Sept 20, 2007) Sheet 1 of 1

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NOTE
For STS-120 and subsequent flights

Incorporate the following:

1. Replace v thru vii, xi and xii
2. Replace 4-17 thru 4-24
5. Replace 11-7 and 11-8

Prepared by: [Signature]
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
DF Manager

Encl: 48 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

MULTI-1738A(R)  OPCL-0492  
MULTI-1785  OPCL-0493  
MULTI-1786  OPCL-0495  
MULTI-1790  OPCL-0496  
MULTI-1792

R – Remainder

Incorporate the following:

1. Replace v thru x
2. Replace 1-3 and 1-4
3. Replace B4-1 and B4-2, 4-5 thru B4-8 (6 pages), 4-21 thru 4-24
4. Replace 5-1 thru 5-4, 5-7 and 5-8
5. Replace A10-61 and A10-62

Prepared by:  

Approved by:  

Accepted by:  

Encl: 38 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1756
MULTI-1769
MULTI-1774

Incorporate the following:
1. Replace v thru x
2. Replace 4-13 and 4-14
   After 4-14, add TEMP 4-13 and TEMP 4-14
3. Replace A10-27 and A10-28
4. Replace B10-27 and B10-28

NOTE
For STS-117 and subsequent flights

Prepared by: Mary Ellen Stone
Publication Manager

Approved by: Jennifer Johnson
Manager, Shuttle Procedures Management

Accepted by: Michael E. Sharr
FDF Manager

Endl: 14 pages

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

ORBIT POCKET CHECKLIST

GENERIC, REVISION M
October 18, 2006

PREPARED BY:

Mary E. Bruce
Publication Manager

APPROVED BY:

Kimberly A. Johnson
Manager, Shuttle Procedures Management

ACCEPTED BY:

Michael T. Hurt
FDF Manager

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

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

OPCL/ALL/GEN M
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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. Applicable procedures from the PL PWR book (i.e., Sections 2 and 3) are placed at the end of the flight copies of this book.

8. The ‘♦’ icon preceding a procedural entry indicates one should √ MCC and if no comm continue with the procedure.
ORBIT POCKET CHECKLIST

LIST OF EFFECTIVE PAGES

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## CUE CARD CONFIGURATION

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HYD ACCUM (RSVR) P LOW
(SM2 HYD ACCUM P, ACUM P < 1930)
(S86 RSVR/ACC P, RSVR P < 28 or ACCUM P < 1930)

CAUTION
Hyd MN Pump may be damaged if APU started with low HYD RSVR P

R2
1. (Aff) HYD CIRC PUMP – ON
2. √MCC
   If no comm, go to MAL, APU/HYD, 1.2a, RSVR P ↓,
   ACCUM P ↓ [1]

HYD CIRC PUMP PRESS LOW
(S87 CIRC PMP P, PRESS < 100)

CAUTION
HYD CIRC PUMP – OFF within 60 sec to avoid damage

R2
1. HYD CIRC PUMP – OFF
2. √MCC
   If no comm, go to MAL, APU/HYD, 1.3a,
   HYD CIRC PUMP P ↓ [1]
**APU FUEL SUPPLY T**

(S86 FU TK VLV)
(S88 APU TANK T)
(S88 APU FU LN)

A12 1. (Aff) APU HTR TK/FU LN/H2O SYS A – OFF  B – OFF

2. √MCC
   If no comm and ‘S88 APU TANK T’ or ‘APU FU LN’ msg, go to MAL, APU/HYD, 1.1b [2]
   If no comm and ‘S86 FU TK VLV’ msg, go to MAL, APU/HYD, 1.1c [1]

**APU FUEL PUMP T**

(S88 APU FU PMP)

CRT 1. If APU FUEL T PUMP OUT or BYP LN ↓:
A12 2. (Aff) APU HTR GAS GEN/FU PUMP – A AUTO(B AUTO)  >>

2. (Aff) APU HTR GAS GEN/FU PUMP – OFF

NOTE

Expect ‘S86 GG/FU PMP’
and ‘S86 GBX P FDA’ msgs

3. √MCC
   If no comm, go to MAL, APU/HYD, 1.1b [2]

**APU WATER T**

(S88 APU H2O T)

If H2O INJ LN 1 or 2 ↓↑:
A12 1. APU HTR TK/FU LN/H2O SYS 1 A(B) – OFF  B(A) – ON

2. √MCC
If H2O INJ LN 3 ↓↑:
3. APU HTR TK/FU LN/H2O SYS 3 A(B) – OFF  B(A) – ON

4. √MCC

1-3  OPCL/ALL/GEN M,2
## COMMUNICATIONS

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### BCE BYP KU
(KU 8=M)

1. **ITEM 8 ENTER**
   If msg repeats:
   2. If AOS: Check MCC for comm config
   3. If no comm: Go to COMM LOST, steps 6,7 for TDRS mode

---

SM 201 ANTENNA
ICOM LOST

Try following until ICOM AUDIO regained:
1. (Aff) AUD CNTL sel – sel alt
2. AUD CTR – 2
3. Plug into another ATU
4. Try another HDST/CCU
5. √MCC

S76 COMM PA 2(1) TEMP
(TEMP > 230)

1. Perform COMM LOST, steps 6,7 for TDRS mode, then:
2. √Comm with MCC
If no comm:
3. Go to COMM LOST

S76 PA 2(1) OUTPUT LOW
(PWR OUT < 60)

1. Perform COMM LOST, steps 6,7 for TDRS mode, then:
2. √Comm with MCC
If no comm:
3. Go to COMM LOST

S76 NSP 2(1) BITE
(BITE = ‘FAIL’)

1. Perform COMM LOST, steps 6,7 for TDRS mode, then:
2. √Comm with MCC
If no comm:
3. Go to COMM LOST

S76 COMSEC 2(1) BITE
(BITE = ‘FAIL’)

1. Perform COMM LOST, steps 6,7 for TDRS mode, then:
2. √Comm with MCC
If no comm:
3. Perform COMM LOST, step 9, then:
4. √Comm with MCC
If no comm:
5. Go to COMM LOST
COMM LOST  (mult pnls)  SM 76 COMMUNICATIONS
SM ANTENNA

NOTE
Perform comm checks with MCC after each step

1. AUD CTR – 2(1)
   If all ICOM and A/G failed (check three ATUs):
   R14:A,F
2. √cb ACCU (two) – cl
3. Go to step 10
4. SM 62 PCMMU/PL COMM
   If PI XMIT PWR not blank:
   A1L
      Deactivate PI:
      √S-BD PL CNTL – CMD
      PWR SEL – PSP
      CNTL – PNL,CMD
      Wait 2 min for TDRS acquisition
5. If F9 meter < 300, wait for next TDRS in view

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

If no joy on next TDRS or comm required sooner:

A1L
6. Verify configured for TDRS mode:
   √NSP UPLK DATA – S-BD
   √S-BD PM MODE sel – TDRS
   √NSP DATA RATE (two) – HI
   √NSP CODING (two) – ON
C3
7. S-BD PM CNTL – PNL

NOTE
XMIT may be delayed 140 sec for PA warmup.
Receive not affected

8. Sel best ant, F9 meter > 300. If no joy, return to GPC
9. Bypass encrypt (2 min reqd for MCC reconfig):
   A1L
      NSP ENCRYPTION MODE – SEL
      SEL – BYP

Cont next page
10. Confirm U/L CMD capability:
   - Cue MCC with: ITEM 88 +8 8 8 8 8 8
   - Check flashing U/L on GNC display
   - Ack with: ITEM 99 +9 9 9 9 9 9
   - Check abort light cycling ON/OFF (MCC ack)
   - Check no flashing U/L

   If U/L CMD confirmed:
   11. Go to MAL, COMM SSR-1, LOSS OF ALL VOICE
       COMM >>

   If no comm and no U/L CMD:
   12. Go to MAL, COMM, 2.3a, NO S-BD COMM: TDRS

**UHF COMM LOST** (mult pnls)

**NOTE**
Perform comm checks with MCC after each step

---

O6
1. √UHF SPLX/EVA PWR AMPL – ON
2. AUD CTR – 2(1)
   Reconfig UHF sys:
3. UHF SPLX SQUELCH – OFF
4. UHF SPLX/EVA XMIT FREQ – 296.8/417.1
   Call site stating “on 296.8”, wait 30 sec for site reconfig
5. Roll vehicle HEADS UP to point UHF antenna at ground
6. UHF SPLX/EVA PWR AMPL – OFF (LO PWR XMIT)
7. UHF MODE sel – G T/R
   Call site stating “on 243.0”, wait 30 sec for site reconfig
DATA PROCESSING SYSTEM
ALL IDPs ASSIGNED TO FAILED GPC

CAUTION
If GPC/CRT key used to assign IDP1(2,3) to BFS, deassign to avoid dual commanders

1. If no active GNC GPC: Go to GNC RECOVERY VIA G2FD >>
2. (Failed) GPC PWR – OFF
3. IDP/CRT1,2,3 MAJ FUNC – PL
4. \( \sqrt{FD} \) GPC PWR – ON
   MODE – STBY,RUN (tb-RUN)
5. IDP/CRT1,2,3 MAJ FUNC – as desired
   If FD GPC not needed to recover lost major function:
6. \( \sqrt{FD} \) 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 DPS DISPLAY COMMANDERS

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

BFS ENGAGE

1. RGAs (four) – ON
2. \( \sqrt{(BFS)} \) GPC PWR – ON
   MODE – STBY (tb-RUN)
   OUTPUT – B/U
3. (SM) GPC OUTPUT – NORM
4. BFC CRT DISP – ON
5. \( \sqrt{(BFS)} \) DDU L,R (four) – cl
6. L(R) FLT CNTLR PWR – ON
7. \( \sqrt{(BFS)} \) Pri RJDs (sixteen) – ON
8. L(R) RHC BFS engage pb – push

NOTE
BFS will take PL buses from SM GPC

9. (BFS) GNC, OPS 301 PRO
10. OI PCMMU FORMAT – FXD
11. If no comm at AOS: sel best S-BD PM ANT
12. Go to MAL, DPS, GPC FRP-4, PASS RECOVERY AFTER BFS ENGAGE (ASCENT/ORBIT/ENTRY)

3-2 OPCL/ALL/GEN M,9
SUMWORD ICC 1(2,3,4)

If CS = 2, when time permits:
   1. Go to MAL, DPS SSR-2, GPC S/W INITIATED MEM DUMP >>
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 (1st FAIL)
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, check att ANG prior to 'resel if IMU'
4. If STBY: Go to MAL, √DPS, 5.3b, BCE STRG X 11 >>

If MTU:
If mult 'STRG MTU' msgs:
5. Go to MAL, √DPS, 5.2d, TIME MTU 11 >>
6. **GNC I/O RESET**
   - If MTU:
   7. Resel if IMU >>
   If NSP and msg repeats:
8. If AOS: √MCC
   If LOS/no comm:
   9. Go to COMM LOST, step 6 (COMM), 2-3 >>
10. **GNC 1 DPS UTILITY**
    - Aff String – port mode
   If recovered:
   11. 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**

Cont next page
If recovered:
14. Resel if IMU
15. Orig ports – resel
16. If IMU or GPS: \textbf{√ MCC}
17. If any other: 
   Go to MAL, \textbf{DPS}, 5.3b, BCE STRG X \[15\]

\textbf{PL1(2) MDM I/O ERROR; PL1(2) MDM OUTPUT}

If mult simo 'I/O ERR' or 'MDM OUTPUT' msgs on PL1 and PL2 (GPC prob):
1. Go to PASS SM GPC FAIL
2. SM I/O RESET; if recovered:
   If PSP reqd:
   3. \textbf{[SM 62 PCMMU/PL COMM]}
      PSP I/O RESET PSP 1(2) – ITEM 6(7) EXEC (*)
4. If reqd, go to PL/DPS RECONFIG, Recovery [PL SYS (PL OPS)\(\text{SODF: ASSY OPS})] >>
5. If reqd, perform PL/DPS RECONFIG, Secure [PL SYS(PL OPS) \(\text{SODF: ASSY OPS})], then:
   If MCC GO for pwr cycle:
6. (Aff) MDM PL – OFF, ON
7. SM I/O RESET; if recovered:
   If PSP reqd:
8. \textbf{[SM 62 PCMMU/PL COMM]}
7. SM I/O RESET; if recovered:
8. If reqd, go to PL/DPS RECONFIG, Recovery [PL SYS (PL OPS)\(\text{SODF: ASSY OPS})] >>
9. If msg repeats:
10. If PL1 msg and no comm: Go to COMM LOST, steps 5,6,7,8 for TDRS mode (COMM), 2-3
11. If PL2 msg and no comm: Sel best S-BD PM ANT
12. Go to MAL, \textbf{DPS}, 5.3c, I/O ERROR/MDM OUTPUT PL 1(2) \[1\]

\textbf{OPCL/ALL/GEN M,7}

\textbf{BCE STRG X} \[3-5\]
FF(FA) MDM OUTPUT

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 >>

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

If not recovered:
5. Go to PASS GNC GPC (1st FAIL)
FF(FA) MDM I/O ERROR

1. GNC I/O RESET; if recovered >>
   If simo 'I/O ERR' msgs for mult MDMs (possible GPC prob):
2. \( \sqrt{ } \) MCC/restring as reqd >>
3. If FF: Check ADI (aff String)
   4. If ADI 'OFF' flag (GPC prob): Go to step 16
5. \[ \text{GNC 1 DPS UTILITY} \]
   Aff String – port mode; if recovered >>
   If alt msg on aff string (GPC prob):
6. Go to step 16
If MCC GO for pwr cycle:
7. If FF:
   \[ \text{GNC 21 IMU ALIGN} \]
   Aff IMU – desel
8. (Aff) MDM – OFF,ON (FF: may cage IMU)
9. GNC I/O RESET
10. If recovered: resel IMU if desel >>
11. Resel orig ports
12. If recovered: resel IMU if desel >>
13. If not: Go to MAL, DPS, 5.3a, I/O ERROR FF(FA) 17 >>
If MCC NO-GO for pwr cycle:
14. If FF:
   \[ \text{GNC 21 IMU ALIGN} \]
   Aff IMU – desel >>
15. If FA1 or FA2, then:
   R OMS TK ISOL A – CL (tb-CL) >>
16. Sel desired FF/FA MDM:
17. \[ \text{GNC 1 DPS UTILITY} \]
   Port mode as reqd
If FF MDM not chosen:
18. \[ \text{GNC 21 IMU ALIGN} \]
   Aff IMU – desel
19. When time permits restring (with possible F-T-S):
   Go to MAL, DPS, 5.3a, I/O ERROR FF(FA) 1

OPCL/ALL/GEN M,8

FF(FA) MDM OUTPUT 3-7 FF(FA) MDM I/O ERROR
PASS GNC GPC (1st FAIL)

NOTE
If Group B(C) LOW LEVEL (MSN EXT) pwrdn config,
MMU 2 – ON

NOTE
No keyboard entries or sw throws 10 sec:
Before and after moding PASS GPCs to RUN
Before OPS transition or set expansion/contraction
requests until new OPS base page is displayed

If no active GNC GPC and G2FD GPC avail:
1. Go to GNC RECOVERY VIA G2FD >>
If no active GNC GPC and no FD GPC avail:
2. Go to BFS ENGAGE >>
If failure is CS split and GPC config is one GNC and one SM:
3. Go to MAL, DPS, 5.1a, CS SPLIT [T] >>
If Dual G2 and RS split (CS intact) but both GPCs appear functional
(check DPS and ADI displays, MODE tb):
4. Retain GPC with two IMUs
If Triple G2 and RS split but GPCs appear functional
(check DPS and ADI displays, MODE tb):
5. Retain GPC with two strings
6. (Aff) GPC PWR – OFF
If FF1 PWR cycled:
7. [GNC 21 IMU ALIGN]
   IMU 1 (caged) – desel
8. Reassign failed GPC IDPs: GPC/CRT as reqd
9. [GNC 0 GPC MEMORY]
   Check downlist to active GNC GPC:
   DOWNLIST GPC – ITEM 44 +X EXEC
If redundant GNC GPCs reqd and G2FD avail:
10. √(G2FD) GPC MODE – HALT
     √OUTPUT – NORM
     √PWR – ON
     MODE – STBY (tb-RUN),RUN
11. IDP/CRTX MAJ FUNC – PL
12. GPC/CRT – (G2FD) GPC/X EXEC
If GNC OPS 202:
13. GNC, OPS 201 PRO

Cont next page
If RNDZ NAV Ena:
14. DAP: LVLH
15. [GNC UNIV PTG]
   CNCL – ITEM 21 EXEC (no *)
16. √Tgt set, assign FC strings, CRTs, and MMUs in current MC
    (check PL1/2 and L1,2 deassigned)
17. GNC, OPS 201 PRO
If RNDZ NAV reqd:
18. Perform RNDZ NAV RECOVERY (RNDZ, CONTINGENCY OPS)
19. [GNC 22 S TRK/COAS CNTL]
   S TRK -Y,-Z: STAR TRK – ITEM 3,4 EXEC (*)
20. [GNC 21 IMU ALIGN], RESUME
If {redundant GNC GPCs not reqd or G2FD not avail} and MCC GO for restring:
21. Assign FC strings, CRTs, and MMUs in current MC
    (check PL1/2 and L1,2 deassigned)
22. GNC, OPS XXX PRO
23. When time permits: Go to MAL, DPS, GPC FRP-1, SINGLE GPC FAIL

PASS SM GPC FAIL

NOTE
No keyboard entries or sw throws 10 sec:
Before and after moding PASS GPCs to RUN
Before OPS transition or set expansion/contraction requests until new OPS base page is displayed

NOTE
Ku-Band sys may be reqd to be taken to STBY
to prevent exceeding radiation constraints of the PL/EVA crewmember

If AOS:
1. √MCC for comm config and radiation constraints
If no comm:
2. KU BD PWR – STBY
   CNTL – PNL,CMD
3. Perform COMM LOST, steps 6,7,8 for TDRS mode
   (COMM), 2-3
4. √MMU 2 PWR – ON
If failure is CS split and GPC config is one GNC and one SM:
5. Go to MAL, DPS, 5.1a, CS SPLIT [T] >>

Cont next page

PASS GNC GPC (1st) 3-9 PASS SM GPC FAIL
6. If reqd, perform PL/DPS RECONFIG, Secure [PL SYS(PL OPS) (SODF: ASSY OPS)], then:

7. (SM) GPC PWR – OFF

8. MDM PL1,2 PWR (two) – OFF, ON

9. **GNC 1 DPS UTILITY**
   - UL CNTL ENA – ITEM 36 EXEC (*)
   - CKPT RETRVR ENA – ITEM 12 EXEC (*)

If G2FD GPC avail:

10. (G2FD) GPC MODE – HALT
    - PWR – ON
    - MODE – STBY (tb-RUN), RUN

If G2FD GPC not avail and triple G2:

11. Assign two GNC GPCs strings, CRTs, and MMUs in current MC (verify PL1/2 and LB1 deassigned). Do not change target set

12. GNC, OPS XXX PRO

13. (Tgt) GPC MODE – STBY (tb-bp) – RUN (tb-RUN)

14. (Tgt) GPC OUTPUT – TERM

15. IDP/CRTX MAJ FUNC – SM

16. GPC/CRT tgt GPC/X EXEC

17. **SM 0 GPC MEMORY**
    - Assign tgt GPC CRTs, MMUs, PL1/2 and LB1 in MC 4(5)

18. SM, OPS 201(401) PRO (Tgt GPC IDP)

19. **SM 1 DPS UTILITY**
    - UL CNTL AUTO – ITEM 35 EXEC (*)
    - CKPT RETRVR ENA – ITEM 12 EXEC (*)

20. Perform LOAD PCMMU FORMAT (ORB OPS FS, COMM/INST), then:
    If PSP reqd:

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

    If PLBD OPS:

22. PL BAY DR SYS (two) – ENA

    If RMS PWR – PRI (MC IUI pwrd):

23. [SM 94 PDRS CONTROL]
    - (MA, C/W GPC DATA it on)
    - I/O ON – ITEM 5 EXEC (*) (C/W GPC DATA it off)
    - Update as needed:
      - WR range, PL ID, PL INIT ID, EE ID, SPEC 95 overrides

    A8U
    - SAFING – CANCEL (tb-bp if arm desel)

24. If reqd, perform PL/DPS RECONFIG, Recovery [PL SYS(PL OPS) (SODF: ASSY OPS)], then:

25. When time permits: Go to MAL, DPS, GPC FRP-1, SINGLE GPC FAIL

3-10

OPCL/ALL/GEN M
PASS GPC BITE 1(2,3,4)

If SM GPC annun BITE:
   1. Go to PASS SM GPC FAIL >>
If single G2 and GNC GPC annun BITE:
   2. Go to GNC RECOVERY VIA G2FD >>
If RS $\geq 2$ and only one GNC GPC annun BITE (hardware):
   3. Go to PASS GNC GPC (1st FAIL) >>
If RS $\geq 2$ and all GNC GPCs annun BITE (software):
   If cyclic logging of BITE:
      4. Go to GNC RECOVERY VIA G2FD >>
   If non-cyclic logging of BITE:
      5. Check MCC for GO to perform BFS ENGAGE >>
      6. When time permits: Go to MAL, DPS SSR-2, GPC S/W INITIATED MEM DUMP
GNC RECOVERY VIA G2FD

NOTE
No keyboard entries or sw throws 10 sec:
Before and after moding PASS GPCs to RUN
Before OPS transition or set expansion/contraction
requests until new OPS base page is displayed

If OPS transition failure:
1. Go to MAL, DPS, 5.2a, I/O ERROR MMU 1(2)
or MAL, DPS, 5.2b, OFF/BUSY MMU 1(2), as reqd >>
2. (Failed) (GNC) GPC(s) PWR – OFF
3. Secure SM:

A1U
KU BD PWR – STBY
CNTL – PNL, CMD

C3
Sel best ant, F9 meter > 300
[SM 62 PCMMU/PL COMM]
FORMAT FXD – ITEM 1 EXEC (*)
Perform PL/DPS RECONFIG, Secure [PL SYS(PL
OPS) (SODF: ASSY OPS)], time permitting, then:
4. (SM) GPC MODE – STBY (tb-bp) (expect Big X/Poll
Fails)
5. Activate Freeze Dry GPC:

G2FD: \GPC MODE – HALT
\OUTPUT – NORM
\PWR – ON
MODE – STBY (tb-RUN), RUN
Verify G2FD grabs three FWD IDP/CRTs (reassign
IDP4 as reqd)
6. If G2FD activation fails, go to step 20
7. MC 2 NBAT Setup for Target GPC (Activated G2FD):

GNC 0 GPC MEMORY

NOTE
If currently active IMU was in STBY or IMU
currently in STBY was active during time of G2
freeze-dry, do not assign associated string

Assign all FC strings (except as noted above), CRTs
1,2,3, and MMUs to just activated target GPC (verify
PL1/2 and L1,2 deassigned)
8. Config for GNC OPS Transition:

Pri RJD DRIVER (eight) – OFF
\RJD MANF L5/F5/R5 DRIVER – ON

Cont next page
NOTE
If G2FD last freeze-dried while RS in G1(G3),
holding DAP: FREE pb during OPS transition
avoids PRCS false jet fail-off msgs (DAP
defaults to A1/AUTO/PRI)

If reqd, DAP: FREE pb – push and hold during OPS
transition
GNC, OPS 201 PRO
√DAP: FREE

9. Configure IMU and restring:
   GNC 21 IMU ALIGN
Desel aff IMU from step 7
Configure aff IMU to STBY(OPR) as reqd to match
   GROUP B PWRDN(PWRUP) (no * until restring)
   GNC 0 GPC MEMORY
Assign remaining FC string to GNC GPC
GNC, OPS 201 PRO
√MCC for resel of aff IMU

10. Re-establish GNC Operational Config:
    Pri RJD DRIVER (eight) – as reqd
    GNC 20 DAP CONFIG
Load desired DAP A,B
   (see FLIGHT PLAN, ORB OPS FS)
   GNC 22 S TRK(COAAS CNTL)
   S TRK -Y,-Z: STAR TRK – ITEM 3,4 EXEC (*)
   GNC 21 IMU ALIGN
   RESUME
   GNC 23 RCS
   JET RESET – ITEM 45 EXEC
If L(R) OMS/RCS‘CNCT:
   L(R) OMS – ITEM 5(6) EXEC

11. If Orbiter attitude control reqd:
    DAP: INRTL/VERN(ALT)

12. Restart SM:
    (SM) GPC MODE – RUN (tb-RUN), pause 10 sec
IDP/CRTX: MAJ FUNC – SM
GPC/CRT – SM GPC/X EXEC (not reqd if
performing step 21)
   SM 1 DPS UTILITY
   √CKPT RETRV ENA – ITEM 12 EXEC (no *)
SM, OPS 201 PRO, pause 10 sec

Cont next page
13. Re-establish SM Operational Config:

**NOTE**
TFLs reloaded to avoid G2FD GPC utilizing stale downlist-rate status when PGM format is resel

[SM 62 PCMMU/PL COMM]
Perform LOAD PCMMU FORMAT (ORB OPS FS, COMM/INST)

[SM 1 DPS UTILITY]
CKPT RETRVS ENA – ITEM 12 EXEC (*)
UL CNTL ENA – ITEM 36 EXEC

If RMS PWR – PRI (re-establish MCIU I/O):
14. **[SM 94 PDRS CONTROL]**
(MA, GPC DATA It on)
I/O ON – ITEM 5 EXEC (*) (GPC DATA It off)
SAFING – CANCEL (tb-bp if arm desel)

A8U

15. If reqd, perform PL/DPS RECONFIG, Recovery [PL SYS(PL OPS) (SODF: ASSY OPS)], then:

16. Wait for Orbiter SV Uplink:

**NOTE**
Auto antenna sel and any auto attitude mnvr may be incorrect until a valid Orbiter SV is uplinked

17. S-BD ANT – GPC
A1U
KU BD PWR – ON
[SM 1 DPS UTILITY]
UL CNTL AUTO – ITEM 35 EXEC

18. Re-establish Track Attitude, as reqd:

[UNIV PTG]
Load desired att (see FLIGHT PLAN)
Init TRK(MNVR) – ITEM 19(18) EXEC
DAP: AUTO

19. Go to MAL, DPS GPC FRP-1, SINGLE GPC FAIL >>
If G2FD activation fails:
20. (G2FD) GPC PWR – OFF
21. Perform step 12 for temp IDP and SM interface
   If second G2FD exists: \MCC for GO to step 4
   If a G3FD exists: \MCC for proc
   If no FD: \MCC for GO to perform BFS ENGAGE
### EQUIPMENT COOLING MATRIX

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<tr>
<th>FORCED COOLED</th>
<th>WATER-COOLED</th>
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<tbody>
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<td><strong>AV BAY 1</strong></td>
<td><strong>AV BAY 1</strong></td>
</tr>
<tr>
<td>GPC 1,4 ①</td>
<td>BFC 1 (ENGAGE)</td>
</tr>
<tr>
<td>MLS RF &amp;</td>
<td>ICU</td>
</tr>
<tr>
<td>DECODER 1</td>
<td>AA 1,4</td>
</tr>
<tr>
<td>PROXIMITY SW</td>
<td>TACAN 1</td>
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<tr>
<td>MIDDECK PL ②</td>
<td>INVERTER DIST &amp;</td>
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<td>CNTL</td>
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<td>AV BAY FAN A,B</td>
<td>BRK CNTL 1</td>
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<tr>
<td>GPC 2,5 ①</td>
<td>BFC 2,3 (ENGAGE)</td>
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<td>MLS RF &amp;</td>
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**AV BAY 3B**

- MTU
- KU-BAND SIGNAL PROCESSOR
- HUD ELECT 1,2
- GPS 2

---

① GPC INSTALLATION REFERS TO CPU/IOP/MEMORY UNIT.
② IF FLOWN.

05/15/09
### EQUIPMENT COOLING MATRIX (Continued)

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<tr>
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<th>FREE-FLOW COOLING</th>
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<td>CABIN</td>
<td>ECLSS EQUIPMENT BAY</td>
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<tr>
<td>MDUs (eleven)</td>
<td>WATER PUMP 1A,1B</td>
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<td>CAB FAN A,B</td>
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<td>IMU 1,2,3</td>
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<tr>
<td>IMU FANS (3)</td>
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<td>TV MONITORS</td>
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### FREON-COOLED

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10/13/04

IMU FANS ARE LOCATED IN AVIONICS BAY 1 BUT CIRCULATE CABIN AIR RATHER THAN FLOW FROM AVIONICS BAY 1 THROUGH THE IMUs FOR COOLING.

---

OV103,104

A4-2

OPCL/ALL/GEN M
## EQUIPMENT COOLING MATRIX

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<th>AIR-COOLED</th>
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<tr>
<td><strong>AV BAY 1</strong></td>
<td><strong>AV BAY 1</strong></td>
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<tr>
<td>GPC 1,4 (1)</td>
<td>BFC 1 (ENGAGE)</td>
<td>AC INV 1A,1B,1C</td>
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<tr>
<td>MLS RF &amp; Decoder 1</td>
<td>CICU</td>
<td>LCA(FWD) 1</td>
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<td>MIDDECK PL (2)</td>
<td>INVERTER DIST &amp; CNTL</td>
<td>PCA(FWD) 2</td>
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<tr>
<td>A/B FAN A,B</td>
<td>BRK CNTL 2</td>
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<td></td>
<td>SMOKE DET A,B</td>
<td>MDM PL2,OF2,</td>
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<td></td>
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<td></td>
<td>ADTA 2,4</td>
<td>DSC OF2</td>
</tr>
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<td>RADAR ALT 2</td>
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<tr>
<td><strong>AV BAY 3A</strong></td>
<td><strong>AV BAY 3A</strong></td>
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<tr>
<td>GPC 3 (1)</td>
<td>S-BAND EQUIP:</td>
<td>AC INV</td>
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<tr>
<td>AV BAY A,B</td>
<td>FM MLTPLXR</td>
<td>EBIA (BYPASS)</td>
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<td>QUAD ANT SW ASSEMBLY</td>
<td>3A,3B,3C</td>
</tr>
<tr>
<td></td>
<td>FM SIG PRC3R</td>
<td>SWITCH</td>
</tr>
<tr>
<td>CW LIMIT MODULE</td>
<td>SW BEAM ANT CNTL ASSY</td>
<td>LCA(FWD) 3</td>
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<td>SSOR (2)</td>
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<td></td>
<td>GPS 2</td>
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</table>

05/15/09

1. GPC INSTALLATION REFERS TO CPU/IOP/MEMORY UNIT.
2. IF FLOWN.
### EQUIPMENT COOLING MATRIX (Continued)

<table>
<thead>
<tr>
<th>AIR-COOLED</th>
<th>WATER-COOLED</th>
<th>ECLSS EQUIPMENT BAY</th>
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<td>CABIN</td>
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<td>FREE-FLOW</td>
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<tr>
<td>BAY 1</td>
<td>WATER PUMP 1A,1B SEC</td>
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<td>BAY 6</td>
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#### FORCED-COOLED

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<th>MIDBODY</th>
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<td>LCA-3</td>
<td>PCA(MID) 1,2,3</td>
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<td>PCA-3,6</td>
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<td>OA2</td>
<td>OA3</td>
<td>FEA 1,2</td>
</tr>
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<td>APU CNTLR 1</td>
<td>APU CNTLR 2</td>
<td>APU CNTLR 3</td>
<td>SSGC</td>
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<td>ATVC ELECT 3,4</td>
<td>H2/O2 CRYO HTR</td>
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<td>EIU 2</td>
<td>EIU 3</td>
<td>1A,1B,2A,2B</td>
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<td>MPS ULL P SC2</td>
<td>MPS ULL P SC3</td>
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<td>ASA 3,4</td>
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<td>RJDIA 2</td>
<td>MN DA 1,2,3</td>
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<td>MEC 1</td>
<td>MEC 2</td>
<td>MPS DP SC</td>
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#### FREON-COOLED

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<td>MCA-3</td>
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<tr>
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<td>MDM FA2</td>
<td>MDM FA3,4</td>
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<td>OA3</td>
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<tr>
<td>EIU 1</td>
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</tr>
<tr>
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<td>MPS ULL P SC2</td>
<td>MPS ULL P SC3</td>
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<td>RGA 2</td>
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<td>RJDIA 2</td>
<td>RJDIA 2</td>
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<td>DSC OA2</td>
<td>DSC OA3</td>
</tr>
<tr>
<td>DBIA 1</td>
<td>DBIA 2</td>
<td>PT SNSR</td>
</tr>
</tbody>
</table>

#### NOTE:

IMU FANS ARE LOCATED IN AVIONICS BAY 1 BUT CIRCULATE CABIN AIR RATHER THAN FLOW FROM AVIONICS BAY 1 THROUGH THE IMUs FOR COOLING.

---

**OV105**

B4-2  OPCL/ALL/GEN M
WARNING

If \(-\frac{dP}{dT}\) is 0.55 psi/min (OSH), loss of vehicle atmosphere imminent

When \(P_{02} < 2.2\), emergency breathing apparatus reqd \((\frac{dP}{dT} \times 0.2 \sim P_{02} \text{ decay rate})\)

If, after alarm, \(O_2(N_2)\) flow > 1.0 lb/hr:
Assume flow rate exceeds 5.0 lb/hr (OSH)

If docked to ISS and hatches open:
1. Perform JOINT EMERGENCY EGRESS (SODF: JOINT OPS, Cue Card) to isolate ISS, then:
2. If \(\frac{dP}{dT}\) EQ positive or zero (ISS leak),
   \(\sqrt{\text{MCC}} \gg\)

MO10W
3. 14.7 CAB REG INLET SYS 1, SYS 2vlv (two) – CL
If orbiter \(\frac{dP}{dT}\) EQ positive or zero:
4. Go to MAL, ECLS, 6.2a, \(O_2(N_2)\) FLOW \(\uparrow\) \(\gg\)

NOTE
If orbiter \(\frac{dP}{dT}\) EQ positive or zero after any leak isolation step, \(\sqrt{\text{MCC}}\)

LEAK ISOLATION

L2
5. CAB RELIEF A – CL (tb-CL), pause, B – CL (tb-CL)
6. \(\sqrt{\text{VENT ISOL}} – \text{ctr (tb-bp)}\)
   \(\sqrt{\text{VENT}} – \text{ctr (tb-bp)}\)

ML31C
7. \(\sqrt{\text{VAC VENT ISOL VLV BUS SEL – MNA}}\)
   CNTL – CL (tb-CL)

Side Hatch
8. NEG PRESS RLF vlv cover (two) – push firmly

WCS
9. Remove urinal hose from hose block
10. Check center hole (between hose block filters) in hose block for airflow
If airflow detected (EMU drain induced cabin leak):
11. Using Gray Tape, block center hole in hose block (EMU drain)
12. Go to MAL, ECLS, 6.2b, CABIN PRES \(\uparrow \downarrow\) \(\gg\)

Ext A/L
13. Reinstall urinal hose
14. NEG PRESS RLF vlv cover (two) – push firmly

Cont next page

4-3 OPCL/ALL/GEN M,7
If SH HATCH open:

15. Perform SH CABIN LEAK ISOLATION (Cue Card)

Middeck flr
16. Disconnect airlock flex duct from cab floor, stow MO13Q
17. AIRLK FAN A(B) – OFF

Inner Hatch
18. Close INNER HATCH:
   - Position handle to preclosing posn per decal
   - Hatch – rotate about hinge and push
   - Handle – CCW to LATCH
   - Lock lever to LOCKED
   - Remove INNER HATCH Equal vlv cap (two)
   - Equal vlv (two) – OFF

Middeck flr
19. Install diffuser cap on cab floor outlet (when time permits)

If dP/dT EQ positive or zero (A/L leak; possible loss of EVA capability and loss of access to ISS/SH):

L2
20. CAB RELIEF (two) – ENA (tb-ENA)
   - If 14.7 psi ops:
     21. O2/N2 CNTLR VLV SYS 1(2) – AUTO

MO10W
22. 14.7 CAB REG INLET SYS 1(SYS 2) vlv – OP
     √ O2 REG INLET SYS 1(SYS 2) vlv – OP

ML31C
23. VAC VENT ISOL VLV CNTL – OP (tb-OP)
24. √ MCC for SH deactivation steps >>

CAUTION
ODS avionics require 8 psia or greater for cooling. √MCC regarding possible repress of ODS prior to ISS undocking

If dP/dT EQ still negative:

UNISOLATABLE ORBITER LEAK:
PREPARE FOR DEORBIT

Utilize SH(A/L) Atmosphere

CAUTION
Perform steps 25-28 before determining type of deorbit, to avoid volume-based nomograph errors

Inner Hatch
25. INNER HATCH Equal vlv (two) – EMER
   (vlvs remain in EMER for duration of flt)

Cont next page
If Spacehab:

26. Open INNER HATCH per decal

27. SH HATCH Equal vlv (two) – EMER

28. Close INNER HATCH:
   - Position handle to preclosing posn per decal
   - Hatch – rotate about hinge and push
   - Handle – CCW to LATCH
   - Lock lever to LOCKED

Deactivate Spacehab:

29. FANS ARS OFF – ITEM 61 EXEC (*)

30. Perform SPACEHAB EMERGENCY DEACT, steps 1-8,10 (Cue Card)

Determine Type of Deorbit

Determine latest poss TIG, Tmax, and avail landing sites using PGSC (preferred) or NOMOGRAPHS, 4-8

If docked to ISS and TIG > 1 hr 30 min and Orbiter Only Tmax does not support PLS, perform UTILIZE ISS ATMOSPHERE, (SODF: JOINT OPS, EMERGENCY RESPONSE) concurrently with remaining steps below

If TIG < 2 hr 40 min and not Orb 2,3 deorbit:

31. CM1,CM2 If docked to ISS, perform JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS, EMERGENCY RESPONSE).
   - If utilizing ISS atmosphere, delay vestibule depress until CDR GO (ISS Press ≅ 9.5 psia)

32. CM1,CM2 Perform EMERGENCY DEORBIT PREP/ENTRY (CONT DEORB, EMERGENCY)

   CM3 Continue with Cabin Pressure Maintenance

If TIG > 2 hr 40 min or Orb 2,3 deorbit:

33. CM1,CM2 Perform LOSS OF CAB PRESS (PWRDN)

   CM3 Continue with Cabin Pressure Maintenance

   \MCC for ISS undocking

Cont next page
Cabin Pressure Maintenance

If \(-dP/dT\) EQ > 0.35 (0.18 if SH):

C5 34. DIRECT O2 vlv – OP

C6,MO32M, MO69M 35. Don LES, open LEH O2 vlvs, check tabs, visor – cl, LES O2 – ON

L2 36. O2/N2 CNTLR VLV SYS 1,2 (two) – OP (N2)

R1 37. O2 MANF VLV TK1,TK2 (two) – OP (tb-OP)

If any O2 QTY > 60%:

C5 38. (Aff) O2 TK HTR B – AUTO

MO10W 39. O2 REG INLET SYS 1 vlv – CL

2 vlv – CL >>

Flow Max O2

R1 40. O2 MANF VLV TK1,TK2 (two) – OP (tb-OP)

TK1,TK2,TK3 HTRS A (three) – AUTO

If any O2 QTY > 60%:

C5 41. (Aff) O2 TK HTR B – AUTO

L2 42. DIRECT O2 vlv – OP

43. O2/N2 CNTLR VLV SYS 1 – CL (O2)

2 – OP (N2)

O2 XOVR SYS 1 – CL

\(\sqrt{2} – OP\)

MO10W 44. 14.7 CAB REG INLET SYS 1 vlv – OP

2 vlv – CL

O2 REG INLET SYS 1 vlv – OP

2 vlv – CL

WARNING

Maintain O2 concentration < 29% (CABIN PRESS > 10.3)
or PPO2 < 3.0 (CABIN PRESS ≤ 10.3)

When PPO2 < 2.2, emergency breathing apparatus reqd.

Manage O2 Levels

MO10W,C5 Using O2 REG INLET SYS 1 vlv and DIRECT O2 vlv:

When CABIN PRESS > 10.3:

45. Maintain PPO2 > 2.2 and O2 conc < 29%

When CABIN PRESS ≤ 10.3:

46. Maintain PPO2 between 2.2 and 3.0

When PPO2 < 2.2:

C6,MO32M, MO69M 47. Don LES, open LEH O2 vlvs, check tabs, visor – cl, LES O2 – ON

MO10W 48. O2 REG INLET SYS 1 vlv – CL

C5 49. DIRECT O2 vlv – CL

L2 50. O2 XOVR SYS 1 – OP

Cont next page
8 PSI CABIN MAINTENANCE (Flow N2)

When CABIN PRESS reaches 8:
51. Continue O2 mgmt per step 46
52. Verify time to N2 depletion, perform N2 DEPLETION GRAPH, 4-10, then:

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

MO10W 53. 14.7 CAB REG INLET SYS 1 vlv – CL
L2 54. O2/N2 CNTLR VLV SYS 1,2 (two) – OP (N2)
     O2 XOVR SYS 1,2 (two) – OP
MO10W 55. REG INLET SYS 1,SYS 2 vlv (two) – CL

56. Reconfig C/W parameters:

<table>
<thead>
<tr>
<th>PARAMETER NAME</th>
<th>C/W CH</th>
<th>H/W C/W LO V(LO EU)</th>
<th>ENA/INH</th>
</tr>
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<tbody>
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<td>4</td>
<td>1.90(7.56)</td>
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<tr>
<td>O2 FLOW 1</td>
<td>14</td>
<td></td>
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<tr>
<td>O2 FLOW 2</td>
<td>24</td>
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<tr>
<td>PPO2 A</td>
<td>34</td>
<td>2.20(2.20)</td>
<td>INH</td>
</tr>
<tr>
<td>PPO2 B</td>
<td>44</td>
<td>2.20(2.20)</td>
<td>INH</td>
</tr>
<tr>
<td>N2 FLOW 1</td>
<td>54</td>
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<td>INH</td>
</tr>
<tr>
<td>N2 FLOW 2</td>
<td>64</td>
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<td>INH</td>
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57. Once PPO2 < 3.00, reconfig C/W parameters:

<table>
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<tr>
<th>PARAMETER NAME</th>
<th>C/W CH</th>
<th>H/W C/W HI V(HI EU)</th>
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<tr>
<td>CAB PPO2 A</td>
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<tr>
<td>CAB PPO2 B</td>
<td>44</td>
<td>3.00(3.00)</td>
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</tbody>
</table>

>>

Cont next page

ORB

A4-7

OPCL/ALL/GEN M,2
TIME TO 8 PSIA NOMOGRAPH
Orbiter + Ext A/L

Initial Cabin Press, psia

14.7
13.0
12.0
11.0
10.0
9.5

Time to 8 psia (hours)

0.01 0.02 0.04 0.06 0.08 0.1 0.2 0.3 0.4 0.5

0.01 0.02 0.04 0.06 0.08 0.1 0.2 0.3 0.4 0.5

0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5

dP/dT-EQ (psi/min)

TIME AT 8 PSIA NOMOGRAPH
Orbiter + Ext A/L

Usable N2 Qty, lbm

400
300
200
150
100

Time at 8 psia to N2 Depletion (hours)

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5

dP/dT-EQ (psi/min)
8 PSI CABIN MAINTENANCE (Flow N2)

When CABIN PRESS reaches 8:
51. Continue O2 mgmt per step 46
52. Verify time to N2 depletion, perform N2 DEPLETION GRAPH, 4-10, then:

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

MO10W 53. 14.7 CAB REG INLET SYS 1 vlv – CL
L2 54. O2/N2 CNTLR VLV SYS 1,2 (two) – OP (N2)
MO10W 55. O2 XOVR SYS 1,2 (two) – OP
MO10W 56. REG INLET SYS 1, SYS 2 vlv (two) – CL

56. Reconfig C/W parameters:

<table>
<thead>
<tr>
<th>PARAMETER NAME</th>
<th>C/W CH</th>
<th>H/W C/W LO V(LO EU)</th>
<th>ENA/INH</th>
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<tr>
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<td>1.90(7.56)</td>
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<td>O2 FLOW 1</td>
<td>14</td>
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<td></td>
<td>24</td>
<td>2.20(2.20)</td>
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<tr>
<td>PPO2 A</td>
<td>34</td>
<td>2.20(2.20)</td>
<td>INH</td>
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<td>44</td>
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<td>N2 FLOW 1</td>
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<td></td>
<td>64</td>
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<td>INH</td>
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57. Once PPO2 < 3.00, reconfig C/W parameters:

<table>
<thead>
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<th>PARAMETER NAME</th>
<th>C/W CH</th>
<th>H/W C/W HI V(HI EU)</th>
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</thead>
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<tr>
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<td>3.00(3.00)</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>3.00(3.00)</td>
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</tbody>
</table>

Cont next page

SHM
B4-7
OPCL/ALL/GEN M,2
Tmax Computation

**SM 66 ENVIRONMENT**

Log:

- dP/dT EQ ______ N2 QTY 1 ______
- CAB P ______ N2 QTY 2 ______
- MET ______

Determine latest poss TIG, Tmax, and avail landing sites using PGSC (preferred)/applicable NOMOGRAPH.

If docked to ISS, determine latest poss TIG and Tmax utilizing ISS atmosphere using PGSC, or if PGSC unavail, use Tmax DETERMINATION for UTILIZE ISS ATMOSPHERE (SODF: JOINT OPS, EMERGENCY RESPONSE) in conjunction with NOMOGRAPH (on facing page) to determine Tmax

<table>
<thead>
<tr>
<th>Orbiter Only</th>
<th>Utilizing ISS Atmosphere (if reqd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time at 9.5 psi (from SODF: JOINT OPS, UTILIZE ISS ATMOSPHERE, EMERGENCY RESPONSE)</td>
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</tr>
<tr>
<td>Time to 8 psi (facing page)</td>
<td>_____ hrs (from current cab press)</td>
</tr>
<tr>
<td>Time at 8 psi (facing page) (N2 Depletion)</td>
<td>+ _____ hrs</td>
</tr>
<tr>
<td>Total Avail Time</td>
<td>______ hrs</td>
</tr>
<tr>
<td>Current MET</td>
<td>+ /: :</td>
</tr>
<tr>
<td>Latest TD MET</td>
<td>= /: :</td>
</tr>
<tr>
<td>Time, TIG to TD</td>
<td>- /: :</td>
</tr>
<tr>
<td>Latest TIG, Tmax (MET)</td>
<td>= /: :</td>
</tr>
<tr>
<td>Landing Site/TIG</td>
<td>/</td>
</tr>
</tbody>
</table>

**NOMOGRAPH Basis:**

- O2 Flow: on/off at 50 lb/hr after 10 min, with PPO2 > 2.2 psi, % O2 < 29
- Orbiter Volume = 2703 ft³
- Orbiter + SHM = 5255 ft³

**CAUTION**

If determining Tmax utilizing ISS atmosphere and ISS hatches OPEN, √MCC for proper dP/dT (Hatch OP dP/dT EQ = (Orbiter Volume/Total Stack Volume) x Hatch CL dP/dT EQ)

03/18/05

4-9 OPCL/ALL/GEN M
N2 DEPLETION GRAPH

MET  /_____ at 8 psia

1. When cabin pressure reaches 8 psia, record MET above, plot total N2 Qty (Sys 1+2) from Spec 66 and start timer

2. Draw point on graph where selected TD time and appropriate residual line intersect

3. Draw a line connecting the initial N2 Qty with point defined in step 2

4. Plot N2 Qty points at various time intervals to verify that N2 will support planned TD time. Note that dispersions in use rate over short time periods are expected

5. If actual N2 use rate is greater than prediction line, select earlier TD time
**H2O TK QTY LOW AND DECR**

SM 66 ENVIRONMENT

L1 1. If PLBD open:  FLASH EVAP CNTLR PRI A,B – OFF

MO10W 2. H2O TK N2 ISOL vlv (two) – CL

**NOTE**

Audible vent and ‘S66 WASTE H2O PRES’ alert for WASTE H2O PRESS ↓ when performing step 3

ML26C 3. SPLY H2O GN2 TK VENT vlv – VENT

√TKA SPLY vlv – OP

When WASTE H2O PRESS ~0 psig (1-2 min):

4. √MCC

**EVAP OUT T HIGH**

SM 88 APU/ENVIRON THERM

SM SYS SUMM 2

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

If PLBD open and RADS in use:

1. Go to MAL, ECLS, 6.4a, EVAP OUT T ↑↓ [1] >>

If PLBD closed or if PLBD open in RAD BYP:

L1 2. FLASH EVAP CNTLR PRI A(B) – OFF

B(A) – ON (wait 30 sec)

3. If EVAP OUT T decr:  (PRI A(B) CNTL lost) >>

If EVAP OUT T not decr:

L1 4. FLASH EVAP CNTLR PRI B(A) – OFF

SEC – ON (Hi Load Evap ena)

5. Minimize ltg (wait 30 sec)

Cont next page

**OV103,104**

OPCL/ALL/GEN M

**N2 DEPLETION**

EMER PLBD OPENING (4-13) A4-11

**H2O TK QTY LOW**

**EVAP OUT T HIGH**
If EVAP OUT T decr:
  If in deorb prep:
    O7  6. √TACAN MODE (three) – OFF
    O8  7. √VRDR ALTM (two) – OFF
        8. √MLS (three) – OFF
    L1  9. TOP EVAP HTR NOZ (two) – OFF
          DUCT sel – OFF >>
  If not in deorb prep >>
If EVAP OUT T not decr (Sec Hi Load failed):
  L1  10. HI LOAD EVAP – OFF (Topping Evap ena)
  C3  11. MSTR MADS PWR – OFF (wait 30 sec)
  If EVAP OUT T decr:
    12. Go to LOSS OF HI LOAD EVAP (PWRDN), 10-33 >>
If EVAP OUT T not decr (all FES lost):
  CDR establish RAD flow:
    13. Perform steps 16 thru 19
  If PLBD closed, MS open doors ASAP:
  MS  14. Perform EMER PLBD OPENING, then:
  If in deorb prep:
    15. Go to LOSS OF FES (PWRDN), 10-69 >>
  If not in deorb prep >>
Establish RAD flow:
  CDR L1  16. RAD BYP VLV MODE (two) – AUTO
               CNTLR LOOP (two) – AUTO A(B)
               17. FLASH EVAP CNTLR SEC – OFF
                    Wait 90 sec
               18. √RAD BYP VLV tb (two) – RAD
                   √CNTLR OUT TEMP – NORM
               19. HI LOAD DUCT HTR sel – OFF
                   TOP EVAP HTR NOZ (two) – OFF
                   DUCT sel – OFF

OV103,104
**H2O TK QTY LOW AND DECR**

**SM 66 ENVIRONMENT**

L1 1. If PLBD open: FLASH EVAP CNTLR PRI A,B – OFF

MO10W 2. H2O TK N2 ISOL vlv (two) – CL

**NOTE**

Audible vent and ‘S66 WASTE H2O PRES’ alert for WASTE H2O PRESS ↓ when performing step 3

ML26C 3. SPLY H2O GN2 TK VENT vlv – VENT
√TKA SPLY vlv – OP

When WASTE H2O PRESS ~0 psig (1-2 min):

4. √MCC

**EVAP OUT T HIGH**

**SM 88 APU/ENVIRON THERM**

**SM SYS SUMM 2**

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

If PLBD open and RADS in use:

| 1. Go to MAL, ECLS, 6.4a, EVAP OUT T ↑↓ | 1 | >>
| If PLBD closed or if PLBD open in RAD BYP: |

L1 2. FLASH EVAP CNTLR PRI A(B) – OFF
√B(A) – ON (wait 30 sec)

3. If EVAP OUT T decr: (PRI A(B) CNTL lost) >>

If EVAP OUT T not decr:

L1 4. FLASH EVAP CNTLR PRI B(A) – OFF
SEC – ON (Hi Load Evap ena)

5. Minimize ltg (wait 30 sec)

---

**Cont next page**

**OV105**

**OPCL/ALL/GEN M**

**N2 DEPLETION**

**EMER PLBD OPENING** (4-13) B4-11

**H2O TK QTY LOW**

**EVAP OUT T HIGH**
If EVAP OUT T decr:

   If in deorb prep:
   O8  6. √ RDR ALTM (two) – OFF
         7. √ MLS (three) – OFF
   L1  8. TOP EVAP HTR NOZ (two) – OFF

   If not in deorb prep >>

If EVAP OUT T not decr (Sec Hi Load failed):

   L1  9. HI LOAD EVAP – OFF (Topping Evap ena)
   C3 10. MSTR MADS PWR – OFF (wait 30 sec)

   If EVAP OUT T decr:
   11. Go to LOSS OF HI LOAD EVAP (PWRDN), 10-33 >>

If EVAP OUT T not decr (all FES lost):
   CDR establish RAD flow:
   12. Perform steps 15 thru 18
   If PLBD closed, MS open doors ASAP:
   MS  13. Perform EMER PLBD OPENING, then:
   If in deorb prep:
   14. Go to LOSS OF FES (PWRDN), 10-69 >>
   If not in deorb prep >>

Establish RAD flow:

   CDR L1 15. RAD BYP VLV MODE (two) – AUTO
               CNTLR LOOP (two) – AUTO A(B)
   16. FLASH EVAP CNTLR SEC – OFF
       Wait 90 sec
   17. √ RAD BYP VLV tb (two) – RAD
       √ CNTLR OUT TEMP – NORM
   18. HI LOAD DUCT HTR sel – OFF
       TOP EVAP HTR NOZ (two) – OFF
       DUCT sel – OFF

OV105
EMER PLBD OPENING

1. PL BAY DR SYS (two) – ENA
2. AC POWER ON – ITEM 1 EXEC (*)
   AUTO MODE SEL – ITEM 3 EXEC (*)
   PBD SW BYPASS – ITEM 14 EXEC (*)
   OPEN – ITEM 15 EXEC (*)
3. CENTER LATCHES 5-8, 9-12 (two) – blank, OP (~20 sec)
   1-4, 13-16 (two) – blank, OP (~20 sec)
   STBD FWD, AFT LATCHES (two) – blank, OP (~30 sec)
   DOOR – RDY, blank, OP (~63 sec)
   PORT FWD, AFT LATCHES (two) – blank, OP (~30 sec)
   DOOR – RDY, blank, OP (~63 sec)
4. STOP – ITEM 16 EXEC (*)
   PBD SW BYPASS – ITEM 14 EXEC (no *)
   AC POWER OFF – ITEM 2 EXEC (*)
5. PL BAY DR SYS (two) – DSBL
EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
   L1 2. FREON PUMP LOOP 1,2 (two) – OFF
   3. H2O PUMP LOOP 1,2 (two) – ON
   4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
   5. RAD CNTLR OUT TEMP – HI
   6. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
   L2 7. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
   If FREON LOOP RAD OUT T LOW:
   L1 8. (Unaff) FREON PUMP – B
   10. Go to FREON LOOP RAD OUT T LOW, step 7 >>
   L1 11. FREON PUMP LOOP 1,2 (two) – B
           If after 60 sec EVAP OUT T = ’L’:
           12. RAD BYP VLV MODE 1,2 (two) – MAN
           13. MAN SEL 1,2 (two) – BYP
               (tb-BYP 3 sec)
           14. Go to MAL, ECLS, 6.4a, EVAP OUT T ↑↓ 47 >>
   If FREON LOOP 1(2) leaking (Accum Qty decr ≥ 1.5%/min):
   L1 11. FREON PUMP LOOP 1,2 (two) – B
           If after 60 sec EVAP OUT T = ’L’:
           12. RAD BYP VLV MODE 1,2 (two) – MAN
           13. MAN SEL 1,2 (two) – BYP
               (tb-BYP 3 sec)
           14. Go to MAL, ECLS, 6.4a, EVAP OUT T ↑↓ 46
   If FREON LOOP 1(2) not leaking:
   If no comm:
   15. FREON PUMP LOOP 1,2 (two) – B
       NH3 CNTLR A,B (two) – SEC/ON
       If after 60 sec EVAP OUT T = ’L’:
       16. RAD BYP VLV MODE 1,2 (two) – MAN
           17. MAN SEL 1,2 (two) – BYP
               (tb-BYP 3 sec)
       18. Go to MAL, ECLS, 6.4a, EVAP OUT T ↑↓ 46
If the FC H2O PRI LN T and associated FC H2O VLV T are converging or within 5 degF of each other for multiple FCs:

R11L
If SUPPLY H2O TKB INLET and XOVR VLV closed (tb-CL or bp):

ML86B:A
1. cb MNB SPLY H2O TKB INLET – cl
2. MNC SPLY H2O XOVR VLV – cl

R11L
3. SPLY H2O TKA OUTLET – CL (tb-CL)
4. TKB INLET – OP (tb-OP)
5. XOVR VLV – OP (tb-OP)

6. √SPLY H2O TKA,TKB,TKC INLET (three) – OP (tb-OP)
7. √XOVR VLV – OP (tb-OP)

ML31C
8. √SPLY H2O TKD INLET – OP (tb-OP)

CRT
If SUPPLY H2O PRESS decr or < 40: >>
If SUPPLY H2O PRESS not decr or ≥ 40:

L1
9. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF

O1
10. RAD CNTLR OUT TEMP – HI

L1
11. FLASH EVAP CNTLR PRI B – ON

12. Go to MAL, ECLS, 6.5d, H2O SPLY PRESS ↑

Else:
13. Go to MAL, ECLS, 6.5d, H2O SPLY PRESS ↑

OPCL/ALL/GEN M

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H2O SPLY PRESS HIGH

SM 69 FUEL CELLS

SM 66 ENVIRONMENT

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EVAP OUT T LOW

4-15

H2O SPLY P HIGH
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, 6.4b, FREON FLOW LOW

   If flow still low in both loops:
   L1 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
   L2 5. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
   C3 6. MSTR MADS PWR – OFF
   R11U 7. FC PURGE HTR – ON
   FC PURGE VLVS (three) – OP
   8. Go to LOSS OF 2 FREON LOOPS (PWRDN), 10-49

   If in OPS 2:
   If AFT cp FLOW in both loops < 200 lb/hr:
   Prepare to deorb:
   L1 9. If AFT cp FLOW < 100 lb/hr:
   FREON PUMP LOOP 1,2 (two) – OFF
   L2 10. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
   C3 11. MSTR MADS PWR – OFF
   R11U 12. FC PURGE HTR – ON
   FC PURGE VLVS (three) – OP
   13. Go to LOSS OF 2 FREON LOOPS (PWRDN), 10-49

   If AFT cp FLOW in either loop > 200 lb/hr:
   14. Go to MAL, ECLS, 6.4b, FREON FLOW LOW
FREON LOOP RAD OUT T LOW

1. If EVAP OUT T not decr after 60 sec (snsr failed) >>
2. (Aff) FREON PUMP – OFF
3. H2O PUMP LOOP 1,2 (two) – ON
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. (Aff) O2 SYS SPLY – CL
6. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
7. (Aff) RAD BYP VLV MODE – MAN
8. CNTLR LOOP – AUTO B
After 10 sec:
9. (Aff) RAD BYP VLV MODE – AUTO
10. (Aff) FREON PUMP LOOP – B
11. √(Aff) RAD BYP VLV tb – RAD
If RAD OUT T LOW continues:
12. (Aff) FREON PUMP LOOP – OFF
13. √MCC (mult failures) >>
If FES reqd:
14. Perform TOPPING FES STARTUP (ORB OPS, ECLS), then:
15. (Aff) O2 SYS SPLY – OP

FREON LEAK

If FREON LOOP ACCUM QTY decr, then immediately:
1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP – ISOL (hold for 5 sec)
3. Go to MAL, ECLS, 6.4f, ACCUM QTY ↓ [11]
LEAKING/EMPTY HALON BOTTLE

If docked to ISS and hatches open:
1. Perform JOINT EMERGENCY EGRESS (SODF: JOINT OPS, Cue Card) to isolate ISS, then:
If FIRE SUPPR AV BAY 1(2,3) pb lt on:
2. Go to POST-FIRE CABIN CLEANUP, steps 16-24 only for Av Bay 1(2,3) >>
If Portable Halon Bottle leaking:
3. Position Halon bottle up to Av Bay 3 fire port.
   Secure body position as reqd

   NOTE
   Halon discharge will be propulsive

4. Discharge portable FIRE EXTGHR into Av Bay 3 fire port. Full discharge will require 90 sec.
   Report actual discharge duration to MCC
5. Stow empty bottle (Wet Trash)
6. Go to POST-FIRE CABIN CLEANUP, steps 16-24 only for Av Bay 3 >>
ODS POST-FIRE ACTIONS

Continue from ODS VOLUME FIRE/SMOKE (Cue Card), on MCC call

CONFIG A

CONFIG B

Cont next page
CM1 1. Don QDM with 14-ft extension O2/Comm line
   All other crewmembers: Don QDMs

   **NOTE**
   CM2 can perform cab air monitoring per
   MAL, ECLS FRP-2, POST-FIRE CABIN
   CLEANUP CONTINUATION at any time

C6, MO32M, MO69M
C7 2. LEH O2 vlv (eight) – OP
MO10W 3. LEH O2 SPLY 1, 2 vlv (two) – OP
   Inner Hatch 4. 14.7 CAB REG INLET SYS 1(SYS 2) vlv – CL
5. Untether Equal vlv cap (one) from INNER HATCH
   vlv, for use in step 6
   Open HATCH per decal

   **NOTE**
   Exit airlock volume IMMED after step 6
   complete. Expect cab dP/dT msg

   ON CLOSEST HATCH EXPOSED TO VACUUM,

   Hatch 6. Equal vlv cap (one) – vent, remove
   Equal vlv (one) – NORM, then IMMED
   INNER HATCH Equal vlv cap (one) – install
   onto HATCH Equal vlv

   Inner Hatch 7. Close HATCH:
   Position handle to preclosing posn per decal
   Hatch – rotate about hinge and push
   Handle – CCW to LATCH
   Lock lever to LOCKED

   CRT 8. [SM 177 EXTERNAL AIRLOCK]

   **NOTE**
   Expect ‘S177 EXT A/L PRES’ msg
   When EXT AIRLOCK P \( \approx 0 \), on MCC GO,
   Inner Hatch 9. Equal vlv (two) – EMER

   **NOTE**
   Expect poss ‘S66 CABIN PRES’,
   PPO2 A(B) msgs and KLAXON

   Cont next page
CM1 9. When $\Delta P$ across INNER HATCH $< 0.5$ psi, Open HATCH per decal, then IMMEDIATELY ON CLOSEST HATCH EXPOSED TO VACUUM, Hatch

10. Equal vlv cap (two) – remove
    Equal vlv (two) – OFF
    Equal vlv cap (two) – reinstall orig vlv caps

Inner Hatch 11. Retether, reinstall orig Equal vlv cap (one)

CM2 12. Perform cab air monitoring per MAL, ECLS FRP-2, POST-FIRE CABIN CLEANUP CONTINUATION if not already done. Do not perform cab cleanup unless CPA readings out of limits. On MCC call, doff QDMs

13. On MCC call, ARLK Fan and ODS avionics may be repwrd, PCS reconfigured, and PL ISOL vlv – OP (cap removed)
**POST-FIRE CABIN CLEANUP** (Cab and Av Bay Fires)

Continue from FIRE/SMOKE Cue Card:

**NOTE**
This proc is to be performed simo by two crewmembers

**CM1**

1. √CAB FAN A(B) – ON
2. Unstow CSA-CP
3. MODE pb – press, hold until ‘RELEASE’ displayed; wait ~1 min for nominal display
4. Sampling Pump sw – ON
5. Monitor cab atmosphere in vicinity of fire and report results to MCC

If HCN > 2.1, HCL > 1.0, or CO > 18 ppm:

- LiOH Box
  6. If HCL < 5 ppm, install ATCO and one fresh LiOH canister
  7. If HCL > 5 ppm, install two fresh LiOH canisters

- L1
  8. CAB TEMP CNTLR – OFF

- MD44F
  9. √Cb MNA,MNB WCS CNTLR (two) – cl

- ML86B:B
  10. √Ac1,2 WCS FAN SEP 1,2 (six) – cl

- WCS
  11. √FAN SEP SEL sw – 1

If Av Bay 1 Fire:

- HOSE BLOCK to SEP 2
- FAN SEP SEL sw – 2
- MODE – COMMODE/MANUAL/EMU
- COMMODE CNTL – PULL UP
- PUSH FWD
- Go to MAL, ECLS FRP-2, POST-FIRE CABIN CLEANUP CONTINUATION

**CM2**

If Av Bay fire, set up for Av Bay purge:

If docked with ISS:

- MCC for attitude control handover
- Obtain from Cont Hose & Cable Kit (Window Shade Bag):
  - Free Fluid Nozzle
  - 20-ft Y/Y Hose
  - Gray Tape
- Connect Free Fluid Nozzle to Y/Y Hose
- Insert tip of Free Fluid Nozzle into fire port of Av Bay
- Secure nozzle and hose with Gray Tape

Cont next page
If attitude control handover reqd:

21. Handover complete prior to initiating purge in following step

WCS

22. Mate free end of Y/Y Hose to Vacuum Vent QD

23. VAC VLV – OP

ML86B:A

24. cb MNA(MNB) H2O LINE HTR A(B) – cl

: B

ml MNA,MNB VAC VENT ISOL VLV (two) – cl

MNA VAC VENT NOZ HTR – cl

ML31C

25. VAC VENT ISOL VLV BUS SEL – MNA

\ NOZ HTR – ON

\ ISOL VLV CNTL – OP (tb-OP)

26. Report to MCC: “Av Bay purge is initiated”

ISS C&W TOX ATM

If docked to ISS and hatches open:

1. Perform JOINT EMERGENCY EGRESS (SODF: JOINT OPS, Cue Card) to isolate ISS, then:

   If ISS AMMONIA LEAK:

   2. Go to MAL, ECLS FRP-5, CABIN AMMONIA CONTAMINATION CLEANUP (ISS AMMONIA LEAK) >>

   \MCC for further actions

SM 211 ISS C&W

OPCL/ALL/GEN M,3

POST-FIRE CABIN CLEANUP 4-23

ISS C&W TOX ATM

PCS SCHEMATIC (4-24)
MN BUS UNDERVOLTS/FC VOLTS

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 pwrd after untie:
         3. Go to aff MN BUS LOSS ACTION (MN bus or tie bus short) >>
      If short eliminated and all MN buses pwrd 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 pwrd:
            5. Perform BUS TIE (Cue Card), then:
               6. Go to PL PWRDN >>
      If short not eliminated, then:
If aff FC/MN BUS connected to PTU:
   7. PTU/MN BUS – OFF (tb-OFF) (pnl A15)
      OPCU CONV – OFF
      If short eliminated (short on PTU/MN Bus connection):
         If a MN bus not pwrd:
            8. Perform BUS TIE (Cue Card) >>
         Otherwise:
            9. >>
    10. (Aff) ESS BUS SOURCE FC – OFF
         FC/MN BUS – OFF (tb-OFF)
If aff FC VOLTS < 32 (FC short):
   11. (Aff) FC REAC VLV – CL (tb-CL)
   12. Go to FC SHUTDN (Cue Card) (do not stop FC until COOL P < 15 and STACK T < 243) >>
If FC VOLTS ≥ 32 (bus short):

   CAUTION
   Do not bus tie to shorted bus

   13. Go to aff MN BUS LOSS ACTION >>

Cont next page
If MN VOLTS < 26.4 and FC VOLTS > 32 and FC AMPS < 20
(FC disconnect, check APUs):
14. MSTR MADS PWR – OFF
If PL PRI BUS pwr lost due to FC disconnect:
15. PL PRI (three) – OFF (tb-OFF)
16. (Aff) FC/MN BUS – ON (tb-ON)
If PL PRI disconnected in step 15:
17. Perform PL PWRDN, then:
If FC3 aff:
18. PL PRI FC3 – ON (tb-ON)
    MNC – ON (tb-ON)
If first FC prob:
19. Perform BUS TIE (Cue Card), then:
If aff FC VOLTS still > 32:
20. Go to FC SHUTDN (Cue Card) >>
21. (Aff) AC BUS SNSR – OFF,AUTO TRIP
22. GNC I/O RESET >>
If second FC failure and aff MN BUS not recovered:
23. PL PRI (three) – OFF (tb-OFF)
If aff MN BUS connected to PTU:
24. PTU/MN BUS – OFF (tb-OFF) (pnl A15)
    OPCU CONV – OFF
25. Go to 2nd FC SHUTDN >>
If neither:
26. Go to MAL, EPS, 7.3b, FUEL CELL VOLTS ↑↓, FUEL CELL
    AMPS ↑↓, MAIN BUS V A(B,C) ↑↓ [1]

MN BUS UNDervolts/
FC Volts
3Φ AC MTR STOPPED (5-4)  5-3
AC Volts (5-5)
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 and FREON PUMP 2B: AC1
   FC2 and FREON PUMP 1B: AC2
   FC3 and CAB FAN A: AC3
2. (Aff) FC – STOP
If AC3 aff:
3.   AV BAY 3 FAN B – OFF
     A – ON
     CAB FAN A – OFF
Isolate aff ΦB(ΦC,ΦA):
4.   (Aff) cb AC CONTR – cl
     INV/AC BUS – OFF (tb-OFF)
If AC1(2,3) aff and AV BAY FAN 3(2,3) ΔP ≥ 0.5:
5.   Go to step 12 (bad Φ isolated)
6.   (Aff) INV/AC BUS – ON (tb-ON)
     cb AC CONTR – op
7.   Repeat from step 4 for ΦC(ΦA), then:
Drop aff AC bus (three Φs):
8. (Aff) cb AC CONTR (three) – cl
9. INV/AC BUS – OFF (tb-OFF)
10. INV PWR – OFF (tb-OFF)
11. Go to aff AC BUS (2 or 3 Φs) BUS LOSS ACTION >>

Bad Φ isolated:
12. (Aff) INV PWR – OFF (tb-OFF)
   cb AC CONTR – op
   FC – START (10 sec or ∆P tb-gray)
13. If AC3 aff: CAB FAN B – ON
14. Go to aff MAL, EPS SSR BUS LOSS ACTION

**AC VOLTS**

1. If AC OVERLOAD F7 light or ‘S67 AC OVLD’ msg: Go to AC OVERLOAD >>
If single Φ AC VOLTS > 123 or between 10 and 110 (confirm with F9 meter):
2. (Aff) cb AC CONTR – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR – op
If other Φ AC VOLTS < 110 or AC AMPS > 14:
3. Go to step 6
If other Φ AC AMPS > 10:
4. Isolate shorted Φ: Open all aff AC1(2,3) three-Φ ganged
   cbs and all aff AC1(2,3) ΦA(B,C) single-Φ cbs as follows:
5. Go to aff MAL, EPS SSR BUS LOSS ACTION >>
If multi Φ AC VOLTS < 110:
   If any AC AMPS > 14 (unannun OVLD):
   (Aff) cb AC CONTR (three) – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR (three) – op
   6. Go to aff BUS LOSS ACTION >>
   If all AC AMPS < 1 (FPC bus lost):
   L 8. Go to aff BUS LOSS ACTION >>
   If all AC VOLTS between 110 and 123:
   9. Go to MAL, EPS, 7.5a, AC VOLTS 1(2,3) ↓↑

<table>
<thead>
<tr>
<th>BUS</th>
<th>L4</th>
<th>MA73C</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1 3Φ</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>ΦA</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>ΦB</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>ΦC</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>AC2 3Φ</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>ΦA</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>ΦB</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>ΦC</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>AC3 3Φ</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>ΦA</td>
<td>15</td>
<td>3</td>
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<tr>
<td>ΦB</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>ΦC</td>
<td>13</td>
<td>3</td>
</tr>
</tbody>
</table>

L 5-6 OPCL/ALL/GEN M
AC OVERLOAD

If any AC VOLTS < 110 or AC AMPS > 14 (OVLD): 
If single φ:
1. (Aff) cb AC CONTR – cl 
   INV/AC BUS – OFF (tb-OFF) 
   INV PWR – OFF (tb-OFF) 
   cb AC CONTR – op 

   If other φ AC VOLTS < 110 or AC AMPS > 14: 
   2. Go to step 5
   3. Isolate shorted φ: Open all aff AC1(2,3) three-φ ganged 
      cbs and all aff AC1(2,3) φA(B,C) single-φ cbs as follows:

      | BUS      | L4 | MA73C |
      |----------|----|-------|
      | AC1 3Φ   | 1  | 5     |
      | φA       | 16 | 5     |
      | φB       | 16 | 4     |
      | φC       | 13 | 5     |
      | AC2 3Φ   | 0  | 9     |
      | φA       | 15 | 5     |
      | φB       | 16 | 4     |
      | φC       | 14 | 5     |

Cont next page
4. Go to aff MAL, EPS SSR BUS LOSS ACTION >>
If multi Φ (bus short):
5. (Aff) cb AC CONTR (three) – cl
   INV/AC BUS – OFF (tb-OFF)
   INV PWR – OFF (tb-OFF)
   cb AC CONTR (three) – op

6. Go to aff BUS LOSS ACTION >>
If all AC VOLTS between 110 and 123 and AC AMPS < 14:

7. Go to MAL, EPS, 7.5b, AC OVLD 1(2,3) ↓ [6]

**ESS BUS VOLTS LOW**
If verified by F9 voltmeter:

<table>
<thead>
<tr>
<th></th>
<th>1BC</th>
<th>2CA</th>
<th>3AB</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>MNA CONTR</td>
<td>MNB CONTR</td>
<td>MNC CONTR</td>
</tr>
<tr>
<td></td>
<td>(pnl O15:B)</td>
<td>(pnl O16:B)</td>
<td>(pnl O14:B)</td>
</tr>
<tr>
<td>2.</td>
<td>MNA CONTR</td>
<td>MNB CONTR</td>
<td>MNC CONTR</td>
</tr>
<tr>
<td></td>
<td>(pnl O13:A)</td>
<td>(pnl O13:C)</td>
<td>(pnl O13:E)</td>
</tr>
<tr>
<td>3.</td>
<td>MNA CONTR</td>
<td>MNB CONTR</td>
<td>MNC CONTR</td>
</tr>
<tr>
<td></td>
<td>(pnl O15:B)</td>
<td>(pnl O16:B)</td>
<td>(pnl O14:B)</td>
</tr>
</tbody>
</table>

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

#### WARNING

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

#### NOTE

CNTL BUS PWR sws must be held continuously in the RESET posn to unpwr bus(es)

1. Identify BUS (BUS LOSS ID)
2. If one CNTL BUS RPC tripped (*):

   **Aff CNTL BUS:**

   **AB1(2,3)**

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

   **BC1(2,3)**

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

Cont next page
**CA1(2,3)**

<table>
<thead>
<tr>
<th>Tripped RPC (*)</th>
<th>Action (for RESET, hold w/sw reten device)</th>
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<tbody>
<tr>
<td><strong>C</strong></td>
<td>R1 CNTL BUS PWR MNA – RESET</td>
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<tr>
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<td>R14:B cb CNTL BUS CA1/2/3 – op</td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>R1 CNTL BUS PWR MNC – RESET</td>
</tr>
<tr>
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<td>R14:B cb CNTL BUS CA1/2/3 – op</td>
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</table>

If no CNTL BUS RPC tripped (no *):

<table>
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<tr>
<th>aff CNTL BUS</th>
<th>Panel R1 action (hold w/sw reten device)</th>
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<tbody>
<tr>
<td><strong>AB1(2,3)</strong></td>
<td>CNTL BUS PWR MNA,MNB (two)– RESET</td>
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<tr>
<td><strong>BC1(2,3)</strong></td>
<td>CNTL BUS PWR MNB,MNC (two) – RESET</td>
</tr>
<tr>
<td><strong>CA1(2,3)</strong></td>
<td>CNTL BUS PWR MNA,MNC (two) – RESET</td>
</tr>
</tbody>
</table>

If CNTL BC2 unpwr:

C3 12. S-BD PM CNTL – PNL,CMD

If CNTL BC1 and BC2 unpwr, comm will be UHF only

For all CNTL V < 25.0:

13. Perform BUS LOSS ACTION (CNTL), then, on MCC call only, perform MAL, EPS SSR-100 thru SSR-108, then:

14. Perform CONTROL BUS PWRDN (IFM, PROCEDURES A THRU F) for shorted bus, then:

15. If reqd, back out of BUS LOSS ACTION for regained buses, then:

16. Perform MAL, EPS SSR-100 thru SSR-108 for shorted bus, then:

If pwr reqd (<3 sec) for crit function:

17. Hold crit function sw

For tripped RPC:

R1 18. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn

---

5-10 OPCL/ALL/GEN M
FC COOLANT PUMP ΔP LOW

If other 3Φ AC motors aff and AC VOLTS OK:
1. Go to 3Φ AC MOTORS STOPPED >>

O14 2. √(Aff) FC CNTLR – ON 
(O15,O16) FC – START (10 sec or ΔP tb-gray)
If FC EXIT T > 164 and not decr, or 
H2 PUMP < 0.3 or > 0.8, or 
RDY tb – bp (30 sec after START) or

L4:C (aff) FC PUMPS cb(s) – op:
3. Go to FC SHUTDN (Cue Card) >>
If FC H2 PUMP status norm, FC EXIT T norm, and RDY 
tb – gray:
N/A (snsr failed)

FC1(2,3) H2 PUMP ↑↓

If other 3Φ AC motors aff and AC VOLTS OK:
1. Go to 3Φ AC MOTORS STOPPED >>
If FC COOL 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, 7.1c, H2 PUMP ↑↓ [1] >>
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, 7.1c, H2 PUMP ↑↓ [7]
FC REACTANT VLV CLOSED

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<tr>
<th></th>
<th>5-12</th>
<th>SM 69 FUEL CELLS</th>
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<td>SM SYS SUMM 1</td>
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</tbody>
</table>

R1 1. FC REAC VLV (three) – OP (tb-OP or hold 1 sec max)
2. Perform BUS TIE (Cue Card), then:
   If no joy on REAC open:
C3 3. √cb FC REAC VLV CL ENA (three) – op
R1 4. FC REAC VLV (three) – OP (tb-OP or hold 10 sec)
   If aff FC COOL P decr or < 50 within 7 min:
   | 5. Go to aff FC SHUTDN (Cue Card) >>
   If aff COOL P > 50 and steady after 7 min:
   | 6. Aff buses – untie if reqd

FC COOL P

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<th>5-12</th>
<th>SM 69 FUEL CELLS</th>
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<td>SM 66 ENVIRONMENT</td>
</tr>
</tbody>
</table>

1. Perform BUS TIE (Cue Card), then:
   If COOL P > 75, incr, and not 100 (H),
      or FC COOL PUMP = ΔP (intermittent),
      or STACK/EXIT T unstable,
      or FC FLOW O2(H2) > 8.4(1.1):
      2. Go to FC SAFING >>
   If FC COOL P < 25 or > 75 and steady:
      3. Go to MAL, EPS, 7.3e, FUEL CELL COOL P ↑↓[ś] >>
   If FC COOL P between 25 and 50:
      If FC COOL P < (SUPPLY H2O PRESS + 10):
      4. Perform FC SHUTDN (Cue Card), then:
         5. Go to MAL, EPS, 7.3e, FUEL CELL COOL P ↑↓[ś] >>
         6. Go to MAL, EPS, 7.3e, FUEL CELL COOL P ↑↓[ś] >>
If H2O RLF NOZ T A and B < 150:
  If more than one FC H2O LN T and H2O VLV T converging or within 5 degF of each other (mult FCs relieving):
    If H2O SUPPLY PRESS ≥ 40:
      1. Go to H2O SPLY PRESS HIGH (ECLS), 4-15 >>
    If H2O SUPPLY PRESS < 40:
      2. Initiate preparations for next PLS entry >>
  If one 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 sw failure):
    4. FC H2O RELIEF HTR – A AUTO(B AUTO) >>
If H2O RLF NOZ T A and B (both) > 425 (HTR fail on):
  5. √MCC

FC H2O RLF NOZ TEMP ↑↓
FC DELTA V 1(2,3)

1. Perform BUS TIE (Cue Card), then:
   If aff FC(H2O LINE) pH ↓ or FC ∆V incr:
   2. Perform FC SAFING, then:
      3. If pH ↓: Go to MAL, EPS, 7.3a, FC/H2O LINE pH HIGH [6] >>
   If no aff FC(H2O LINE) pH ↓ and FC ∆V not incr:
      4. Two min after bus tie, record FC ∆AMPS between aff and tied FC; monitor for 20 min
      If change in FC ∆AMPS > 12 or FC ∆V incr:
         5. Go to FC SAFING >>
      If change in FC ∆AMPS ≤ 12, FC ∆V not incr, and no MCC:
         6. SM 60 SM TABLE MAINT
            Reset limits for (aff) FC ∆AMPS 1(2,3):
            ITEM 1 ±(FC ∆AMPS + 40) EXEC
            ITEM 2 ±(FC ∆AMPS – 40) EXEC

FC pH HIGH or H2O LINE pH HIGH

If FC1(2,3) pH ↓:
1. Perform BUS TIE (Cue Card), then:
   If aff FC ∆V SS 1(2,3) ≥ 150 and incr:
   2. Perform FC SAFING, then:
   3. Go to MAL, EPS, 7.3a, FC/H2O LINE pH HIGH [6] >>
   4. SPLY H2O TKA INLET,OUTLET (two) – CL (tb-CL)
      TKB INLET – CL [(tb-CL(bp)]
      TKC OUTLET – CL (tb-CL)
      TKD INLET – CL (tb-CL)
   5. Go to MAL, EPS, 7.3a, FC/H2O LINE pH HIGH [1]
FC SHUTDN (1st)

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

1. MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE (Cue Card), then:
   If ORB (not deorb prep), kW > 18:
      MN BUS TIE (three) – ON
3. ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF (tb-OFF)
   FC – STOP (COOL PUMP \( \Delta P \) tb-bp or 1 sec) (expect FDA msgs)
4. FC REAC VLV – CL (tb-CL)
   Go to LOSS OF 1 FC (PWRDN), 10-39

2nd FC SHUTDN

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

1. MSTR MADS PWR – OFF
2. If aff FC pwrs one MN bus: Go to step 5
3. MN BUS TIE (three) – OFF (tb-OFF)
4. Perform BUS TIE (Cue Card) to good FC/BUS, then:
5. ESS BUS SOURCE FC – OFF
6. FC/MN BUS – OFF (tb-OFF)
7. FC – STOP (COOL PUMP \( \Delta P \) tb-bp or 1 sec)
8. FC REAC VLV – CL (tb-CL)
9. Go to LOSS OF 2nd FC (PWRDN), 10-41
**BUS TIE** (do not tie bus short, check APUs)  
If MN Volts > 20: Bus Tie >>  
If MN Volts < 20 (do not BUS TIE Pre MECO for 1st FC):  
1. (Aff) AC BUS SNSR – OFF  
2. cb AC CONTR (three) – cl  
3. (Aff) INV/AC BUS – OFF (tb-OFF)  
4. (Aff) INV PWR – OFF (tb-OFF)  
5. If MNC(B) dn: CAB FAN A(B) – OFF  
6. Bus Tie  
7. (Aff) INV PWR – ON (tb-ON)  
♦  
8. (Aff) INV/AC BUS – ON (tb-ON)  
9. cb AC CONTR (three) – op  
10. GNC I/O RESET  
Post MECO:  
11. (Aff) AC BUS SNSR – AUTO TRIP  
12. If pwrdn not reqd: \(\sqrt{\)CAB FAN A(B) – ON

<table>
<thead>
<tr>
<th>FC SAFING</th>
<th>SM SYS SUMM 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>If FC already SHUTDN:</td>
<td></td>
</tr>
<tr>
<td>1. (\sqrt{FC1(2,3)}) REAC – CL (O₂,H₂ tb-CL)</td>
<td></td>
</tr>
<tr>
<td>2. FC1(2,3) – START (10 sec or (\Delta P) tb-gray)</td>
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</tr>
<tr>
<td>3. FC/MN BUS A(B,C) – ON (tb-ON)</td>
<td></td>
</tr>
<tr>
<td>When FC1(2,3) COOL P decr to &lt; 15 or FC1(2,3) AMPS (\leq 0):</td>
<td></td>
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<tr>
<td>4. FC/MN BUS A(B,C) – OFF (tb-OFF)</td>
<td></td>
</tr>
<tr>
<td>When FC1(2,3) COOL P &lt; 15, then:</td>
<td></td>
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<tr>
<td>5. FC1(2,3) – STOP ((\Delta P) tb-bp or 1 sec) &gt;&gt;</td>
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<tr>
<td>If FC not SHUTDN:</td>
<td></td>
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<tr>
<td>6. MSTR MADS PWR – OFF</td>
<td></td>
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<tr>
<td>If not already tied:</td>
<td></td>
</tr>
<tr>
<td>7. Perform BUS TIE (Cue Card), then:</td>
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<tr>
<td>8. If ORB (not deorb prep) kW &gt; 18:</td>
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<tr>
<td>9. FC1(2,3) REAC – CL (O₂,H₂ tb-CL)</td>
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<tr>
<td>If either FC REAC tb still OP:</td>
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<tr>
<td>C3</td>
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<tr>
<td>10. cb FC1(2,3) REAC VLV CL ENA – cl</td>
<td></td>
</tr>
<tr>
<td>11. FC REAC VLV 1(2,3) – CL</td>
<td></td>
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<tr>
<td>If no joy:</td>
<td></td>
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<tr>
<td>R1</td>
<td></td>
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<tr>
<td>12. Install sw reten device FC REAC sw</td>
<td></td>
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<tr>
<td>When FC1(2,3) COOL P decr to &lt; 15 or FC1(2,3) AMPS (\leq 0):</td>
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<tr>
<td>13. ESS BUS SOURCE FC1(2,3) – OFF</td>
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<tr>
<td>14. FC/MN BUS A(B,C) – OFF (tb-OFF)</td>
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<tr>
<td>When FC1(2,3) COOL P &lt; 15, then:</td>
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<tr>
<td>15. FC1(2,3) – STOP ((\Delta P) tb-bp or 1 sec)</td>
<td></td>
</tr>
<tr>
<td>Go to LOSS OF 1 FC(2nd FC)(PWREDN), 10-39/10-41/10-45</td>
<td></td>
</tr>
</tbody>
</table>
CRYO O2(H2) PRESS/TEMP HIGH

1. (Aff) O2(H2) TK HTRS (two) – OFF
2. O2(H2) MANF VLV TK1,TK2 (two) – OP (tb-OP)
3. If PRESS ↑, go to MAL, EPS, 7.6b, CRYO O2(H2) PRES, TK P ↓↑ 1 >>
4. If O2 T ↑, go to MAL, EPS, 7.6l, O2 HTR T 1 >>
5. If H2 T ↑, go to MAL, EPS, 7.6f, H2 HTR T 1

CRYO O2(H2) LEAK

If only one TK aff and P/TK P disagree:
1. Go to MAL, EPS, 7.6b, CRYO O2(H2) PRES, TK P ↓↑ 7 >>
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 TK1,TK2 (two) – CL
   If either MANF VLV fails to close:
   4. Hold sw in CLOSE posn (install sw reten device if reqd), then:
   5. Reconfig TK HTRS A,B – AUTO in TK(s) with incr P
6. Perform aff MN BUS TIE (Cue Card), then:
If O2(H2) TK 1(2) aff (open unaff manf):
7. O2(H2) MANF VLV TK2(1) – OP
If O2 TK 1(2) aff:
8. O2 SYS 1(2) SPLY – CL
   If O2 TK 1(2) P now incr (PCS leak):
   9. O2 TK1(2) HTRS A,B (two) – AUTO
      MANF VLV TK1,TK2 (two) – OP >>
10. Perform aff FC SHUTDN (Cue Card), then:
    If aff TK P incr (FC leak):
11. O2(H2) MANF VLV TK1,TK2 (two) – OP (ASAP if FC3)
12. (Aff) TK HTRS A,B (two) – AUTO >>

Cont next page
If aff TK P not incr within 2 min (MANF or TK leak):
13.  (Aff) TK HTRS A,B (two) – OFF
If TK 1(2) aff and TK P/MANF P diverging (TK leak):
14.  O2(H2) MANF VLV TK1,TK2 (two) – OP
15.  Go to MAL, EPS SSR-6, FC RESTART >>
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 Δ > 50:
16.  O2(H2) MANF VLV TK1,TK2 (two) – OP
17.  (Aff) TK HTRS A,B (two) – OFF (TK leak or blockage)
18.  (Other) TK HTRS – AUTO >>
If neither of the above and all TK Ps now steady or incr (small leak or HTR fail):

CAUTION
Do not allow P to exceed 920(260)

19.  √MCC
<table>
<thead>
<tr>
<th>BUS LOSS</th>
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</table>

*IF TK IS PAIRED WITH A FAILED TK(S), AUTO CAPABILITY IN THIS TK IS LOST. AUTO CAPABILITY IN THIS TK CAN BE REGAINED BY TAKING FAILED TK(S) HTR SWITCHES OUT OF AUTO. TK1 PAIRED WITH TK2, AND TK3 PAIRED WITH TK4.

A/M = AUTO AND MANUAL CAPABILITY LOST

03/27/03
<table>
<thead>
<tr>
<th>INDICATION</th>
<th>BUS</th>
<th>MAIN A</th>
<th>MAIN B</th>
<th>MAIN C</th>
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<tr>
<td>APC 3</td>
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</table>

*For MNA(B,C) FPC 1(2,3) many other indications are present, most of which are associated with the resultant AC 1(2,3) loads.

Only the additional indications that positively identify the FPC bus loss are listed.

DATE 07/29/05
# MAIN DC BUS LOSS ID TABLE

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>MAIN A</th>
<th>MAIN B</th>
<th>MAIN C</th>
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<tr>
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<td>O</td>
<td>R</td>
<td>M</td>
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<tr>
<td></td>
<td>O</td>
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</tr>
<tr>
<td></td>
<td>O</td>
<td>R</td>
<td>M</td>
</tr>
<tr>
<td>C/W CABIN ATM</td>
<td>•</td>
<td>•</td>
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</tr>
<tr>
<td>LIGHTS FLOODS (L Seat, R Seat, CTR Cnsl, MS, OS, PS)</td>
<td>PS</td>
<td>LC</td>
<td>OS</td>
</tr>
<tr>
<td>Floods (LR Ovhd Cnsl)</td>
<td>L</td>
<td>R</td>
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<td>MIDDECK FLOODS X (X: 1, 2, 3, 4, 5, 6, 7, 8)</td>
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<tr>
<td>WMC FLOOD</td>
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<tr>
<td>COMM All Voice via AUDIO CTR 2</td>
<td>PS, MS, MD, AL</td>
<td>MS</td>
<td>MD</td>
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<tr>
<td>UHF SPLX PWR AMP</td>
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<tr>
<td>TIMERS X MISSION TIMER (X: Fwd, Aft)</td>
<td>F</td>
<td>A</td>
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<tr>
<td>X EVENT TIMER (X: Fwd, Aft)</td>
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<td>F</td>
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<td>FWD MDUs MFD2 PLT1</td>
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<td>B</td>
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<tr>
<td>AFT MDU</td>
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<td>B</td>
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<tr>
<td>L2 CAB RELIEF X tb – bp</td>
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<td>B</td>
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<tr>
<td>ATM NZ SYS X SPLY, REG INLET tb – bp</td>
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<tr>
<td>PANELES O1 CAB dP/dT = 0.45</td>
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<tr>
<td>CAB PRESS = 0 psia</td>
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<tr>
<td>PPO2 SNSR X = 0 psia</td>
<td>A</td>
<td>BC</td>
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<tr>
<td>O3 RCS/OMS PRPLT QTY Disp Blanks</td>
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<tr>
<td>R1TL SPLY H2O TK X INLET tb – bp</td>
<td>A</td>
<td>B</td>
<td>C</td>
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<tr>
<td>SPLY H2O TK X OUTLET tb – bp</td>
<td>B</td>
<td>C</td>
<td>A</td>
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<tr>
<td>SPLY H2O DUMP ISOL, B SPLY ISOL VLV tb – bp</td>
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<tr>
<td>SPLY H2O DUMP, XOVR, GALLEY SPLY VLV tb – bp</td>
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<tr>
<td>A8U RES EE (6), SAFING, S/W STOP tb – bp, BRAKES tb – OFF</td>
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<td>ML31C WASTE H2O TK X VLV tb – bp</td>
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<tr>
<td>WASTE H2O DUMP ISOL VLV tb – bp</td>
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<tr>
<td>SPLY H2O TK D X tb – bp (X: INLET, OUTLET)</td>
<td>O</td>
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</table>

DATE 12/09/03
### ESS DC BUS LOSS ID TABLE

**INDICATION**

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<tr>
<th>BUS</th>
<th>ESS1BC</th>
<th>ESS2CA</th>
<th>ESS3AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA, but no F7 C/W Lts</td>
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<td>*</td>
<td>*</td>
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<tr>
<td>O2 PRESS</td>
<td>*</td>
<td>*</td>
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</tr>
<tr>
<td>H2 PRESS</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>FC REAC</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>FC PUMP</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>PRIMARY C/W (Cannot be Reset)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>BACKUP C/W (Cannot be Reset)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>F9 METER</td>
<td>All Off ESS VOLTS OFF Scale Lo</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>SM1</td>
<td>All DC VOLTS ESS = 0</td>
<td>*</td>
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</tr>
<tr>
<td>COMM</td>
<td>All Voice via AUDIO CTR 1</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>X ATU, CCU, MIC (X: Cdr, Pil)</td>
<td>C</td>
<td>C</td>
<td>P</td>
</tr>
<tr>
<td>F7 C/W MATRIX</td>
<td>*</td>
<td>*</td>
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</tr>
<tr>
<td>MA BULBS 2 of 4 per MA (except Lamp Test)</td>
<td>*</td>
<td>*</td>
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<tr>
<td>GPC STATUS LTS</td>
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<td>*</td>
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<tr>
<td>X Glaresheild Flood (X: L, R)</td>
<td>L</td>
<td>L</td>
<td>R</td>
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<tr>
<td>O2</td>
<td>O2, H2 TK X QTY = 0% (X: 1, 2, 3, 4)</td>
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<td>R1</td>
<td>FC/MN BUS X tb – OFF</td>
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<tr>
<td>PL PRI MNC tb – OFF</td>
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<tr>
<td>INV PWR X tb – OFF (Inv OK)</td>
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<td>O2, H2 MANF VLV TK X tb – CL</td>
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<td>FC X REAC tb – CL</td>
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<td>FC X RDY tb – bp</td>
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<td>FC X COOL PUMP ∆P tb – bp</td>
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<tr>
<td>A12</td>
<td>FC3 STRUCT RTN tb – OFF</td>
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</table>

**DATE**: 05/23/00

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5-23

OPC/LAL/GEN M
CNTL AB1
MDU CRT 1 Blanks
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 BYP VLV MAN SEL 2 (tb-bp)
S-BD SYS 1 Comm
PL SYS 1
R HUD lost

CNTL BC2
MDU CRT 2 Blanks
C/W – H2O LOOP (if Pump 1B ON)
S-BD SYS 2 Comm
PL SYS 2

CNTL BC3
(O8) – FWD RCS MANF ISOL 2 (tb-bp)
C/W – H2O LOOP (if Pump 1B ON)

NOTE
If CNTL Bus Loss suspected, check [SM1] DC V CNTL for confirming cue

06/17/98
BUS LOSS ACTION

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<thead>
<tr>
<th>PAGE</th>
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<tr>
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<td>DA1</td>
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<td>MPC1 (CIL)</td>
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<td>FD (CIL)</td>
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<td>O13 &amp; R14</td>
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<td>FD (CIL)</td>
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<td>O13 &amp; R14</td>
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<td>ESS 3AB</td>
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<tr>
<td>FD (CIL)</td>
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PROBLEM | PWRUP
---------|--------
EPS BUS LOSS | LOW LEVEL (Group B) | MSN EXT (Group C)
| N/A | ALL FF&FA MDMs

BUS LOSS ID (5-21) 5-25

BUS LOSS ACTION
AC1 (2 or 3Φs)

L1
1. 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 MNA FPC1 bus lost, return to MNA FPC1 BUS LOSS ACTION >>

3. Go to MAL, EPS SSR-110, BUS LOSS: AC1
MNA DA1 (Entire Bus) (Includes AC1)

NOTE
Loss of UHF SPLX Hi Pwr Xmit

1. Perform FC1 SHUTDN (Cue Card), then:
   R1 2. PL CAB – MNB
L1 3. 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 sel – B
If HI LOAD EVAP ENA:
   4. HI LOAD DUCT HTR sel – B
O6 5. ANNUN BUS SEL ACA 1 – MNB
A12 6. APU HTR
   GAS GEN/FU PUMP 1 – B AUTO
   3 – A AUTO
   TK/FU LN/H2O SYS 1B – AUTO
   3A – AUTO
7. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
8. Go to MAL, EPS SSR-10, BUS LOSS:
   MNA DA1
MNA FPC1
1. Perform AC1 (2 or 3Φs) (omit MAL, EPS SSR-110, BUS LOSS: AC1), then:
2. Go to MAL, EPS SSR-11, BUS LOSS: MNA FPC1

MNA FLC1
1. **GNC 23 RCS**
   Ovrd F1 MANF STAT – CL
2. Go to MAL, EPS SSR-11, BUS LOSS: MNA FLC1

MNA FMC1
If reqd for att control:
1. **GNC 23 RCS**
   Ovrd F1 MANF STAT – OP
2. Go to MAL, EPS SSR-15, BUS LOSS: MNA FMC1

MNA MPC1
L1  1. TOP EVAP HTR DUCT sel – B
    If HI LOAD EVAP ENA:
    2. HI LOAD DUCT HTR sel – B
R1  3. PL CAB – MNB
4. Go to MAL, EPS SSR-12, BUS LOSS: MNA MPC1

MNA APC4
L1  1. TOP EVAP HTR DUCT sel – B
    If HI LOAD EVAP ENA:
    2. HI LOAD DUCT HTR sel – B
A12 3. APU HTR
     GAS GEN/FU PUMP 1 – B AUTO
     3 – A AUTO
     TK/FU LN/H2O SYS 1B – AUTO
     3A – AUTO
4. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
5. Go to MAL, EPS SSR-14, BUS LOSS: MNA APC4
MNA ALC1

L1  1. TOP EVAP HTR DUCT sel – B
   If HI LOAD EVAP ENA:
      2. HI LOAD DUCT HTR sel – B
A12  3. APU HTR
      GAS GEN/FU PUMP 1 – B AUTO
      3 – A AUTO
      TK/FU LN/H2O SYS 1B – AUTO
      3A – AUTO
   4. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
   5. Go to MAL, EPS SSR-16, BUS LOSS:
      MNA ALC1

MNA O14

O6  1. ANNUN BUS SEL ACA 1 – MNB
   2. Go to MAL, EPS SSR-23, BUS LOSS:
      MNA O14

MNA R14

NOTE
Loss of UHF SPLX Hi Pwr Xmit

Go to MAL, EPS SSR-21, BUS LOSS: MNA R14
AC2 (2 or 3Φs)

1. Perform FC2 SHUTDN (Cue Card), then:
   L1 2. 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

O17:C 3. SIG CONDR FREON A – AC3
If MNB FPC2 bus lost, return to MNB FPC2 BUS LOSS ACTION >>
4. Go to MAL, EPS SSR-120, BUS LOSS: AC2
MNB DA2 (Entire Bus) (Includes AC2)

**CAUTION**
Do not sw S-BD PM CNTL to PNL if subs Fault Msg – ‘BCE STRG 3 NSP’ or loss of comm

1. Perform FC2 SHUTDN (Cue Card), then:

L1  2. 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 sel – A

If HI LOAD EVAP ENA:
3. HI LOAD DUCT HTR sel – A

O6  4. ANNUN BUS SEL ACA 1 – MNA
    2/3 – MNC

O17:C  5. SIG CONDR FREON A – AC3

A12  6. APU HTR
    GAS GEN/FU PUMP 1 – A AUTO
    2 – B AUTO
    TK/FU LN/H2O SYS 1A – AUTO
    2B – AUTO

If PL comm reqd:

A1L  7. S-BD PL PWR SYS – 2
    CNTL – PNL,CMD

8. To reconfig PSP, √MCC

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

10. Go to MAL, EPS SSR-30, BUS LOSS: MNB DA2
MNB FPC2

CAUTION
Do not sw S-BD PM CNTL to PNL if subs Fault Msg – ‘BCE STRG 3 NSP’ or loss of comm

If PL comm reqd:
A1L
1. S-BD PL PWR SYS – 2 CNTL – PNL, CMD
   If OIU reqd (✓MCC):
SSP
2. OIU PWR – OIU 2 ON (tb-DN)
3. To reconfig PSP/OIU, ✓MCC
4. Perform AC2 (2 or 3 Φs) (omit MAL, EPS SSR-120, BUS LOSS: AC2), then:
5. Go to MAL, EPS SSR-31, BUS LOSS: MNB FPC2

MNB FLC2

CAUTION
Do not sw S-BD PM CNTL to PNL if subs Fault Msg – ‘BCE STRG 3 NSP’ or loss of comm

1. GNC 23 RCS
   Ovrd F2 MANF STAT – CL
If PL comm reqd:
A1L
2. S-BD PL PWR SYS – 2 CNTL – PNL, CMD
   If OIU reqd (✓MCC):
SSP
3. OIU PWR – OIU 2 ON (tb-DN)
4. To reconfig PSP/OIU, ✓MCC
5. Go to MAL, EPS SSR-35, BUS LOSS: MNB FLC2

MNB FMC2

If reqd for att control:
1. GNC 23 RCS
   Ovrd F2 MANF STAT – OP
2. Go to MAL, EPS SSR-37, BUS LOSS: MNB FMC2

MNB MPC2

L1
1. TOP EVAP HTR DUCT sel – A
   If HI LOAD EVAP ENA:
   2. HI LOAD DUCT HTR sel – A
A1U
3. KU BD PWR – OFF CNTL – PNL
4. Go to MAL, EPS SSR-32, BUS LOSS: MNB MPC2

5-32 OPCL/ALL/GEN M
MNB APC5

L1  1. TOP EVAP HTR DUCT sel – A
   If HI LOAD EVAP ENA:
      2. HI LOAD DUCT HTR sel – A
A12 3. APU HTR
      GAS GEN/FU PUMP 1 – A AUTO
      2 – B AUTO
      TK/FU LN/H2O SYS 1A – AUTO
      2B – AUTO
4. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
5. Go to MAL, EPS SSR-34, BUS LOSS: MNB APC5

MNB ALC2

L1  1. TOP EVAP HTR DUCT sel – A
   If HI LOAD EVAP ENA:
      2. HI LOAD DUCT HTR sel – A
A12 3. APU HTR
      GAS GEN/FU PUMP 1 – A AUTO
      2 – B AUTO
      TK/FU LN/H2O SYS 1A – AUTO
      2B – AUTO
4. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
5. Go to MAL, EPS SSR-36, BUS LOSS: MNB ALC2

MNB O15

O6  1. ANNUN BUS SEL ACA 1 – MNA
      2/3 – MNC
2. Go to MAL, EPS SSR-45, BUS LOSS: MNB O15
AC3 (2 or 3Φs)

1. Perform FC3 SHUTDN (Cue Card), then:
2. CAB FAN A – OFF
   B – ON
   IMU FAN B(A) – ON
   C – OFF
3. SIG CONDR FREON B – AC2
   If MNC FPC3 bus lost, return to MNC FPC3 BUS
   LOSS ACTION >>
4. Go to MAL, EPS SSR-130, BUS LOSS: AC3
MNC DA3 (Entire Bus) (Includes AC3)

1. Perform FC3 SHUTDWN (Cue Card), then:
   L1 2. 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
   B – ON

   C3 3. S-BD PM CNTL – PNL, CMD

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

   4. AUD CTR – 1
   O6 5. ANNUN BUS SEL ACA 2/3 – MNB
   O17:C 6. SIG CONDR FREON B – AC2
   A12 7. APU HTR
       GAS GEN/FU PUMP 2 – A AUTO
       3 – B AUTO
       TK/FU LN/H2O SYS 2A – AUTO
       3B – AUTO

   8. Perform LOSS OF VERNIERS (ORB OPS,
      RCS), then:
   9. Go to MAL, EPS SSR-50, BUS LOSS:
      MNC DA3
MNC FPC3

C3 1. S-BD PM CNTL – PNL, CMD

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

2. Perform AC3 (2 or 3 Φs) (omit MAL, EPS SSR-130, BUS LOSS: AC3), then:
3. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
4. Go to MAL, EPS SSR-51, BUS LOSS: MNC FPC3

MNC FLC3

C3 1. S-BD PM CNTL – PNL, CMD

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

2. [GNC 23 RCS]
   Ovrd F4 MANF STAT – CL
3. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
4. Go to MAL, EPS SSR-55, BUS LOSS: MNC FLC3

MNC APC6

L1 1. FLASH EVAP CNTLR PRI A – OFF B – ON

A12 2. APU HTR
   GAS GEN/FU PUMP 2 – A AUTO 3 – B AUTO
   TK/FU LN/H2O SYS 2A – AUTO 3B – AUTO
3. Go to MAL, EPS SSR-54, BUS LOSS: MNC APC6
MNC ALC3
L1  1.  FLASH EVAP CNTLR PRI A – OFF
     B – ON
A12 2.  APU HTR
       GAS GEN/FU PUMP 2 – A AUTO
       3 – B AUTO
       TK/FU LN/H2O SYS 2A – AUTO
       3B – AUTO
3.  Go to MAL, EPS SSR-56, BUS LOSS:
    MNC ALC3

MNC O16
O6  1.  ANNUN BUS SEL ACA 2/3 – MNB
2.  Go to MAL, EPS SSR-63, BUS LOSS:
    MNC O16

MNC R14
C3  1.  AUD CTR – 1
2.  Go to MAL, EPS SSR-61, BUS LOSS:
    MNC R14
**CNTL AB1**

L1  
1. TOP EVAP HTR DUCT sel – B  
   If HI LOAD EVAP ENA:  
   2. HI LOAD DUCT HTR sel – B  

A12  
3. APU HTR  
   GAS GEN/FU PUMP 1 – B AUTO  
   3 – A AUTO  
   TK/FU LN/H2O SYS 1B – AUTO  
   3A – AUTO  

If AB1,2,3 unpwrd:  
4. [GNC 23 RCS]  
   Ovrd F1 MANF STAT – CL  

5. Go to MAL, EPS SSR-100, BUS LOSS: CNTLAB1

**CNTL AB2**

L1  
1. TOP EVAP HTR DUCT sel – B  
   If HI LOAD EVAP ENA:  
   2. HI LOAD DUCT HTR sel – B  

A12  
3. [GNC 23 RCS]  
   Ovrd F1 MANF STAT – CL  

4. APU HTR  
   GAS GEN/FU PUMP 1 – B AUTO  
   TK/FU LN/H2O SYS 1B – AUTO  
   3A – AUTO  

5. Go to MAL, EPS SSR-101, BUS LOSS: CNTLAB2

**CNTL AB3**

**NOTE**  
CDR’s BFS engage capability lost

L1  
1. TOP EVAP HTR DUCT sel – B  
   If HI LOAD EVAP ENA:  
   2. HI LOAD DUCT HTR sel – B  
   Do not perform next step if AB1,2,3 unpwrd:  
   If reqd for att control:  
   3. [GNC 23 RCS]  
      Ovrd F1 MANF STAT – OP  

A12  
4. APU HTR  
   GAS GEN/FU PUMP 1 – A AUTO  
   TK/FU LN/H2O SYS 1B – AUTO  
   3A – AUTO

Cont next page
If DAP MAN MODE reqd:

5. Use aft station

If BFS engage reqd:

6. Use PLT’s RHC

GPC MODE 1,2,4 (three) – STBY,HALT

BFS I/O RESET

7. Go to MAL, **EPS SSR-102, BUS LOSS:**

CNTLAB3

**CNTL BC1**

**CAUTION**

Do not sw S-BD PM CNTL to PNL if subs Fault Msg – ‘BCE STRG 3 NSP’ or loss of comm

**L1**

1. TOP EVAP HTR NOZ L – B AUTO
   DUCT sel – A

If HI LOAD EVAP ENA:

2. HI LOAD DUCT HTR sel – A

**A12**

3. APU HTR
   GAS GEN/FU PUMP 1 – A AUTO
   2 – B AUTO
   TK/FU LN/H2O SYS 1A – AUTO
   2B – AUTO

If PL comm reqd:

**A1L**

4. S-BD PL PWR SYS – 2
   CNTL – PNL, CMD

If OIU reqd (√MCC):

**SSP**

5. OIU PWR – OIU 2 ON (tb-DN)

6. To reconfig PSP/OIU, √MCC

If BC1,2,3 unpwrd:

7. **GNC 23 RCS**
   Ovrd F2 MANF STAT – CL

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

9. Go to MAL, **EPS SSR-103, BUS LOSS:**

CNTLBC1
CNTL BC2

L1  1. TOP EVAP HTR DUCT sel – A
   If HI LOAD EVAP ENA:
      2. HI LOAD DUCT HTR sel – A
C3  3. S-BD PM CNTL – PNL, CMD

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

4. GNC 23 RCS
   Ovrd F2 MANF STAT – CL

A12  5. APU HTR
      GAS GEN/FU PUMP 2 – B AUTO
      TK/FU LN/H2O SYS 1A – AUTO
      2B – AUTO

C3  6. If DAP MAN MODE reqd: Use fwd station

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

8. Go to MAL, EPS SSR-104, BUS LOSS:
   CNTLBC2

CNTL BC3

L1  1. TOP EVAP HTR NOZ R – B AUTO
   DUCT sel – A
   If HI LOAD EVAP ENA:
      2. HI LOAD DUCT HTR sel – A
   If reqd for att control:
      Do not perform next step if BC1,2,3 unpwrdd:
      3. GNC 23 RCS
         Ovrd F2 MANF STAT – OP

A12  4. APU HTR
      GAS GEN/FU PUMP 2 – A AUTO
      TK/FU LN/H2O SYS 1A – AUTO
      2B – AUTO

A6  5. If DAP MAN MODE reqd: Use aft station

6. Go to MAL, EPS SSR-105, BUS LOSS:
   CNTLBC3
CNTL CA1

NOTE
GPC 3,5 – no BFS engage capability. √MCC for possible move of BFS FUNCTION

A12 1. APU HTR
   GAS GEN/FU PUMP 2 – A AUTO
   3 – B AUTO
   TK/FU LN/H2O SYS 2A – AUTO
   3B – AUTO

If CA1,2,3 unpwrd:
2. [GNC 23 RCS]
   Ovrd F3 MANF STAT – CL
3. Go to MAL, EPS SSR-106, BUS LOSS: CNTLCA1

CNTL CA2

L1 1. FLASH EVAP CNTLR PRI A – OFF
   B – ON
2. [GNC 23 RCS]
   Ovrd F3 MANF STAT – CL
A12 3. APU HTR
   GAS GEN/FU PUMP 3 – B AUTO
   TK/FU LN/H2O SYS 2A – AUTO
   3B – AUTO

C3 4. If DAP MAN MODE reqd: Use fwd station
5. Go to MAL, EPS SSR-107, BUS LOSS: CNTLCA2

CNTL CA3

A12 1. APU HTR
   GAS GEN/FU PUMP 3 – A AUTO
   TK/FU LN/H2O SYS 2A – AUTO
   3B – AUTO
2. Go to MAL, EPS SSR-108, BUS LOSS: CNTLCA3

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

1. Perform FC1 SHUTDN (Cue Card), then:
   - If calling proc complete:
   2. Go to MAL, **EPS** SSR-70, BUS LOSS:
      ESS1BC DA1

ESS 1BC MPC1

1. Perform FC1 SHUTDN (Cue Card), then:
2. Go to MAL, **EPS** SSR-72, BUS LOSS:
   ESS1BC MPC1

ESS 1BC FD

**NOTE**
GPC 1,4 lost if pwr cycled OFF or ON

1. Perform FC1 SHUTDN (Cue Card), then:
2. Go to MAL, **EPS** SSR-74, BUS LOSS:
   ESS1BC FD

ESS 1BC O13&R14

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

Go to MAL, **EPS** SSR-75, BUS LOSS:
   ESS1BC O13&R14
**ESS 2CA DA2** (Entire Bus)

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

GPC 2,5 lost if pwr cycled OFF or ON

C3
1. AUD CTR – 2
2. Perform **FC2 SHUTDOWN** (Cue Card), then:
   If calling proc complete:
   3. Go to MAL, **EPS SSR-80**, BUS LOSS:
      ESS2CA DA2

**ESS 2CA MPC2**

1. Perform **FC2 SHUTDOWN** (Cue Card), then:
2. Go to MAL, **EPS SSR-82**, BUS LOSS:
   ESS2CA MPC2

**ESS 2CA FD**

**NOTE**
GPC 2,5 lost if pwr cycled OFF or ON

1. Perform **FC2 SHUTDOWN** (Cue Card), then:
2. Go to MAL, **EPS SSR-83**, BUS LOSS:
   ESS2CA FD

**ESS 2CA O13&R14**

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

C3
1. AUD CTR – 2
2. Go to MAL, **EPS SSR-84**, BUS LOSS:
   ESS2CA O13&R14
ESS 3AB DA3 (Entire Bus)

NOTE
Do not engage BFS. Computer Status Matrix lost. GPC 3 lost if pwr cycled OFF or ON

1. Perform FC3 SHUTDN (Cue Card), then:
   If calling proc complete:
   2. Go to MAL, EPS SSR-90, BUS LOSS:
      ESS3AB DA3

ESS 3AB MPC3

1. Perform FC3 SHUTDN (Cue Card), then:
2. Go to MAL, EPS SSR-92, BUS LOSS:
   ESS3AB MPC3

ESS 3AB FD

NOTE
Do not engage BFS. GPC 3 lost if pwr cycled OFF or ON

1. Perform FC3 SHUTDN (Cue Card), then:
2. Go to MAL, EPS SSR-93, BUS LOSS:
   ESS3AB FD
**GPS TROUBLESHOOTING**

1. **VERIFY GPS FUNCTIONING PROPERLY**

   **[GNC 55 GPS STATUS]**
   - CRT
     - STAT = BLANK or BATT
     - MODE = INS
     - DG FAIL = BLANK
     - QA1 P 1c ≤ 175 (can be > 175 for no more than 5 min)
     - LAST SEL FIL UPDATE < 5 min

   If GPS functioning properly for 10 min, √MCC >>
   (if no comm, go to GPS INCORPORATION (ORBIT
   OPS, GNC)) >>

2. **GPS TROUBLESHOOTING**

   √GPS TO NAV INH – ITEM 36 EXEC (*)

   **A. GPS sw Config**
   - A13
     - GPS PWR – ON

   If OV103:
     - GPS PRE AMPL (two) – MNC

   If OV104:
     - GPS PRE AMPL (two) – ON

   * If receiver not pwrd:

   A13
   - GPS PRE AMPL (two) – MNC (OV103)
   - GPS PRE AMPL (two) – ON (OV104)
   - GPS PWR – ON
   - GPS ENCRYPT – NORM
   - Wait at least 30 sec
   - GNC I/O RESET

   **B. GPS Filter Restart**
   - CRT
     - MODE – INS

   If not in INS MODE, go to GPS INIT, step C,
   next page

   CRT
   - RESTART – ITEM 21 EXEC (*)
   - Wait 5 sec
   - RESTART – ITEM 21 (no *)

   Cont next page **OV103,104**
NOTE
GPS may take up to 1 min for steady state performance

Repeat step 1. If GPS not functioning properly within 1 min, perform step C below

C. GPS INIT
CRT
INIT – ITEM 15 EXEC (*)
\MODE – INIT
NAV – ITEM 18 EXEC (*)
\MODE – INS

NOTE
GPS may take up to 5 min for steady state performance

Repeat step 1. If GPS not functioning properly within 5 min, perform step D below

D. GPS Long Pwr Cycle
A13
GPS PWR – OFF (at least 30 sec).ON
(expect ‘BCE STRG 2 GPS’ msg)
Wait at least 30 sec
CRT
GNC I/O RESET
\NAV – ITEM 18 (*)
\INIT – ITEM 15 EXEC (*)
\MODE – INIT
NAV – ITEM 18 EXEC (*)
\MODE – INS

NOTE
May take up to 12 min to acquire 4 or more satellites

Check SATELLITES – tracking at least 4 satellites

Repeat step 1. If GPS not functioning properly within 12 min, perform step E next page
E. GPS S/TEST

A13 GPS PRE AMPL (two) – OFF
CRT \NAV – ITEM 18 (*)
S/TEST – ITEM 12 EXEC (*)
\BIT' in STAT field after ~6 sec
Wait for 'BIT' to clear after ~2 min
\S/TEST '↑'; if '↓', go to GPS SAFING (step 3)
A13 GPS PRE AMPL (two) – MNC (OV103)
CRT – ON (OV104)

\S/TEST '↑'; if '↓', go to GPS SAFING (step 3)

CRT NAV – ITEM 18 EXEC (*)
\MODE – INS

Repeat step 1. If GPS not functioning properly,
perform step 3 below

3. GPS SAFING

[GNC 55 GPS STATUS]

CRT \GPS TO G&C INH – ITEM 33 EXEC (*)
\GPS TO NAV INH – ITEM 36 EXEC (*)
GPS TROUBLESHOOTING

1. VERIFY GPS FUNCTIONING PROPERLY

GNC 55 GPS STATUS
CRT
\- STAT = BLANK or BATT
\- MODE = INS
\- DG FAIL = BLANK
\- QA1 P 1σ ≤ 175 (can be > 175 for no more than 5 min)
\- LAST SEL FIL UPDATE < 5 min

If GPS functioning properly for 10 min, MCC >>
(if no comm, go to GPS INCORPORATION (ORBIT OPS, GNC)) >>

2. GPS TROUBLESHOOTING
Desel affected GPS
CRT
DES RCVR 1(2,3) – ITEM 26(27,28) EXEC (*)

A. GPS sw Config
O7
\- GPS 1(2,3) PWR – ON
\- PRE AMPL (two) – ON

* If receiver not pwrd:
O7
* GPS 1(2,3) PRE AMPL (two) – ON *
* PWR – ON *
* GPS ENCRYPT – NORM *
* Wait at least 30 sec *

CRT
* GNC I/O RESET *
* *
* [GNC 55 GPS STATUS]
* NAV ITEM 17(18,19) (*)
* INIT – ITEM 14(15,16) EXEC (*)
* MODE – INIT *
* NAV – ITEM 17(18,19) EXEC (*)
* MODE – INS *

B. GPS Filter Restart
\- MODE – INS
If not in INS MODE, go to GPS INIT, step C, next page
CRT
RESTART – ITEM 20(21,22) EXEC (*)
Wait 5 sec
\- RESTART – ITEM 20(21,22) (no *)

Cont next page

OV105
OPCL/5/GEN M,5
NOTE
GPS may take up to 1 min for steady state performance

Repeat step 1. If GPS not functioning properly within 1 min, perform step C, next page

C. GPS INIT
CRT
INIT – ITEM 14(15,16) EXEC (*)
\nMODE – INIT
NAV – ITEM 17(18,19) EXEC (*)
\nMODE – INS

NOTE
GPS may take up to 5 min for steady state performance

Repeat step 1. If GPS not functioning properly within 5 min, perform step D below

D. GPS Long Pwr Cycle
O7
GPS 1(2,3) PWR – OFF (at least 30 sec), ON (expect ‘BCE STRG X GPS’ msg)
Wait at least 30 sec
CRT
GNC I/O RESET
\NAV – ITEM 17(18,19) (*)
\INIT – ITEM 14(15,16) EXEC (*)
\MODE – INIT
NAV – ITEM 17(18,19) EXEC (*)
\MODE – INS

NOTE
May take up to 12 min to acquire 4 or more satellites

Check SATELLITES – tracking at least 4 satellites

Repeat step 1. If GPS not functioning properly within 12 min, perform step E

Cont next page
E. GPS S/TEST

O7 CRT
GPS 1(2,3) PRE AMPL (two) – OFF
\NAV – ITEM 17(18,19) (*)
\S/TEST – ITEM 11(12,13) EXEC (*)
\BIT in STAT field after ~6 sec
Wait for ‘BIT’ to clear after ~2 min
\S/TEST ↑; if ‘↓’, go to GPS CLEANUP (step 3)

O7 CRT
GPS 1(2,3) PRE AMPL (two) – ON
NAV – ITEM 17(18,19) EXEC (*)
\MODE – INS

Repeat step 1. If GPS not functioning properly,
perform step 3, next page

3. GPS CLEANUP
If GPS functioning properly, on MCC GO, resel affected
GPS

[**GNC 55 GPS STATUS**]

CRT
DES RCVR 1(2,3) – ITEM 26(27,28) EXEC (no *)

If no GPS functioning properly:
\GPS TO G&C INH – ITEM 33 EXEC (*)
\GPS TO NAV INH – ITEM 36 EXEC (*)
OMS SECURE

1. OMS ENG (two) – OFF  
   If OMS XFEED config:
2. (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

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

XFEED: R OMS to L OMS

NOTE
Proc only to be used preburn

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 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

NOTE
Proc only to be used preburn

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 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

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

OMS N2 TK P LOW

1. \( \sqrt{N2TKP} < 1200 \) or decr (OMS/MPS and SPEC)
   If [OMS/MPS] and SPEC disagree (inst prob):
      2. Go to MAL, OMS, 11.1a, L(R) OMS TK P [1] >>
   If [OMS/MPS] and SPEC agree:
      3. \( \sqrt{(Aff)} \) OMS ENG – OFF
      4. Go to MAL, OMS, 11.1a, L(R) OMS TK P [4]

OMS N2 REG P LOW

1. \( \sqrt{OMS ENG (two)} \) – OFF
2. Go to MAL, OMS, 11.1a, L(R) OMS TK P [10]

OMS N2 REG P HIGH

1. \( \sqrt{OMS ENG (two)} \) – OFF
2. Go to MAL, OMS, 11.1a, L(R) OMS TK P [21]
OMS TK P (FU or OX) LOW

1. Check with corresp ENG IN P
   If ENG IN P disagrees:
   2. Go to MAL, OMS, 11.1a, L(R) OMS TK P [29] >>

If aff OMS feeding OMS/RCS I’CNCT:
   If both OX 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), 8-4, then:
   8. Go to MAL, OMS, 11.1a, L(R) OMS TK P [22] >>

If OX or FU (not both) TK P LOW:
   Secure RCS and OMS:
   9. DAP: FREE
   10. L,R RCS MANF ISOL (ten) – CL (tb-CL)
       XFEED (four) – CL (tb-CL)
   11. (Aff) OMS XFEED (two) – CL (tb-CL)
       TK ISOL (two) – CL (tb-CL)
       He PRESS/VAP ISOL (two) – CL
\SINGLE MANF (\MANF P)
   12. If leak found: Return to desired config except leave aff
       MANF closed >>
\TK LEG (\TWO MANF P)
   13. If leak found: Return to desired config except leave TK
       ISOL (1/2 or 3/4/5), MANFs, and corresp XFEED vlvvs
       closed
   14. If MANF 3/4/5 Leg leak: Go to LOSS OF VERNIERS
       (ORB OPS, RCS) >>
If leak found:
15. √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), GPC
16. GNC 23 RCS
    OMS PRESS ENA OFF – ITEM 7 EXEC
17. DAP: as reqd
18. If OMS PRPLT TK P decr:
   | Go to LEAKING OMS PRPLT/He BURN >>
19. If OMS IN P decr >>

XFEED LINES
20. GNC 23 RCS
    RCS L – ITEM 2 EXEC
If XFEED P decr or zero:
21. 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), GPC
22. GNC 23 RCS
    OMS PRESS ENA OFF – ITEM 7 EXEC
23. DAP: as reqd
24. Do not XFEED/I’CNCT >>
If leak not found:
25. 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), GPC
26. GNC 23 RCS
    OMS PRESS ENA OFF – ITEM 7 EXEC
27. DAP: as reqd, PR(ALT) only
28. Go to MAL, OMS, 11.1a, L(R) OMS TK P [36] >>
If aff OMS not feeding OMS/RCS I’CNCT:
29. Perform OMS SECURE, then:
30. If OMS PRPLT TK P decr:
   | Go to LEAKING OMS PRPLT/He BURN >>
31. If either OMS IN P decr >>
If leak not found:
32. Go to MAL, OMS, 11.1a, L(R) OMS TK P [47]

OPCL/ALL/GEN M

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

1. √He TK P < 1500 or decr abnormal ([OMS/MPS] and SPEC)
   If [OMS/MPS] and SPEC disagree (inst prob):
   2. Go to MAL, OMS, 11.1a, L(R) OMS TK P 63 >>
   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 Icnct: Perform I’CNCT RETURN (RCS), 8-4, then:
      If OMS TK P FU/OX decr:
   7. Go to OMS TK P (FU or OX) LOW >>
   If neither decr (He leg leak):
   8. √MCC for OMS Burn deltas
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 55 GPS STATUS]
   √GPS TO NAV – INH (*)

3. If MM106: PASS, OPS 301 PRO
   BFS, OPS 301 PRO

4. GNC, OPS 202(302) PRO

5. [GNC XXXXX MNVR EXEC] leaking OMS – sel, and determine out-of-plane or retrograde burn based on TIG (MCC or msg)

6. Enter PEG 7 TARGET data:
   If out-of-plane:
     Enter ∆VX and ∆VZ = 0.0
     For PRPLT LK, enter ∆VY ±500
     For He LK, enter ±∆VY from LEAKING OMS He ∆V TABLE
   If retrograde:
     Enter ∆VY and ∆VZ = 0.0
     For PRPLT LK, enter -∆VX from ∆VX vs ORB ALT chart
     For He LK, enter -∆VX from LEAKING OMS He ∆V TABLE, steps 1-4

7. Load TARGET DATA:
   LOAD – ITEM 22 EXEC (if retrograde burn, √TGT HP = 95±1; adjust ∆VX as reqd)
   TIMER – ITEM 23 EXEC
   If OPS 2:
     √Pri RJD LOGIC, DRIVER (sixteen) – ON
     √cb L,R DDU (four) – cl
     DAP: B/AUTO/PRI
     DAP TRANS: NORM/PULSE/PULSE
   If OPS 3:

8. [GNC 23 RCS]
   L1A or L3A – desel (N/A He leak)
   R1A or R3A – desel (N/A He leak)

9. Mnvr to burn att. When mnvr complete, update TIG if appropriate

10. GMBL CK sel sys

Cont next page
At TIG-4, perform OMS burn prep:

12. (Leaking) OMS TK ISOL (two) – OP (tb-OP)
   √XFEED (four) – CL (tb-CL)
   He PRESS/VAP ISOL A – OP (wait 2 sec),
   B – OP

13. Perform burn using LEAKING OMS PRPLT/He BURN (Cue Card),
    then postburn:
    If OPS 3:
      14. [GNC 23 RCS]
          AFT jets – resel (N/A He leak)
      15. FLT CNTLR PWR (two) – OFF
          cb L,R DDU (four) – as reqd
      16. (Aff) OMS He PRESS/VAP ISOL (two) – CL
          TK ISOL (two) – CL (tb-CL)
      17. DAP: INRTL
      18. If OPS 2: DAP TRANS: PULSE/PULSE/PULSE
          | GNC, OPS 201 PRO
          If MM 302: GNC, OPS 301 PRO
      19. DAP – as reqd
LEAKING OMS He $\Delta V$ TABLE

1. Pick $\Delta V$ from table to achieve MAX BLOWDOWN

<table>
<thead>
<tr>
<th>Affected OMS % (QTY)</th>
<th>$\Delta V$</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>352</td>
</tr>
<tr>
<td>90</td>
<td>320</td>
</tr>
<tr>
<td>85</td>
<td>289</td>
</tr>
<tr>
<td>80</td>
<td>257</td>
</tr>
<tr>
<td>75</td>
<td>226</td>
</tr>
<tr>
<td>70</td>
<td>195</td>
</tr>
<tr>
<td>65</td>
<td>164</td>
</tr>
<tr>
<td>60</td>
<td>133</td>
</tr>
<tr>
<td>55</td>
<td>102</td>
</tr>
<tr>
<td>50</td>
<td>71</td>
</tr>
<tr>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>40</td>
<td>10</td>
</tr>
</tbody>
</table>

If retrograde burn:

2. Verify $\Delta V_X$ vs ORB ALT

If $\Delta V$ from table < $\Delta V_X$ from chart:

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

If $\Delta V$ from table > $\Delta V_X$ from chart:

4. Use $\Delta V_X$ from chart to take Hp to 95 nm, then repeat proc to burn out-of-plane to achieve max blowdown (39%)
**RCS SECURE** (FWD,AFT)

If normal config:

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

If (feeding) XFEED:

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

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

3. √RCS TK ISOL (three) – CL (tb-CL)
   He PRESS (two) – CL (tb-CL)
I'CNCT: L OMS to RCS

NOTE
Gauging not avail in OPS 3

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 -->
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. L OMS TO AFT – ITEM 5 EXEC
6. DAP: as reqd

I'CNCT: R OMS to RCS

NOTE
Gauging not avail in OPS 3

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 -->
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. R OMS TO AFT – ITEM 6 EXEC
6. DAP: as reqd

OPCL/ALL/GEN M

RCS SECURE 8-3 I'CNCT: OMS to RCS
I’CNCT TK SWITCH:  
From L to R OMS FEED

1. DAP: FREE
2. L OMS XFEED B – CL (tb-CL) 
   R OMS XFEED B – OP (tb-OP) 
3. R OMS TO AFT – ITEM 6 EXEC 
4. DAP: as reqd

I’CNCT TK SWITCH:  
From R to L OMS FEED

1. DAP: FREE
2. R OMS XFEED B – CL (tb-CL) 
   L OMS XFEED B – OP (tb-OP) 
3. L OMS TO AFT – ITEM 5 EXEC 
4. DAP: as reqd

I’CNCT RETURN (OPS 2,3)  

1. DAP: FREE
2. OMS 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
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

OPCL/ALL/GEN M

I’CNCT TK SW
I’CNCT RETURN 8-5 XFEED: RCS to RCS XFEED RETURN
RCS RM LOSS

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. Aff jet – desel >>
      If L5D,R5D,F5L, and/or F5R aff:
         3. (Aff) RCS MANF ISOL 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. Aff jet – DES INH (*) (reprioritize)
         6. If auto deselected: resel
         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. Aff jet – 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. Aff jet – 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) RCS MANF ISOL – GPC
2. RCS MANF VLVS OVRD – ITEM 40(41,42,43,44) EXEC
3. Go to MAL, RCS, 10.1b, RM DLMA MANF [T]
RCS TK P LOW (FU or OX)  

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, 10.1a [64]

RCS TK P HIGH (FU or OX)  

1. (Aff) RCS He PRESS (two) – CL (tb-CL)  
2. Go to MAL, RCS, 10.1a [55]

RCS JET FAIL (ON)  

1. (Aff) RCS MANF ISOL – CL (tb-CL)  
2. Go to MAL, RCS, 10.1a [13]

RCS JET FAIL (LEAK)  

If RCS FU and OX qty diverging:  
1. (Aff) RCS MANF ISOL – CL (tb-CL)  
2. Go to MAL, RCS, 10.1a [21]

RCS JET FAIL (OFF)  

If FAIL OFF(s) caused by pwrdn of RJDs:  
1. RJD LOGIC, DRIVER – ON  
2. JET RESET – ITEM 45 EXEC  
3. Resel all FAIL OFF jets  
4. JET RESET – ITEM 45 EXEC  
Otherwise:  
5. Go to MAL, RCS, 10.1a [1]
RCS LEAK ISOL

1. If FU or OX TK P high, go to RCS TK P HIGH (FU or OX) >>
   If FU or OX TK P normal:
   2. √FU(OX) He P (CRT and O3 meter) decr
   3. DAP: FREE

   When proc complete:
   4. If not loss of VERNs: DAP as reqd

SECURE RCS
5. Perform aff RCS SECURE, then:
   If aff RCS was receiving XFEED/I’CNCT when leak occurred:
   6. Go to step 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 MANF 3,4 P decr:
8. Return to normal config except leave aff TK ISOL (1/2 or 3/4/5), MANFs, and corresp XFEED vlvs closed
   If MANF 3/4/5 leg leak:
   9. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

Cont next page
\( \sqrt{\text{He TK}} \)

If He P decr:

1. MCC for use of MAL, RCS SSR-5, LEAKING RCS PRPLT/He BURN

If no comm or burn not performed:

If AFT RCS:

1. Perform XFEED from leaking RCS, then:
   2. When He TK P < 456:
      3. (Aff) RCS He PRESS A,B – CL (tb-CL)
      4. Go to I’CNCT: L(R) OMS to RCS >>
   5. If FWD RCS:
      6. Return to normal config
      7. When He TK P < 456:
         8. FWD RCS He PRESS A,B – CL (tb-CL)
      9. When PRPLT TK P < 190:
         10. Perform RCS SECURE (FWD), then:
            11. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

If burn performed:

If AFT RCS >>

If FWD RCS:

1. When PRPLT TK P < 190:
   2. Perform RCS SECURE (FWD), then:
   3. Go to LOSS OF VERNIERS (ORB OPS, RCS) >>

\( \sqrt{\text{PRPLT TK}} \)

If PRPLT TK P decr:

20. Go to MAL, RCS SSR-5, LEAKING RCS PRPLT/He BURN >>

\( \sqrt{\text{He LEG}} \)

21. (Aff) RCS He PRESS A,B – OP (tb-OP)

If He P decr:

If AFT RCS:

22. (Aff) RCS He PRESS A,B – CL (tb-CL)
23. Perform I’CNCT: L(R) OMS to RCS, then:
24. (Aff) MANFs (all) – OP (tb-OP), GPC

Prior to deorb TIG:

25. Return to RCS straight feed
26. (Aff) RCS He PRESS A,B – CL (tb-CL)
27. Cycle He PRESS A(B) to maintain PRPLT TK P 220-245

When He TK P < 456:

28. Perform I’CNCT: L(R) OMS to RCS, then:
At EI:

29. Go to XFEED: L(R) RCS to R(L) RCS >>

Cont next page

OPCL/ALL/GEN M

**RCS LEAK ISOL** 8-9
If FWD RCS:
30. Return to normal config
31. (Aff) RCS He PRESS A,B – CL (tb-CL)
32. Cycle He PRESS A(B) to maintain PRPLT TK P 220-245
When He TK P < 456:
33. [GNC 23 RCS]
   Ovrd FWD MANFs STAT – CL
34. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
   Prior to deorb:
35. Ovrd FWD MANFs STAT – OP
   When PRPLT TK P < 190:
36. Go to RCS SECURE >>

√XFEED LINES
If aff RCS was feeding XFEED when leak occurred:
37. [GNC 23 RCS]
   RCS L – ITEM 2 EXEC
If XFEED P decr or zero:
38. 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), GPC
39. Do not XFEED/I’CNCT >>

√RCS MANF ISOL 5
If leak not found above:
40. Reconfig sys as reqd
41. (Aff) RCS MANF ISOL 5 – CL
   – GPC (tb-CL)
42. Perform LOSS OF VERNIERS (ORB OPS, RCS), then:
43. Go to MAL, RCS, 10.1a [75]
MAIN PROPULSION SYSTEM
MPS C/W

MPS PNEU He ISOL – OP
FILL/DRAIN LH2 OUTBD – OP
   INBD – OP
LO2 OUTBD – OP
   INBD – OP

√MCC
PWRDN

LOSS OF 2 CAB FANS ............................................................... 10-2
2 H2O LOOPS ....................................................................... 10-7
CAB PRESS ............................................................................ 10-27
HI LOAD EVAP ....................................................................... 10-33
1 FREON LOOP ................................................................. 10-35
1 FC ...................................................................................... 10-39
2nd FC ON-ORBIT (TIG < 4 hr) ......................................... 10-41
(TIG > 4 hr) ....................................................................... 10-45
2 FREON LOOPS ............................................................... 10-49
FES ..................................................................................... 10-69
AV BAY FIRE ........................................................................ 10-73
1 ....................................................................................... 10-73
2 ....................................................................................... 10-77
3A ..................................................................................... 10-81

OV103,104
LOSS OF 2 CAB FANS

1. Perform MS PWRDN, 10-5, ASAP

**NOTE**
Normal CO2 removal and humidity control lost. Wipe off any visible moisture with towel.
Cab press increase due to air heating may cause CAB PRESS RELIEF vlv cycling

2. MSTR MADS PWR – OFF
3. Minimize ltg

FWD 4. All MDU PWR (nine) – OFF
C2 All IDP/CRTs (three) – OFF
F6/F8 √FLT CNTLR PWR (two) – OFF

If FLT CNTLR PWR not reqd:
O14,O15, O16:E 5. cb DDU L,R,AFT (six) – op
L1 6. CAB FAN A,B (two) – OFF
    TEMP CNTLR – OFF
7. HUM SEP A,B (two) – OFF
8. Use one PGSC

W1-10 9. Install Window Shades or mnvr to tail Sun att

[**GNC 201 UNIV PTG**]
TGT ID – ITEM 8 +4 EXEC
BODY VECT – ITEM 14 +5 EXEC
P – ITEM 15 +18 4 EXEC
Y – ITEM 16 +0 EXEC
OM – blank (MCC-provided if reqd)

C3 DAP: A/AUTO/VERN
CRT START TRK – ITEM 19 EXEC (*)

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

Cont next page **OV103,104**
NOTE
Don QDM for temp > 90 degF and discomfort. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON.

Inflate anti-g suit as needed for on-orbit circulatory support.

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

11. Go to LOSS OF 2 CAB FANS (DEORB PREP, CONTINGENCY DELTAS) and perform at next PLS opportunity. Expedite NOMINAL DEORBIT PREP proc 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
   O14:B 2. cb MNA EVENT TIMER AFT – op
   O15:B 3. cb MNB OI H2O BYP LOOP 2 SNSR – op
   O16:C 4. cb MNC SMOKE DETN CAB – op
   L4:J 5. cb AC3 ΦA SIG CONDR HUM SEP – op
   A6U 6. ANNUN BUS SEL – OFF
   A13 7. cb MNA SMOKE KE DETN L/R FLT DK – op

**NOTE**

Galley OVEN/RHS sw should be OFF unless dispensing H2O

**GALLEY**

8. cb MNB MS N TIMER AFT – op
   MA73C:G 9. cb MNB OI H2O HTR (two) – OFF
   ML86B:B 10. cb MNB GALLEY H2O HTR – op

   If RMS pwrd dn:
   A3 11. cb MNB GALLEY H2O HTR (two) – OFF
   A7U 12. cb MNB GALLEY FAN (three) – op
   O19 13. cb MNB GALLEY FAN (three) – op
   R12L 14. cb MNB GALLEY FAN (three) – op
   MO58F 15. cb MNB GALLEY FAN (three) – op

   If not reqd:
   R11L 16. cb MNB GALLEY FAN (three) – op
   A6U 17. cb MNB GALLEY FAN (three) – op

**LOSS OF 2 CAB FANS**

**OV103,104**

ON-ORBIT

MS PAGE A10-5

OPCL/ALL/GEN M,6
PLB EQUIP PWRDN

1. Perform PL SAFING, then:

   **CAUTION**
   If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:

2. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:

If RMS-only:

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

If KU-BD ANT deployed:

4. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:

If radiators deployed:

5. Go to RAD STOW (ORB OPS, ECLS)
LOSS OF 2 H2O LOOPS

NOTES

• THIS PROCEDURE IS TIME CRITICAL
• Proc requires > 45 min, but time critical steps should be done ASAP
• Loss of H2O cooling aff both water and air cooled equipment
• Proc pwrs dn all comm. If comm reqd, preferred comm config in order of heat production:
  1. UHF only
  2. SGLS/STDN LO PWR if reqd
  3. TDRS only if mandatory (10 min max)
• Call ground at every avail UHF site
• Tear out COMM pages from proc and use until touchdown
• Cab depress/repress cycles to 10.2 psia are used for cab temp and humidity control
• If docked to ISS, proc is to be worked simo with JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)
• When pwrdns complete, perform actions on 10-19 and 10-20 as time permits at crew discretion

1. Perform PART 1 of this pwr dn and, based on TIG, complete PART 2 or PART 3
LOSS OF 2 H2O LOOPS, PART 1 – INITIAL PWRDN

TIME CRITICAL PROCEDURES (execute simo)

1. Record MET of 2nd H2O Loop Fail
   ____ / ___:___:___

2. Establish comm plan with MCC, determine best TIG opportunities, then have MS3 perform COMM PWRDN, 10-23, ASAP (S-Bd Pwr Amp may fail in 10 min with no cooling)

3. Have MS perform MS OVHD PNL PWRDN, 10-19, ASAP

4. Have second MS perform MCA CONFIG, 10-17, and PLB EQUIP PWRDN, 10-17, ASAP

5. If docked to ISS, have CDR perform JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)

6. Have PLT proceed with CDR AND PLT PWRDN, ASAP

DETERMINE MAXIMUM TIME TO TIG, NUMBER OF DEP/REP, FROM N2 QTY FROM SPEC 66. Sel best landing site and deorbit TIG from PGSC. Set Wristwatch Timer (A17) counting down to TIG.

Enter TARGETS in LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP)

<table>
<thead>
<tr>
<th>TIG:</th>
<th>TGTS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td></td>
</tr>
<tr>
<td>HT</td>
<td></td>
</tr>
<tr>
<td>Θ</td>
<td></td>
</tr>
</tbody>
</table>

TIG: _____________
TGTS: 
C1 _____________
C2 _____________
HT _____________
ΘT _____________

IF TOTAL N2
NUMBER OF DEP/REP
SEL BEST TIG WITHIN
>160 LB 3 45M - 4H:00M
>120 LB 2 45M - 2H:50M

CDR AND PLT PWRDN

O14, O15, O16:F

7. √Pri RJD LOGIC, DRIVER (sixteen) – ON
   DAP: ALT (proc results in loss of VERNs)
   RJD MANF L5/F5/R5 DRIVER – OFF

C3

8. √MSTR MADS PWR – OFF

9. Minimize ltg

10. Use only one IDP with two MDUs, one PGSC

NOTE
Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 2 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry. IDPs do not require cycling

Cont next page OV103,104
F6,F8,A6 11. FLT CNTLR PWR (three) – OFF, use one as reqd
O7 12. √TACAN MODE sel (three) – OFF
O8 13. √RDR ALTM (two) – OFF
14. √MLS (three) – OFF
L1 15. √H2O PUMP LOOP 1,2 (two) – OFF
(leave ON if any loop running)
HUM SEP (two) – OFF
(leave HUM SEP A ON if any loop running)
If any loop running, minimize bypass:
16. √H2O LOOP 1(2) BYP MODE – MAN
       MAN – DECR (30 sec)
MA73C:A 17. √MCA LOGIC MNA FWD 1 – ON
       (MNB FWD 2 – ON)
L1 18. √CAB FAN (two) – OFF
       TEMP CNTLR – OFF
19. √FLOW PROP VLV LOOP tb (two) – ICH
20. √FREON PUMP LOOP 1 – OFF
       √2 – B
21. HI LOAD DUCT HTR sel – A/B
       √TOP EVAP HTR NOZ L,R (two) – B AUTO(A AUTO)
       √DUCT sel – B(A)
L2 22. √O2 SYS 1 SPLY – CL (tb-CL)
L4:J 23. √cb AC3 ΦA SIG CONDR HUM SEP – op
If not currently single G2, reassign strings to GPC 1 in MC 2:
24. GPC 0 GPC MEMORY
       CONFIG – ITEM 1 +2 EXEC
       Modify MC 2 per table – - - - - - - - - - - - - - - - - -
       CONFIG GPC
       CRT 25. GNC, OPS 201 PRO
       STR 1 1
       2 1
       3 1
       4 1
       1/2 0
       CRT 1 1
       2 1
       3 0
       4 1
27. √GPC MODE 3,5 (two) – HALT
       √OUTPUT 5 – NORM
L1 28. √AV BAY 1 FAN A – ON
      B – OFF
      2,3 FAN A,B (four) – OFF
29. √IMU FAN A – ON
      B – OFF
      √C – OFF
For any fwd IDP/CRT that is OFF:
O6 30. GPC/CRT1/X EXEC
O6 26. √GPC MODE 2 – STBY
       (tb-bp)
       – HALT
       – STBY
       (tb-RUN)
       – HALT
       (tb-bp)
       L 1 0
       2 0
R2 31. HYD CIRC PUMP (three) – ON
Cont next page
C3  32.  C/W MODE – ACK

**NOTE**
For F7 lights, hold in F2 or F4 MA

If current time to TIG < 50 min:

33.  Go to LOSS OF 2 H2O LOOPS, PART 2 – SHORT ON-ORBIT WAIT, next page >>

L1  34.  Cycle CAB FAN A(B) – ON (7 min)/OFF (1 hr) (to control PPCO2)

L4:P  35.  cb AC2,3  \( \Phi \) A LG SNSR (two) – op

**WARNING**
Do not unpwr all IMU/FF MDM’s pairs

If IMU 2 in OPER:

36.  [GNC 21 IMU ALIGN]
IMU 1,3 (two) – desel

O14,O16:A  37.  IMU 1,3 (two) – OFF

If IMU 2 in STBY:

38.  [GNC 21 IMU ALIGN]
IMU 2,3 (two) – desel

O15,O16:A  39.  IMU 2,3 (two) – OFF

O6  40.  MDM FF3,FF4 (two) – OFF

41.  Verify MS OVHD PWRDN complete

**NOTE**
Both MMUs are OFF. If a ROLL-IN DISPLAY is reqd: turn MMU 1 ON, try transaction, turn MMU 1 OFF again

If time from failure to TIG < 2 hr 30 min:

42.  Go to LOSS OF 2 H2O LOOPS, PART 2 – SHORT ON-ORBIT WAIT, next page >>

If time from failure to TIG > 2 hr 30 min:

43.  Go to LOSS OF 2 H2O LOOPS, PART 3 – EXTENDED ON-ORBIT WAIT, 10-13
LOSS OF 2 H2O LOOPS, PART 2 – SHORT ON-ORBIT WAIT

If Undocking from ISS, delay step 1 until after Undocking and Post Final Sep, but continue with steps 2 through 19 of PART 2 – SHORT ON-ORBIT WAIT:

1. Perform POST UNDOCKING AND FINAL SEP RECONFIG, 10-15

BYPASS RADS/FES ACT

ML86B:A 2. cb MNC SPLY H2O XOVR VLV – cl

R11L 3. SPLY H2O XOVR VLV – OP (tb-OP)
√TKA OUTLET – CL (tb-CL)

L1 4. FLASH EVAP CNTLR (three) – OFF

5. HI LOAD EVAP – ENA
RAD BYP VLV MODE 1,2 (two) – MAN
MAN SEL 1,2 (two) – BYP,
wait 3 sec (tb-BYP)

CNTLR LOOP 1,2 (two) – OFF

When EVAP OUT T > 65:

6. FLASH EVAP CNTLR PRI A(B) – ON

7. Wait 1 min, verify EVAP OUT T = 39 degF

8. Give MS GO to perform PLBD CLOSURE, 10-18

If current time to TIG < 50 min, at TIG-30 min:

9. Go to LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP) >>

NOTE
Limit operation of each GPC (1 hr max ON time from second H2O Loop failure)

If reqd, perform steps 10 thru 13:

O6 10. GPC MODE 2 – STBY (tb-RUN), hands off 10 sec
RUN (OUTPUT tb-gray), hands off 10 sec

IDPX 11. In MCX add GPC 2 to tgt set (leave GPC 1 in tgt set)
Assign all strings to GPC2
(if SM GPC active, \PL 1/2 not assigned)
GNC, OPS X01 PRO

\All IDPs deassigned from GPC1

O6 12. GPC MODE 1 – STBY (tb-bp)
– HALT
– STBY (tb-RUN)
– HALT (tb-bp)

L1 13. AV BAY 1 FAN A(B) – OFF
2 FAN A(B) – ON

Wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP)

Cont next page OV103,104
SM GPC/PL MDM Deact – Delay SM GPC/PL MDM Deact
(steps 14-21) until PLBD are closed. Then perform ASAP:

14. **SM T DPS UTILITY**
   UL CNTL ENA – ITEM 36 EXEC
C3

15. UPLK – GPC BLK
C2

16. IDP/CRT1,2,3 MAJ FUNC (three) – GNC
O6

17. GPC MODE 4 – STBY (tb-bp)
   – HALT
   PWR 4 – OFF

18. **GNC 0 GPC MEMORY**
   CONFIG – ITEM 1 +2 EXEC
CRT

19. Assign PL1/2 to GPC 1 in MC2
O6

20. GNC, OPS 201 PRO

21. MDM PL1,PL2 (two) – OFF

22. Perform first cab depress/repress cycle starting at approx 1 hr 15 min after the failure, the final cycle at TIG-20 min. Procs in the 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS); use until last depress/repress is complete

**NOTE**
Possible cab air OVBD RLF due to loss of cab cooling.

Use Quick Don mask as needed to provide additional respirator cooling during periods of high cab temp and humidity. To determine health of crewmember, place temp strip (MED Kit) on forehead. If any crewmember temp greater than 99 degF and crew feels ill, begin cab depress/repress cycle ASAP

At TIG-30 min:

23. Go to LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP) >>

OV103,104
LOSS OF 2 H₂O LOOPS, PART 3 – EXTENDED ON-ORBIT WAIT

If Undocking from ISS, delay step 1 until after undocking and Post Final Sep, but continue with steps 2 thru 6:

1. Perform POST UNDOCKING AND FINAL SEP RECONFIG, 10-15

2. √GPC MODE 2,3,5 (three) – HALT
3. PWR 2,3,5 (three) – OFF

When RMS PWRDN (PDRS OPS) complete, perform steps 4 thru 6 ASAP:

4. GPC MODE 4 – STBY (tb-bp), hands off 10 sec
   – RUN (tb-RUN), hands off 10 sec
   OUTPUT 4 – NORM (tb-gray)
5. [GNC 0 GPC MEMORY]
   CONFIG – ITEM 1 +2 EXEC

Modify MC 2 per table – – – – –
GNC, OPS 201 PRO

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPC</td>
<td>10040</td>
</tr>
<tr>
<td>STR</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>PL</td>
<td>1/2</td>
</tr>
<tr>
<td>CRT</td>
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</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
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<td>1</td>
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<tr>
<td>MM</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

6. GPC MODE 4 – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)

   PWR 4 – OFF

Delay steps 7 thru 20 of PART 3 – EXTENDED ON-ORBIT WAIT, 10-14, until POST UNDOCKING AND FINAL SEP RECONFIG is complete (perform step 19 as reqd):

Cont next page  **OV103,104**
Establish free drift:

- **F8**  Verify att mnvr complete
  - ADI ATT – INRTL

- **C3**  DAP: B/AUTO/PRI (wait 30 sec)
  - FREE

- **O6**  MDM PL1,PL2 (two) – OFF

- **O6**  Wrist watch set to MET

Pwr dn remaining GPC:

- **O6**  GNC, OPS 000 PRO

- **O6**  GPC MODE 1 – STBY (tb-bp)
  - HALT
  - STBY (tb-RUN)
  - HALT (tb-bp)

- **O6**  GPC PWR 1 – OFF

- **C2,R11L**  All MDU PWR (eleven) – OFF

- **L1**  AV BAY FAN (six) – OFF

- **O13:C**  cb ESS 2CA MTU B – op
  - 3AB GPC STAT – op

- **O14:B**  MNA MSN TIMER FWD – op
  - SMOKE DETN L/R FLT DK – op

- **W1-10**  Install Window Shades

- **W1-10**  Check all pwrdns complete

- **W1-10**  Perform first cab depress/repress cycle starting at approx 1 hr 15 min after the failure, the second at TIG-1:15 and the final cycle at TIG-20 min. Procs in the 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS); use until last depress/repress is complete

  **NOTE**
  Possible cab air OVBD RLF due to loss of cab cooling.

  Use QDM as needed to provide additional respirator cooling during periods of high cab temp and humidity. To determine health of crewmember, place temp strip (MED Kit) on forehead of CDR and PLT

- **O14:C**  Go to LOSS OF 2 H2O LOOPS, ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS)
POST UNDOCKING AND FINAL SEP RECONFIG

If Undocking with ISS and Final Sep complete or if not docked with ISS:

1. **GNC 20 DAP CONFIG**
   - DAP A, B set to A1, B1 except:
     - (A) ITEM 10 +1.0 0 EXEC
     - ITEM 11 +3.0 0 EXEC
     - ITEM 15 EXEC (TAIL)
     - ITEM 16 EXEC (TAIL)
     - (B) ITEM 30 +0.2 0 EXEC
     - ITEM 31 +1.0 0 EXEC
     - ITEM 35 EXEC (TAIL)
     - ITEM 36 EXEC (TAIL)

   **CAUTION**
   - DO NOT mnvr on PRCS until MS has completed RMS JETT or STOW

2. Mnvr to tail Sun att:
   - **GNC 201 UNIV PTG**
   - TGT ID – ITEM 8 +4 EXEC
   - BODY VECT – ITEM 14 +5 EXEC
   - P – ITEM 15 +2 2 5 EXEC
   - Y – ITEM 16 +0 EXEC
   - OM – blank (MCC-provided as reqd)
   - DAP: A/AUTO/PRI
   - START TRK – ITEM 19 EXEC (CUR-

   If IMU 2 in OPER:

   O6
   3. MDM FF1 – OFF

   If IMU 2 in STBY:

   O6
   4. MDM FF2 – OFF

   O14, O15, O16:F
   5. RJDF LOGIC, DRIVER (eight) – OFF

   **NOTE**
   - Expect FRCS jet(s) to false fail leak when OF DSC cbs are opened

   O14:B
   6. cb MNA OI SIG CONDR OF 1/4 A – op

   O15:B
   7. cb MNB OI SIG CONDR OF 1/4 B – op

   O16:B
   8. cb MNC OI SIG CONDR OF 2/3 B – op

   O16:E
   9. DDU AFT – op

**OV103,104**
MCA CONFIG (Execute ASAP)

L1 If either H2O PUMP LOOP 1 A(B) – ON:

MA73C:A 1. Leave MCA LOGIC MNA FWD 1(MNB FWD 2) ON in next step

**CAUTION**
Coordinate steps 2 and 3 with CDR. FRCS is lost with step 2 and recovered with step 3

MA73C:A 2. MCA LOGIC MNA,B,C (fourteen) – OFF

3. **GNC 23 RCS**
   ITEM 1 EXEC (FRCS page)
   OVRD FRCS MANF(s) – OP

4. For PLB EQUIP PWRDN, use 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 sw config until step 8 of the PLB EQUIP PWRDN. Disregard MCA sw throws in the PL SAFING, RAD STOW, KU-BD ANT STOW, and RMS PWRDN procs

MO13Q 5. √AIRLK FAN A,B (two) – OFF

PLB EQUIP PWRDN (Execute ASAP)

1. Perform PL SAFING, then:

**CAUTION**
If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

2. If TV reqd for OBSS jettison or RMS/Ku stow, perform ACTIVATION and OPERATION (Auto Ops only) (Cue Card, TV)
   If RMS grappled to OBSS:
   3. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:
   If RMS-only:
   4. Perform RMS PWRDN (PDRS OPS), then:

Cont next page

LOSS OF 2 H2O LOOPS ON-ORBIT MS PAGE OV103,104

A10-17 OPCL/ALL/GEN M
If KU-BD ANT deployed:
5. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:

If radiators deployed:
6. Perform RAD STOW (ORB OPS, ECLS), then:
7. Notify CDR: RMS stowed (jettisoned)

If performing PART 2 – SHORT ON-ORBIT WAIT:
8. Perform PLBD CLOSURE, below, on GO from CDR, then:

MA73C:A 9. MCA LOGIC MNA MID 1,3 (two) – OFF
B MNB MID 2,3,4 (three) – OFF
MNC MID 2,4 (two) – OFF

PLBD CLOSURE (Short On-Orbit Wait only)

WARNING
Verify no obstructions before closing and latching PLBD (Ku ANT, RAD, RMS, etc)

1. Notify CDR: Beginning PLBD CLOSURE
O6 2. √ MDM PL1,PL2 (two) – ON
3. SM I/O RESET
CRT4 4. SM, OPS 202 PRO – close PLBD ASAP
5. [SM PL BAY DOORS]
R13L 6. AC POWER ON – ITEM 1 EXEC
CRT4 AUTO MODE SEL – ITEM 3 EXEC
R13L PBD SW BYPASS – ITEM 14 EXEC
R11L CLOSE – ITEM 17 EXEC

If ‘PLB SEQ FAIL’ msg during door closure and aft latches for that door are not ‘CL’:
7. Check door scallop on or below tgt line before continuing in MAN mode; otherwise:
8. Perform MAL, MECH SSR-2, L CONTINGENCY PLBD CLOSURE, then:

After PLBD closed:
CRT4 9. PBD STOP – ITEM 16 EXEC
AC POWER OFF – ITEM 2 EXEC
R13L 10. PL BAY DR SYS (two) – DSBL
GPC/CRT 0/4 EXEC
R11L 11. IDP/CRT4 PWR – OFF
A7U 12. √ PL BAY FLOOD (all) – OFF
If either H2O PUMP LOOP 1 A(B) – ON:
MA73C:A 13. Leave MCA LOGIC MNA FWD 1 (MNB FWD 2) – ON in next step
MA73C 14. MCA LOGIC MNA,B,C (fourteen) – OFF
15. Notify CDR: PLBDs closed

LOSS OF 2 H2O LOOPS TO
ON-ORBIT
MS PAGE OV103,104
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 __ __ __/__ __:__ __:__ __

2. Minimize ltg on Aft Flt Deck

O13:A 3. cb ESS 1BC MTU A – op
    :C 2CA C/W B – op

O14:A 4. √ BRAKES MNA – OFF
    :B 5. cb MNA OI H2O BYP LOOP 1 SNSR – op
        EVENT TIMER AFT – op
        √ ADTA 1 – op
        DDU L,AFT (two) – op

O15:A 6. √ BRAKES MNB – OFF
    :B 7. cb MNB OI H2O BYP LOOP 2 SNSR – op
        MSN TIMER AFT – op
        EVENT TIMER FWD – op
        √ ADTA 2 – op
        DDU L,R (two) – op

    :F 8. MMU 2 – OFF

O16:A 9. √ BRAKES MNC – OFF
    :E 10. √ cb MNC ADTA 3,4 (two) – op
        DDU R – op

When N2 QTY and TIG determined by CDR:

O14:B 11. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O15:B MNB OI MDM OF 1/2 B – op
O16:B MNC OI MDM OF 3/4 B – op
O14:F MMU 1 – OFF

A13 12. GPS PWR – OFF

13. Notify CDR: MS OVHD PNL PWRDN complete
14. Assist other MS with completion of PLB EQUIP PWRDN, 10-17
When pwrdns complete, perform following at crew discretion:

**FLUID LOADING PREP**

**GALLEY**
1. OVEN/RHS – ON
2. Unstow, fill 4 water containers (per crewmember) with 8 oz of water each. Temp stow near seat
3. Unstow 8 salt tablets (per crewmember). Temp stow in Flt Suit pocket
4. OVEN/RHS – OFF
5. √H2O HTRS (two) – OFF
6. √OVEN FAN – OFF
7. Stow Personal Hygiene Hose

**NOTE**
Ensure sufficient containers and salt tablets are prepared to continue fluid loading thru entry

**FLUID LOADING**
1. Immed begin drinking H2O (one 8-oz container every 15 min with a salt tablet in every other container) and continue through entry

**CLOTHING CONFIG**
1. Don QDM for temp > 90 degF and discomfort

**FDF CONFIG**
1. Unstow: ENT, ENT PKT, Deor Burn Cards, ENT Cue Cards

**CAB CONFIG**
1. Stow loose equipment, Backup PGSC
2. Remove and stow side hatch UV filter, locking device, and pyro box safing pin
3. Tape foot loops in egress routes
4. Remove and stow Window Shades (if not needed for cab T control)
WCS DEACT

WCS 1. Foot Restraints – up, locked
ML31C 2. √VAC VENT ISOL VLV CNTL – OP (tb-OP)

INSTALL SEATS

POLE SETUP

1. ESCAPE POLE SETUP:
   - Reinstall Stbd pip pin and Large Port pin
   - Retract and hold Locking Pin(Ring)
   - Reinstall Large pin
   - Release Locking Pin(Ring)
   - Slide forward Safing latch
   - Verify pole straps secure

2. Check minimum ltg on Middeck
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NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

MS After comm plan established with MCC, perform COMM PWRDN ASAP (delay 10 min max)

CAUTION
Must complete steps 1 thru 3 within 10 min. TDRS or STDN – HI AOS is limited to 10 min or power amp will overheat

NOTE
Proc pwrs 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 sel – STDN LO
      XPNDR – OFF

2. NSP PWR – OFF
   ENCRYPTION PWR – OFF
   (Encrypt OFF rest of flt)
   MODE – SEL
   SEL – BYP

   NOTE
   Verify CDR ready for COMM PWRDN prior to performing step 3

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)
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>O5</td>
<td>6. L AUD PWR – OFF (turn ON as reqd for ICOM audio)</td>
</tr>
<tr>
<td>O6</td>
<td>7. UHF MODE sel – OFF</td>
</tr>
<tr>
<td>O9</td>
<td>8. R AUD PWR – OFF (turn ON as reqd for ICOM audio)</td>
</tr>
<tr>
<td></td>
<td>√PWR SYS – OFF</td>
</tr>
<tr>
<td>A1R</td>
<td>10. PL DATA INTLVR PWR – OFF</td>
</tr>
</tbody>
</table>
| A3 | 11. S-BD FM CNTL – PNL  
| | PWR – OFF |
| A7U | 12. MON 1,2 PWR (two) – OFF |
| R14:B | 13. TV PWR CONTR UNIT – OFF  
| :D | TV (fourteen) – op  
| :E | MNB VPU – op  
| L9,R10 | 14. cb MNA,MNC GCILC (two) – op  
| A13 | 15. PS,MS AUD PWR (two) – OFF |
| MO42F | 16. OS AUD SPKR PWR – OFF  
| 17. MIDDECK SPKR AUD SPKR PWR – OFF |
| 18. Call ground at every avail UHF site per COMM POWERUP, 10-25; voice down cab temp, crew body temps, heart rates, and words to indicate severity of cab humidity |
| If MCC request data on cab environ or Av bays: | 19. Perform CABIN ENVIRONMENT MONITOR (CONT DEORB, LOSS OF 2 H2O LOOPS), then: |
| If after TIG-10 min: | 20. Perform AFT PNL CONFIG FOR ENTRY COMM (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP) |
COMM POWERUP (If comm reqd prior to landing site coverage)

Pwr up audio sys:

C3  1.  AUD CTR – 1
O5  2.  L AUD PWR – AUD
O9  3.  R AUD PWR – AUD

If UHF avail, config for UHF comm (voice only):

O6  4.  UHF MODE sel – SPLX
    √ SPLX/EVA PWR AMPL – ON

3.  After comm with MCC complete: Go to COMM PWRDN, steps 5 thru 8, 10-23 >>

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 sel – STDN LO(SGLS)
    XPNDR – 2

5.  NSP PWR – 2
    √ DATA RATE XMIT – HI
    √ RCV – HI
    CODING XMIT – OFF
    RCV – OFF
    √ UPLK DATA – S-BD

C3/F9  6.  Sel best S-BD PM ANT

If MCC requests data:

O15:B  7.  cb MNB OI SIG CONDR OF 1/4 B,2/3 A
    (two) – cl
O14:B  8.  cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
C3  9.  OI PCMMU PWR – 1
O6  10.  MDM PL2 – ON
       11.  BFS, GNC I/O RESET

At end of data transmission:

O14:B  12.  cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O15:B  13.  cb MNB OI SIG CONDR OF 1/4 B,2/3 A
    (two) – op

If not reqd for PLBD CLOSURE:

O6  14.  MDM PL2 – OFF

After comm/data complete:

L  15.  Go to COMM PWRDN, 10-23 >>

~

Cont next page

LOSS OF 2 H2O LOOPS
ON-ORBIT
MS PAGE

OV103,104

A10-25
OPCL/ALL/GEN M
NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

If UHF site and GSTDN unavail and comm/data critical:
Config for TDRS S-BD during AOS

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  16. S-BD PM CNTL – PNL
    A1L S-BD PM ANT SW ELEC – 2
        PRE AMP – 2
        PWR AMPL OPER – 2
        MODE sel – TDRS DATA
        XPNDR – 2

17. NSP PWR – 2
    DATA RATE XMIT – HI
    RCV – HI
    CODING XMIT – ON
    RCV – ON
    UPLK DATA – S-BD

C3/F9  18. Sel best S-BD PM ANT
If MCC requests data:

O15:B  19. cb MNB OI SIG CONDR OF 1/4 B,2/3 A (two) – cl

O14:B  20. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl

C3  21. OI PCMMU PWR – 1

O6  22. MDM PL2 – ON

23. BFS, GNC I/O RESET
    At end of data transmission:

O15:B  24. cb MNB OI SIG CONDR OF 1/4 B,2/3 A (two) – op

O14:B  25. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
    If not reqd for PLBD CLOSURE:

O6  L  26. MDM PL2 – OFF
    After comm/data complete:

27. Go to COMM PWRDN, 10-23

LOSS OF 2 H2O LOOPS
ON-ORBIT MS PAGE

OV103,104
LOSS OF CAB PRESS

CDR  Perform JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)
MS1,MS2  Perform procs on 10-30
PLT  Perform following pwrdn

NOTE
Cab press will stabilize at 8 psia for following EQ dP/dT values:
< 0.6 for Orbiter + Airlock
< 0.4 for Orbiter + Airlock + Spacehab.

If docked to ISS, undocking will be performed with Single G2 (i.e., no +Z redundancy)

C3  1. MSTR MADS PWR – OFF
   2. Minimize ltg
   3. Use one IDP/CRT with two MDUs, as reqd (IDP4 preferable)
   4. Use one PGSC, FLT CNTRL PWR as reqd
   If FLT CNTRL PWR not reqd:
      5. cb DDU L,R,AFT (six) – op

O14,O15, O16:E
      6. √TACAN MODE sel (three) – OFF
      7. √MLS (three) – OFF
      8. √RDR ALTM (two) – OFF
      L1  8. CAB TEMP CNTRL – OFF
      9. HUM 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:
      12. RAD CNTRL OUT TEMP – HI
      When EVAP OUT T > 50 degF:
      13. FLASH EVAP CNTRL PRI A(B) – ON, then
           immed:
           14. RAD CNTRL OUT TEMP – NORM
      If EVAP OUT T < 41 or > 47 degF:
      L  15. FLASH EVAP CNTRL PRI A(B) – ON
      L2  16. √ANTISKID – OFF
           √NWS – OFF
      L4:L  17. cb ΦA CAB T CNTRL 1,2 (two) – op

Cont next page  OV103,104
If orbit 2,3 deorbit due to cab leak:
   18. Use DEORB PREP/ENTRY DELTAS PULLOUT PAGE, 10-31, then go to LAUNCH DAY DEORBIT PREP (ORBIT 2(3)) (CONT DEORB, LAUNCH DAY ORBIT 2(3)) >>

If orbit 3 deorbit due to fire, tox spill, or glass in cabin:
   19. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB, LAUNCH DAY ORBIT 3) >>

W1-10 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 +1 8 4 EXEC
   Y – ITEM 16 +0 EXEC
   OM – blank (MCC-provided if reqd)
   C3 DAP: A/AUTO/VERN
   CRT START TRK – ITEM 19 EXEC

If time to TIG < 4 hr:
   21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hr:
   If currently in single G2 GPC OPS:
      22. Perform G2 SET EXPANSION, target Dual G2 (ORB OPS, DPS), then:

Cont next page  **OV103,104**
REASSIGN STRINGS TO GPC 2 IN MC 2

NOTE
If Av Bay 2 fire and TIG > 4 hr:
   Reassign strings to GPC in unaffected Av Bay

23. GNC 0 GPC MEMORY
    CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table
    DOWNLIST GPC –
    ITEM 44 +2 EXEC

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

24. GNC, OPS 201 PRO
25. GPC MODE 1(3) – STBY
    – HALT
    – STBY (tb-RUN)
    – HALT (tb-bp)
    PWR 1(3) – OFF
    √MODE 3,5 (two) – HALT (tb-bp)

26. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)
MS PWRDN

CDR, MS1  Perform PLB EQUIP PWRDN (below)
MS2  Perform remaining pwrdsn

O14, O15,
1. cb ADTA (four) – op
O16:E
2. cb MNC RCS/OMS PRPLT QTY GAUGE – op
If TIG > 2 hr 40 min:
O14:B
3. cb MNA EVENT TIMER AFT – op
O15:B
4. MNB MSN TIMER AFT – op
A7U
5. TV PWR CNTL – PNL
       CONTR UNIT – OFF
A13
6. OS AUD SPKR PWR – OFF
L9
7. PS AUD PWR – OFF
MO42F
8. MIDDECK SPKR AUD SPKR PWR – OFF
MO58F
9. TV PWR – OFF

When RMS pwrdsn:
A3
10. MON PWR (two) – OFF
R14:E
11. cb CAMR (six) – op
MD44F
12. Cab temp cntl act link – pin to FULL COOL, stow link >>

PLB EQUIP PWRDN

13. If orbit 2,3 deorbit >>
14. Perform PL SAFING, then:

   CAUTION
If stow prob occurs with either RMS and/or
KU-BD ANT, perform aff sys QUICK
RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
15. Perform OBSS JETTISON (PDRS OPS FS,
      OBSS CONTINGENCY), then:
If RMS-only:
16. Perform RMS PWRDN (PDRS OPS), then:
If KU-BD ANT deployed:
17. Perform KU-BD ANT STOW (ORB OPS,
       COMM/INST), then:
If radiators deployed:
18. Go to RAD STOW (ORB OPS, ECLS)

LOSS OF CAB PRESS
ON-ORBIT
MS PAGE

OV103,104
DEORB PREP/ENTRY DELTAS PULLOUT PAGE

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

Single fault tolerance used for most cab air-cooled equipment. Add'l LRUs may be activated if reqd and if CAB PRESS stable $\geq$ 8 psia

A. Deltas to the LAUNCH DAY ORBIT 2(3) (CONT DEORB)
   1. Minimize use of IDPs, MDUs, FLT CNTRL PWR, DDU. Use one PGSC
      If rev 2:
      2. APU HTRS & DED DISP ENT CONFIG [3]
         Do not pwr TACANs
      If rev 3:
      3. ENT FWD FLT DECK CONFIG [10]
         Do not pwr MLS,TACANs
      4. In ENT SW LIST/VER, do not activate pwrdn items

B. Deltas to DEORBIT BURN (ENT)
   At TIG-4:
   1. Use two IDP/CRTs with four MDUs as reqd for deorbit burn
   O14,O15, O16:E
   2. cb DDU L,R (four) – cl
   F6,F8
   3. L,R FLT CNTRL PWR (two) – ON

C. Deltas to POST BURN (ENT)
   1. Use one IDP/CRT with two MDUs as reqd
   F6,F8
   O14,O15, O16:E
   2. L,R FLT CNTRL PWR (two) – OFF
   3. cb DDU L,R,AFT (six) – op
   4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
D. Deltas to ENTRY MANEUVERS (Cue Card)

At EI:
1. Use two IDP/CRTs with four MDUs as reqd
2. cb DDU L,R (four) – cl
3. L,R FLT CNTLR PWR (two) – ON
4. cb ADTA 1,2,3 (three) – cl
5. BFS, GNC I/O RESET

At V = 15K:
   If CAB P < 8 psia:
      6. Delete NAVAIDS callout
   If CAB P ≥ 8 psia:
      7. Activate all TACANs, RAs, MLSs
         GNC I/O RESET
         At M < 1.0, go to step 11

At V = 10K:
8. TACAN 2,3 MODE sel (two) – GPC

At M = 2.7:
9. Use two HUDs, MLSs, and RAs as reqd
10. GNC I/O RESET

At M < 1.0:
11. ANTISKID – ON
12. NWS – 1
LOSS OF HI LOAD EVAP

NOTE
MAL, ECLS SSR-2, FES CORE FLUSH
PROCEDURE should be performed if core icing is suspected. If unsuccessful, perform pwrdn prior to RAD BYPASS at TIG-2:50 during deorb prep. If already in deorb prep, perform pwrdn and review activities already performed for changes.

1. √MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs, one FLT CNTLR PWR, and one PGSC as reqd
4. Perform PL PWRDN, then:
5. √TACAN MODE sel (three) – OFF
6. √RDR ALTM (two) – OFF
7. √MLS (three) – OFF
8. √FLOW PROP VLV LOOP tb (two) – ICH
9. √HI LOAD DUCT HTR sel – OFF
10. TV MON (two) – OFF
If FLT CNTLR PWR not reqd:
11. cb DDU L,R,AFT (six) – op
12. Reset EVAP OUT T C&W upper limit (ch 107,117) to 2.15V (70 degF). Change B/U C&W parameter, 0631207, 0631407 upper limit to 70

A. Deltas to NOMINAL DEORBIT PREP (DEORB PREP) if not already performed
At TIG-03:00, prior to RAD BYP:
1. H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
   FLASH EVAP CNTLR PRI A – OFF
   SEC – ON
   √HI LOAD EVAP – OFF
Perform RAD BYPASS/FES C/O (ORB OPS, ECLS):
Delete steps 3 and 5 thru 8 (SEC FES C/O)
At TIG-03:15 in DED DISP ENT CONFIG:
2. Do not pwr NAV/LDG AIDS, ADTAs
   Pwr DDUs, MDUs only as reqd

Cont next page

OV103,104
At TIG-01:50, ENT SWITCH LIST/VERIF:

3. Do not pwr NAVAIDS, ADTAs
   Delete BRAKE/ANTISKID ACT
4. Go to LOSS OF HI LOAD EVAP DEORB OR
   ENTRY PULLOUT PAGE (ENT PKT, PWRDN)

B. Deltas to DEORBIT BURN (ENT)

At TIG-10:

O14,O15, O16:E
1. cb DDU L,R (four) – cl
2. Use two IDP/CRTs with four MDUs, and two FLT CNTLR PWR for burn

At TIG-5:

L1
3. TOP EVAP HTR NOZ (two) – OFF
   DUCT sel – OFF

C. Deltas to POST BURN (ENT)

F6,F8
1. L,R FLT CNTLR PWR (two) – OFF
2. cb DDU L,R (four) – op (save for entry)

O14,O15, O16:E
3. Use one IDP/CRT with two MDUs
4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

D. Deltas to ENTRY MANEUVERS (Cue Card)

At EI:

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

O14,O15, O16:A
4. BRAKES (three) – ON
O14,O15, O16:E
5. cb ADTA 1,2,3 (three) – cl

L2
6. GNC I/O RESET
7. NWS – 1
8. ANTISKID – ON

At V = 15K:

O7
9. Delete NAVAIDS callout
10. TACAN 2,3 MODE sel (two) – GPC

At M = 2.7:

11. Use two HUDs, MLSs, and RAs
12. GNC I/O RESET

OV103,104
**LOSS OF 1 FREON LOOP**

**MS**
- Perform MS PWRDN, 10-36

**C3**
1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs as reqd, and one PGSC
   
   If FLT CNTLR PWR not reqd:

**O14,O15,**
4. cb DDU L,R,AFT (six) – op

**O16:E**
5. If reqd, perform PL PWRDN, then:

**L1**
6. √FLOW PROP VLV LOOP tb (two) – ICH
7. H2O LOOP 2(1) BYP MODE – MAN
   
   MAN – DECR (hold 30 sec)

[SM SYS SUMM 2]

If EVAP OUT T not ~39 degF and stable:
8. Perform TOPPING FES STARTUP (ORB OPS, ECLS), then:

If prior to deorb prep:
   
   If dual or triple G2:
9. Perform G2 SET CONTRACTION (ORB OPS, DPS) to single G2, then:

**O15:F**
10. MMU 2 – OFF
11. Mnvr to shade windows from sun or install
   
   Window Shades

[SM SYS SUMM 1]
12. Check kW; if >14 kW: Perform PRIOR PWRDN (numbered) (except FES and one PGSC) until ≤ 14 kW, then:
13. Use UNDOCKING/DEORB/ENTRY DELTAS PULLOUT PAGE, 10-37, for changes to UNDOCKING/DEORB PREP and ENT >>

If in deorb prep:

**F6,F8**
14. √FLT CNTLR PWR (two) – OFF
15. Use one IDP/CRT with two MDUs, as reqd

**O7**
16. TACAN MODE sel (three) – OFF

**O8**
17. RDR ALTM (two) – OFF
18. MLS (three) – OFF

**L2**
19. ANTISKID – OFF
   
   NWS – OFF
20. Continue with DEORB PREP; use UNDOCKING/DEORB/ENTRY DELTAS PULLOUT PAGE, 10-37, for changes

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**OV103,104**
MS PWRDN

1. Minimize ltg on Aft Flt Deck and Middeck
2. cb TV (fifteen) – op
3. CAMR (six) – op
4. MON 1,2 PWR (two) – OFF

If in deorb prep:
5. BRAKES (three) – OFF
6. cb ADTA (four) – op
UNDOCKING/DEORB/ENTRY DELTAS PULLOUT PAGE

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN.

Incorporate following changes or remove these pages for use with the indicated checklist or cue card.

Undocking from ISS will be performed with Single G2 (i.e., no +Z redundancy)

Perform NOMINAL DEORBIT PREP (DEORB PREP) with the following contingency deltas to the procedure

A. Deltas to DEORB PREP
1. Use one FLT CNTLR PWR, DDU, PGSC, and one IDP/CRT with two MDUs, as reqd
2. Minimize ltg
3. Minimize sun in cab if possible
If rev 3 deorb, deltas to LAUNCH DAY ORBIT 3 (CONT DEORB):
4. ENT FWD FLT DECK CONFIG 10
   Do not pwr MLS,TACANs
If nominal deorb prep:
   Deltas to NOMINAL DEORBIT PREP (DEORB PREP):
5. Verify steps 14 thru 20, 10-35, MS, steps 7,8, 10-36
6. DED DISP ENT CONFIG [6]
   Do not pwr ADTAS,TACANs
   Add: Pwr NAV/LDG AIDS per ENTRY MANEUVERS (Cue Card)
   Minimize MDU use
7. ENT SWITCH LIST/VERIF
   Do not pwr LRUs previously pwrd dn

B. Deltas to DEORBIT BURN (ENT)
1. Maintain window shading att until TIG-15
   At TIG-15:
   2. Remove Window Shades if installed
   At TIG-10:
   O14,015,016:E
   3. cb DDU L,R (four) – cl
   4. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

Cont next page
C. Deltas to POST BURN (ENT)

1. L, R FLT CNTLR PWR (two) – OFF
2. cb DDU L, R (four) – op
3. Use one IDP/CRT with two MDUs
4. Delete ANTISKID, NWS callouts
   (ENTRY SW CHECK)

D. Deltas to ENTRY MANEUVERS (Cue Card)

At EI:

1. cb DDU L, R (four) – cl
2. L FLT CNTLR PWR – ON
3. Use two IDP/CRTs with four MDUs
4. BRAKES (three) – ON
   cb ADTA 1,2,3 (three) – cl
   GNC I/O RESET
   L2
   ANTISKID – ON
   NWS – 1

At V = 15K:
5. Delete NAVAIDS callout
   TACAN MODE sel (two) – GPC

At V = 12K:
6. Perform RAD FLOW in unfailed loop
   (Cue Card)
At M = 2.7:
7. Use two HUDs, MLSs, and RAs
   GNC I/O RESET

E. Deltas to POST LDG (ENT)

If EVAP OUT T high and incr, go to EMER PWRDN
   (Cue Card)

F. Deltas to EVAP OUT TEMP HIGH (Cue Card)

If EVAP OUT T HIGH and V > 12K:
   Establish RAD FLOW in unaff loop:
   L1
   1. RAD BYP VLV MODE 1(2) – AUTO
      CNTLR LOOP 1(2) – AUTO A(B)
   2. Perform EVAP OUT T HIGH (Rads
      Coldsoaked), steps 2 thru 4
   If EVAP OUT T HIGH and V < 12K:
      If loop 1(2) lost:
   L1
   3. NH3 CNTLR B(A) – PRI/GPC
LOSS OF 1 FC

If before deorb prep:

L1
1. √CAB FAN A(B) – ON
   If total Orb kW > 18:
   2. Perform PRIOR PWRDN, GROUP 1,2 (except FES), then:
   3. Perform PL PWRDN
   If FC 1 or 2 failed:
   R1
   4. √MN BUS TIE A,B (two) – ON
      √C – OFF
   If FC 3 failed:
   5. PL PRI MNB – ON
      MNC – OFF
      FC3 – OFF
   6. √MN BUS TIE C,A (two) – ON
      √B – OFF
   If any FC AMPS > 330 or ∆AMPS > 100:
   7. Perform MAL, EPS SSR-8, BUS LOADING – LRU SELECT, then:
   8. Go to step 18
   If in deorb prep:
   9. Minimize ltg
   10. Use only one DDU, and FLT CNTLR PWR as reqd.
   One IDP/CRT off as reqd
   O7
   11. TACAN MODE sel (three) – OFF
   O8
   12. RDR ALTM (two) – OFF
   13. MLS (three) – OFF
   L1
   14. √CAB FAN A(B) – ON
   R14:D
   15. cb TV (fifteen) – op
   :E
   16. MON 1,2 PWR (two) – OFF
   A3
   17. CRYO TK HTR (four) – OFF
   If FC recoverable:
   18. Go to MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE >>
   If FC unrecoverable:
   19. Make FDF Delta changes as given (next page), then as time permits reconfig C/W limits per MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE

Cont next page  OV103,104
FDF changes:

A. Deltas to DEORBIT BURN (ENT) 
TIG-5:
L1
1. TOP EVAP HTR NOZ (two) – OFF 
   DUCT sel – OFF 
   HI LOAD DUCT HTR sel – OFF 
   HUM SEP (two) – OFF 
L2 
   FLASH EVAP FDLN HTR SPLY (two) – OFF

B. Deltas to EPS proc in this book 
1. FC REACTANT VLV CLOSED: Delete step 6; 
   Change step 2 to read: 
   If aff FC/MN bus tied and COOL P > 40: 
   2. MN BUS TIE (three) – ON (ASAP) 
      (Aff) MN BUS TIE (one) – OFF (ASAP) 
2. FC COOL P: Delete step 1 
3. BUS TIE, steps 1,7: Delete ‘(A to...A)’ 
4. FC1(2,3) H2 PUMP ↑↓: Replace step 3 with: 
   If aff FC/MN bus tied: 
   3. MN BUS TIE (three) – ON 
      (Aff) MN BUS TIE (one) – OFF 
5. FC SAFING: Replace steps 7,8 with: 
   If aff FC/MN bus tied: 
   7. MN BUS TIE (three) – ON 
   8. (Aff) MN BUS TIE (one) – OFF 
6. FC H2O RLF NOZ TEMP ↑↓: Replace step 3 with: 
   If aff FC/MN bus tied: 
   3. MN BUS TIE (three) – ON 
      (Aff) MN BUS TIE (one) – OFF 
7. FC DELTA V 1(2,3): 
   Delete step 1 
   Add ‘MN BUS TIE (three) – ON, then:’ to 
   beginning of step 4

C. Deltas to EPS (ENT PKT) 
1. Perform LOSS OF 1 FC, part B, steps 1 thru 8 (ENT 
   PKT, PWRDN), then: 
   If in deorb prep: 
   2. Go/return to NOMINAL DEORBIT PREP (DEORB 
      PREP) >>

D. Deltas to FLIGHT PLAN at 10 min prior to ‘Go to DEORB 
   PREP’, add: ‘perform LOSS OF 1 FC, steps 9 thru 17 
   (ORB PKT, PWRDN)’

OV103,104
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 pwrdown and the deorbit prep require 1.5 hr)

NOTE
Do NOT perform BUS LOSS ACTION unless
bus shorted (step 29 regains bus)

* FC capability is ~12 kW for sustained operations, *
* ~13 kW for short duration (~4 hr), ~16 kW for *
* contingency situations (~10 min). Purge FC at  *
* 430 amps or less

MS
3. Perform AFT PNL PWRDN, 10-43, immed

C3
4. √MSTR MADS PWR – OFF
5. Minimize ltg
6. Use only one DDU, PGSC, and FLT CNTLR PWR as
   reqd. One IDP/CRT off as reqd

O7
7. √TACAN MODE sel (three) – OFF

O8
8. √RDR ALTM (two) – OFF

MS
9. √MLS (three) – OFF

If GPC 2 on:
10. [GNC 0 GPC MEMORY]
    CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table – – – –

For any IDP that is OFF:
11. GPC/CRT1/X EXEC
12. √DOWNSLIT GPC (ITEM 44) – 1
13. GPC MODE 2 – STBY (tb-bp)
    PWR 2 – OFF
14. √MODE 3, 5 (two) – HALT (tb-bp)
    PWR 3 – OFF
15. √MMU 2 – OFF

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<tr>
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</tr>
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</tr>
</tbody>
</table>

Cont next page

OV103,104
16. **GNC 20 DAP CONFIG**
   Sel TAIL PRI P,Y OPTION
   Sel PRI JETS

O7 17. AFT L,R RCS MANF ISOL 4 (two) – CL
O14,O15, 18. RJDF DRIVER (four) – OFF
O16:F  19. MDM FF4 – OFF
O6 20. RJDA 2A L4/R4 DRIVER – OFF
L1: 21. √ FLOW PROP VLV LOOP tb (two) – ICH
L1: 22. [SM 88 APU/ENVIRON THERM]
L1: 23. H2O LOOP 2 BYP MODE – MAN
   MAN – INCR(DEC)
   (adjust until ICH FLOW ~950)

If no MANF leak:

R1 24. √ O2,H2 MANF VLV (four) – OP
   TK1 HTRS B – AUTO (MNA or MNB ↓) or
   TK2 HTRS B – AUTO (MNC or no
   MN BUS ↓), then:
   All others OFF
If MANF leak:

R2 25. √ O2/H2 HTR LOSS TABLE (EPS), 5-20
   Sel one htr in one O2,H2 TK

L4:L 26. HYD CIRC PUMP (three) – OFF
   cb AC1,2 φA CAB T CNTRL 1,2 (two) – op
If not MN bus short, tie three MN BUSES:

L1 27. Perform BUS TIE (Cue Card), then:
   Post BUS TIE config check:

L1 28. CAB FAN A(B) – ON

L1 29. Perform RCS SECURE, FWD RCS only (RCS), 8-2,
   then:
L1 30. Perform MAL, EPS SSR-3, FC SHUTDN C&W LIMIT
   CHANGE, then:
L1 31. Go to LOSS OF 2 FC (CONT DEORB). Refer to
   Activities Priority Table for activities to be performed in
   the CONT DEORB
AFT PNL PWRDN

A11  1. CRYO TK HTR (four) – OFF
A12  2. APU HTR LUBE OIL LN (three) – OFF
     3. HYD HTR (eight) – OFF
A14  4. RCS/OMS HTR FWD RCS – OFF
     RCS JET (five) – OFF
     5. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or
KU-BD ANT, perform aff sys QUICK
RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
   6. Perform OBSS JETTISON (PDRS OPS FS,
      OBSS CONTINGENCY), then:
   If RMS-only:
      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 (ORB OPS, ECLS), then:
A3   10. MON PWR (two) – OFF
R14:D 11. cb TV (fifteen) – op
         :E  CAMR (six) – op
ML86B:C 12. √cb MNB EXT AIRLK HTR VEST Z1/2/3 – op
   If MMU is pwrd:
         :D  13. cb MNA MMU PORT HTR A – op
              STBD HTR A – op
              MNB MMU PORT HTR B – op
              STBD HTR B – op
MD44F  14. Cab temp cntl act link – pin to FULL COOL
LOSS OF 2nd FC ON-ORBIT (TIG > 4 hr)

NOTE
Do NOT perform BUS LOSS ACTION unless bus shorted (step 8 regains bus).

If docked with ISS, perform PWRDN completely prior to undocking

* FC capability is ~12 kW for sustained operations,
  ~13 kW for short duration (~4 hr), ~16 kW for contingency situations (~10 min). Purge FC at * 430 amps or less

MS 1. Perform MS OVHD AND AFT PNL PWRDN, 10-47, immed
C3 2. √ MSTR MADS PWR – OFF
   [GNC 21 IMU ALIGN]
3. IMU 1,2 (two) – desel
   If GPC 2(3) on:
4. [GNC 0 GPC MEMORY
   CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table – – – – –
   \DOWNLIST GPC
   (ITEM 44) – 1

 CRT  GNC, OPS 201 PRO
 For any IDP that is OFF:
O6  5. GPC/CRT1/X EXEC
6. GPC MODE 2 – STBY (tb-bp) – HALT
   PWR 2 – OFF
   \MODE 3,5 (two) – HALT (tb-bp)
   \PWR 3 – OFF
7. MMU 2 – OFF
   If not MN bus short, tie three MN buses:
8. Perform BUS TIE (EPS), 5-16, then:
9. Minimize ltg
10. Use one DDU, PGSC, and FLT CNTLR PWR as reqd.
   Use one IDP/CRT with four MDUs
O7 11. √ TACAN MODE sel (three) – OFF
O8 12. √ RDR ALTM (two) – OFF
13. √ MLS (three) – OFF
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 AC1,2 φA CAB T CNTLR 1,2 (two) – op
18. Perform GG FREE DRIFT, ATT ID B (mnvr in PRI, establish drift in VERN) (ORB OPS, RCS), then:
   If docked with ISS, have ISS establish mated att control
19. Set event timer for 30 min (for FES duct htr deact)

O14,O15, O16:F
20. RJD LOGIC, DRIVER (seventeen) – OFF

O6
21. MDM FF1,FF2,FF4 (three) – OFF
   FA1,FA2,FA3,FA4 (four) – OFF

L1
22. TOP EVAP HTR NOZ L,R (two) – OFF
23. √HI LOAD DUCT HTR sel – OFF
24. SM 88 APU/ENVIRON THERM
25. H2O LOOP 2 BYP MODE – MAN
   MAN – INCR(DECR)
   (adjust until ICH FLOW ~950)

R1
26. √O2,H2 MANF VLV (four) – OP
   TK1 HTRS B – AUTO (MNA or MNB ↓) or
   TK2 HTRS B – AUTO (MNC or no
   MN BUS ↓), then:
   All others OFF

If MANF leak:
27. √O2/H2 HTR LOSS TABLE (EPS), 5-20
   Sel one htr in one O2,H2 TK

R2
28. BLR CNTLR/HTR (three) – OFF
29. HYD CIRC PUMP (three) – OFF

R4
30. Verify RMS, KU-BD ANT, and RADS stowed, then:
   MCA LOGIC (fourteen) – OFF

B
If H2O LOOP 2 failed:
31. MCA LOGIC MNB FWD 2 – ON
30 min after FES deact:

L1
32. TOP EVAP HTR DUCT sel – OFF
33. Perform MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE, then:
   If docked with ISS, perform UNDOCKING DELTAS
   prior to undocking
34. Go to LOSS OF 2 FC (CONT DEORB)

OV103,104
A10-46               OPCL/ALL/GEN M
MS OVHD AND AFT PNL PWRDN

O14:A 1. IMU 1 – OFF (confirm IMU desel)
O15:A 2. IMU 2 – OFF (confirm IMU desel)
O16:E 3. cb MNC RCS/OMS PRPLT QTY GAUGE – op
R14:D 4. TV (fifteen) – op
A11 5. CRYO TK HTR (four) – OFF
A12 6. APU HTR LUBE OIL LN (three) – OFF
7. HYD HTR (eight) – OFF
A14 8. RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – OFF
ML31C 9. VAC VENT NOZ HTR – OFF
ML86B:A 10. cb MNA H2O LN HTR A – op
11. cb MNB H2O LN HTR B – op
C 12. √cb MNB EXT AIRLK HTR VEST Z1/2/3 – op
If MMU is pwrd:
D 13. cb MNA MMU PORT HTR A – op
STBD HTR A – op
MNB MMU PORT HTR B – op
STBD HTR B – op
MD44F 14. Cab temp cntl act link – pin to FULL COOL
15. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
16. Berth OBSS or perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:
If RMS-only:
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 (ORB OPS, ECLS), then:
20. Report to CDR: RMS, KU-BD ANT, and RADS stowed
O14:F 21. MMU 1 – OFF
R14:E 22. cb CAMR (six) – op
A3 23. MON PWR (two) – OFF

LOSS OF 2nd FC
ON-ORBIT (TIG > 4 hr)
MS PAGE

OV103,104
OPCL/ALL/GEN M,6
UNDOCKING DELTAS

NOTE
Following steps reqd to recover RCS functionality prior to undock

1. One hour prior to undock:
   A14  RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – ON
   O14,O15, 2. RJD LOGIC, DRIVER (seventeen) – ON
   O16:F 3. MDM FF1, FF2, FA1, FA2 (four) – ON

After undocking complete and post Final Sep:
4. Perform GG FREE DRIFT, ATT ID B (mnr in PRI.
   Establish drift in VERN) (ORB OPS, RCS), then:
   O14,O15, 5. RJD LOGIC, DRIVER (seventeen) – OFF
   O16:F 6. MDM FF1, FF2, FA1, FA2 (four) – OFF
   O6 7. RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – OFF
LOSS OF 2 FREON LOOPS

<table>
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<th>WARNING</th>
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<tr>
<td>FC purge must be started and loads pwr'd dn ASAP</td>
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<tr>
<td>Orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP with all three FCs running. This assumes three FCs are pwr'd dn to a total level of 8 kW imm'd and are continuously purged</td>
</tr>
<tr>
<td>Earliest possible landing is req'd</td>
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</tbody>
</table>

NOTES

- Failure assumed to occur after GO for On-orbit and before Deorbit TIG-2:05
- COMM procs, 10-65 thru 10-68, should be used throughout this proc and CONT DEORB
- Preferred comm config is:
  A. UHF only
  B. GSTDN S-BD if reqd
  C. TDRS only if mandatory
- If docked to ISS, this proc is to be worked simo with JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)
TIME CRITICAL PROCEDURES

NOTE
Undocking will be performed with Single G2
(i.e., no +Z redundancy)

1. If in OPS 1: Go to LOSS OF 2 FREON LOOPS (POST OMS-2)
   (ASC PKT, PWRDN) >>
2. Have CDR perform JOINT EXPEDITED UNDOCKING AND
   SEPARATION (SODF: JOINT OPS)
3. Have MS exec RAD STOW, KU-BD ANT STOW, and PLBD
   CLOSE, 10-57, ASAP
4. Have second MS exec RMS STOW and MS OVHD AND AFT PNL
   CONFIG, 10-59 thru 10-62, ASAP
5. Have third MS exec COMM PWRDN, 10-65; delay 10 min max if
   AOS

Perform following steps ASAP:
O14,O15, 6. √Pri RJD LOGIC, DRIVER (sixteen) – ON
O16:F
   DAP: ALT (this proc results in loss of VERNs)
O16:F
   RJD MANF L5/F5/R5 DRIVER – OFF
7. Record MET of failure of 2nd FREON LOOP:
   ___/___ ___:___ ___:___ ___
   C3
8. MSTR MADS PWR – OFF
   MS R11U
9. √FC PURGE HTR – ON
10. √VLVS 1,2,3 (three) – OP
11. Minimize ltg
   CRTX
12. Use only one fwd IDP/CRT with one MDU (save IDP3
    for entry)
   F6/F8
13. Use only one PGSC
   F6/F8
14. √FLT CNTLR PWR (two) – OFF, as reqd
Config GPC 1 to MC 2:

15. **GNC 0 GPC MEMORY**

16. **CONFIG – ITEM 1 +2 EXEC**

   If not GNC 201, then:
   17. GNC, OPS 201 PRO
   18. Modify MC 2 per table

**NOTE**

The following must be an OPS mode recall:

GNC, OPS 201 PRO

For any IDP that is OFF:

19. **GPC/CRT1/X EXEC**

   C3

   20. √BFC CRT DISP – OFF

   O6

   21. 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

   O7

   22. √TACAN MODE sel (three) – OFF

   O8

   23. √RDR ALTM (two) – OFF

   24. √MLS (three) – OFF

   C3

   25. FCS CH (four) – AUTO

   R4

   26. MPS MANF PRESS (two) – CL

   R2

   27. HYD CIRC PUMP (three) – OFF

   28. MPS He ISOL (six) – CL

   PNEU He ISOL – CL

   L ENG He XOVR – CL

   L1

   29. HUM SEP (two) – OFF

   30. √IMU FAN B – ON

   A,C (two) – OFF

Cont next page

OV103,104

A10-51 OPCL/3,4 /GEN M
31. Cab temp cntl act link – pin to FULL COOL

32. CAB FAN A,B (two) – OFF

33. √AV BAY 1 FAN A – OFF
   √2,3 FAN A,B (four) – OFF
   √4 FAN B – ON

34. FREON PUMP LOOP 1,2 (two) – OFF (one-ON, if any flow)

35. RAD CNTLR LOOP 1,2 (two) – OFF

36. √NH3 CNTLR A,B (two) – OFF
   If no FREON PUMPS ON, then:

37. O2 SYS 1,2 SPLY (two) – OP (tb-OP)

38. FLASH EVAP CNTLR PRI A,B (two) – OFF
   TOP EVAP HTR NOZ (two) – OFF
   DUCT sel – OFF

39. HI LOAD DUCT HTR sel – OFF

40. FLASH EVAP FDLN HTR SPLY (two) – OFF
   If one FREON PUMP ON:

41. FLASH EVAP CNTLR PRI A – ON

42. TOP EVAP HTR NOZ (two) – OFF
   DUCT sel – ON

43. HI LOAD DUCT HTR sel – ON

44. FLASH EVAP FDLN HTR B SPLY – OFF

45. √ANTISKID – OFF

46. √NWS – OFF

47. S TRK PWR -Y,-Z (two) – OFF

48. ANNUN BUS SEL ACA 2/3 – OFF
   [GNC 21 IMU ALIGN]

49. IMU 1,2 (two) – desel
   – OFF

50. IDP/CRT MAJ FUNC (three) – GNC

51. GPC MODE 4 – STBY (tb-bp)
   – HALT
   PWR 4 – OFF
   [GNC 0 GPC MEMORY]

52. CONFIG – ITEM 1 +2 EXEC

53. Assign PL1/2 to GPC 1 (provides Uplk path)

54. GNC, OPS 201 PRO

CAUTION
Do not perform steps 50 thru 56 until PLBDs are closed
55. All IDPs, MDUs – OFF (use one IDP/CRT with one MDU as reqd until CONT DEORB proc, 3 min OFF for each min ON)

O6 56. MDM FF1,4 (two) – OFF
   FA1,4 (two) – OFF

F6 57. CDR disp sws – green dot

NOTE
If no site avail, bailout will be reqd; TIG will = MET of 2nd FREON LOOP failure + 1 hr

58. Sel ELS TIG ≤ 1 hr after MET of 2nd FREON LOOP failure (from MCC or PGSC):
   Selected TIG ___:___:___ MET
   (-) Present TIME ___:___:___ MET
   (=) Time to TIG ___:___:___ MET

If PL MDMs not currently being used for comm:
59. Verify PLBDs are closed, then:

O6 √ 60. cb AC3 ΦA SIG CONDR HUM SEP – op
   ΦB SIG CONDR IMU FAN – op

L4:J 61. AC1 ΦA CAB T CNTLR 2 – op
   ΦB AV BAY 2 S/C – op

:L 62. AC2 ΦA CAB T CNTLR 1 – op
   ΦB AV BAY 3 S/C – op

   AC3 ΦA H2O CNTLR 1 – op

R1 63. MN BUS TIE (three) – ON

R2 64. √O2,H2 MANF VLV TK1,TK2 (four) – op
   TK2 HTRS A,B (four) – OFF
   TK1,TK3 HTRS A,B (eight) – AUTO

If O2 TK1(TK3) QTY < 80%:
65. O2 TK1,TK3 HTRS A (two) – OFF

If not docked with ISS or when undocking complete and Post Final Sep:
66. BLR CNTLR/HTR 2 – OFF
   PWR 2 – OFF

67. Perform POST UNDOCKING AND FINAL SEP RECONFIG, 10-55

68. Go to ENTRY CONFIG (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP) by ~ TIG-15 >>
POST UNDOCKING AND FINAL SEP RECONFIG

1. DAP: FREE
O14, O15, O16

2. RJD LOGIC, DRIVER (seventeen) – OFF

3. cb MNA OI SIG CONDR OF 1/4 A – op
O14:B

4. cb MNB OI SIG CONDR OF 1/4 B – op
O15:B

5. cb MNC OI SIG CONDR OF 2/3 A – op
O16:B

6. √cb L,R,AFT DDU (six) – op
O14, O15, O16:E

OV103,104
MS PULLOUT PAGE

MS    Execute ASAP

R11U   1. FC PURGE HTR – ON
        VLVS (three) – OP
  2. Minimize ltg on Aft Flt Deck

NOTE
For following RAD STOW, KU-BAND ANT
STOW, and PLBD CLOSE procs, use the
following MCA config. Disregard MCA sw
throws in other procs until PLB doors closed

MCA LOGIC CONFIG

MA73C:A,  3. √ All MCA LOGIC (fourteen) – ON
        B
          4. MCA LOGIC 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

5. GNC 23 RCS
   ITEM 1 EXEC (FRCS page)
   OVRD FRCS MANF(s) – OP

   CAUTION
   If stow prob occurs with KU-BD ANT,
   perform QUICK RESPONSE JETTISON
   (CONT DEORB)

If KU-BD ANT deployed:
  6. Perform KU-BD ANT STOW (ORB OPS,
     COMM/INST), then:
If radiators deployed:
  7. Perform RAD STOW (ORB OPS, ECLS), then:

Cont next page

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE

OV103,104

A10-57 OPCL/ALL/GEN M,6
PLBD CLOSURE

WARNING
Verify no obstructions before closing and latching PLBD (Ku ANT, RAD, RMS, etc)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>√ MDM PL1, PL2 (two) – ON</td>
</tr>
<tr>
<td>2</td>
<td>SM I/O RESET</td>
</tr>
<tr>
<td>3</td>
<td>Verify PL SAFING complete</td>
</tr>
<tr>
<td>4</td>
<td>SM PL BAY DOORS</td>
</tr>
<tr>
<td>5</td>
<td>PL BAY DR SYS 1,2 (two) – ENA</td>
</tr>
<tr>
<td>6</td>
<td>AC POWER ON – ITEM 1 EXEC</td>
</tr>
<tr>
<td>7</td>
<td>AUTO MODE SEL – ITEM 3 EXEC</td>
</tr>
<tr>
<td>8</td>
<td>PBD SW BYPASS – ITEM 14 EXEC</td>
</tr>
<tr>
<td>9</td>
<td>CLOSE – ITEM 17 EXEC</td>
</tr>
<tr>
<td>10</td>
<td>If ‘PLB SEQ FAIL’ msg during door closure and aft latches for that door are not ‘CL’:</td>
</tr>
<tr>
<td>11</td>
<td>Check door scallop on or below tgt line before continuing in MAN mode; otherwise:</td>
</tr>
<tr>
<td>12</td>
<td>Perform MAL, MECH SSR-2,</td>
</tr>
<tr>
<td>13</td>
<td>CONTINGENCY PLBD CLOSURE, then:</td>
</tr>
<tr>
<td>14</td>
<td>PBD STOP – ITEM 16 EXEC</td>
</tr>
<tr>
<td>15</td>
<td>AC POWER OFF – ITEM 2 EXEC</td>
</tr>
<tr>
<td>16</td>
<td>GPC/CRT 04 EXEC</td>
</tr>
<tr>
<td>17</td>
<td>IDP/CRT4 PWR – OFF</td>
</tr>
<tr>
<td>18</td>
<td>PL BAY DR SYS (two) – DSBL</td>
</tr>
<tr>
<td>19</td>
<td>√ FLOOD (all) – OFF</td>
</tr>
<tr>
<td>20</td>
<td>All MCA LOGIC sw except MNA FWD 1 (thirteen)</td>
</tr>
<tr>
<td>21</td>
<td>MCA LOGIC MNA FWD 1 – ON</td>
</tr>
<tr>
<td>22</td>
<td>GNC 23 RCS ITEM 1 EXEC (FRCS page)</td>
</tr>
<tr>
<td>23</td>
<td>OVRD FRCS MANF(s) – OP</td>
</tr>
<tr>
<td>24</td>
<td>Report to CDR: RMS, KU-BD ANT, and RADS stowed; PLBD closed</td>
</tr>
<tr>
<td>25</td>
<td>Go to FLUID LOADING PREP, 10-63</td>
</tr>
</tbody>
</table>
RMS STOW

NOTE
For following RMS STOW, use following MCA config. Disregard MCA sw throws in other procs until PLB doors closed.

MA73C:A
1. \(\sqrt{\text{MCA LOGIC MNA MID 1}}\) – ON
2. Perform PL SAFING, then:

CAUTION
If stow prob occurs with RMS, perform QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
3. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:

If RMS-only:
4. Perform RMS PWRDN (PDRS OPS), then:

MS OVHD AND AFT PNL CONFIG

O13:A
1. cb ESS 1BC C/W A – op
2. CB 2CA C/W B – op
3. CB ESS 2CA MTU B – op
4. CB ESS 3AB GPC STAT – op

O13:B
1. CB ESS 1BC CRYO QTY O2,H2 TK2 (two) – op
2. CB FAULT SUMM and SM ALERT light remains

O13:C
1. CB ESS 2CA C/W B – op

O13:E
1. CB MNA OI SIG CONDR OM 1/2 A – op
2. CB MNA OI MDM OF 1/2 A – op
3. CB MNA OI MDM OF 3/4 A – op
4. CB MNA OI H2O BYP LOOP 1 SNSR – op
5. CB MNA MSN TIMER FWD – op
6. CB MNA EVENT TIMER AFT – op

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE

OV103,104
O14:C 5. cb MNA UTIL PWR O19/MO52J – op
   :D FREON RAD CNTLR 1,2 (two) – op
   :D O2/N2 CNTLR 1 – op (leave cl if PCS 1 active)
   :D CAB VENT – op
   :D VENT ISOL – op
   :E \√ADTA 1 – op
   :E \√ACCEL 1 – op
   :E DDU L,AFT (two) – op
   :F 6. MMU 1 – OFF
   :F 7. ASA 1 – OFF
O15:A 8. \√BRAKES MNB – OFF
   :B 10. cb MNB OI MDM OF 1/2 B – op
   :B H2O BYP LOOP 2 SNSR – op
   :B MSN TIMER AFT – op
   :B EVENT TIMER FWD – op
   :C \√UTIL PWR F1/MO13Q – op (leave cl if PGSC reqd)
   :D FREON RAD CNTLR 1,2 (two) – op
   :D O2/N2 CNTLR 2 – op (leave cl if PCS 2 active)
   :E ADTA 2 – op
   :E ACCEL 2 – op
   :E DDU L,R (two) – op
   :F 11. MMU 2 – OFF
   :F 12. ASA 2 – OFF
   :F 13. ACCEL 4 – OFF
O16:A 14. \√BRAKES MNC – OFF
   :B 16. cb MNC OI MDM OF 3/4 B – op
   :B AUX TIMING BUFF – op
   :C 17. CRYO O2 HTR TK2 SNSR 1 – op
   :C If GALLEY:
   :C 18. cb MNC UTIL PWR A11/A15/MO30F – op

Cont next page
O16:C 19. cb MNC ANNUN AFT ACA 4/5 – 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
O17: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, wait 2 sec, then
       2 – OFF
MO58F 27. TV PWR – OFF
O19 28. COAS – OFF
A11 29. CRYO TK4 HTR O2,H2 A,B (four) – OFF
A12 30. APU HTR GAS GEN/FU PUMP 2 – OFF
   LUBE OIL LN 1,2,3 (three) – OFF
   APU HTR TK/FU LN/H2O SYS
       1B,2A,2B,3A (four) – OFF
       1A,3B (two) – AUTO
   31. HYD HTR (eight) – OFF
A13 32. OS AUD SPKR PWR – OFF
   33. GPS PWR – OFF
       PRE AMPL (two) – OFF
A14 34. RCS/OMS HTR FWD RCS – OFF
   L,R,POD (four) – OFF
   OMS CRSFD LN (two) – OFF
   FWD RCS JET (five) – OFF
   AFT RCS JET (five) – OFF
A15 If OV-103:
   35. PTU/MAIN BUS A,B (two) – OFF (tb-OFF)
A6U 36. FLT CNTLR PWR – OFF, as reqd
   37. ANNUN BUS SEL – OFF

Cont next page

LOSS OF 2 FREON LOOPS
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A10-61 OPCL/3,4/GEN M,2
R14:A  38. cb MNA ADC 1A/2A – op
       MNB ADC 1B/2B – op
: B    MNA, MNB, MNC PALLET DSC (three) – op
: D    39. TV (fifteen) – op
: E    CAMR (six) – op
L9, R10  40. PS, MS AUD PWR (two) – OFF
        41. Minimize Middeck ltg
ML31C  42. VAC VENT NOZ HTR – OFF
ML86B:A  43. cb MNB H2O LN HTR B – op
If MMU is pwrd:
   :D  44. cb MNA MMU PORT HTR A – op
       STBD HTR A – op
       MNB MMU PORT HTR B – op
       STBD HTR B – op
MO39M  45. MIDDECK COMM CCU PWR – OFF
MO42F  46. SPKR AUD PWR – OFF
If no GALLEY:
   46. Go to step 49
GALLEY  47. OVEN/RHS – OFF
        H2O HTR (two) – OFF
        OVEN FAN – OFF
   48. Go to step 51
   49. FOOD WARMER – OFF
   50. H2O DISPENSER PWR pb – OFF
MD44F  51. Cab temp cntl act link – pin to FULL COOL
MO13Q  52. All MIDDECK lts – lt off
FLUID LOADING PREP

GALLEY 1. OVEN/RHS – ON
2. Unstow, fill 4 water containers (per crewmember) with 8 oz of water each. Temp stow near seat
3. Unstow 8 salt tablets (per crewmember). Temp stow in Flt Suit pocket
4. OVEN/RHS – OFF
5. √ H2O HTR (two) – OFF
6. √ OVEN FAN – OFF
7. Stow Personal Hygiene Hose

NOTE
Ensure sufficient containers and salt tablets are prepared to continue fluid loading thru entry

FLUID LOADING

Immed (or as soon as time permits), begin drinking H2O (one 8-oz container every 15 min with a salt tablet in every other container); continue thru entry

CLOTHING CONFIG

Don QDM for temp > 90 degF and discomfort. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON

NOTE
Inflate anti-g suit as needed for on-orbit circulatory support

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 D/O PREP)

CAB CONFIG

1. Stow loose equipment
After Deorbit Targeting complete:
2. Stow Backup PGSC
3. Remove and stow Side hatch UV filter, 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)

LOSS OF 2 FREON LOOPS
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MS PAGE
OV103,104

A10-63 OPCL/ALL/GEN M
WCS DEACT

WCS 1. Foot Restraints – up, locked
ML31C 2. VAC VENT ISOL VLV CNTL – CL (tb-CL)

POLE SETUP

Perform ESCAPE POLE STOWAGE/SETUP (Cue Card), then:

SEAT INSTALLATION

1. Confirm minimum Itg on Middeck
2. Unstow LOSS OF 2 FREON LOOPS D/O PREP (CONT DEORB);
   perform MS PAGE procs
NOTE
The COMM PWRDN and POWERUP procs on this and following pages should be used until Touchdown

COMM PWRDN

MS
Pwr dn comm ASAP after comm with MCC no longer reqd.
Delay 10 min max if AOS. Use COMM POWERUP, 10-67, if MCC comm reqd. Comm will be pwr'd on entry by AFT PNL
CONFIG FOR ENTRY COMM, MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP) 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 sel – STDN LO
   XPNDR – OFF

2. NSP PWR – OFF
   ENCRYPTION PWR – OFF
   (Encrypt disabled rest of flt)
   ENCRYPTION MODE – SEL
   SEL – BYP

C3
3. S-BD PM CNTL – PNL,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. S-BD FM CNTL – PNL
   PWR – OFF

A3
6. MON PWR (two) – OFF

A7U
7. TV PWR CONTR UNIT – OFF

O6
8. UHF MODE sel – OFF

R12L
9. MDM PL1,PL2 (two) – OFF

R14:B
10. VTR PWR – OFF

11. cb MNA,MNC GCILC (two) – op

Cont next page

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS COMM PAGE

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NOTE
During each comm window, voice down cab temp, crew body temps and heart rates, per COMM POWERUP, 10-67; indicate severity of cab humidity

If after TIG-10:
12. Go to AFT PNL CONFIG FOR ENTRY COMM, MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP)
COMM POWERUP (If comm reqd prior to landing site coverage)

Pwr up audio sys:

C3 1. AUD CTR – 1
O5 \L AUD PWR – AUD
O9 \R AUD PWR – AUD

If UHF avail, config for UHF comm (voice only):

O6 2. UHF MODE sel – SPLX
\SPLX/EVA PWR AMPL – ON
3. After comm with MCC complete: Go to COMM PWRDN, 10-65 >>

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 sel – STDN LO(SGLS)
XPNDR – 2
5. NSP PWR – 2
DATA RATE XMIT – HI
RCV – HI
CODING XMIT – OFF
RCV – OFF
\UPLK DATA – S-BD
C3/F9 6. Sel best S-BD PM ANT

If MCC requests data:

O14:B 7. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
O17:D 8. SIG CONDR OA 1/2/3 – ON
9. MDM OA 1/2/3 – ON
C3 10. OI PCMMU PWR – 1
O6 11. MDM PL2 – ON
12. GNC I/O RESET

At end of data transmission:

O14:B 13. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O17:D 14. SIG CONDR OA 1/2/3 – OFF
15. MDM OA 1/2/3 – OFF
After comm/data complete:

L 16. Go to COMM PWRDN, 10-65

Cont next page
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 after S-BD PM PNL/CMD before Pwr Amp is active. Uplink not affected. Proceed with selection of best antenna

C3  17. $\sqrt{\text{S-BD PM CNTL – PNL}}$
A1L  18. $\sqrt{\text{ANT SW ELEC – 2}}$
A1L  19. $\sqrt{\text{PWR AMPL OPER – 2}}$
A1L  20. $\sqrt{\text{XPNDR – 2}}$
A1L  21. $\sqrt{\text{S-BD PM MODE sel – TDRS DATA}}$
C3/F9  22. $\sqrt{\text{XPLK DATA – S-BD}}$
C3  23. $\sqrt{\text{NSP PWR – 2}}$
C3  24. $\sqrt{\text{DATA RATE XMIT – HI}}$
C3  25. $\sqrt{\text{NSP DATA RATE RCV – HI}}$
C3  26. $\sqrt{\text{NSP CODING XMIT – ON}}$
C3  27. $\sqrt{\text{NSP CODING RCV – ON}}$
C3  28. $\sqrt{\text{UPLK DATA – S-BD}}$
C3/F9  29. $\sqrt{\text{S-BD PM ANT}}$

If MCC requests data:

O14:B :  21. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
O17:D :  22. SIG CONDR OA 1/2/3 – ON
C3  :  23. MDM OA 1/2/3 – ON
C3  :  24. OI PCMMU PWR – 1
O6  :  25. MDM PL2 – ON
O6  :  26. GNC I/O RESET
C3  :  27. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O14:B :  28. SIG CONDR OA 1/2/3 – OFF
O17:D :  29. MDM OA 1/2/3 – OFF

At end of data transmission:

O14:B :  30. Go to COMM PWRDN, 10-65

After comm/data complete:

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS COMM PAGE  

OV103,104
LOSS OF FES

MS
Perform MS PWRDN, 10-71, immed

C3
1. √MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one PGSC, and one IDP/CRT with two MDUs only as reqd

If FLT CNTLR PWR not reqd:

O14,O15,
4. cb DDU L,R,AFT (six) – op

O16:E

O7
5. √TACAN MODE sel (three) – OFF

O8
6. √RDR ALTM (two) – OFF
7. √MLS (three) – OFF
8. Perform PL PWRDN, then:

L1
9. CAB TEMP CNTLR – OFF
10. H2O LOOP 2 BYP MODE – MAN

PUMP LOOP 1 (two) – OFF, B

11. √FLOW PROP VLV LOOP tb (two) – ICH
12. √TOP EVAP HTR NOZ L,R (two) – OFF

DUCT sel – OFF

13. √HI LOAD DUCT HTR sel – OFF

L2
14. √NWS – OFF

15. √ANTISKID – OFF

L4:L
16. cb CAB T CNTLR 1,2 (two) – op

R2
17. BLR CNTLR/HTR (three) – OFF

MMU 2 deact:

18. √[SM 1 DPS UTILITY]

MMU ASSIGN 1 SM – ITEM 3 EXEC

O15:F

If IMU ALIGN not reqd, mnvr to tail Sun att:

19. √[GNC UNIV PTG]

TGT ID – ITEM 8 +4 EXEC

BODY VECT – ITEM 14 +5 EXEC

P – ITEM 15 +1 8 4 EXEC

Y – ITEM 16 +0 EXEC

OM – ITEM 17 +9 0 EXEC (β < 0)

+2 7 0 EXEC (β > 0)

START TRK – ITEM 19 EXEC

20. Confirm MS pwrdn activities complete, then:

For deorbit prep:

21. Go to LOSS OF FES (CONT DEORB)
MS PULLOUT PAGE

MS2 Deploy rads, RAD DEPLOY (ORB OPS, ECLS)
MS1 Perform pwrdn below

MS PWRDN

1. Minimize ltg
2. √BRAKES (three) – OFF
3. √cb ADTA (four) – op
4. MSN TIMER FWD – op
5. MSN TIMER AFT – op
6. PL DATA INTLVR PWR – OFF
7. APU HTR LUBE OIL LN (three) – OFF
8. HYD HTR (eight) – OFF
9. RCS/OMS HTR FWD RCS – OFF
   R, L R POD (four) – OFF
   OMS CRSFD LN (two) – OFF
10. cb TV (fifteen) – op
    :E
11. MON 1,2 PWR (two) – OFF
    A3
12. VAC VENT NOZ HTR – OFF
    ML31C
13. cb MNA,MNB STBD HTR A,B (two) – op
    PORT HTR A,B (two) – op
    ML86B:D
14. Cab temp cntl act link – pin to FULL COOL
    MD44F

If Manned Mnvr Unit is pwrd:

OV103,104
AV BAY FIRE

AV BAY 1

While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
- FPCA 1 MDM OF1
- FLCA 1 DSC OF1
- IMU FAN ACCU

If docked with ISS, proc results in loss of Lo Z Translation.

If no active GNC GPC: Perform GNC RECOVERY VIA G2FD (DPS), 3-12, concurrent with remainder of this proc

R1
1. cb AC CONTR AC1 (three) – cl
2. INV/AC BUS 1 – OFF (tb-OFF)
3. cb AC CONTR AC1 (three) – op
4. Perform FC1 SHUTDN, except PWRDN (Cue Card), then:
   L1
   5. √AV BAY 1 FAN A,B (two) – OFF
   6. FREON PUMP LOOP 2 – A
   7. AV BAY 3 FAN A – ON
   B – OFF
   C3
   8. OI PCMMU FORMAT – FXD
   PWR – 2
   O6
   9. BFC CRT DISP – ON
   10. √GPC PWR 5 – ON
   OUTPUT 5 – NORM
   MODE 5 – STBY (tb-RUN), RUN
   11. 4 – STBY (tb-bp), HALT
   PWR 4 – OFF

If GNC RECOVERY VIA G2FD (DPS), 3-12, performed:
12. Go to step 15

If Single G2 GPC OPS:
13. Perform G2 SET EXPANSION, target Dual G2 (ORB OPS, DPS), then:
If/when in Multiple GPC OPS:
14. Reassign strings to GPC 2 in MC 2

[GN C 0 GPC MEMORY]
CRT

CONFIG – ITEM 1 +2 EXEC
Modify MC 2 per table — — — —

DOWNLIST GPC – ITEM 44
+2 EXEC

GPC, OPS 201 PRO

O6 15. GPC MODE 1(3) – STBY (tb-bp)
– HALT

PWR 1 – OFF

16. MDM FF1 – OFF

PL1 – OFF

17. Perform PL_PWRDN, then:

O7 18. TACAN 1 MODE sel – OFF

O8 19. RDR ALTM 1 – OFF

20. MLS 1 – OFF

21. GNC 23 RCS

CRT

RCS FWD – ITEM 1 EXEC (*)
MANF VLVS STAT OVRD – ITEM 41 EXEC –

CL (MANF 2)

O13:A 22. cb ESS 1BC AC1 SNSR – op

:E 3AB GPC STAT – op

O14:A 23. BRAKES MNA – OFF

:C 24. cb MNA TACAN 1 – op

:E 25. RDR ALTM 1 – op


MLS 1 – op


ADTA 1 – op


ACCEL 1 – op

:F 26. MMU 1 – OFF

27. RJDF 1B F1 LOGIC – OFF

DRIVER – OFF

O15:F 28. RJDF 1A F2 LOGIC – OFF

DRIVER – OFF

29. ACCEL 4 – OFF

O16:A 30. BRAKES MNC – OFF

:E 31. cb MNC ADTA 3 – op

A1R 32. PL DATA INTLVR PWR – OFF

MA73C:A 34. MCA LOGIC MNA FWD 1 – OFF

AW18H 35. PWR/BATT CHGR EMU 1,2 BUS SEL (two) – OFF

A12 36. HYD CIRC PUMP PWR 1 – MNB

2 – MNC

3 – MNA
37. cb AC2 ΦA,ΦB,ΦC AV BAY 1 FAN B (three) – op

38. Perform MAL, EPS SSR-110, BUS LOSS: AC1, except:
   L1 √AV BAY 1 FAN A,B (two) – OFF, then:

39. Reassign SM into GPC 3, per MAL, DPS SSR-4, SM REASSIGNMENT

40. Perform LOAD PCMMU FORMAT, using TFL 161/103 (ORB OPS FS, COMM/INST), then:

41. BFC CRT DISP – OFF
   SEL – 3+1
   Check all IDPs deassigned from BFS

42. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB) >>

43. Perform MAL, ECLS SSR-12, AV BAY FIRE RECOVERY/RECONFIG, Checkout and Recovery, then:

For deorb prep:
   If orbit 3 deorbit:
   44. Perform P&I nominal POST INSERTION, DEORB PREP (POST INSERT, ORBIT 7 D/O), then:

45. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)

---

OV103,104
AV BAY 2

NOTE
While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
  FPCA 2 MDM OF2
  FLCA 2 DSC OF2
  BFC 3A (When GPC 3 is powered).

If docked with ISS, proc will require ISS to control mated attitude or result in loss of mated attitude control. Proc also results in loss of Lo Z Translation

R1
1. cb AC CONTR AC2 (three) – cl
2. INV/AC BUS 2 – OFF (tb-OFF)
   INV PWR 2 – OFF (tb-OFF)
3. cb AC CONTR AC2 (three) – op
4. Perform FC2 SHUTDN, except PWRDN (Cue Card), then:

L1
5. IMU FAN A(C) – ON
   B – OFF
6. AV BAY 1 FAN A – ON
   B – OFF
7. FREON PUMP LOOP 1 – A
8. √CAB FAN A – ON
   √B – OFF
9. √AV BAY 2 FAN A,B (two) – OFF

C3
10. √Ol PCMMU PWR – 1

A1L
11. √S-BD PM MODE sel – TDRS DATA
    √NSP DATA RATE XMIT – HI
    √RCV – HI
    √CODING XMIT – ON
    √RCV – ON
    √PWR – 1
    √UPLK DATA – S-BD

C3
12. S-BD PM CNTL – PNL, CMD

Cont next page
REASSIGN STRINGS TO GPC 1 IN MC 2

13. [GNC 0 GPC MEMORY]
    CRT
    CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table

14. GNC, OPS 201 PRO
    O6
    15. GPC MODE 2 – STBY(tb-bp)
        – HALT
        PWR 2 – OFF
        \MODE 5 – HALT
        OUTPUT 5 – NORM
        PWR 5 – OFF
    16. MDM FF2,FF4 (two) – OFF
        PL2 – OFF

17. Perform PL PWRDN, then:
    O7
    18. \TACAN 2 MODE sel – OFF
    O8
    19. \RDR ALTM 2 – OFF
    20. \MLS 2.3 (two) – OFF

13:C
    21. cb ESS 2CA AC2 SNSR – op
    O15:A
    22. \BRAKES MNB – OFF

If OV103:
    :C
    23. cb MNB TACAN 2 – op
    :E
    24. cb MNB RDR ALTM 2 – op
        MLS 2 – op
        \ADTA 2 – op
        \ACCEL 2 – op

If OV104:
    :E
    25. cb MNB TACAN 2 – op
    :F
    26. MMU 2 – OFF

O14,O15, O16:F
    27. \RJDA LOGIC,DRIVER (eight) – ON

28. [GNC 20 DAP CONFIG] – sel tail only
    P,Y OPTION – ITEM 15,16 EXEC (TAIL)
    – ITEM 35,36 EXEC (TAIL)

29. DAP: PRI

O16:A
    30. \BRAKES MNC – OFF
    :E
    31. cb MNC MLS 3 – op
        \ADTA 4 – op
    :F
    32. RJDF 2A F3 LOGIC – OFF
        DRIVER – OFF
        2B F4/F5 LOGIC – OFF
        F4 DRIVER – OFF

33. \ACCEL 3 – OFF

34. RJD MANF L5/F5/R5 DRIVER – OFF

A1L
    35. S-BD PL PWR SYS – OFF
        CNTL – PNL,CMD

OV103,104
A12  36. √HYD CIRC PUMP PWR 1 – MNA
    2 – MNB
    3 – MNC

MA73C:A  37. MCA LOGIC MNB FWD 2 – OFF
L4:H  38. cb AC3 AV BAY 2 FAN B (three) – op
39. Perform MAL, EPS SSR-120, BUS LOSS: AC2, except:
    L1  √AV BAY 2 FAN A,B (two) – OFF, then:
40. Reassign BFS into GPC 3, per MAL, DPS SSR-7, GPC IPL MENU OPTION (PASS/BFS)

For deorb prep:
   If orbit 3 deorbit:
      41. Go to LAUNCH DAY DEORBIT PREP
           (ORBIT 3) (CONT DEORB) >>
42. Perform MAL, ECLS SSR-12, AV BAY FIRE RECOVERY/RECONFIG, Checkout and Recovery, then:

For deorb prep:
   If orbit 7 deorbit:
      43. Perform Deltas to nominal POST INSERTION, DEORB PREP (POST INSERT, ORBIT 7 D/O), then:
44. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)
AV BAY 3A

NOTE
While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
- FPCA 3 MDM OF3 GCIL
- FLCA 3 DSC OF3

Active comm sys equipment
- S-BD PWR-AMP stby (alt sys)

R1
1. cb AC CONTR AC3 (three) – cl
2. INV/AC BUS 3 – OFF (tb-OFF)
   INV PWR 3 – OFF (tb-OFF)
3. cb AC CONTR AC3 (three) – op
4. Perform FC3 SHUTDN, except PWRDN (Cue Card), then:

L1
5. AV BAY 3 FAN A,B (two) – OFF
6. CAB FAN B – ON
   A – OFF
7. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
   H2O PUMP LOOP 1 – ON
   H2O PUMP LOOP 2 – GPC
If Triple G2:
8. CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table – →

O6
9. GNC, OPS 201 PRO
10. √ GPC MODE 3 – HALT
    √ OUTPUT 3 – NORM
    √ PWR 3 – OFF
11. MDM FF3 – OFF
12. Perform PL PWRDN, then:

O7
13. √ TACAN 3 MODE sel – OFF

O13:A
14. cb ESS 1BC C/W A – op
    2CA C/W B – op
   (all SM tones and C/W lights and tones lost; CRT FAULT SUMM and SM ALERT light remains)
15. cb ESS 3AB AC3 SNSR – op

O13:E
16. Perform LOSS OF VERNIERS
   (ORB OPS, RCS) while continuing with pwrdn, then:

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If comm not working:

A1L  17. √S-BD PM MODE sel – TDRS DATA
    √NSP DATA RATE XMIT – HI
    √RCV – HI
    √CODING XMIT – ON
    √RCV – ON
    √PWR – 1
    √UPLK DATA – S-BD

C3  18. S-BD PM CNTL – PNL,CMD

If comm still not working:

    PWR SYS – OFF

C3  20. PL DATA INTLVR PWR – OFF

A1L  21. S-BD PM CNTL – PNL
    ANT SW ELEC – OFF
    PRE AMP – OFF
    PWR AMPL STBY – OFF
    OPER – OFF
    XPNDR – OFF

C3  22. NSP PWR – OFF
    ENCRYPTION PWR – OFF

MA73C:A  23. 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 sys)

L4:H  24. cb AC1 AV BAY 3 FAN B (three) – op
O16:C  25. cb MNC TACAN 3 – op

26. Perform MAL, EPS, SSR-130, BUS LOSS: AC3, except:

L1

Av BAY 3 FAN A,B (two) – OFF, then:

For deorb prep:
If orbit 3 deorbit:

27. Go to LAUNCH DAY DEORBIT PREP
    (ORBIT 3) (CONT DEORB, LAUNCH DAY
    ORBIT 3) >>

28. Perform MAL, ECLS SSR-12, AV BAY FIRE
    RECOVERY/RECONFIG, Checkout and Recovery,
    then:

For deorb prep:
If orbit 7 deorbit:

29. Perform Deltas to nominal POST INSERTION,
    DEORB PREP (POST INSERT, ORBIT 7 D/O),
    then:

30. Go to AV BAY FIRE (DEORB PREP,
    CONTINGENCY DELTAS)

OV103,104

A10-82 OPCL/3,4/GEN M,10
PWRDN

LOSS OF 2 CAB FANS ............................................................... 10-2
2 H2O LOOPS ........................................................................ 10-7
CAB PRESS ........................................................................... 10-27
HI LOAD EVAP ...................................................................... 10-33
1 FREON LOOP ...................................................................... 10-35
1 FC ........................................................................................ 10-39
2nd FC ON-ORBIT (TIG < 4 hr) ............................................ 10-41
(TIG > 4 hr) .......................................................................... 10-45
2 FREON LOOPS .................................................................... 10-49
FES ....................................................................................... 10-69
AV BAY FIRE .......................................................................... 10-73
1 ............................................................................................ 10-73
2 ............................................................................................ 10-77
3A.......................................................................................... 10-81

OV105

B10-1 OPCL/ALL/GEN M
LOSS OF 2 CAB FANS

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

   NOTE
   Normal CO2 removal and humidity control lost.
   Wipe off any visible moisture with towel.
   Cab press increase due to air heating may
   cause CAB PRESS RELIEF vlv cycling

2. MSTR MADS PWR – OFF
3. Minimize ltg

FWD
4. All MDU PWR (nine) – OFF
C2
   All IDP/CRTs (three) – OFF
F6/F8
   √FLT CNTLR PWR (two) – OFF
   If FLT CNTLR PWR not reqd:
   O14, O15, O16: E
   5. cb DDU L,R,AFT (six) – op
L1
6. CAB FAN A,B (two) – OFF
   TEMP CNTLR – OFF
7. HUM SEP A,B (two) – OFF
8. Use one PGSC
W1-10
9. Install Window Shades or mnvr to tail Sun att

   GNC 201 UNIV PTG
   TGT ID – ITEM 8 +4 EXEC
   BODY VECT – ITEM 14 +5 EXEC
   P – ITEM 15 +18 4 EXEC
   Y – ITEM 16 +0 EXEC
   OM – blank (MCC-provided if reqd)
C3
   DAP: A/AUTO/VERN
CRT
   START TRK – ITEM 19 EXEC (*)
10. Cycle MDUs. If ON at loss of cooling, turn OFF within
   30 min. Allow 3 min OFF prior to each 1 min ON (30
   min max ON time). Save two MDUs that interface with
   a single IDP for entry

Cont next page
NOTE
Don QDM for temp > 90 degF and discomfort. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON.

Inflate anti-g suit as needed for on-orbit circulatory support.

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

11. Go to LOSS OF 2 CAB FANS (DEORB PREP, CONTINGENCY DELTAS) and perform at next PLS opportunity. Expedite NOMINAL DEORBIT PREP proc 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
   O14:B 2. cb MNA EVENT TIMER AFT – op
   :C     SMOKE DETN L/R FLT DK – op
 O15:B 3. MNB OI H2O BYP LOOP 2 SNSR – op
   MSN TIMER AFT – op
 O16:C 4. MNC SMOKE DETN CAB – op
   L4:J  5. AC3 A SIG CONDR HUM SEP – op
   A6U  6. ANNUN BUS SEL – OFF
   A13  7. OS AUD SPKR PWR – OFF

NOTE
Galley OVEN/RHS sw should be
OFF unless dispensing H2O

GALLEY  8. OVEN/RHS – ON, as reqd
   H2O HTRS (two) – OFF
 MA73C:G 9. cb AC3 GALLEY FAN (three) – op
 ML86B:B 10. MNB GALLEY H2O HTR – op
   If RMS pwrd dn:
   A3  11. MON 1,2 PWR (two) – OFF
   A7U  12. TV PWR CNTL – PNL
       CONTR UNIT – OFF
   13. VID OUT MON1,MON2 pb (two) – push
       (MON1,MON2 lt on)
 O19  14. TV PWR – OFF
 R12L  15. VTR PWR – OFF
 MO58F  16. TV PWR – OFF
   If not reqd:
 R11L  17. IDP/CRT4 PWR – OFF
       CRT4,AFC1 MDU PWR – OFF
 A6U  18. FLT CNTLR PWR – OFF

LOSS OF 2 CAB FANS
ON-ORBIT
MS PAGE

OV105
OPCL/ALL/GEN M,6
PLB EQUIP PWRDN

1. Perform PL SAFING, then:

   CAUTION
   If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
   2. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:
If RMS-only:
   3. Perform RMS PWRDN (PDRS OPS), then:
If KU-BD ANT deployed:
   4. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:
If radiators deployed:
   5. Go to RAD STOW (ORB OPS, ECLS)
LOSS OF 2 H2O LOOPS

NOTES

• THIS PROCEDURE IS TIME CRITICAL
• Proc requires > 45 min, but time critical steps should be done ASAP
• Loss of H2O cooling aff both water and air cooled equipment
• Proc pwrs dn all comm. If comm reqd, preferred comm config in order of heat production:
  1. UHF only
  2. SGLS/STDN LO PWR if reqd
  3. TDRS only if mandatory (10 min max)
• Call ground at every avail UHF site
• Tear out COMM pages from proc and use until touchdown
• Cab depress/repress cycles to 10.2 psia are used for cab temp and humidity control
• If docked to ISS, proc is to be worked simo with JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)
• When pwrdns complete, perform actions on 10-19 and 10-20 as time permits at crew discretion

1. Perform PART 1 of this pwr dn and, based on TIG, complete PART 2 or PART 3
LOSS OF 2 H2O LOOPS, PART 1 – INITIAL PWRDN

TIME CRITICAL PROCEDURES (execute simo)

1. Record MET of 2nd H2O Loop Fail
   __ __ __/ __ __: __ __: __ __

2. Establish comm plan with MCC, determine best TIG opportunities, then have MS3 perform COMM PWRDN, 10-23, ASAP (S-Bd Pwr Amp may fail in 10 min with no cooling)

3. Have MS perform MS OVHD PNL PWRDN, 10-19, ASAP

4. Have second MS perform MCA CONFIG, 10-17, and PLB EQUIP PWRDN, 10-17, ASAP

5. If docked to ISS, have CDR perform JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)

6. Have PLT proceed with CDR AND PLT PWRDN, ASAP

DETERMINE MAXIMUM TIME TO TIG, NUMBER OF DEP/REP, FROM N2 QTY FROM SPEC 66. Sel best landing site and deorbit TIG from PGSC. Set Wristwatch Timer (A17) counting down to TIG.

Enter TARGETS in LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP)

<table>
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<th>IF TOTAL N2</th>
<th>NUMBER OF DEP/REP</th>
<th>SEL BEST TIG WITHIN</th>
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<tbody>
<tr>
<td>&gt;160 LB</td>
<td>3</td>
<td>45M - 4H:00M</td>
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<tr>
<td>&gt;120 LB</td>
<td>2</td>
<td>45M - 2H:50M</td>
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CDR AND PLT PWRDN

O14,O15, 7. √Pri RJD LOGIC, DRIVER (sixteen) – ON
O16:F

DAP: ALT (proc results in loss of VERNs)

O16:F RJD MANF L5/F5/R5 DRIVER – OFF

C3 8. √MSTR MADS PWR – OFF

9. Minimize ltg

10. Use only one IDP with two MDUs, one PGSC

NOTE
Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 2 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry. IDPs do not require cycling

Cont next page
F6, F8, A6 11. FLT CNTLR PWR (three) – OFF, use one as reqd
O7 12. GPS PWR (three) – OFF
O8 13. √RDR ALTM (two) – OFF
14. √MLS (three) – OFF
L1 15. √H2O PUMP LOOP 1, 2 (two) – OFF
   (leave ON if any loop running)
   HUM SEP (two) – OFF
   (leave HUM SEP A ON if any loop running)
If any loop running, minimize bypass:
   16. H2O LOOP 1(2) BYP MODE – MAN
       MAN – DECR (30 sec)
MA73C:A 17. √MCA LOGIC MNA FW 1 – ON
       (MNB FW 2 – ON)
L1 18. CAB FAN (two) – OFF
   TEMP CNTLR – OFF
19. √FLOW PROP VLV LOOP tb (two) – ICH
20. FREON PUMP LOOP 1 – OFF
   √2 – B
21. HI LOAD DUCT HTR sel – A/B
   √TOP EVAP HTR NOZ L, R (two) – B AUTO(A AUTO)
   √DUCT sel – B(A)
L2 22. O2 SYS 1 SPLY – CL (tb-CL)
L4: J 23. cb AC3 ΦA SIG CONDR HUM SEP – op
If not currently single G2, reassign strings to GPC 1 in MC 2:
   24. [GNC 0 GPC MEMORY]
       CONFIG – ITEM 1 +2 EXEC
       Modify MC 2 per table
       CRT 25. GNC, OPS 201 PRO
       O6 26. GPC MODE 2 – STBY
       (tb-bp)
       – HALT
       – STBY
       (tb-RUN)
       – HALT
       (tb-bp)
   27. √GPC MODE 3, 5 (two) – HALT
       √OUTPUT 5 – NORM
L1 28. AV BAY 1 FAN A – ON
   B – OFF
   2, 3 FAN A, B (four) – OFF
29. IMU FAN A – ON
   B – OFF
   √C – OFF
For any fwd IDP/CRT that is OFF:
   30. GPC/CRT1/X EXEC
R2 31. HYD CIRC PUMP (three) – ON
Cont next page
C3  32. C/W MODE – ACK

NOTE
For F7 lights, hold in F2 or F4 MA

If current time to TIG < 50 min:
   33. Go to LOSS OF 2 H2O LOOPS, PART 2 – SHORT
       ON-ORBIT WAIT, next page >>

L1  34. Cycle CAB FAN A(B) – ON (7 min)/OFF (1 hr)
       (to control PPCO2)
L4:P  35. cb AC2,3 φA LG SNSR (two) – op

L4:P
35. cb AC2,3 φA LG SNSR (two) – op

O14,O16:A  36. [GNC 21 IMU ALIGN]
IMU 1,3 (two) – desel
If IMU 2 in OPER:
   37. IMU 1,3 (two) – OFF
If IMU 2 in STBY:
   38. [GNC 21 IMU ALIGN]
IMU 2,3 (two) – desel
O15,O16:A  39. IMU 2,3 (two) – OFF
O6  40. MDM FF3,FF4 (two) – OFF
41. Verify MS OVHD PWRDN complete

NOTE
Both MMUs are OFF. If a ROLL-IN DISPLAY
is reqd: turn MMU 1 ON, try transaction, turn
MMU 1 OFF again

If time from failure to TIG < 2 hr 30 min:
   42. Go to LOSS OF 2 H2O LOOPS, PART 2 – SHORT
       ON-ORBIT WAIT, next page >>
If time from failure to TIG > 2 hr 30 min:
   43. Go to LOSS OF 2 H2O LOOPS, PART 3 –
       EXTENDED ON-ORBIT WAIT, 10-13

OV105
B10-10 OPCL/ALL/GEN M
LOSS OF 2 H2O LOOPS, PART 2 – SHORT ON-ORBIT WAIT

If Undocking from ISS, delay step 1 until after Undocking and Post Final Sep, but continue with steps 2 through 19 of PART 2 – SHORT ON-ORBIT WAIT:

1. Perform POST UNDOCKING AND FINAL SEP RECONFIG, 10-15

BYPASS RADS/FES ACT

ML86B:A
2. cb MNC SPLY H2O XOVR VLV – cl
R11L
3. SPLY H2O XOVR VLV – OP (tb-OP)
   □TKA OUTLET – CL (tb-CL)
L1
4. FLASH EVAP CNTLR (three) – OFF
5. HI LOAD EVAP – ENA
   RAD BYP VLV MODE 1,2 (two) – MAN
   MAN SEL 1,2 (two) – BYP,
   wait 3 sec (tb-BYP)
   CNTLR LOOP 1,2 (two) – OFF

When EVAP OUT T > 65:
6. FLASH EVAP CNTLR PRI A(B) – ON
7. Wait 1 min, verify EVAP OUT T = 39 degF
8. Give MS GO to perform PLBD CLOSURE, 10-18

If current time to TIG < 50 min, at TIG-30 min:
9. Go to LOSS OF 2 H2O LOOPS DEORB
   PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP) >>

   NOTE
   Limit operation of each GPC (1 hr max ON time
   from second H2O Loop failure)

If reqd, perform steps 10 thru 13:

   O6 10. GPC MODE 2 – STBY (tb-RUN), hands off 10 sec
   – RUN (OUTPUT tb-gray), hands off
   – 10 sec

   IDPX 11. In MCX add GPC 2 to tgt set (leave GPC 1 in tgt set)
   Assign all strings to GPC2
   (if SM GPC active, □PL 1/2 not assigned)
   GNC, OPS X01 PRO
   □All IDPs deassigned from GPC1

   O6 12. GPC MODE 1 – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)

   L1 13. AV BAY 1 FAN A(B) – OFF
   2 FAN A(B) – ON

Wherever GPC 1 is referenced, replace with GPC 2 in the LOSS OF 2 H2O LOOPS DEORB
   PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP)

Cont next page
SM GPC/PL MDM Deact – Delay SM GPC/PL MDM Deact (steps 14-21) until PLBD are closed. Then perform ASAP:

14. [SM T DPS UTILITY]
   UL CNTL ENA – ITEM 36 EXEC
   C3

15. UPLK – GPC BLK
   C2

16. IDP/CRT1,2,3 MAJ FUNC (three) – GNC
   O6

17. GPC MODE 4 – STBY (tb-bp)
   – HALT
   – PWR 4 – OFF

18. GNC 0 GPC MEMORY
   CONFIG – ITEM 1 +2 EXEC
   CRT

19. Assign PL1/2 to GPC 1 in MC2
   O6

20. GNC, OPS 201 PRO

21. MDM PL1,PL2 (two) – OFF

22. Perform first cab depress/repress cycle starting at approx 1 hr 15 min after the failure, the final cycle at TIG-20 min. Procs in the 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS); use until last depress/repress is complete

   **NOTE**
   Possible cab air OVBD RLF due to loss of cab cooling.

   Use Quick Don mask as needed to provide additional respirator cooling during periods of high cab temp and humidity. To determine health of crewmember, place temp strip (MED Kit) on forehead. If any crewmember temp greater than 99 degF and crew feels ill, begin cab depress/repress cycle ASAP

At TIG-30 min:

23. Go to LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP) >>
LOSS OF 2 H₂O LOOPS, PART 3 – EXTENDED ON-ORBIT WAIT

If Undocking from ISS, delay step 1 until after undocking and Post Final Sep, but continue with steps 2 thru 6:

1. Perform POST UNDOCKING AND FINAL SEP RECONFIG, 10-15

O6

2. √GPC MODE 2,3,5 (three) – HALT
3. PWR 2,3,5 (three) – OFF

When RMS PWRDN (PDRS OPS) complete, perform steps 4 thru 6 ASAP:

4. GPC MODE 4 – STBY (tb-bp), hands off 10 sec
   – RUN (tb-RUN), hands off 10 sec
   OUTPUT 4 – NORM (tb-gray)
5. [GNC 0 GPC MEMORY]
   CONFIG – ITEM 1 +2 EXEC

Modify MC 2 per table — — — —
GNC, OPS 201 PRO

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O6

6. GPC MODE 4 – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)
   PWR 4 – OFF

Delay steps 7 thru 20 of PART 3 – EXTENDED ON-ORBIT WAIT, 10-14, until POST UNDOCKING AND FINAL SEP RECONFIG is complete (perform step 19 as reqd):
Establish free drift:

F8  7. Verify att mnvr complete
    ADI ATT – INRTL
C3  8. DAP:  B/AUTO/PRI (wait 30 sec)
    FREE
O6  9. Wrist watch set to MET

Pwr dn remaining GPC:
10. GNC, OPS 000 PRO
11. GPC MODE 1 – STBY (tb-bp)
    – HALT
    – STBY (tb-RUN)
    – HALT (tb-bp)
12. GPC PWR 1 – OFF

FWD,AFT 13. All MDU PWR (eleven) – OFF
C2,R11L IDP/CRT PWR (four) – OFF
L1  14. AV BAY FAN (six) – OFF
O13:C 15. cb ESS 2CA MTU B – op
      3AB GPC STAT – op
O14:B 16. MNA MSN TIMER FWD – op
      SMOKE DETN L/R FLT DK – op
W1-10 17. Install Window Shades
18. Check all pwrdns complete

19. Perform first cab depress/repress cycle starting at approx 1 hr 15 min after the failure, the second at TIG-1:15 and the final cycle at TIG-20 min. Procs in the 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS); use until last depress/repress is complete

NOTE
Possible cab air OVBD RLF due to loss of cab cooling.

Use QDM as needed to provide additional respirator cooling during periods of high cab temp and humidity. To determine health of crewmember, place temp strip (MED Kit) on forehead of CDR and PLT

20. Go to LOSS OF 2 H2O LOOPS, ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS)
POST UNDOCKING AND FINAL SEP RECONFIG

If Undocking with ISS and Final Sep complete or if not docked with ISS:

1. **GNC 20 DAP CONFIG**
   - DAP A,B set to A1,B1 except:
     - (A) ITEM 10 +1.0 0 EXEC
       - ITEM 11 +3.0 0 EXEC
       - ITEM 15 EXEC (TAIL)
       - ITEM 16 EXEC (TAIL)
     - (B) ITEM 30 +0.2 0 EXEC
       - ITEM 31 +1.0 0 EXEC
       - ITEM 35 EXEC (TAIL)
       - ITEM 36 EXEC (TAIL)

   **CAUTION**
   - DO NOT mnvr on PRCS until MS has completed RMS JETT or STOW

2. Mnvr to tail Sun att:
   - **GNC 201 UNIV PTG**
     - TGT ID – ITEM 8 +4 EXEC
     - BODY VECT – ITEM 14 +5 EXEC
     - P – ITEM 15 +2 2 5 EXEC
     - Y – ITEM 16 +0 EXEC
     - OM – blank (MCC-provided as reqd)
     - DAP: A/AUTO/PRI
     - START TRK – ITEM 19 EXEC (CUR-*)

   If IMU 2 in OPER:
   - O6
     - 3. MDM FF1 – OFF
   If IMU 2 in STBY:
   - O6
     - 4. MDM FF2 – OFF
   - O14,O15, O16:F
     - 5. RJDF LOGIC, DRIVER (eight) – OFF

   **NOTE**
   - Expect FRCS jet(s) to false fail leak when OF DSC cbs are opened

   - O14:B
     - 6. cb MNA OI SIG CONDR OF 1/4 A – op
   - O15:B
     - 7. cb MNB OI SIG CONDR OF 1/4 B – op
     - 2/3 A – op
   - O16:B
     - 8. cb MNC OI SIG CONDR OF 2/3 B – op
   - O16:E
     - 9. DDU AFT – op

OV105

B10-15 OPCL/ALL/GEN M
MCA CONFIG (Execute ASAP)

L1 If either H2O PUMP LOOP 1 A(B) – ON:

MA73C:A 1. Leave MCA LOGIC MNA FWD 1(MNB FWD 2) ON in next step

CAUTION
Coordinate steps 2 and 3 with CDR. FRCS is lost with step 2 and recovered with step 3

MA73C:A

B

2. MCA LOGIC MNA,B,C (fourteen) – OFF

GNC 23 RCS
3. ITEM 1 EXEC (FRCS page)
   OVRD FRCS MANF(s) – OP

4. For PLB EQUIP PWRDN, use 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 sw config until step 8 of the PLB EQUIP PWRDN. Disregard MCA sw throws in the PL SAFING, RAD STOW, KU-BD ANT STOW, and RMS PWRDN procs

MO13Q 5. √AIRLK FAN A,B (two) – OFF

PLB EQUIP PWRDN (Execute ASAP)

1. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

2. If TV reqd for OBSS jettison or RMS/Ku stow, perform ACTIVATION and OPERATION (Auto Ops only) (Cue Card, TV)
   If RMS grappled to OBSS:
   3. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:
      If RMS-only:
   4. Perform RMS PWRDN (PDRS OPS), then:

Cont next page

LOSS OF 2 H2O LOOPS
ON-ORBIT
MS PAGE

OV105

B10-17 OPCL/ALL/GEN M
If KU-BD ANT deployed:
5. Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:
If radiators deployed:
6. Perform RAD STOW (ORB OPS, ECLS), then:
7. Notify CDR: RMS stowed (jettisoned)
If performing PART 2 – SHORT ON-ORBIT WAIT:
8. Perform PLBD CLOSURE, below, on GO from CDR, then:

MA73C:A, 9. MCA LOGIC MNA MID 1,3 (two) – OFF
MNB MID 2,3,4 (three) – OFF
MNC MID 2,4 (two) – OFF

MA73C:B

PLBD CLOSURE (Short On-Orbit Wait only)

WARNING
Verify no obstructions before closing and latching PLBD (Ku ANT, RAD, RMS, etc)

1. Notify CDR: Beginning PLBD CLOSURE
O6 2. √ MDM PL1,PL2 (two) – ON
3. SM I/O RESET
CRT4 4. SM, OPS 202 PRO – close PLBD ASAP
5. [SM PL BAY DOORS]
R13L 6. AC POWER ON – ITEM 1 EXEC
       AUTO MODE SEL – ITEM 3 EXEC
       PBD SW BYPASS – ITEM 14 EXEC
       CLOSE – ITEM 17 EXEC
       If ‘PLB SEQ FAIL’ msg during door closure and aft latches for that door are not ‘CL’:
       7. Check door scallop on or below tgt line before continuing in MAN mode; otherwise:
       8. Perform MAL, MECH SSR-2,
L CONTINGENCY PLBD CLOSURE, then:
After PLBD closed:

CRT4 9. PBD STOP – ITEM 16 EXEC
       AC POWER OFF – ITEM 2 EXEC
R13L 10. PL BAY DR SYS (two) – DSBL
       GPC/CRT 0/4 EXEC
R11L 11. IDP/CRT4 PWR – OFF
A7U 12. √ PL BAY FLOOD (all) – OFF
       If either H2O PUMP LOOP 1 A(B) – ON:
MA73C:A 13. Leave MCA LOGIC MNA FWD 1
       (MNB FWD 2) – ON in next step
MA73C 14. MCA LOGIC MNA,B,C (fourteen) – OFF
15. Notify CDR: PLBDs closed

LOSS OF 2 H2O LOOPS
ON-ORBIT
MS PAGE
B10-18
OPCL/ALL/GEN M
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 __ __ __/__ __:__ __:__ __

2. Minimize ltg on Aft Flt Deck

O13:A 3. cb ESS 1BC MTU A – op
   :C 2CA C/W B – op

O14:A 4. √BRAKES MNA – OFF
   :B 5. cb MNA OI H2O BYP LOOP 1 SNSR – op
       EVENT TIMER AFT – op
       ADTA 1 – op
       DDU L,AFT (two) – op

O15:A 6. √BRAKES MNB – OFF
   :B 7. cb MNB OI H2O BYP LOOP 2 SNSR – op
       MSN TIMER AFT – op
       EVENT TIMER FWD – op
       ADTA 2 – op
       DDU L,R (two) – op

O16:A 9. √BRAKES MNC – OFF
   :E 10. √cb MNC ADTA 3,4 (two) – op
       DDU R – op

When N2 QTY and TIG determined by CDR:

O14:B 11. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O15:B MNB OI MDM OF 1/2 B – op
O16:B MNC OI MDM OF 3/4 B – op
O14:F MMU 1 – OFF

12. Notify CDR: MS OVHD PNL PWRDN complete
13. Assist other MS with completion of PLB EQUIP PWRDN, 10-17

LOSS OF 2 H2O LOOPS
ON-ORBIT MS PAGE B10-19

OV105
OPCL/5/GEN M
When pwrdns complete, perform following at crew discretion:

**FLUID LOADING PREP**

**GALLEY**
1. OVEN/RHS – ON
2. Unstow, fill 4 water containers (per crewmember) with 8 oz of water each. Temp stow near seat
3. Unstow 8 salt tablets (per crewmember). Temp stow in Flt Suit pocket
4. OVEN/RHS – OFF
5. √H2O HTRS (two) – OFF
6. √OVEN FAN – OFF
7. Stow Personal Hygiene Hose

**NOTE**
Ensure sufficient containers and salt tablets are prepared to continue fluid loading thru entry

**FLUID LOADING**
1. Immed begin drinking H2O (one 8-oz container every 15 min with a salt tablet in every other container) and continue through entry

**CLOTHING CONFIG**
1. Don QDM for temp > 90 degF and discomfort

**FDF CONFIG**
1. Unstow: ENT, ENT PKT, Deor b Burn Cards, ENT Cue Cards

**CAB CONFIG**
1. Stow loose equipment, Backup PGSC
2. Remove and stow side hatch UV filter, locking device, and pyro box safing pin
3. Tape foot loops in egress routes
4. Remove and stow Window Shades (if not needed for cab T control)
WCS DEACT

WCS 1. Foot Restraints – up, locked
ML31C 2. √VAC VENT ISOL VLV CNTL – OP (tb-OP)

INSTALL SEATS

POLE SETUP

1. ESCAPE POLE SETUP:
   - Reinstall Stbd pip pin and Large Port pin
   - Retract and hold Locking Pin(Ring)
   - Reinstall Large pin
   - Release Locking Pin(Ring)
   - Slide forward Safing latch
   - Verify pole straps secure

2. Check minimum Itg on Middeck
NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

MS After comm plan established with MCC, perform COMM PWRDN ASAP (delay 10 min max)

CAUTION
Must complete steps 1 thru 3 within 10 min. TDRS or STDN – HI AOS is limited to 10 min or power amp will overheat

NOTE
Proc pwrs 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 sel – STDN LO
XPNDR – OFF

2. NSP PWR – OFF
ENCRYPTION PWR – OFF
(Encrypt OFF rest of flt)
MODE – SEL
SEL – BYP

NOTE
Verify CDR ready for COMM PWRDN prior to performing step 3

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)

LOSS OF 2 H2O LOOPS
ON-ORBIT
MS PAGE

OV105
NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

O5 6. L AUD PWR – OFF (turn ON as reqd for ICOM audio)
O6 7. UHF MODE sel – OFF
O9 8. R AUD PWR – OFF (turn ON as reqd for ICOM audio)
     √PWR SYS – OFF
10. PL DATA INTLVR PWR – OFF
A1R 11. S-BD FM CNTL – PNL
       PWR – OFF
A3 12. MON 1,2 PWR (two) – OFF
A7U 13. TV PWR CONTR UNIT – OFF
R14:B 14. cb MNA,MNC GCILC (two) – op
       :D
       TV (fourteen) – op
       MNB VPU – op
       :E
       CAMR (six) – op
L9,R10 15. PS,MS AUD PWR (two) – OFF
A13 16. OS AUD SPKR PWR – OFF
MO42F 17. MIDDECK SPKR AUD SPKR PWR – OFF
18. Call ground at every avail UHF site per COMM
    POWERUP, 10-25; voice down cab temp, crew body
    temps, heart rates, and words to indicate severity of cab
    humidity
If MCC request data on cab environ or Av bays:
19. Perform CABIN ENVIRONMENT MONITOR (CONT
    DEORB, LOSS OF 2 H2O LOOPS), then:
If after TIG-10 min:
20. Perform AFT PNL CONFIG FOR ENTRY COMM
    (CONT DEORB, LOSS OF 2 H2O LOOPS D/O
    PREP)
NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

COMM POWERUP (If comm reqd prior to landing site coverage)

Pwr up audio sys:
C3 1. AUD CTR – 1
O5 L AUD PWR – AUD
O9 R AUD PWR – AUD

If UHF avail, config for UHF comm (voice only):
O6 2. UHF MODE sel – SPLX
  \SPLX/EVA PWR AMPL – ON
3. After comm with MCC complete: Go to COMM
   PWRDN, steps 5 thru 8, 10-23 >>

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 sel – STDN LO(SGLS)
  XPNDR – 2

5. NSP PWR – 2
  DATA RATE XMIT – HI
  RCV – HI
  CODING XMIT – OFF
  RCV – OFF
  UPLK DATA – S-BD
C3/F9 6. Sel best S-BD PM ANT

If MCC requests data:
O15:B 7. cb MNB OI SIG CONDR OF 1/4 B,2/3 A
O14:B (two) – cl

O14:B 8. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
C3 9. OI PCMMU PWR – 1
O6 10. MDM PL2 – ON
11. BFS, GNC I/O RESET
   At end of data transmission:
O14:B 12. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O15:B 13. cb MNB OI SIG CONDR OF 1/4 B,2/3 A
   (two) – op

If not reqd for PLBD CLOSURE:
O6 14. MDM PL2 – OFF
   After comm/data complete:
L 15. Go to COMM PWRDN, 10-23 >>

Cont next page

LOSS OF 2 H2O LOOPS
ON-ORBIT
MS PAGE

OV105
NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN

~
If UHF site and GSTDN unavail and comm/data critical: Config for TDRS S-BD during AOS

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  16. \S-BD PM CNTL – PNL
   A1L  ANT SW ELEC – 2
        PRE AMP – 2
        PWR AMPL OPER – 2
        MODE sel – TDRS DATA
        XPNDR – 2

17.  NSP PWR – 2
     \DATA RATE XMIT – HI
     \RCV – HI
     CODING XMIT – ON
     RCV – ON
     \UPLK DATA – S-BD

C3/F9  18. Sel best S-BD PM ANT

If MCC requests data:

O15:B  19. cb MNB OI SIG CONDR OF 1/4 B,2/3 A
            (two) – cl

O14:B  20. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl

C3  21. OI PCMMU PWR – 1

O6  22. MDM PL2 – ON

O6  23. BFS, GNC I/O RESET

At end of data transmission:

O15:B  24. cb MNB OI SIG CONDR OF 1/4 B,2/3 A
            (two) – op

O14:B  25. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op

If not reqd for PLBD CLOSURE:

O6  26. MDM PL2 – OFF

After comm/data complete:

27. Go to COMM PWRDN, 10-23

LOSS OF 2 H2O LOOPS
ON-ORBIT MS PAGE

OV105
LOSS OF CAB PRESS

CDR
Perform JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)

MS1, MS2
Perform procs on 10-30

PLT
Perform following pwrdn

NOTE
Cab press will stabilize at 8 psia for following EQ dP/dT values:
< 0.6 for Orbiter + Airlock
< 0.4 for Orbiter + Airlock + Spacehab.

If docked to ISS, undocking will be performed with Single G2 (i.e., no +Z redundancy)

C3
1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs, as reqd (IDP4 preferable)
4. Use one PGSC, FLT CNTLR PWR as reqd

If FLT CNTLR PWR not reqd:

O14, O15, O16, E
5. cb DDU L,R,AFT (six) – op

O7
6. √GPS 1, 3 PWR (two) – OFF

O8
7. √MLS (three) – OFF
   √RDR ALTM (two) – OFF

L1
8. CAB TEMP CNTLR – OFF
9. HUM 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
      :    immed:
      : 14. RAD CNTLR OUT TEMP – NORM
      : If EVAP OUT T < 41 or > 47 degF:
      L 15. FLASH EVAP CNTLR PRI A(B) – ON

L2
16. √ANTISKID – OFF
    √NWS – OFF

L4:L
17. cb φA CAB T CNTLR 1, 2 (two) – op

Cont next page

OV105

OPCL/5/GEN M
If orbit 2,3 deorbit due to cab leak:

18. Use DEORB PREP/ENTRY DELTAS PULLOUT PAGE, 10-31, then go to LAUNCH DAY DEORBIT PREP (ORBIT 2(3)) (CONT DEORB, LAUNCH DAY ORBIT 2(3)) >>

If orbit 3 deorbit due to fire, tox spill, or glass in cabin:

19. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB, LAUNCH DAY ORBIT 3) >>

20. Install Window Shades (ten) or mnvr to tail Sun att:

   W1-10

   GNC UNIV PTG
   TGT ID – ITEM 8  +4 EXEC
   BODY VECT – ITEM 14 +5 EXEC
   P – ITEM 15 +1 8 4 EXEC
   Y – ITEM 16 +0 EXEC
   OM – blank (MCC-provided if reqd)

   C3
   DAP: A/AUTO/VERN
   CRT START TRK – ITEM 19 EXEC

If time to TIG < 4 hr:

21. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS) >>

If time to TIG > 4 hr:

If currently in single G2 GPC OPS:

22. Perform G2 SET EXPANSION, target Dual G2 (ORB OPS, DPS), then:
REASSIGN STRINGS TO GPC 2 IN MC 2

NOTE
If Av Bay 2 fire and TIG > 4 hr:
Reassign strings to GPC in unaffected Av Bay

23. **GNC 0 GPC MEMORY**
   CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table – – – – – – – –
   DOWNLIST GPC –
   ITEM 44 +2 EXEC

   | CRT | O6 | 24. GNC, OPS 201 PRO |

   | STR | 1 | 2 |
   | 2 | 2 |
   | 3 | 2 |
   | 4 | 2 |
   | PL | 1/2 | 0 |

   | 25. GPC MODE 1(3) – STBY |
   | – HALT |
   | – STBY (tb-RUN) |
   | – HALT (tb-bp) |
   | PWR 1(3) – OFF |
   | √MODE 3,5 (two) – HALT (tb-bp) |

   | CRT | 1 | 2 |
   | 2 | 2 |
   | 3 | 0 |
   | 4 | 2 |
   | L | 1 | 0 |
   | 2 | 0 |
   | MM | 1 | 2 |
   | 2 | 2 |

26. Go to 8 PSI DEORBIT PREP (DEORB PREP, CONTINGENCY DELTAS)
MS PWRDN

CDR, MS1  Perform PLB EQUIP PWRDN (below)
MS2  Perform remaining pwr dn

O14, O15, O16:E  1. cb ADTA (four) – op
O16:E  2. cb MNC RCS/OMS PRPLT QTY GAUGE – op

If TIG > 2 hr 40 min:

O14:B  3. cb MNA EVENT TIMER AFT – op
O15:B  4. MNB MSN TIMER AFT – op
A7U  5. TV PWR CNTL – PNL
      CONTR UNIT – OFF
A13  6. OS AUD SPKR PWR – OFF
L9  7. PS AUD PWR – OFF
MO42F  8. MIDDECK SPKR AUD SPKR PWR – OFF
MO58F  9. TV PWR – OFF

When RMS pwr dn:

A3  10. MON PWR (two) – OFF
R14:E  11. cb CAMR (six) – op
MD44F  12. Cab temp cntl act link – pin to FULL COOL, stow
        linkage >>

PLB EQUIP PWRDN

13. If orbit 2, 3 deorbit >>
14. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or
KU-BD ANT, perform aff sys QUICK
RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
15. Perform OBSS JETTISON (PDRS OPS FS,
    OBSS CONTINGENCY), then:

If RMS-only:
16. Perform RMS PWRDN (PDRS OPS), then:
If KU-BD ANT deployed:
17. Perform KU-BD ANT STOW (ORB OPS,
    COMM/INST), then:
If radiators deployed:
18. Go to RAD STOW (ORB OPS, ECLS)

LOSS OF CAB PRESS
ON-ORBIT
MS PAGE  OV105

B10-30  OPCL/ALL/GEN M,3
NOTE
Incorporate following changes or remove this page for use with the indicated checklist or cue card.

Single fault tolerance used for most cab air-cooled equipment. Add'l LRUs may be activated if reqd and if CAB PRESS stable $\geq 8$ psia

A. Deltas to the LAUNCH DAY ORBIT 2(3) (CONT DEORB)
   1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDU. Use one PGSC
   If rev 3:
      2. ENT FWD FLT DECK CONFIG [10]
      Do not pwr MLS
      3. In ENT SW LIST/VER, do not activate pwrdn items

B. Deltas to DEORBIT BURN (ENT)
   At TIG-4:
   1. Use two IDP/CRTs with four MDUs as reqd for deorbit burn
   O14,O15, O16:E
   2. cb DDU L,R (four) – cl
   F6,F8
   3. L,R FLT CNTLR PWR (two) – ON

C. Deltas to POST BURN (ENT)
   1. Use one IDP/CRT with two MDUs as reqd
   F6,F8
   2. L,R FLT CNTLR PWR (two) – OFF
   O14,O15, O16:E
   3. cb DDU L,R,AFT (six) – op
   O14,O15, O16:E
   4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
   At EI-15:
   O7
   5. GPS 3 PWR – ON
   PRE AMPL (two) – ON
   Wait 30 sec
   GNC I/O RESET
   [GNC 55 GPS STATUS]
   INIT – ITEM 16 EXEC
   NAV – ITEM 19 EXEC

Cont next page
D. Deltas to ENTRY MANEUVERS (Cue Card)

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

5. BFS, GNC I/O RESET

At V = 15K:
   If CAB P < 8 psia:
   6. Delete NAVAIDS callout
   If CAB P ≥ 8 psia:
   7. Activate all RAs, MLSs
      GNC I/O RESET
      At M < 1.0, go to step 10

At M = 2.7:
8. Use two HUDs, MLSs, and RAs as reqd
9. GNC I/O RESET

At M < 1.0:
L2
10. ANTISKID – ON
11. NWS – 1
LOSS OF HI LOAD EVAP

NOTE
MAL, ECLS SSR-2, FES CORE FLUSH
PROCEDURE should be performed if core icing is suspected. If unsuccessful, perform pwrdn prior to RAD BYPASS at TIG-2:50 during deorb prep. If already in deorb prep, perform pwrdn and review activities already performed for changes.

C3
1. √MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs, one FLT CNTLR PWR, and one PGSC as reqd
4. Perform PL PWDRDN, then:
   If not in deorb prep:
   O7
   5. √GPS 1,3 PWR (two) – OFF
   6. √PRE AMPL (four) – OFF
   O8
   6. √RDR ALTM (two) – OFF
   7. √MLS (three) – OFF
   L1
   8. √FLOW PROP VLV LOOP tb (two) – ICH
   9. √HI LOAD DUCT HTR sel – OFF
   A3
   10. TV MON (two) – OFF
   If FLT CNTLR PWR not reqd:
   O14,O15, 11. cb DDU L,R,AFT (six) – op
   O16:E
   12. Reset EVAP OUT T C&W upper limit (ch 107,117) to 2.15V (70 degF). Change B/U C&W parameter, 0631207, 0631407 upper limit to 70

A. Deltas to NOMINAL DEORBIT PREP (DEORB PREP)
   if not already performed
   At TIG-03:00, prior to RAD BYP:
   L1
   1. H2O LOOP 2(1) BYP MODE – MAN
      MAN – DECR (hold 30 sec)
      FLASH EVAP CNTLR PRI A – OFF
      B – OFF
      SEC – ON
      √HI LOAD EVAP – OFF
      Perform RAD BYPASS/FES C/O (ORB OPS, ECLS):
      Delete steps 3 and 5 thru 8 (SEC FES C/O)
   At TIG-03:15 in DED DISP ENT CONFIG:
   2. Do not pwrd NAV/LDG AIDS, ADTAs
      Pwr DDUs, MDUs only as reqd

Cont next page
At TIG-01:50, ENT SWITCH LIST/VERIF:
3. Do not pwr NAVAIDS, ADTAs
   Delete BRAKE/ANTISKID ACT
4. Go to LOSS OF HI LOAD EVAP DEORB OR
   ENTRY PULLOUT PAGE (ENT PKT, PWRDN)

B. Deltas to DEORBIT BURN (ENT)
   At TIG-10:
   O14, O15, O16:E
   1. cb DDU L,R (four) – cl
   2. Use two IDP/CRTs with four MDUs, and two FLT
      CNTLR PWR for burn
   At TIG-5:
   L1
   3. TOP EVAP HTR NOZ (two) – OFF
      DUCT sel – OFF

C. Deltas to POST BURN (ENT)
   F6, F8
   O14, O15, O16:E
   1. L,R FLT CNTLR PWR (two) – OFF
   2. cb DDU L,R (four) – op (save for entry)
   3. Use one IDP/CRT with two MDUs
   4. Delete ANTISKID, NWS callouts (ENTRY SW
      CHECK)

D. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   O14, O15, O16:E
   F6
   1. cb DDU L,R (four) – cl
   2. L FLT CNTLR PWR – ON
   3. Use two IDP/CRTs with four MDUs
   O14, O15, O16:A
   4. BRAKES (three) – ON
   O14, O15, O16:E
   5. cb ADTA 1,2,3 (three) – cl
   L2
   6. GNC I/O RESET
   7. NWS – 1
   8. ANTISKID – ON
   At M = 2.7:
   9. Use two HUDs, MLSs, and RAs
   10. GNC I/O RESET
**LOSS OF 1 FREON LOOP**

**MS**
- Perform MS PWRDN, 10-36

**C3**
1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs as reqd, and one PGSC

If FLT CNTLR PWR not reqd:
4. cb DDU L,R,AFT (six) – op

**O14,O15, O16:E**
5. If reqd, perform PL PWRDN, then:

**L1**
6. √FLOW PROP VLV LOOP tb (two) – ICH
7. H2O LOOP 2(1) BYP MODE – MAN

- MAN – DECR (hold 30 sec)

**SM SYS SUMM 2**
If EVAP OUT T not ~39 degF and stable:
8. Perform TOPPING FES STARTUP (ORB OPS, ECLS), then:

If prior to deorb prep:
- If dual or triple G2:
  9. Perform G2 SET CONTRACTION (ORB OPS, DPS) to single G2, then:

**O15:F**
10. MMU 2 – OFF

**W1-10**
11. Mnvr to shade windows from sun or install Window Shades

**SM SYS SUMM 1**
12. Check kW; if >14 kW: Perform PRIOR PWRDN (numbered) (except FES and one PGSC) until ≤ 14 kW, then:
13. Use UNDOCKING/DEORB/ENTRY DELTAS PULLOUT PAGE, 10-37, for changes to UNDOCKING/DEORB PREP and ENT >>

If in deorb prep:
14. √FLT CNTLR PWR (two) – OFF
15. Use one IDP/CRT with two MDUs, as reqd
16. GPS 1,3 PWR (two) – OFF
17. GPS 1,3 PRE AMPL (four) – OFF
18. RDR ALTM (two) – OFF
19. MLS (three) – OFF
20. Continue with DEORB PREP; use UNDOCKING/DEORB/ENTRY DELTAS PULLOUT PAGE, 10-37, for changes

**OV105**
MS PWRDN

1. Minimize light on Aft Flt Deck and Middeck
2. cb TV (fifteen) – op
3. CAMR (six) – op
4. MON 1,2 PWR (two) – OFF

If in deorb prep:
5. BRAKES (three) – OFF
6. cb ADTA (four) – op
UNDocking/DEOrbit/ENTRY DELTAS PULLOUT PAGE

NOTE
KEEP THIS PAGE UNTIL TOUCHDOWN.

Incorporate following changes or remove these pages for use with the indicated checklist or cue card.

Undocking from ISS will be performed with Single G2 (i.e., no +Z redundancy)

Perform NOMINAL DEORBIT PREP (DEORB PREP) with the following contingency deltas to the procedure

A. Deltas to DEORB PREP
   1. Use one FLT CNTLR PWR, DDU, PGSC, and one IDP/CRT with two MDUs, as reqd
   2. Minimize ltg
   3. Minimize sun in cab if possible
   If rev 3 deorb, deltas to LAUNCH DAY ORBIT 3 (CONT DEORB):
      4. ENT FWD FLT DECK CONFIG
         Do not pwr MLS
   If nominal deorb prep:
   Deltas to NOMINAL DEORBIT PREP (DEORB PREP):
      5. Verify steps 14 thru 20, 10-35, MS, steps 7,8, 10-36
      6. DED DISP ENT CONFIG
         Do not pwr ADTAs
         Add: Pwr NAV/LDG AIDS per ENTRY MANEUVERS (Cue Card)
         Minimize MDU use
      7. ENT SWITCH LIST/VERIF
         Do not pwr LRUs previously pwrd dn

B. Deltas to DEORBIT BURN (ENT)
   1. Maintain window shading att until TIG-15
   At TIG-15:
      2. Remove Window Shades if installed
   At TIG-10:
      O14,O15,O16:E
      3. cb DDU L,R (four) – cl
      4. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

Cont next page
C. Deltas to POST BURN (ENT)

F6,F8
1. L,R FLT CNTRL PWR (two) – OFF

O14,O15,
2. cb DDU L,R (four) – op

O16:E
3. Use one IDP/CRT with two MDUs
4. Delete ANTISKID, NWS callouts
   (ENTRY SW CHECK)

At El-15:

O7
5. GPS 3 PWR – ON
   PRE AMPL (two) – ON
   Wait 30 sec
   GNC I/O RESET
   GNC 55 GPS STATUS
   INIT – ITEM 16 EXEC
   NAV – ITEM 19 EXEC

D. Deltas to ENTRY MANEUVERS (Cue Card)

At El:

O14,O15,
1. cb DDU L,R (four) – cl

O16:E
2. L FLT CNTRL PWR – ON
3. Use two IDP/CRTs with four MDUs

O14,O15,
4. BRAKES (three) – ON

O16:A
O14,O15,
5. cb ADTA 1,2,3 (three) – cl

O16:E
GNC I/O RESET
L2
ANTISKID – ON
NWS – 1

At V = 12K:
5. Perform RAD FLOW in unfailed loop

At M = 2.7:
6. Use two HUDs, MLSs, and RAs
   GNC I/O RESET

E. Deltas to POST LDG (ENT)

If EVAP OUT T high and incr, go to EMER PWRDN
   (Cue Card)

F. Deltas to EVAP OUT TEMP HIGH (Cue Card)

If EVAP OUT T HIGH and V > 12K:
   Establish RAD FLOW in unaff loop:

L1
1. RAD BYP VLV MODE 1(2) – AUTO
   CNTLR LOOP 1(2) – AUTO A(B)
2. Perform EVAP OUT T HIGH (Rads
   Coldsoaked), steps 2 thru 4

If EVAP OUT T HIGH and V < 12K:
If loop 1(2) lost:

L1
3. NH3 CNTRL B(A) – PRI/GPC

LOSS OF 1 FREON LOOP
PULLOUT PAGE
LOSS OF 1 FC

If before deorb prep:

L1 1. √CAB FAN A(B) – ON
   If total Orb kW > 18:
   2. Perform PRIOR PWRDN, GROUP 1,2 (except FES), then:
   3. Perform PL PWRDN

If FC 1 or 2 failed:

R1 4. √MN BUS TIE A,B (two) – ON
       √C – OFF

If FC 3 failed:

5. PL PRI MNB – ON
   MNC – OFF
   FC3 – OFF

6. √MN BUS TIE C,A (two) – ON
   √B – OFF

If any FC AMPS > 330 or ∆AMPS > 100:

7. Perform MAL, EPS SSR-8, BUS LOADING – LRU SELECT, then:

8. Go to step 18

If in deorb prep:

9. Minimize ltg

10. Use only one DDU, and FLT CNTLR PWR as reqd.

O7 11. GPS 1,3 PWR (two) – OFF
       PRE AMPL (four) – OFF

O8 12. RDR ALTM (two) – OFF

13. MLS (three) – OFF

L1 14. √CAB FAN A(B) – ON

R14:D 15. cb TV (fifteen) – op

16. GB TV (six) – op

A3 17. MON 1,2 PWR (two) – OFF

A11 18. CRYO TK HTR (four) – OFF

If FC recoverable:

18. Go to MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE >>

If FC unrecoverable:

19. Make FDF Delta changes as given (next page), then
   as time permits reconfig C/W limits per MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE

Cont next page

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B10-39

OPCL/5/GEN M,3
FDF changes:

A. Deltas to DEORBIT BURN (ENT)  
  TIG-5:
  L1  
  1. TOP EVAP HTR NOZ (two) – OFF
     DUCT sel – OFF
     HI LOAD DUCT HTR sel – OFF
     HUM SEP (two) – OFF
  L2  
     FLASH EVAP FDLN HTR SPLY (two) – OFF

B. Deltas to POST BURN (ENT)  
  At EI-15:
  O7  
  1. GPS 1,3 PWR (two) – ON
     PRE AMPL (four) – ON
     Wait 30 sec
     GNC I/O RESET
     GNC 55 GPS STATUS
     INIT – ITEM 14,16 EXEC
     NAV – ITEM 17,19 EXEC
  O8  
  2. MLS (three) – ON
  3. RDR ALTM (two) – ON

C. Deltas to EPS procs in this book
  1. FC REACTANT VLV CLOSED: Delete step 6;  
     Change step 2 to read:
     If aff FC/MN bus tied and COOL P > 40:
     2. MN BUS TIE (three) – ON (ASAP)
        (Aff) MN BUS TIE (one) – OFF (ASAP)
  2. FC COOL P: Delete step 1
  3. BUS TIE, steps 1,7: Delete ‘(A to...A)’
  4. FC1(2,3) H2 PUMP ↑↓: Replace step 3 with:
     If aff FC/MN bus tied:
     3. MN BUS TIE (three) – ON
        (Aff) MN BUS TIE (one) – OFF
  5. FC SAFING: Replace steps 7,8 with:
     If aff FC/MN bus tied:
     7. MN BUS TIE (three) – ON
        (Aff) MN BUS TIE (one) – OFF
  6. FC H2O RLF NOZ TEMP ↑↓: Replace step 3 with:
     If aff FC/MN bus tied:
     3. MN BUS TIE (three) – ON
        (Aff) MN BUS TIE (one) – OFF
  7. FC DELTA V 1(2,3):  
     Delete step 1
     Add ‘MN BUS TIE (three) – ON, then:’ to
     beginning of step 4

Cont next page
D. Deltas to EPS (ENT PKT)
   1. Perform LOSS OF 1 FC, part B, steps 1 thru 8 (ENT PKT, PWRDN), then:
      If in deorb prep:
      2. Go/return to NOMINAL DEORBIT PREP (DEORB PREP) >>

E. Deltas to FLIGHT PLAN at 10 min prior to ‘Go to DEORB PREP’, add: ‘perform LOSS OF 1 FC, steps 9 thru 17 (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 ACTION unless
bus shorted (step 29 regains bus)

* FC capability is ~12 kW for sustained operations,
* ~13 kW for short duration (~4 hr), ~16 kW for
* contingency situations (~10 min). Purge FC at
* 430 amps or less

MS 3. Perform AFT PNL PWRDN, 10-43, immed
C3 4. √MSTR MADS PWR – OFF
5. Minimize ltg
6. Use only one DDU, PGSC, and FLT CNTLR PWR as
   reqd. One IDP/CRT off as reqd
O7 7. GPS PWR (three) – OFF
   PRE AMPL (six) – OFF
O8 8. √RDR ALTM (two) – OFF
MS 9. √MLS (three) – OFF

If GPC 2 on:
10. [GNC 0 GPC MEMORY]
    CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table

    For any IDP that is OFF:
    11. GPC/CRT1/X EXEC
    12. √DOWNLIST GPC (ITEM 44) – 1
    CRT
    O6 13. GPC MODE 2 – STBY (tb-bp)
        PWR 2 – OFF
        CRT 1 2 3
        PL 1/2 0
    14. √MODE 3,5 (two) – HALT
        (tb-bp)
        PWR 3 – OFF
    O15:F 15. √MMU 2 – OFF

Cont next page
16. **GNC 20 DAP CONFIG**
   - Sel TAIL PRI P,Y OPTION
   - Sel PRI JETS

O7 17. AFT L,R RCS MANF ISOL 4 (two) – CL
O14,O15, 18. RJDF DRIVER (four) – OFF
O16:F 19. MDM FF4 – OFF
O14:F 20. RJDA 2A L4/R4 DRIVER – OFF
     LOGIC – OFF

L1 21. √FLOW PROP VLV LOOP tb (two) – ICH
22. [SM 88 APU/ENVIRON THERM]
23. H2O LOOP 2 BYP MODE – MAN
     MAN – INCR(DECR)
     (adjust until ICH FLOW ~950)

If no MANF leak:

R1 24. √O2,H2 MANF VLV (four) – OP
     TK1 HTRS B – AUTO (MNA or MNB ↓) or
     TK2 HTRS B – AUTO (MNC or no
     MN BUS ↓), then:
     All others OFF

If MANF leak:

R2 25. √O2/H2 HTR LOSS TABLE (EPS), 5-20
     Sel one htr in one O2,H2 TK

26. HYD CIRC PUMP (three) – OFF

L4:L 27. cb AC1,2 ΦA CAB T CNTLR 1,2 (two) – op
If not MN bus short, tie three MN BUSES:
28. Perform BUS TIE (Cue Card), then:
Post BUS TIE config check:

L1 29. √CAB FAN A(B) – ON
30. Perform RCS SECURE, FWD RCS only (RCS), 8-2,
    then:
31. Perform MAL, EPS SSR-3, FC SHUTDN C&W LIMIT
    CHANGE, then:
32. Go to LOSS OF 2 FC (CONT DEORB). Refer to
    Activities Priority Table for activities to be performed in
    the CONT DEORB
AFT PNL PWRDN

A11  1. CRYO TK HTR (four) – OFF
A12  2. APU HTR LUBE OIL LN (three) – OFF
     3. HYD HTR (eight) – OFF
A14  4. RCS/OMS HTR FWD RCS – OFF
     RCS JET (five) – OFF
     5. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or
KU-BD ANT, perform aff sys QUICK
RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
6. Perform OBSS JETTISON (PDRS OPS FS,
   OBSS CONTINGENCY), then:
If RMS-only:
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 (ORB OPS, ECLS), then:
A3  10. MON PWR (two) – OFF
R14:D 11. cb TV (fifteen) – op
     :E  CAMR (six) – op
ML86B:C 12. √cb MNB EXT AIRLK HTR VEST Z1/2/3 – op
If MMU is pwrd:
    :D 13. cb MNA MMU PORT HTR A – op
           STBD HTR A – op
           MNB MMU PORT HTR B – op
           STBD HTR B – op
MD44F 14. Cab temp cntl act link – pin to FULL COOL
LOSS OF 2nd FC ON-ORBIT (TIG > 4 hr)

NOTE
Do NOT perform BUS LOSS ACTION unless bus shorted (step 8 regains bus).

If docked with ISS, perform PWRDN completely prior to undocking

* FC capability is ~12 kW for sustained operations,
* ~13 kW for short duration (~4 hr), ~16 kW for contingency situations (~10 min). Purge FC at * 430 amps or less

MS 1. Perform MS OVHD AND AFT PNL PWRDN, 10-47, immed
C3 2. \(\sqrt{\text{MSTR MADS PWR – OFF}}\)
   \(\text{GNC 2T IMU ALIGN}\)
3. IMU 1,2 (two) – desel
   If GPC 2(3) on:
4. \(\sqrt{\text{GNC 0 GPC MEMORY}}\)
   CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table – – – – – – – – – – – – – – – – – – – –
   \(\sqrt{\text{DOWNLIST GPC}}\)
   (ITEM 44) – 1

CRT GNC, OPS 201 PRO
For any IDP that is OFF:
5. \(\sqrt{\text{GPC/CRT1/X EXEC}}\)
O6 6. GPC MODE 2 – STBY (tb-bp)
   \(\text{HALT}\)
   PWR 2 – OFF
   \(\sqrt{\text{MODE 3,5 (two) – HALT}}\)
   (tb-bp)
   \(\sqrt{\text{PWR 3 – OFF}}\)
O15:F 7. MMU 2 – OFF
If not MN bus short, tie three MN buses:
8. Perform BUS TIE (EPS), 5-16, then:
9. Minimize ltg
10. Use one DDU, PGSC, and FLT CNTLR PWR as reqd.
   Use one IDP/CRT with four MDUs
O7 11. GPS PWR (three) – OFF
   PRE AMPL (six) – OFF
O8 12. \(\sqrt{\text{RDR ALTM (two) – OFF}}\)
13. \(\sqrt{\text{MLS (three) – OFF}}\)

Cont next page

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B10-45

OPCL/5/GEN M
14. √FLOW PROP VLV LOOP tb (two) – ICH
15. AV BAY 2 FAN A,B (two) – OFF
16. √CAB FAN A(B) – ON
17. cb AC1,2 φA CAB T CNTLR 1,2 (two) – op
18. Perform GG FREE DRIFT, ATT ID B (mnvr in PRI, establish drift in VERN) (ORB OPS, RCS), then:
   If docked with ISS, have ISS establish mated att control
19. Set event timer for 30 min (for FES duct htr deact)
20. RJD LOGIC, DRIVER (seventeen) – OFF
21. MDM FF1,FF2,FF4 (three) – OFF
22. TOP EVAP HTR NOZ L,R (two) – OFF
23. √HI LOAD DUCT HTR sel – OFF
24. SM 88 APU/ENVIRON THERM
25. H2O LOOP 2 BYP MODE – MAN
   MAN – INCR(DECR)
   (adjust until ICH FLOW ~950)
26. √O2,H2 MANF VLV (four) – OP
   TK1 HTRS B – AUTO (MNA or MNB ↓) or
   TK2 HTRS B – AUTO (MNC or no
   MN BUS ↓), then:
   All others OFF
27. √O2/H2 HTR LOSS TABLE (EPS), 5-20
   Sel one htr in one O2,H2 TK
28. BLR CNTLR/HTR (three) – OFF
29. HYD CIRC PUMP (three) – OFF
30. Verify RMS, KU-BD ANT, and RADS stowed, then:
   MCA LOGIC (fourteen) – OFF
   MA73C:A, B
   If H2O LOOP 2 failed:
   31. MCA LOGIC MNB FWD 2 – ON
   30 min after FES deact:
   32. TOP EVAP HTR DUCT sel – OFF
   33. Perform MAL, EPS SSR-3, FC SHUTDN C&W LIMIT CHANGE, then:
      If docked with ISS, perform UNDOCKING DELTAS
      prior to undocking
   34. Go to LOSS OF 2 FC (CONT DEORB)
MS OVHD AND AFT PNL PWRDN

O14:A 1. IMU 1 – OFF (confirm IMU desel)
O15:A 2. IMU 2 – OFF (confirm IMU desel)
O16:E 3. cb MNC RCS/OMS PRPLT QTY GAUGE – op
R14:D 4. TV (fifteen) – op
A11 5. CRYO TK HTR (four) – OFF
A12 6. APU HTR LUBE OIL LN (three) – OFF
   7. HYD HTR (eight) – OFF
A14 8. RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – OFF
ML31C 9. VAC VENT NOZ HTR – OFF
ML86B:A 10. cb MNA H2O LN HTR A – op
           11. cb MNB H2O LN HTR B – op
           :C 12. cb MNB EXT AIRLK HTR VEST Z1/2/3 – op
If MMU is pwrd:
           :D 13. cb MNA MMU PORT HTR A – op
                      STBD HTR A – op
                      MNB MMU PORT HTR B – op
                      STBD HTR B – op
MD44F 14. Cab temp cntl act link – pin to FULL COOL
           15. Perform PL SAFING, then:

CAUTION
If stow prob occurs with either RMS and/or KU-BD ANT, perform aff sys QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
   16. Berth OBSS or perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:
If RMS-only:
   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 (ORB OPS, ECLS), then:
O14:F 20. Report to CDR: RMS, KU-BD ANT, and RADS stowed
R14:E 21. MMU 1 – OFF
A3 22. cb CAMR (six) – op
A3 23. MON PWR (two) – OFF

LOSS OF 2nd FC
ON-ORBIT (TIG > 4 hr)
MS PAGE

OV105
OPCL/ALL/GEN M,6
UNDOCKING DELTAS

NOTE
Following steps reqd to recover RCS functionality prior to undock

1. One hour prior to undock:
   A14 RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – ON
   O14,O15, 2. RJD LOGIC, DRIVER (seventeen) – ON
   O16:F
   O6 3. MDM FF1, FF2, FA1, FA2 (four) – ON

After undocking complete and post Final Sep:
4. Perform GG FREE DRIFT, ATT ID B (mnvr in PRI, Establish drift in VERN) (ORB OPS, RCS), then:
   O14,O15, 5. RJD LOGIC, DRIVER (seventeen) – OFF
   O16:F
   O6 6. MDM FF1, FF2, FA1, FA2 (four) – OFF
   A14 7. RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – OFF
LOSS OF 2 FREON LOOPS

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC purge must be started and loads pwr’d dn ASAP</td>
</tr>
<tr>
<td>Orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP with all three FCs running. This assumes three FCs are pwr’d dn to a total level of 8 kW immed and are continuously purged</td>
</tr>
<tr>
<td>Earliest possible landing is reqd</td>
</tr>
</tbody>
</table>

NOTES

- Failure assumed to occur after GO for On-orbit and before Deorbit TIG-2:05
- COMM procs, 10-65 thru 10-68, should be used throughout this proc and CONT DEORB
- Preferred comm config is:
  A. UHF only
  B. GSTDN S-BD if reqd
  C. TDRS only if mandatory
- If docked to ISS, this proc is to be worked simo with JOINT EXPEDITED UNDOCKING AND SEPARATION (SODF: JOINT OPS)
TIME CRITICAL PROCEDURES

NOTE
Undocking will be performed with Single G2
(i.e., no +Z redundancy)

1. If in OPS 1: Go to LOSS OF 2 FREON LOOPS (POST OMS-2)
   (ASC PKT, PWRDN) >>
2. Have CDR perform JOINT EXPEDITED UNDOCKING AND
   SEPARATION (SODF: JOINT OPS)
3. Have MS exec RAD STOW, KU-BD ANT STOW, and PLBD
   CLOSE, 10-57, ASAP
4. Have second MS exec RMS STOW and MS OVHD AND AFT PNL
   CONFIG, 10-59 thru 10-62, ASAP
5. Have third MS exec COMM PWRDN, 10-65; delay 10 min max if
   AOS

Perform following steps ASAP:
O14,O15, 6. √Pri RJD LOGIC,DRIVER (sixteen) – ON
O16:F DAP: ALT (this proc results in loss of VERNs)
O16:F RJD MANF L5/F5/R5 DRIVER – OFF
7. Record MET of failure of 2nd FREON LOOP:
   / ______ : ______ : ______ 
C3 8. MSTR MADS PWR – OFF
MS R11U 9. √FC PURGE HTR – ON
10. \VLVS 1,2,3 (three) – OP
11. Minimize ltg
CRTX 12. Use only one fwd IDP/CRT with one MDU (save IDP3
   for entry)
13. Use only one PGSC
F6/F8 14. √FLT CNTLR PWR (two) – OFF, as reqd
Config GPC 1 to MC 2:

15. GNC 0 GPC MEMORY

16. CONFIG – ITEM 1+2 EXEC

If not GNC 201, then:

17. GNC, OPS 201 PRO

18. Modify MC 2 per table

NOTE

The following must be an OPS mode recall:

GNC, OPS 201 PRO

For any IDP that is OFF:

19. GPC/CRT1/X EXEC

20. √ BFC CRT DISP – OFF

O6 21. 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

O7 22. GPS PWR (three) – OFF

PRE AMPL (six) – OFF

O8 23. √ RDR ALTM (two) – OFF

24. √ MLS (three) – OFF

C3 25. FCS CH (four) – AUTO

R4 26. MPS MANF PRESS (two) – CL

R2 27. HYD CIRC PUMP (three) – OFF

28. MPS He ISOL (six) – CL

PNEU He ISOL – CL

L ENG He XOVR – CL

L1 29. HUM SEP (two) – OFF

30. √ IMU FAN B – ON

A,C (two) – OFF
MD44F 31. Cab temp cntl act link – pin to FULL COOL
L1 32. CAB FAN A,B (two) – OFF
33. √AV BAY 1 FAN A – OFF
   √2,3 FAN A,B (four) – OFF
   √1 FAN B – ON
34. FREON PUMP LOOP 1,2 (two) – OFF (one-ON, if any flow)
35. RAD CNTLR LOOP 1,2 (two) – OFF
36. √NH3 CNTLR A,B (two) – OFF
   If no FREON PUMPS ON, then:
L2 37. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
L1 38. FLASH EVAP CNTLR PRI A,B (two) – OFF
   TOP EVAP HTR NOZ (two) – OFF
   DUCT sel – OFF
39. HI LOAD DUCT HTR sel – OFF
L2 40. FLASH EVAP FDLN HTR SPLY (two) – OFF
   If one FREON PUMP ON:
L1 41. FLASH EVAP CNTLR PRI A – ON
42. TOP EVAP HTR NOZ (two) – OFF
   DUCT sel – ON
43. √HI LOAD DUCT HTR sel – ON
L2 44. FLASH EVAP FDLN HTR B SPLY – OFF
45. √ANTISKID – OFF
46. √NWS – OFF
O6 47. S TRK PWR -Y,-Z (two) – OFF
48. ANNUN BUS SEL ACA 2/3 – OFF
   GNC 21 IMU ALIGN
49. IMU 1,2 (two) – desel
   – OFF
O14,
O15:A

CAUTION
Do not perform steps 50 thru 56 until PLBDs are closed

C2 50. IDP/CRT MAJ FUNC (three) – GNC
O6 51. GPC MODE 4 – STBY (tb-bp)
   – HALT
   PWR 4 – OFF
   GNC 0 GPC MEMORY
52. CONFIG – ITEM 1 +2 EXEC
53. Assign PL1/2 to GPC 1 (provides Uplk path)
54. GNC, OPS 201 PRO

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55. All IDPs, MDUs – OFF (use one IDP/CRT with one
MDU as reqd until CONT
DEORB proc, 3 min OFF
for each min ON)

O6 56. MDM FF1,4 (two) – OFF
FA1,4 (two) – OFF

F6 57. CDR disp sws – green dot

NOTE
If no site avail, bailout will be reqd; TIG will = MET
of 2nd FREON LOOP failure + 1 hr

58. Sel ELS TIG ≤ 1 hr after MET of 2nd FREON LOOP
failure (from MCC or PGSC):
Selected TIG ___:___:___ MET
(-) Present TIME ___:___:___ MET
(=) Time to TIG ___:___:___ MET

If PL MDMs not currently being used for comm:
59. Verify PLBDs are closed, then:

O6 √ MDM PL1,PL2 (two) – OFF

L4:J 60. cb AC3 ΦA SIG COND HUM SEP – op
ΦB SIG COND IMU FAN – op

:L 61. AC1 ΦA CAB T CNTLR 2 – op
ΦB AV BAY 2 S/C – op

62. AC2 ΦA CAB T CNTLR 1 – op
ΦB AV BAY 3 S/C – op
AC3 ΦA H2O CNTLR 1 – op

R1 63. MN BUS TIE (three) – ON

64. √O2,H2 MANF VLV TK1,TK2 (four) – op
TK2 HTRS A,B (four) – OFF
TK1,TK3 HTRS A,B (eight) – AUTO

If O2 TK1(TK3) QTY < 80%:
65. O2 TK1,TK3 HTRS A (two) – OFF

R2 66. BLR CNTLR/HTR 2 – OFF
PWR 2 – OFF

If not docked with ISS or when undocking complete and Post
Final Sep:
67. Perform POST UNDOCKING AND FINAL SEP
RECONFIG, 10-55

68. Go to ENTRY CONFIG (CONT DEORB, LOSS OF 2
FREON LOOPS D/O PREP) by ~ TIG-15 >>

OV105
POST UNDOCKING AND FINAL SEP RECONFIG

1. DAP: FREE
 O14, O15, O16
2. RJD LOGIC, DRIVER (seventeen) – OFF
 O14:B 3. cb MNA OI SIG CONDR OF 1/4 A – op
 O15:B 4. cb MNB OI SIG CONDR OF 1/4 B – op
 O16:B 5. cb MNC OI SIG CONDR OF 2/3 A – op
 O14, O15, O16:E 6. √cb L,R, AFT DDU (six) – op
MS PULLOUT PAGE

MS  Execute ASAP

R11U 1. FC PURGE HTR – ON
      VLVS (three) – OP
2. Minimize ltg on Aft Flt Deck

NOTE
For following RAD STOW, KU-BAND ANT
STOW, and PLBD CLOSE procs, use the
following MCA config. Disregard MCA sw
throws in other procs until PLB doors closed

MCA LOGIC CONFIG

MA73C:A, 3. √All MCA LOGIC (fourteen) – ON
   :A 4. MCA LOGIC 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
      5. [GNC 23 RCS]
         ITEM 1 EXEC (FRCS page)
         OVRD FRCS MANF(s) – OP

CAUTION
If stow prob occurs with KU-BD ANT,
perform QUICK RESPONSE JETTISON
(CONT DEORB)

If KU-BD ANT deployed:
6. Perform KU-BD ANT STOW (ORB OPS,
   COMM/INST), then:
If radiators deployed:
7. Perform RAD STOW (ORB OPS, ECLS), then:

Cont next page
PLBD CLOSURE

**WARNING**
Verify no obstructions before closing and
latching PLBD (Ku ANT, RAD, RMS, etc)

1. √ MDM PL1, PL2 (two) – ON
   SM I/O RESET
2. Verify PL SAFING complete
3. SM, OPS 202 PRO – close PLBD ASAP
4. **SM PL BAY DOORS**
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 'PLB SEQ FAIL' msg during door closure and aft latches
   : for that door are not 'CL':
   : 7. Check 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
10. AC POWER OFF – ITEM 2 EXEC
   GPC/CRT 04 EXEC
11. IDP/CRT4 PWR – OFF
12. PL BAY DR SYS (two) – DSBL
13. All MCA LOGIC sw except MNA FWD 1 (thirteen)
   B → OFF
   A
14. √ MCA LOGIC MNA FWD 1 – ON
   GNC 23 RCS
   ITEM 1 EXEC (FRCS page)
   OVRD FRCS MANF(s) – OP
15. Report to CDR: RMS, KU-BD ANT, and RADS stowed;
   PLBD closed
16. Go to FLUID LOADING PREP, 10-63
RMS STOW

NOTE
For following RMS STOW, use following MCA config. Disregard MCA sw throws in other procs until PLB doors closed.

MA73C:A, √1. MCA LOGIC MNA MID 1 – ON
MA73C:B, √3 – ON
MA73C:B, √MNB MID 2 – ON
MA73C:B, √4 – ON
MA73C:B, √MNC MID 2 – ON
MA73C:B, √4 – ON

2. Perform PL SAFING, then:

CAUTION
If stow prob occurs with RMS, perform QUICK RESPONSE JETTISON (CONT DEORB)

If RMS grappled to OBSS:
3. Perform OBSS JETTISON (PDRS OPS FS, OBSS CONTINGENCY), then:

If RMS-only:
4. Perform RMS PWRDN (PDRS OPS), then:

MS OVHD AND AFT PNL CONFIG

O13:A 1. cb ESS 1BC C/W A – op
O13:B cb ESS 1BC CRYO QTY O2, H2 TK2 (two) – op
O13:C cb ESS 2CA C/W B – op
(all SM tones and C/W lights and tones lost; CRT FAULT SUMM and SM ALERT light remains)
O13:E cb ESS 2CA MTU B – op
O13:E 3AB GPC STAT – op

O14:A 2. √BRAKES MNA – OFF
O14:B 3. √RGA 1 – OFF
O14:B 4. cb MNA OI SIG CONDR OM 1/2 A – op
O14:B MDM OF 1/2 A – op
O14:B 3/4 A – op
O14:B H2O BYP LOOP 1 SNSR – op
O14:B MSN TIMER FWD – op
O14:B EVENT TIMER AFT – op

Cont next page
5. cb MNA UTIL PWR O19/MO52J – op
   FREON RAD CNTLR 1,2 (two) – op
   O2/N2 CNTLR 1 – op (leave cl if PCS 1 active)
   CAB VENT – op
   VENT ISOL – op
6. MMU 1 – OFF
7. ASA 1 – OFF
8. √ BRAKES MNB – OFF
   4 – OFF
9. √ RGA 2 – OFF
   RGA 3 – OFF
10. cb MNB OI MDM OF 1/2 B – op
    H2O BYP LOOP 2 SNSR – op
    MSN TIMER AFT – op
    EVENT TIMER FWD – op
    UTIL PWR F1/MO13Q – op (leave cl if PGSC reqd)
11. MMU 2 – OFF
12. ASA 2 – OFF
13. ACCEL 4 – OFF
14. √ BRAKES MNC – OFF
15. √ RGA 3 – OFF
16. cb MNC OI MDM OF 3/4 B – op
    AUX TIMING BUFF – op
17. CRYO O2 HTR TK2 SNSR 1 – op
    If GALLEY:
    cb MNC UTIL PWR A11/A15/MO30F – op

Cont next page
O16:C 19. cb MNC ANNUN AFT ACA 4/5 – 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
    O17: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. MEC 1 – OFF, wait 2 sec, then
    2 – OFF
    MO58F 27. TV PWR – OFF
    O19 28. COAS – OFF
    A11 29. CRYO TK4 HTR O2,H2 A,B (four) – OFF
    A12 30. APU HTR GAS GEN/FU PUMP 2 – OFF
    LUBE OIL LN 1,2,3 (three) – OFF
    APU HTR TK/FU LN/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 LN (two) – OFF
    FWD RCS JET (five) – OFF
    AFT RCS JET (five) – OFF
    A15 34. PTU/MAIN BUS A,B (two) – OFF (tb-OFF)
    A6U 35. FLT CNTLR PWR – OFF, as reqd
    36. ANNUN BUS SEL – OFF

Cont next page

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS PAGE

OV105

OPCL/5/GEN M,2
R14:A  37. cb MNA ADC 1A/2A – op
   MNB ADC 1B/2B – op
   cb MNA,MNB,MNC PALLET DSC (three) – op
R14:B  38. cb MNA,MNB,MNC PALLET DSC (three) – op
R14:D  39. cb TV (fifteen) – op
R14:E  40. cb CAMR (six) – op
L9,R10 41. PS,MS AUD PWR (two) – OFF
40. Minimize Middeck Itg
ML31C  42. cb MNB H2O LN HTR B – op
ML86B:A 43. cb MNA MMU PORT HTR A – op
           STBD HTR A – op
           cb MNB MMU PORT HTR B – op
           STBD HTR B – op
MO39M  44. MIDDECK COMM CCU PWR – OFF
MO42F  45. MIDDECK SPKR AUD PWR – OFF
   If MMU is pwrd:
   :D  46. cb MNA MMU PORT HTR A – op
        STBD HTR A – op
        cb MNB MMU PORT HTR B – op
        STBD HTR B – op
   If no GALLEY:
   46. GALLEY 47. Go to step 48
   47. Go to step 50
   48. FOOD WARMER – OFF
   49. H2O DISPENSER PWR pb – OFF
MD44F  50. Cab temp cntl act link – pin to FULL COOL
MO13Q  51. All MIDDECK lts – It off
FLUID LOADING PREP

GALLEY 1. OVEN/RHS – ON
2. Unstow, fill 4 water containers (per crewmember) with 8 oz of water each. Temp stow near seat
3. Unstow 8 salt tablets (per crewmember). Temp stow in Flt Suit pocket
4. OVEN/RHS – OFF
5. √ H2O HTR (two) – OFF
6. √ OVEN FAN – OFF
7. Stow Personal Hygiene Hose

NOTE
Ensure sufficient containers and salt tablets are prepared to continue fluid loading thru entry

FLUID LOADING

Immed (or as soon as time permits), begin drinking H2O (one 8-oz container every 15 min with a salt tablet in every other container); continue thru entry

CLOTHING CONFIG

Don QDM for temp > 90 degF and discomfort. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON

NOTE
Inflate anti-g suit as needed for on-orbit circulatory support

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 D/O PREP)

CAB CONFIG

1. Stow loose equipment
After Deorbit Targeting complete:
2. Stow Backup PGSC
3. Remove and stow Side hatch UV filter, 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)

LOSS OF 2 FREON LOOPS
ON-ORBIT MS PAGE

OV105 B10-63 OPCL/ALL/GEN M
WCS DEACT

WCS 1. Foot Restraints – up, locked
ML31C 2. VAC VENT ISOL VLV CNTL – CL (tb-CL)

POLE SETUP

Perform ESCAPE POLE STOWAGE/SETUP (Cue Card), then:

SEAT INSTALLATION

1. Confirm minimum ltg on Middeck
2. Unstow LOSS OF 2 FREON LOOPS D/O PREP (CONT DEORB); perform MS PAGE procs
NOTE
The COMM PWRDN and POWERUP procs on this and following pages should be used until Touchdown

COMM PWRDN

MS Pwr dn comm ASAP after comm with MCC no longer reqd.
Delay 10 min max if AOS. Use COMM POWERUP, 10-67, if MCC comm reqd. Comm will be pwr'd on entry by AFT PNL CONFIG FOR ENTRY COMM, MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP) 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 sel – STDN LO
XPNDR – OFF

2. NSP PWR – OFF
ENCRIPTION PWR – OFF
(Encrypt disabled rest of flt)
ENCRIPTION MODE – SEL
SEL – BYP

C3 3. S-BD PM CNTL – PNL,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. S-BD FM CNTL – PNL
PWR – OFF

A3 6. MON PWR (two) – OFF
A7U 7. TV PWR CONTR UNIT – OFF
O6 8. UHF MODE sel – OFF

R12L 9. MDM PL1,PL2 (two) – OFF
R14:B 10. VTR PWR – OFF

Cont next page

LOSS OF 2 FREON LOOPS
ON-ORBIT
MS COMM PAGE

OV105

OPCL/ALL/GEN M
NOTE
During each comm window, voice down cab temp, crew body temps and heart rates, per COMM POWERUP, 10-67; indicate severity of cab humidity

If after TIG-10:
12. Go to AFT PNL CONFIG FOR ENTRY COMM, MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP)
COMM POWERUP (If comm reqd prior to landing site coverage)

Pwr up audio sys:
C3 1. AUD CTR – 1
O5 √ L AUD PWR – AUD
O9 √ R AUD PWR – AUD
If UHF avail, config for UHF comm (voice only):
O6 2. UHF MODE sel – SPLX
   √ SPLX/EVA PWR AMPL – ON
3. After comm with MCC complete: Go to COMM PWRDN, 10-65 >>
If UHF site unavail or if MCC requests data
   (config for GSTDN(SGLS) S-BD):
   C3 4. √ S-BD PM CNTL – PNL
      A1L S-BD PM ANT SW ELEC – 2
         MODE sel – STDN LO(SGLS)
         XPNDR – 2
      5. NSP PWR – 2
         DATA RATE XMIT – HI
         RCV – HI
         CODING XMIT – OFF
         RCV – OFF
         √ UPLK DATA – S-BD
      C3/F9 6. Sel best S-BD PM ANT
If MCC requests data:
O14:B 7. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
O17:D 8. SIG CONDR OA 1/2/3 – ON
   9. MDM OA 1/2/3 – ON
   C3 10. OI PCMMU PWR – 1
   O6 11. MDM PL2 – ON
   12. GNC I/O RESET
At end of data transmission:
O14:B 13. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
O17:D 14. SIG CONDR OA 1/2/3 – OFF
   15. MDM OA 1/2/3 – OFF
   After comm/data complete:
   L 16. Go to COMM PWRDN, 10-65

Cont next page
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 after S-BD PM PNL/CMD before Pwr Amp is active. Uplink not affected. Proceed with selection of best antenna.

<table>
<thead>
<tr>
<th></th>
<th>17. S-BD PM CNTL – PNL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1L</td>
<td>18. ANT SW ELEC – 2</td>
</tr>
<tr>
<td></td>
<td>PRE AMP – 2</td>
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<tr>
<td></td>
<td>PWR AMPL OPER – 2</td>
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<tr>
<td></td>
<td>MODE sel – TDRS DATA</td>
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<tr>
<td></td>
<td>XPNDR – 2</td>
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<tr>
<td></td>
<td>19. NSP PWR – 2</td>
</tr>
<tr>
<td></td>
<td>DATA RATE XMIT – HI</td>
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<td>RCV – HI</td>
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<td>CODING XMIT – ON</td>
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<tr>
<td></td>
<td>RCV – ON</td>
</tr>
<tr>
<td></td>
<td>20. UPLK DATA – S-BD</td>
</tr>
</tbody>
</table>

If MCC requests data:

|   | 21. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl |
|   | 22. SIG CONDR OA 1/2/3 – ON |
|   | 23. MDM OA 1/2/3 – ON |
|   | 24. OI PCMMU PWR – 1 |
|   | 25. MDM PL2 – ON |
|   | 26. GNC I/O RESET |

At end of data transmission:

| O14:B | 27. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op |
| O17:D | 28. SIG CONDR OA 1/2/3 – OFF |
| L      | 29. MDM OA 1/2/3 – OFF |

After comm/data complete:

|   | 30. Go to COMM PWRDN, 10-65 |
LOSS OF FES

MS  Perform MS PWRDN, 10-71, immed

C3  1. √MSTR MADS PWR – OFF
    2. Minimize ltg
    3. Use one PGSC, and one IDP/CRT with two MDUs only as reqd

If FLT CNTLR PWR not reqd:

O14,O15,  4. cb DDU L,R,AFT (six) – op

O16:E

If not in deorb prep:

O7  5. √GPS 1,3 PWR (two) – OFF
    √PRE AMPL (four) – OFF

O8  6. √RDR ALTM (two) – OFF
    7. √MLS (three) – OFF
    8. Perform PL PWRDN, then:

L1  9. CAB TEMP CNTLR – OFF
    10. H2O LOOP 2 BYP MODE – MAN

L2  11. √FLOW PROP VLV LOOP tb (two) – ICH
    12. √TOP EVAP HTR NOZ L,R (two) – OFF
        √DUCT sel – OFF

L4:L 13. √HI LOAD DUCT HTR sel – OFF

R2  14. √NWS – OFF
    15. √ANTISKID – OFF

MMU 2 deact:

O15:F  18. [SM 1 DPS UTILITY]
    √MMU ASSIGN 1 SM – ITEM 3 EXEC
    MMU 2 – OFF

If IMU ALIGN not reqd, mnvr to tail Sun att:

GNC UNIV PG (β < 0)

START TRK – ITEM 19 EXEC

Confirm MS pwrnd activities complete, then:

For deorbit prep:

21. Go to LOSS OF FES (CONT DEORB)

OV105

B10-69 OPCL/5/GEN M
MS PULLOUT PAGE

MS2 Deploy rads, RAD DEPLOY (ORB OPS, ECLS)
MS1 Perform pwrdn below

MS PWRDN

1. Minimize ltg
2. √BRAKES (three) – OFF
3. √cb ADTA (four) – op
4. MSN TIMER FWD – op
   EVENT TIMER AFT – op
5. MSN TIMER AFT – op
   EVENT TIMER FWD – op
6. PL DATA INTLVR PWR – OFF
7. APU HTR LUBE OIL LN (three) – OFF
8. HYD HTR (eight) – OFF
9. RCS/OMS HTR FWD RCS – OFF
   L,R POD (four) – OFF
   OMS CRSFD LN (two) – OFF
10. cb TV (fifteen) – op
    CAMR (six) – op
11. MON 1,2 PWR (two) – OFF
12. VAC VENT NOZ HTR – OFF
   If Manned Mnvr Unit is pwrd:
13. cb MNA,MNB STBD HTR A,B (two) – op
    PORT HTR A,B (two) – op
14. Cab temp cntl act link – pin to FULL COOL
AV BAY FIRE

AV BAY 1

NOTE

While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
- FPCA 1  MDM OF1
- FLCA 1  DSC OF1
- IMU FAN  ACCU

If docked with ISS, proc results in loss of Lo Z Translation.

If no active GNC GPC: Perform GNC RECOVERY VIA G2FD (DPS), 3-12, concurrent with remainder of this proc

R1
1. cb AC CONTR AC1 (three) – cl
2. INV/AC BUS 1 – OFF (tb-OFF)
   INV PWR 1 – OFF (tb-OFF)
3. cb AC CONTR AC1 (three) – op
4. Perform FC1 SHUTDN, except PWRDN (Cue Card), then:

L1
5. √AV BAY 1 FAN A,B (two) – OFF
6. FREON PUMP LOOP 2 – A
7. AV BAY 3 FAN A – ON
   B – OFF

C3
8. OI PCMMU FORMAT – FXD
   PWR – 2
9. BFC CRT DISP – ON

O6
10. √GPC PWR 5 – ON
      \OUTPUT 5 – NORM
      MODE 5 – STBY (tb-RUN), RUN
11. 4 – STBY (tb-bp), HALT
    PWR 4 – OFF

If GNC RECOVERY VIA G2FD (DPS), 3-12, performed:
12. Go to step 15
If Single G2 GPC OPS:
13. Perform G2 SET EXPANSION, target Dual G2 (ORB OPS, DPS), then:
If/when in Multiple GPC OPS:
14. Reassign strings to GPC 2 in MC 2
    [GNC 0 GPC MEMORY]
CRT

CONFIG – ITEM 1 +2 EXEC
Modify MC 2 per table

DOWNLIST GPC – ITEM 44 +2 EXEC

GPC, OPS 201 PRO

O6 15. GPC MODE 1(3) – STBY (tb-bp) – HALT
   PWR 1 – OFF
   MDM FF1 – OFF
   PL1 – OFF
16. MDM FF1 – OFF
   PL1 – OFF
17. Perform PL PWRDN, then:
O7 18. GPS 1 PWR – OFF
   PRE AMPL (two) – OFF
19. GPS 1 – OFF
   PRE AMPL (two) – OFF
20. MLS 1 – OFF
21. **GNC 23 RCS**

CRT
   RCS FWD – ITEM 1 EXEC (*)
   MANF VLVS STAT OVRD – ITEM 41 EXEC –
   CL (MANF 2)

O13:A 22. cb ESS 1BC AC1 SNSR – op
    3AB GPC STAT – op
:E
O14:A 23. **BRAKES MNA** – OFF
    cb MNA RDR ALTM 1 – op
:E 24. MLS 1 – op
    ADTA 1 – op
    ACCEL 1 – op
:F 25. MMU 1 – OFF
26. RJDF 1B F1 LOGIC – OFF
    DRIVER – OFF
O15:F 27. RJDF 1A F2 LOGIC – OFF
    DRIVER – OFF
28. ACCEL 4 – OFF
O16:A 29. **BRAKES MNC** – OFF
    cb MNC ADTA 3 – op
:E 30. xxcb MNC ADTA 3 – op
A1R 31. PL DATA INTLVR PWR – OFF
32. S-BD PL CNTL – PNL,CMD
MA73C:A 33. MCA LOGIC MNA FWD 1 – OFF
AW18H 34. PWR/BATT CHGR EMU 1,2 BUS SEL (two) – OFF
A12 35. HYD CIRC PUMP PWR 1 – MNB
   2 – MNC
   3 – MNA

Cont next page

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B10-74

OPCL/5/GEN M,2
36. cb AC2 $\Phi_A, \Phi_B, \Phi_C$ AV BAY 1 FAN B (three) – op
37. Perform MAL, EPS SSR-110, BUS LOSS: AC1, except:
   - AV BAY 1 FAN A, B (two) – OFF, then:
38. Reassign SM into GPC 3, per MAL, DPS SSR-4, SM REASSIGNMENT
39. Perform LOAD PCMMU FORMAT, using TFL
   - AV BAY 1 FAN A, B (two) – OFF, then:
40. BFC CRT DISP – OFF
   - GPC MODE 5 – STBY, HALT (tb-bp)
   - Output 5 – NORM

For deorb prep:
   If orbit 3 deorbit:
      41. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB) >>
      42. Perform MAL, ECLS SSR-12, AV BAY FIRE RECOVERY/RECONFIG, Checkout and Recovery,

For deorb prep:
   If orbit 7 deorbit:
      43. Perform P&I nominal POST INSERTION, DEORB PREP (POST INSERT, ORBIT 7 D/O).
      44. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)
AV BAY 2

NOTE
While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
- FPCA 2 MDM OF2
- FLCA 2 DSC OF2
- BFC 3A (When GPC 3 is powered).

If docked with ISS, proc will require ISS to control mated attitude or result in loss of mated attitude control. Proc also results in loss of Lo Z Translation

R1
1. cb AC CONTR AC2 (three) – cl
2. INV/AC BUS 2 – OFF (tb-OFF)
   INV PWR 2 – OFF (tb-OFF)
3. cb AC CONTR AC2 (three) – op
4. Perform FC2 SHUTDN, except PWRDN (Cue Card), then:
L1
5. IMU FAN A(C) – ON
   B – OFF
6. AV BAY 1 FAN A – ON
   B – OFF
7. FREON PUMP LOOP 1 – A
8. √CAB FAN A – ON
   √B – OFF
9. √AV BAY 2 FAN A,B (two) – OFF
C3
10. √O1 PCMMU PWR – 1
A1L
11. √S-BD PM MODE sel – TDRS DATA
    √NSP DATA RATE XMIT – HI
    √RCV – HI
    √CODING XMIT – ON
    √RCV – ON
    √PWR – 1
    √UPLK DATA – S-BD
C3
12. S-BD PM CNTL – PNL,CMD

Cont next page

OV105

B10-77
OPCL/ALL/GEN M
REASSIGN STRINGS TO GPC 1 IN MC 2

13. **GNC 0 GPC MEMORY**
   
   CRT
   CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table

14. GNC, OPS 201 PRO

15. GPC MODE 2 – STBY(tb-bp)
   – HALT
   PWR 2 – OFF
   MODE 5 – HALT
   OUTPUT 5 – NORM
   PWR 5 – OFF

16. MDM FF2,FF4 (two) – OFF
    PL2 – OFF

17. Perform PL PWRDN, then:

18. RDR ALTM 2 – OFF
19. MLS 2,3 (two) – OFF

20. cb ESS 2CA AC2 SNSR – op

21. cb BRAKES MNB – OFF

22. cb MNB RDR ALTM 2 – op
    MLS 2 – op
    √ADTA 2 – op
    √ACCEL 2 – op

23. MMU 2 – OFF

24. RJDA LOGIC,DRIVER (eight) – ON

25. [GNC 20 DAP CONFIG] – sel tail only
    P,Y OPTION – ITEM 15,16 EXEC (TAIL)
    – ITEM 35,36 EXEC (TAIL)

26. DAP: PRI

27. cb BRAKES MNC – OFF

28. cb MNC MLS 3 – op
    √ADTA 4 – op

29. RJDF 2A F3 LOGIC – OFF
    DRIVER – OFF
    2B F4/F5 LOGIC – OFF
    F4 DRIVER – OFF

30. √ACCEL 3 – OFF

31. RJDF MANF L5/F5/R5 DRIVER – OFF

32. S-BD PL PWR SYS – OFF
    CNTL – PNL,CMD

Cont next page
A12

33. √HYD CIRC PUMP PWR 1 – MNA
   2 – MNB
   3 – MNC

MA73C:A

34. MCA LOGIC MNB FWD 2 – OFF

L4:H

35. cb AC3 AV BAY 2 FAN B (three) – op

36. Perform MAL, EPS SSR-120, BUS LOSS: AC2, except:
   L1 √AV BAY 2 FAN A,B (two) – OFF, then:

37. Reassign BFS into GPC 3, per MAL, DPS SSR-7, GPC IPL MENU OPTION (PASS/BFS)

For deorb prep:
   If orbit 3 deorbit:
      38. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB) >>

   39. Perform MAL, ECLS SSR-12, AV BAY FIRE RECOVERY/RECONFIG, Checkout and Recovery, then:

   For deorb prep:
      If orbit 7 deorbit:
         40. Perform Deltas to nominal POST INSERTION, DEORB PREP (POST INSERT, ORBIT 7 D/O), then:

         41. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)
AV BAY 3A

NOTE
While performing proc, note any cbs open.

Equipment still pwrd in Av Bay following pwrdn:
FPCA 3  MDM OF3  GCIL
FLCA 3  DSC OF3
Active comm sys equipment
S-BD PWR-AMP stby (alt sys)

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

If Triple G2:

CRT
8. CONFIG – ITEM 1 +2 EXEC
   Modify MC 2 per table
9. GNC, OPS 201 PRO
O6
10. √GPC MODE 3 – HALT
    OUTPUT 3 – NORM
    PWR 3 – OFF
11. MDM FF3 – OFF
12. Perform PL PWRDN, then:
O7
13. √GPS 3 PWR – OFF
    PRE AMPL – OFF
O13:A
14. cb ESS 1BC C/W A – op
    2CA C/W B – op
    (all SM tones and C/W lights and
    tones lost; CRT FAULT SUMM
    and SM ALERT light remains)
O13:E
15. cb ESS 3AB AC3 SNSR – op
16. Perform LOSS OF VERNIERS
    (ORB OPS, RCS) while continuing
    with pwrdn, then:
If comm not working:

**A1L**
17. \(\sqrt{\text{S-BD PM MODE sel – TDRS DATA}}\)
18. \(\sqrt{\text{NSP DATA RATE XMIT – HI}}\)
19. \(\sqrt{\text{RCV – HI}}\)
20. \(\sqrt{\text{CODING XMIT – ON}}\)
21. \(\sqrt{\text{RCV – ON}}\)
22. \(\sqrt{\text{PWR – 1}}\)
23. \(\sqrt{\text{UPLK DATA – S-BD}}\)

**C3**
18. \(\sqrt{\text{S-BD PM CNTL – PNL,CMD}}\)

If comm still not working:

**A1L**

**C3**
20. \(\sqrt{\text{PL DATA INTLVR PWR – OFF}}\)

**A1L**
21. \(\sqrt{\text{S-BD PM CNTL – PNL ANT SW ELEC – OFF}}\)
22. \(\sqrt{\text{PRE AMP – OFF}}\)
23. \(\sqrt{\text{PWR AMPL STBY – OFF}}\)
24. \(\sqrt{\text{OPER – OFF}}\)
25. \(\sqrt{\text{XPNDR – OFF}}\)
26. \(\sqrt{\text{NSP PWR – OFF}}\)
27. \(\sqrt{\text{ENCRYPTION PWR – OFF}}\)

**MA73C:A**
23. \(\sqrt{\text{MCA LOGIC MNC FWD 3 – OFF}}\)

**NOTE**

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

**L4:H**
24. \(\sqrt{\text{cb AC1 AV BAY 3 FAN B (three) – op}}\)
25. \(\sqrt{\text{Perform MAL, EPS SSR-130, BUS LOSS: AC3, except:}}\)
   **L1**
   \(\sqrt{\text{AV BAY 3 FAN A,B (two) – OFF, then:}}\)

For deorb prep:

If orbit 3 deorbit:

26. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB, LAUNCH DAY ORBIT 3) >>
27. Perform MAL, ECLS SSR-12, AV BAY FIRE RECOVERY/RECONFIG, Checkout and Recovery, then:

For deorb prep:

If orbit 7 deorbit:

28. Perform Deltas to nominal POST INSERTION, DEORB PREP (POST INSERT, ORBIT 7 D/O), then:
29. Go to AV BAY FIRE (DEORB PREP, CONTINGENCY DELTAS)

**OV105**

B10-82 OPCL/5/GEN M,10
PRIORITY PWRDN PROCEDURES
(And Mission Specific Pwrdsn)

1. Letter coded priority pwrdsn are for mission specific operations. Group A (normal) is standard sw list config for on-orbit operations. Group B (LOW LEVEL) and Group C (MSN EXT) are specialized pwrdsn.

Group B (with A) comprises a nonstandard avionics config to be used nominally on power-critical missions not normally involving payload deploys, rendezvous, proximity, or RMS operations. Group C (with A) will be implemented, if reqd, during mission extension days.

Activities not consistent with Group B and C Pwrdsn are:

   LOW LEVEL CONFIG (Group B)       MISSION EXT (Group C)
   a. OMS BURNS                      f. OMS BURNS
   b. FCS CHECKOUT                   g. FCS CHECKOUT
   c. NOMINAL OPS TRANSITIONS (i.e., not reqd for troubleshooting)  
   d. DEORB PREP                      i. CIRC PUMP OPS
   e. DTOs                            j. APU OPS
                                          k. PLBD OPS
                                          l. KU BAND OPS
                                          m. PAYLOAD OPS
                                          n. DEORB PREP
                                          o. DTOs

Pwrup for any of the activities listed above will be accomplished using the B or C Pwrdsn in reverse order.

2. Numbered priority pwrdn procs 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 procs.
3. The loads for the major power users are presented below.

4. Use PWRUP column in reverse order to back out of numbered priority pwrdns.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>dc Watts (Avg)</th>
<th>Pnl</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADS – ASCENT/ENTRY</td>
<td>305</td>
<td>C3</td>
</tr>
<tr>
<td>– ORBIT</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>LTG PNL (L OVHD, L CTR)</td>
<td>654</td>
<td>O6</td>
</tr>
<tr>
<td>LTG PNL (R OVHD, R)</td>
<td>396</td>
<td>O8</td>
</tr>
<tr>
<td>LTG INST (L/CTR, OVHD)</td>
<td>108</td>
<td>O6</td>
</tr>
<tr>
<td>LTG INST (R)</td>
<td>63</td>
<td>O8</td>
</tr>
<tr>
<td>GPC (RUN)</td>
<td>560</td>
<td>O6</td>
</tr>
<tr>
<td>GPC (HALT)</td>
<td>56</td>
<td>O6</td>
</tr>
<tr>
<td>IDP</td>
<td>55</td>
<td>C2</td>
</tr>
<tr>
<td>MDU</td>
<td>66</td>
<td>R14:A</td>
</tr>
<tr>
<td>ADC</td>
<td>3.7</td>
<td>R14:A</td>
</tr>
<tr>
<td>FLT CNTLR PWR</td>
<td>10</td>
<td>F7,F8</td>
</tr>
<tr>
<td>ADI/DDU</td>
<td>129</td>
<td>O14,O15, O16:E</td>
</tr>
<tr>
<td>TACAN – SEARCH</td>
<td>75</td>
<td>O7</td>
</tr>
<tr>
<td>– TRACK</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>MLS</td>
<td>55</td>
<td>O14,O15, O16:E</td>
</tr>
<tr>
<td>GPS</td>
<td>25.2</td>
<td>A13</td>
</tr>
<tr>
<td>RA</td>
<td>23</td>
<td>O8</td>
</tr>
<tr>
<td>HUD</td>
<td>245</td>
<td>F3</td>
</tr>
<tr>
<td>IMU – OPER</td>
<td>119</td>
<td>O14,O15, O16:A</td>
</tr>
<tr>
<td>– STBY</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>FREON LOOP PUMP</td>
<td>467</td>
<td>L1</td>
</tr>
<tr>
<td>H2O PUMP LOOP</td>
<td>258</td>
<td>L1</td>
</tr>
<tr>
<td>FES HTRS – (FES OFF)</td>
<td>222</td>
<td>L1</td>
</tr>
<tr>
<td>– (FES ON)</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>ACIP htr</td>
<td>50</td>
<td>A7U</td>
</tr>
</tbody>
</table>
### PRIORITY PWRDN GROUP A

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP A</th>
<th>PWRDN (normal)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal on-orbit config:</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>O14,</td>
<td>1. Lights – OFF except when needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O15,</td>
<td>2. BRAKES (three) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O16:A</td>
<td>3. cb ADTA (four) – op</td>
<td></td>
<td></td>
</tr>
<tr>
<td>:E</td>
<td>If ASA – ON:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>4. Sequence FCS CH (four) – OFF rapidly, then:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O14,</td>
<td>5. ASA (four) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O15,</td>
<td>6. ATVC (four) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O16:F</td>
<td>7. EIU (three) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O17:A</td>
<td>8. MEC (two) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>:B</td>
<td>9. TACAN MODE sel (three) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>:D</td>
<td>10. RDR ALTM (two) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O7</td>
<td>11. MLS (three) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O8</td>
<td>12. HI LOAD DUCT HTR sel – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>13. ANTISKID – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>14. FLT CNTLR PWR (two) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6,F8</td>
<td>15. APU HTR TK/FU LN/H2O SYS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A12</td>
<td>One set – AUTO, one set – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O6</td>
<td>16. GPC MODE 3 – STBY (tb-bp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– HALT (tb-bp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– STBY (tb-RUN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– HALT (tb-bp)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 – STBY (tb-RUN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– HALT (tb-bp)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cont next page

1 As reqd per other FDF documents
<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP A</th>
<th>PWRDN (Cont)</th>
<th>(normal)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O6</td>
<td>17.</td>
<td>GPC MODE 2 – as reqd</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>O14, O15, O16:A</td>
<td>18.</td>
<td>RGA (four) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O14, O15:E</td>
<td>19.</td>
<td>cb ACCEL 1,2 (two) – op</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O15, O16:F</td>
<td>20.</td>
<td>ACCEL 4,3 (two) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>21.</td>
<td>HUD PWR (two) – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O14, O15, O16:E</td>
<td>22.</td>
<td>cb DDU L,R,AFT (six) – op</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>O6</td>
<td>23.</td>
<td>IDPs – three ON for crew awake&lt;br&gt;MDUs – ON as desired&lt;br&gt;All MDUs and IDPs OFF for crew&lt;br&gt;single-shift sleep</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24.</td>
<td>UHF MODE sel – OFF</td>
<td>SPLX</td>
<td></td>
</tr>
</tbody>
</table>

2 If GPC 2 not reqd, perform G2 SET CONTRACTION (ORB OPS, DPS)
3 As reqd per FLIGHT PLAN, perform G2 SET EXPANSION (ORB OPS, DPS)
4 Other(s) ON as reqd
5 ON as reqd for FLT CNTLR PWR
PRIORITY PWRDN PROCEDURES
(And Mission Specific Pwrdns)

1. Letter coded priority pwrdns are for mission specific operations. Group A (normal) is standard sw 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 not normally involving payload deploys, rendezvous, proximity, or RMS operations. Group C (with A) will be implemented, if reqd, during mission extension days.

Activities not consistent with Group B and C Pwrdns are:

- LOW LEVEL CONFIG (Group B)
  - a. OMS BURNS
  - b. FCS CHECKOUT
  - c. NOMINAL OPS TRANSITIONS (i.e., not reqd for troubleshooting)
  - d. DEORB PREP
  - e. DTOs

- MISSION EXT (Group C)
  - f. OMS BURNS
  - g. FCS CHECKOUT
  - h. OPS TRANSITIONS
  - i. CIRC PUMP OPS
  - j. APU OPS
  - k. PLBD OPS
  - l. KU BAND OPS
  - m. PAYLOAD OPS
  - n. DEORB PREP
  - o. DTOs

Pwrup for any of the activities listed above will be accomplished using the B or C Pwrdns in reverse order.

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<td>LTG PNL (L OVHD, L CTR)</td>
<td>654</td>
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<td>LTG PNL (R OVHD, R)</td>
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<td>C2</td>
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<tr>
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<td>R14:A</td>
</tr>
<tr>
<td>ADC</td>
<td>3.7</td>
<td>R14:A</td>
</tr>
<tr>
<td>FLT CNTLR PWR</td>
<td>10</td>
<td>F7,F8</td>
</tr>
<tr>
<td>ADI/DDU</td>
<td>129</td>
<td>O14,O15,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O16:E</td>
</tr>
<tr>
<td>MLS</td>
<td>55</td>
<td>O14,O15,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O16:E</td>
</tr>
<tr>
<td>GPS</td>
<td>25.2</td>
<td>O7</td>
</tr>
<tr>
<td>RA</td>
<td>23</td>
<td>O8</td>
</tr>
<tr>
<td>HUD</td>
<td>245</td>
<td>F3</td>
</tr>
<tr>
<td>IMU – OPER</td>
<td>119</td>
<td>O14,O15,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O16:A</td>
</tr>
<tr>
<td>– STBY</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>FREON LOOP PUMP</td>
<td>467</td>
<td>L1</td>
</tr>
<tr>
<td>H2O PUMP LOOP</td>
<td>258</td>
<td>L1</td>
</tr>
<tr>
<td>FES HTRS – (FES OFF)</td>
<td>222</td>
<td>L1</td>
</tr>
<tr>
<td>– (FES ON)</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>ACIP htr</td>
<td>50</td>
<td>A7U</td>
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</tbody>
</table>
### PRIORITY PWRDN GROUP A

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP A</th>
<th>PWRDN (normal)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O14, O15, O16:A:E</td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>C3</td>
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</tr>
<tr>
<td>O14, O15, O16:F</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>O17:A:B:D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O7</td>
<td></td>
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<td></td>
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<td>O8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F6,F8</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>A12</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>O6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Nominal on-orbit config:**

1. Lights – OFF except when needed
2. BRAKES (three) – OFF
3. cb ADTA (four) – op
4. Sequence FCS CH (four) – OFF rapidly, then:
5. ASA (four) – OFF
6. ATVC (four) – OFF
7. EIU (three) – OFF
8. MEC (two) – OFF
9. GPS 1,3 PWR (two) – OFF
10. RDR ALTM (two) – OFF
11. MLS (three) – OFF
12. HI LOAD DUCT HTR sel – OFF
13. ANTISKID – OFF
14. FLT CNTLR PWR (two) – OFF
15. APU HTR TK/FU LN/H2O SYS:
   One set – AUTO, one set – OFF
16. GPC MODE 3 – STBY (tb-bp)
   - HALT (tb-bp)
   - STBY (tb-RUN)
   - HALT (tb-bp)
   - STBY (tb-RUN)
   - HALT (tb-bp)

**As reqd per other FDF documents**
<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP A</th>
<th>PWRDN (Cont) (normal)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O6</td>
<td>O14,</td>
<td>GPC MODE 2 – as reqd</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>O15,</td>
<td>18. RGA (four) – OFF</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>O16:A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O14,</td>
<td>O15:E</td>
<td>19. cb ACCEL 1,2 (two) – op</td>
<td>4</td>
</tr>
<tr>
<td>O15,</td>
<td>O16:F</td>
<td>20. ACCEL 4,3 (two) – OFF</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td></td>
<td>21. HUD PWR (two) – OFF</td>
<td></td>
</tr>
<tr>
<td>O14,</td>
<td>O15,</td>
<td>22. cb DDU L,R,AFT (six) – op</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>O16:E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O6</td>
<td></td>
<td>23. IDPs – three ON for crew awake</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MDUs – ON as desired</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>All MDUs and IDPs OFF for crew</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>single-shift sleep</td>
<td></td>
</tr>
</tbody>
</table>

2. If GPC 2 not reqd, perform G2 SET CONTRACTION (ORB OPS, DPS)
3. As reqd per FLIGHT PLAN, perform G2 SET EXPANSION (ORB OPS, DPS)
4. Other(s) ON as reqd
5. ON as reqd for FLT CNTLR PWR
**PRIORITY PWRDN GROUP B**

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP B</th>
<th>PWRDN (LOW LEVEL)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOTE</td>
<td>KU-BD and S-BD FM sw: As reqd to conserve energy and accomplish mission objectives, MCC will cmd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Turn off all lights except Middeck lts 6,7,8 (no lts for single-shift sleep, one for split-shift sleep)</td>
<td>As reqd</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>MSTR MADS PWR – OFF (as reqd, cycle ON per FLIGHT PLAN)</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>A14</td>
<td>RCS/OMS HTR L POD (two) – A AUTO, B OFF R POD (two) – A AUTO, B OFF</td>
<td>MCC call</td>
<td></td>
</tr>
<tr>
<td>GALLEY</td>
<td>H2O HTR (two), OVEN FAN – OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>O14, O15, O16:E</td>
<td>cb DDU L,R,AFT (six) – op</td>
<td>cl</td>
<td></td>
</tr>
<tr>
<td>If GPC MODE 2 – RUN:</td>
<td>6. Perform G2 SET CONTRACTION (ORB OPS, DPS), then:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O15:F</td>
<td>MMU 2 – OFF (1 of 2 off)</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Minimize PGSC use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O14, O15, O16:F</td>
<td>Pri RJDF DRIVER,LOGIC (eight) – OFF RJDA 1A L2/R2 DRIVER – ON</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Use only one IDP with three MDUs max. All IDPs and MDUs OFF for single-shift sleep; otherwise – ON</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Pri RJDA DRIVER,LOGIC (eight) – OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>GNC 21 IMU ALIGN IMU 2 STBY – ITEM 22 EXEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>COLOR PRINTER – OFF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Insert drink package to keep water tank pump from cycling (water temp may decrease slightly); if repowering Galley, remove drink package
2. If reqd, go to G2 SET EXPANSION (ORB OPS, DPS)
3. Recover IMU 2 (MAL, GNC FRP-3)
4. MCC will instruct crew when to turn COLOR PRINTER ON
# PRIORITY PWRDN GROUP C

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP C</th>
<th>PWRDN (MSN EXT)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O14, O15, O16:F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O6, A14, A1L, A1R</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Perform PRIORITY PWRDN GROUP 1,2
   If prior to first deorbit prep:
   2. Perform PRIORITY PWRDN GROUP 3A, then:
   3. Turn off all lights except two Middeck lts (use no lts for single-shift sleep or split-shift sleep)

**GALLEY**

4. H2O HTR (two), OVEN FAN – OFF
   ON
5. MDUs: Cycle ON when reqd
   MCC call

**O14, O15, O16:F**

6. Pri RJDF DRIVER,LOGIC (eight) – OFF
   ON
7. Pri RJDA DRIVER,LOGIC (eight) – OFF
   ON
8. RJDA 1A L2/R2 DRIVER – ON
   MCC call
9. MDM PL2 – OFF
   ON
10. RCS/OMS HTR
    L POD (two) – A AUTO, B OFF
    R POD (two) – A AUTO, B OFF
    MCC call
11. PL DATA INTLVR PWR – OFF
    S-BD PL PWR SYS – OFF
    CNTL – PNL,CMD
12. FM PWR – OFF
    CNTL – PNL,CMD
13. \UHF MODE sel – OFF
14. cb DDU L,R,AFT (six) – op
15. COLOR PRINTER – OFF
   MCC call

1. Insert drink package to keep water tank pump from cycling (water temp may decrease slightly); if repowering Galley, remove drink package
2. Before powering off PF2 MDM, \UHF for Antenna Electronics 1 activation
3. SM I/O RESET
4. If PDI and/or PSP pwrd off, expect ‘S62 BCE BYP PL’, ‘S62 BCE BYP PDI’ and/or ‘S62 BCE BYP PSP’ msgs
5. As reqd, MCC will command
**PRIORITY PWRDN GROUP 1**

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 1</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O15:F</td>
<td>1.</td>
<td>Minimize ltg</td>
<td>①</td>
</tr>
<tr>
<td>2.</td>
<td>Use only one IDP with three MDUs max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>If GPC 2 – RUN: Perform G2 SET CONTRACTION (ORB OPS, DPS), then:</td>
<td>①</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>MMU 2 OFF – (1 of 2 off)</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>IMU 2 STBY – ITEM 22 EXEC</td>
<td>②</td>
<td></td>
</tr>
</tbody>
</table>

① If reqd, go to G2 SET EXPANSION (ORB OPS, DPS)
② Recover IMU 2 (MAL, GNC FRP-3)

**PRIORITY PWRDN GROUP 2**

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 2</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O6</td>
<td>1.</td>
<td>S TRK PWR -Y,-Z (two) – OFF</td>
<td>As reqd</td>
</tr>
<tr>
<td>2.</td>
<td>Perform GPS PWRDN (ORB OPS, GNC) for GPS 2</td>
<td>①</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>MDM FF2,4 (two) – OFF</td>
<td>ON ②</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>MSTR MADS PWR – OFF</td>
<td>ON 3</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>FLASH EVAP CNTLR PRI (two) – OFF</td>
<td>④</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SEÇ – OFF</td>
<td>Two ON ③</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOP EVAP HTR NOZ (two) – OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DUCT sel – OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE</td>
<td>RMS temps no longer avail on A8U; however, MCC has insight</td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>6.</td>
<td>cb AC1 RMS PRI ΦA – op</td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>7.</td>
<td>PORT RMS HTR A(B) – OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* If PDRS PORT TEMP msg (MA tone only): *</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Within 30 min, PORT RMS HTR A(B) – AUTO</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
| | * AUTO | *
| | * On MCC call: | *
| | * PORT RMS HTR A(B) – OFF; | *
| | * repeat as reqd | *
| MA73C:F | 8. | Use only one orbiter PGSC | ON |
| A8L | If OCAC flown: | |
| | 9. | OCAC PWR – OFF | |

① Perform GPS PWRUP (ORB OPS, GNC) for GPS 2
② GNC I/O RESET
③ Perform TOPPING FES STARTUP, using Pri A/B (ORB OPS, ECLS)
④ SEC CNTLR ON only if both primary controllers failed
PRIORITY PWRDN GROUP 3

Perform PL PWRDN

PRIORITY PWRDN 3A (PP3A) contains recoverable PL ops pwrdn steps. PRIORITY PWRDN 3B (PP3B) is a total PL pwrdn that may cause PL ops to be nonrecoverable.

PRIORITY PWRDN GROUP 4

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 4</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GALLEY</td>
<td>1.</td>
<td>H2O HTR (two), OVEN FAN – OFF</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>If RMS pwrd:</td>
<td></td>
<td>MCC call</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>Perform RMS PWRDN (PDRS OPS), then:</td>
<td></td>
</tr>
<tr>
<td>L4:L</td>
<td>3.</td>
<td>cb AC1 ΦB AV BAY 2 S/C – op</td>
<td>cl</td>
</tr>
</tbody>
</table>

PRIORITY PWRDN GROUP 5

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 5</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O15:A</td>
<td>1.</td>
<td>IMU 2 – OFF (1 of 3)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>GNC 20 DAP CONFIG TAIL P,Y OPTION</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DAP: X/AUTO/PRI</td>
<td></td>
</tr>
<tr>
<td>O8</td>
<td>3.</td>
<td>FWD RCS MANF ISOL 1,2,3,4 (four) – CL</td>
<td>3</td>
</tr>
<tr>
<td>O6</td>
<td>4.</td>
<td>MDM PL2 – OFF</td>
<td>ON</td>
</tr>
<tr>
<td>A14</td>
<td>5.</td>
<td>RCS/OMS HTR FWD RCS JET 1,2,3,4 (four) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ON</td>
</tr>
<tr>
<td>O14, O15, O16:F</td>
<td>6.</td>
<td>RJDF DRIVER,LOGIC (eight) – OFF</td>
<td></td>
</tr>
<tr>
<td>O14:C</td>
<td>7.</td>
<td>cb UTIL PWR O19/MO52J – op</td>
<td>cl</td>
</tr>
<tr>
<td>O15:C</td>
<td></td>
<td>F1/MO13Q – op</td>
<td>cl</td>
</tr>
<tr>
<td>R14:C</td>
<td>8.</td>
<td>Perform KU-BD ANT STOW (ORB OPS, COMM/INST), then:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.</td>
<td>cb MNB KU ANT HTR – op</td>
<td>cl</td>
</tr>
</tbody>
</table>

1. Recover IMU 2 (MAL, GNC FRP-3)
2. At MCC call, sel JET OPT 1 (cont PWRUP until AOS)
3. For PWRUP, perform MAL, RCS SSR-4, STAGED, MANF REPRESS
4. SM I/O RESET
5. Perform KU-BD ANT DEPLOY (ORB OPS, COMM/INST)
## PRIORITY PWRDN GROUP 6

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 6</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O14:A</td>
<td>1.</td>
<td>IMU 1 – OFF (2 of 3 off)</td>
<td>①</td>
</tr>
<tr>
<td>O15:D</td>
<td>2.</td>
<td>cb O2/N2 CNTLR 2 – op</td>
<td>cl</td>
</tr>
<tr>
<td>O16:E</td>
<td>3.</td>
<td>RCS/OMS PRPLT QTY GAUGE – op</td>
<td>cl</td>
</tr>
<tr>
<td>L4:L</td>
<td>4.</td>
<td>AC1 ① A CAB T CNTLR 2 – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AC2 ① A CAB T CNTLR 1 – op</td>
<td>CL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(if desired, pin CAB T CNTLR)</td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>5.</td>
<td>BLR CNTLR/HTR (three) – OFF</td>
<td>B</td>
</tr>
<tr>
<td>A12</td>
<td>6.</td>
<td>APU HTR LUBE OIL LN (three) – OFF</td>
<td>B AUTO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HYD HTR A (four) – OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B (four) – OFF</td>
<td></td>
</tr>
<tr>
<td>A14</td>
<td>7.</td>
<td>RCS/OMS HTR OMS CRSFD LN (two) – A OFF, B OFF</td>
<td>ON</td>
</tr>
<tr>
<td>ML31C</td>
<td>8.</td>
<td>VAC VENT NOZ HTR – OFF</td>
<td>As reqd</td>
</tr>
<tr>
<td>ML86B:C</td>
<td>9.</td>
<td>cb MNB EXT AIRLK HTR STRUCT Z1/2/3 – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VEST Z1/2/3 – op</td>
<td>cl</td>
</tr>
<tr>
<td>:A</td>
<td>10.</td>
<td>cb MNA H2O LN HTR A – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MNB H2O LN HTR B – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If MMU pwrds:</td>
<td>②</td>
</tr>
<tr>
<td>ML86B:D</td>
<td>11.</td>
<td>cb MNA MMU PORT HTR A – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STBD HTR A – op</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MNB MMU PORT HTR B – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STBD HTR B – op</td>
<td></td>
</tr>
<tr>
<td>MA73C</td>
<td>12.</td>
<td>MCA LOGIC MNA,B,C: MID 1,2,3,4 (eight) – OFF</td>
<td>ON</td>
</tr>
<tr>
<td>A6U</td>
<td>13.</td>
<td>ANNUN BUS SEL – OFF</td>
<td>MNC</td>
</tr>
<tr>
<td>R14:D</td>
<td>14.</td>
<td>cb MNA TV C AFT BAY CAMR HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAN-TILT HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MNB TV A FWD BAY CAMR HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAN-TILT HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MNC B TV B KEEL/EVA CAMR HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAN-TILT HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td>:E</td>
<td>15.</td>
<td>cb MNB RMS PORT RMS TV CAMR HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAN-TILT HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MNA D STBD RMS TV CAMR HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PAN-TILT HTR – op</td>
<td>cl</td>
</tr>
<tr>
<td></td>
<td>16.</td>
<td>Purge both supply, waste H2O lines. Go to SUPPLY(WASTE) H2O PURGE FROM DUMP LINE(S) (IFM, PROCEDURES S THRU Z)</td>
<td>③</td>
</tr>
</tbody>
</table>

① Recover IMU 1 (MAL, GNC FRP-3)
② One of two reqd
③ For PWRUP, reopen SPLY(WASTE) H2O DUMP ISOL VLV
### PRIORITY PWRDN GROUP 7

<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 7</th>
<th>PWRDN</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O13:D</td>
<td>1.</td>
<td>cb CRYO (four) – op</td>
<td>cl</td>
</tr>
<tr>
<td>O14:C</td>
<td>2.</td>
<td>cb MNA CRYO O2 HTR TK1 SNSR 1 – op</td>
<td>cl</td>
</tr>
<tr>
<td>:F</td>
<td>3.</td>
<td>MMU 1 – OFF (2 of 2 off)</td>
<td>ON</td>
</tr>
<tr>
<td>O16:C</td>
<td>4.</td>
<td>cb MNC CRYO O2 HTR TK1 SNSR 2 – op</td>
<td>cl</td>
</tr>
<tr>
<td>L4:K</td>
<td>5.</td>
<td>cb AC1 φA H2O CNTLR 2 – op</td>
<td>cl</td>
</tr>
<tr>
<td>L1</td>
<td>6.</td>
<td>FREON PUMP LOOP 2 – OFF</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAD CNTLR LOOP 2 – OFF</td>
<td>A</td>
</tr>
<tr>
<td>L2</td>
<td>7.</td>
<td>O2 SYS 2 SPLY – CL (tb-CL)</td>
<td>OP</td>
</tr>
<tr>
<td>R1</td>
<td>8.</td>
<td>O2 TK1,TK2,TK3 HTRS A (three) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TK1,TK3 HTRS B (two) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2 TK1,TK2,TK3 HTRS A (three) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TK1,TK3 HTRS B (two) – OFF</td>
<td>AUTO</td>
</tr>
</tbody>
</table>

If Primary Jets Only Option:
- 8. Go to step 17

If Vernier Jets Only Option:
- 9. Go to step 27

If Gravity Gradient Option:
- 10. Perform GG FREE DRIFT, ATT ID B, steps 1,2 (do not sel LO Z) (ORB OPS, RCS), then:
  - 11. All RJD DRIVER,LOGIC (seventeen) – OFF
  - 12. Perform RCS SECURE (FWD,AFT) (RCS), 8-2, then:
    - 13. MDM FF1 – OFF
    - FA1,FA2,FA3 (three) – OFF
    - MCA LOGIC MNA,B,C:
      - FWD 1,2,3 (three) – OFF
      - AFT 1,2,3 (three) – OFF
    - RCS/OMS HTR FWD RCS – OFF
    - RCS JET (five) – OFF
    - AFT RCS JET (five) – OFF

16. Go to step 31

---

1. Perform GG FREE DRIFT, step 3 (ORB OPS, RCS)
2. Perform MAL, RCS SSR-4, STAGED, MANF REPRESS (FRCS only). √L,R MANF P > 130 prior to MANF ISOL – OP

Cont next page
<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 7 PWRDN (Cont)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>O6</td>
<td>17. Perform XFEED: L RCS to R RCS (RCS), 8-5, then:</td>
<td></td>
</tr>
<tr>
<td>O14:F</td>
<td>18. <strong>GNC 23 RCS</strong>&lt;br&gt; Ovrd L,R,1,3,4,5 STAT – CL</td>
<td>OP</td>
</tr>
<tr>
<td>O15, O16:F</td>
<td>19. MDM FA2 – OFF&lt;br&gt; FF1 – OFF</td>
<td></td>
</tr>
<tr>
<td>O7</td>
<td>20. <strong>GNC 20 DAP CONFIG</strong>&lt;br&gt; TAIL P,Y OPTION</td>
<td>ON (3)</td>
</tr>
<tr>
<td>O8</td>
<td>21. RJDA 1A L2/R2 LOGIC – ON&lt;br&gt; DRIVER – ON</td>
<td></td>
</tr>
<tr>
<td>A14</td>
<td>22. (Remaining) RJD DRIVER,LOGIC&lt;br&gt; (fifteen) – OFF</td>
<td>ON</td>
</tr>
<tr>
<td>O16:F</td>
<td>23. AFT L,R RCS MANF ISOL 5 (two) – CL</td>
<td>OP</td>
</tr>
<tr>
<td>O14, O15, O16:F</td>
<td>24. FWD RCS MANF ISOL 5 – CL&lt;br&gt; RCS JET (five) – OFF&lt;br&gt; AFT RCS JET 1,3,4,5&lt;br&gt; (four) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td>A14</td>
<td>25. RCS/OMS HTR FWD RCS – OFF&lt;br&gt; RCS JET 1,2,3,4&lt;br&gt; (four) – OFF&lt;br&gt; AFT RCS JET 1,2,3,4&lt;br&gt; (four) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td>O6</td>
<td>26. Go to step 31</td>
<td></td>
</tr>
<tr>
<td>O16:F</td>
<td>27. MDM FA3 – OFF&lt;br&gt; FF1 – OFF</td>
<td></td>
</tr>
<tr>
<td>O14, O15, O16:F</td>
<td>28. Vern RJD – ON&lt;br&gt; Pri RJD DRIVER,LOGIC (sixteen) – OFF</td>
<td>ON</td>
</tr>
<tr>
<td>A14</td>
<td>29. RCS/OMS HTR FWD RCS – OFF&lt;br&gt; RCS JET 1,2,3,4&lt;br&gt; (four) – OFF&lt;br&gt; AFT RCS JET 1,2,3,4&lt;br&gt; (four) – OFF</td>
<td>AUTO</td>
</tr>
<tr>
<td>A11</td>
<td>30. CRYO TK HTR (four) – OFF</td>
<td>MCC call</td>
</tr>
</tbody>
</table>

Cont next page

(3) GNC I/O RESET
<table>
<thead>
<tr>
<th>PNL</th>
<th>GRP 7</th>
<th>PWRDN (Cont)</th>
<th>PWRUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ML86B:C</td>
<td>32. cb EXT ARLK HTR LN ZONE 1 (three) – op</td>
<td>cl (tb-ON)</td>
<td></td>
</tr>
<tr>
<td>:F</td>
<td>2 (three) – op</td>
<td>cl</td>
<td></td>
</tr>
<tr>
<td>:G</td>
<td>33. cb CRYO O2 HTR SNSR (four) – op</td>
<td>cl</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34. All cbs – op</td>
<td>MCC call</td>
<td></td>
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<tr>
<td>R1</td>
<td>If three good FCs, shut dn FC2 and AC2 per the following:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>35. MN BUS TIE A,B (two) – ON (tb-ON)</td>
<td>op</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36. Perform AC2 BUS LOSS ACTION (EPS), 5-30, only, leaving FC2 REACS open, then:</td>
<td>ON (tb-ON)</td>
<td></td>
</tr>
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<td></td>
<td>37. cb AC CONTR (three) – cl</td>
<td>ON</td>
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<tr>
<td></td>
<td>INV/AC BUS 2 – OFF (tb-OFF)</td>
<td>ON</td>
<td></td>
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<tr>
<td></td>
<td>INV PWR 2 – OFF (tb-OFF)</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AC BUS SNSR 2 – OFF</td>
<td>ON</td>
<td></td>
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<tr>
<td></td>
<td>38. Use only IDP4, aft MDUs, and aft FLT CNTLR PWR</td>
<td>As reqd</td>
<td></td>
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<td></td>
<td>4 Perform MAL, EPS SSR-6, FC RESTART, then:</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>MN BUS TIE A,B (two) – OFF (tb-OFF)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
LEAKING OMS PRPLT/He BURN

CURRENT MET + 10 min

OUT-OF-PLANE RETROGRADE

\( \Delta VX (\ ) 0.0 \) \( \Delta VY (\ ) 50.0 \) \( \Delta VZ (\ ) 0.0 \)

TRIM LOAD

TGT PEG 7

TIG-2

Selected OMS ENG – ARM/PRESS

WARNING

Do not burn if:
- OMS He TK P < 640
- FU ENG IN P < 216
- OX ENG IN P < 151
- Payload/RMS not berthed or stowed

-15 EXEC, and if PRPLT LEAK, THC + X

00 TIG** (Pc, \( \Delta VTOT \), ENG VLV)

15 Release THC

If PRPLT LEAK, when CUR HP = 95±1 or Pc < 80:
- OMS ENG – OFF; secure aff OMS
- If He LEAK, when CUR HP = 95±1 or OMS He TK P < 640 or OMS QTY < 39 OMS ENG – OFF

If reqd, repeat proc to burn OUT-OF-PLANE; start in step 6 (if ENT PKT, start in step 5)

CUTOFF**

If PER ADJ TIG < four orbits from Deorb TIG, FRCS

* On MCC call:
* If QTY > 6%, and \( \Delta VTOT \) > 10 fps at OMS fail, mnvr to
* -X ATT (pitch up at 3°/sec to VGOz = 1/4 \( \Delta VTOT \));
* THC -X to CUR HP = 95 or FRCS PRPLT deplete

CC 12-2

OPCL/ALL/GEN M
HAZARDOUS SPILL RESPONSE – ORBITER

**LEVEL 4 (RED) MOST HAZARDOUS SPILL (NONCONTAINABLE)**
1. Inform other crew, MCC – “Level 4 spill in cabin”
2. All crew don/activate QDMs
3. QDM Regulator mode – EMERGENCY (red knob cw)
   If Booster Fan active:
4. AIRLK FAN A(B) – OFF, then:
   If hatches to ISS open:
   5. Simo, perform JOINT EMERGENCY EGRESS (Cue Card), continue with this proc
L1 6. CAB TEMP sel – COOL
WCS 7. MODE – COMM/COMMODE/MANUAL/EMU
8. COMMODE CNTL – PULL UP (wait 15 sec), PUSH FWD
OCAC 9. OCAC PWR – ON
10. \*MCC

**LEVEL 3 (ORANGE) HAZARDOUS SPILL (CONTAINABLE)**
1. Inform other crew, MCC – “Level 3 spill in cabin”
2. All crew don/activate QDMs
3. QDM Regulator mode – EMERGENCY (red knob cw)
   If Booster Fan active:
4. AIRLK FAN A(B) – OFF, then:
   If hatches to ISS open:
   5. Simo, perform JOINT EMERGENCY EGRESS (Cue Card), continue with this proc
L1 6. CAB FAN A(B) – OFF (max 30 min)
7. IMU FAN B(A,C) – OFF (max 90 min)
OCAC 8. OCAC PWR – OFF
CCK 9. Cleanup crew don Silver Shield Gloves, clean up spill w/Dry Wipes. Bag, label, stow in Wet Trash
   If cleanup fails, perform steps 13 and 14, then go to Level 4 step 6 >>
10. QDM Regulator mode – NORM (red knob ccw)
11. Doff Quick Don Masks, gloves. Stow gloves in Wet Trash
12. Inform other crew, MCC – “Spill in cabin cleaned up”
L1 13. CAB FAN A(B) – ON
14. IMU FAN B(A,C) – ON
OCAC 15. OCAC PWR – ON
   If Booster Fan in bypass config >>
MO13Q 16. AIRLK FAN A(B) – ON
HAZARDOUS SPILL RESPONSE – ORBITER

LEVEL 2 (YELLOW) HAZARDOUS SPILL
LEVEL 1 (BLUE) LEAST HAZARDOUS SPILL
LEVEL 0 (GREEN) NONHAZARDOUS SPILL

1. Inform other crew, MCC – “Level 2(1,0) spill in cabin”
   If Level 2 spill:
   CCK 2. Cleanup crew in vicinity don goggles, masks, and gloves (√MCC for Silver Shield or latex)
   If Level 1 spill:
   CCK 3. Cleanup crew in vicinity don goggles, masks, latex gloves
   If Level 0 controlled spill, >>
   If Booster Fan active:
   MO13Q 4. AIRLK FAN A(B) – OFF, then:
   L1 5. CAB FAN A(B) – OFF (max 30 min)
   6. IMU FAN B(A,C) – OFF (max 90 min)
   OCAC 7. OCAC PWR – OFF
   CCK 8. Clean up spill w/Dry Wipes. Bag, label, stow in Wet Trash
   If Level 2(1,0) cleanup fails, perform steps 11 and 12, then go to Level 4 step 5 >>
   9. As reqd, doff goggles, masks, gloves. Stow gloves in Wet Trash
   10. Inform other crew, MCC – “Spill in cabin cleaned up”
   L1 11. CAB FAN A(B) – ON
   12. IMU FAN B(A,C) – ON
   OCAC 13. OCAC PWR – ON
   If Booster Fan in bypass config >>
   MO13Q 14. AIRLK FAN A(B) – ON
If VISUAL SMOKE/FIRE, or two SMOKE DETN lit on, or two CONC > 2, or one SMOKE DETN lit on and other CONC > 2:
1. Go to step 6

If single Av Bay SMOKE DETN A(B) lit and assoc CONC > 2:
2. SMOKE DETN CKT TEST – B(A) (25 sec)
3. SMOKE DETN CKT TEST – OFF
4. SMOKE DETN SNSR – RESET >>
5. Go to step 6

If none of above >>
6. AIRLK FAN A(B) – OFF
7. If DOCKED: Perform JOINT EMERGENCY EGRESS (Cue Card)
8. Den Quick Don Masks
   LEH O2 vlvs – OP
   SUPPLY vlvs – OP
   TOP

If AV BAY FIRE:
9. FIRE SUPPR – ARM
   pb – DISCH
   (push until lit)
10. AV BAY FAN (two) – OFF
11. Simp, go to POST-FIRE CABIN CLEANUP (ORB PKT, ECLS) and
   AV BAY FIRE (ORB PKT, POWER)

If CABIN FIRE:
12. CAB FAN A,B (two) – OFF
    (max 20 min)
13. Locate source
14. Unplug source of smoke
15. If smoke persists or source cannot be unplug:

   WARNING
   Discharge is propulsive
   Discharge handheld FIRE EXTGHR
16. Go to POST-FIRE CABIN CLEANUP (ORB PKT, ECLS)

ALARM SEQUENCE

SOURCE AREA

ALARM PANEL
or
PS/MSL (left) CONSOLE

AFT FLT DK, MIDDECK

FWD FLT DK, WCS, LEH

OPCL-7b(AESP-7a), front of FIRE/SMOKE (ORBIT) appears in the
ASCENT/ENTRY SYSTEMS PROCEDURES

TOP
BACK OF FIRE/SMOKE

(ASCENT/ENTRY)

FIRE/SMOKE

.replace side tab with clear tape
and Hook Velcro

(reduced copy)

FAB USE ONLY

CC 12-6

OPCL/ALL/GEN M
If hatches open to ISS, perform JOINT EMERGENCY EGRESS (Cue Card), then:

**MO13Q**
1. AIRLK FAN A(B) – OFF
2. APDS PWR (three) – OFF
3. √A,B,C lts (three) – OFF
4. HTRS/DCU PWR (three) – OFF
5. CNTL PNL PWR (three) – OFF

**A7L**
6. PSU PWR (two) – OFF
7. SYS PWR MNA,MNB (two) – OFF (hold 5 sec)
   √SYS PWR SYS1,SYS2 tb (two) – OFF

If SH HATCH flown:

**SH Hatch**
8. Close SH HATCH per decal
   √Equal vlvs (two) – OFF, caps installed

**Tnl Adp**
9. PL ISOL vlv – CL, install cap in flex duct

**Inner Hatch**
10. Close INNER HATCH per decal
    √Equal vlvs (two) – OFF, caps installed
11. On MCC call, go to ODS POST-FIRE ACTIONS (ECLS)

BACK OF ‘ODS VOLUME FIRE/SMOKE’
ORBIT POCKET CHECKLIST

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