Ascent Pocket Checklist

Mission Operations Directorate
Operations Division

Generic, Rev N
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
List of Implemented Change Requests (482s):

<table>
<thead>
<tr>
<th>MULTI-1817</th>
<th>APCL-0265</th>
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<td>MULTI-1829</td>
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<td>MULTI-1830</td>
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Incorporate the following:

1. Replace v thru vii
2. Replace A3-3 thru B3-10 with 3-3 thru 3-10 (8 pages)
3. Replace A7-5 thru B7-6 with 7-5 and 7-6
   Replace A7-9 thru B7-10 with 7-9 and 7-10

**NOTE**
For STS-126 and subsequent flights

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Prepared by: [Signature]  
Publication Manager

Approved by: [Signature]  
Manager, Shuttle Procedures Management

Accepted by: [Signature]  
FDF Manager

Encl: 16 pages

*File this PCN immediately behind the front cover as a permanent record*
List of Implemented Change Requests (482s):
MULTI-1821

Incorporate the following:
1. Replace v thru viii
2. Replace 4-17 and 4-18

NOTE
For STS-125 and subsequent flights

Prepared by: Maury Ellen Livsic
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
FDF Manager

Encl: 6 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
APCL-0263
APCL-0264

Incorporate the following:
1. Replace v thru viii
2. Replace 3-9 and 3-10 with A3-9 thru B3-10 (4 pages)
3. Replace 5-37 and 5-38

NOTE
For STS-124 and subsequent flights

Prepared by: Mary Ellen Bruce
Publication Manager

Approved by: 
Manager, Shuttle Procedures Management

Accepted by: 
DF Manager

Encl: 10 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1808

Incorporate the following:
1. Replace v thru viii
2. Replace B3-3 and B3-4

NOTE
For STS-120 and subsequent flights

Prepared by: Nancy Ellen Sier
Publication Manager

Approved by: Gerald W. Johnson
Manager, Shuttle Procedures Management

Accepted by: Michael J. Shaw
FDF Manager

Encl: 6 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1803
MULTI-1805

APCL-0262A

Incorporate the following:
1. Replace v thru viii
2. Replace 3-3 and 3-4 with A3-3 thru B3-4 (4 pages)
3. Replace 4-11 and 4-12
   Delete TEMP 4-11 and TEMP 4-12
4. Replace 7-5 and 7-6 with A7-5 thru B7-6 (4 pages)
   Replace 7-9 and 7-10 with A7-9 thru B7-10 (4 pages)

NOTE
For STS-120 and subsequent flights

Prepared by: Mary Ann Greene
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
FDF Manager

Encl: 18 pages

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

MULTI-1738A(R) APCL-0261
MULTI-1785
MULTI-1786
MULTI-1797

R – Remainder

Incorporate the following:

1. Replace v thru viii
2. Replace B4-1 and B4-2, 4-17 thru B4-20 (6 pages)
3. Replace 5-7 and 5-8
4. Replace 7-1 and 7-2
5. Replace B10-7 thru B10-12

Prepared by: Mary Ellen Bruce
Publication Manager

Approved by: (Signature)
Manager, Shuttle Procedures Management

Accepted by: (Signature)
FDF Manager

Encl: 22 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1779
MULTI-1780
MULTI-1782

Incorporate the following:
1. Replace v and vi, ix and x
2. Replace 3-1 thru 3-4
3. After A4-6, add A4-7 and A4-8
   Replace 4-7 and 4-8 with B4-7 and B4-8
   Replace B4-19 and B4-20

Prepared by: [Signature]
Publication Manager

Approved by: [Signature]
Manager, Shuttle Procedures Management

Accepted by: [Signature]
FDP Manager

Endl: 14 pages

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

MULTI-1756
MULTI-1764A
MULTI-1769
MULTI-1774
MULTI-1778

APCL-0260

Incorporate the following:

1. Replace v thru xii
2. Replace 4-11 thru 4-20 (12 pages) with 4-11 thru 4-22 (16 pages)
3. Replace A10-33 and A10-34, A10-39 and A10-40
4. Replace B10-33 and B10-34, B10-39 and B10-40

NOTE
For STS-117 and subsequent flights

Prepared by:  
Mary Ellen Lunn
Publication Manager

Approved by:  
Kimberly Johnson
Manager, Shuttle Procedures Management

Accepted by:  
[Signature]
FDP Manager

Encl: 32 pages

File this PCN immediately behind the front cover as a permanent record
PCN-1 (Nov 10, 2006) Sheet 1 of 1

List of Implemented Change Requests (482s):
APCL-0259 MULTI-1759A

Incorporate the following:
1. Replace v thru xii
2. Replace 1-3 and 1-4
   After 1-4, add 1-5 and 1-6
3. Replace 4-15 and 4-16
4. Replace 7-5 and 7-6
5. Replace A10-21 and A10-22

NOTE
For STS-116 and subsequent flights

Prepared by: Mary Olsen
Publication Manager

Approved by: Manager, Shuttle Procedures Management

Accepted by: FDF Manager

Encl: 18 pages

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

ASCENT POCKET CHECKLIST

GENERIC, REVISION N
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 requester’s name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184.

APCL/ALL/GEN N
Incorporates the following:

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<td>MULTI-1768</td>
<td>APCL-0255A</td>
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<td>MULTI-1766</td>
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**AREAS OF TECHNICAL RESPONSIBILITY**

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<tr>
<td>Publication Manager</td>
<td>DO352/M. Bruce</td>
<td>281-483-6083</td>
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<td>Alternate</td>
<td>DO352/C. Pierce</td>
<td>281-483-6087</td>
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<tr>
<td>APU/HYD</td>
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<td>281-483-7575</td>
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<td>COMM</td>
<td>DF2/J. McKinnie</td>
<td>281-483-0792</td>
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<td>DF6/T. Campa</td>
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NOTES

1. The pocket checklists contain contingency procedures to safe a system and continue the flight. As a rule, these procedures do not troubleshoot a malfunction to determine its cause.

2. The pocket checklist is generally constrained to include only those procedures that can and must be performed within 5 minutes. All procedures should be completed promptly and in the step sequence noted. For longer or less time-critical procedures during the orbit phase, the Flight Data File Malfunction Procedures (MAL) book is available.

3. The Ascent Pocket Checklist alone includes the TROUBLESHOOT notation, alerting the crew to the malfunction procedure which may be required later at a less flight-critical time.

4. The absence of a procedure implies no immediate action required.

5. The Ascent Pocket Checklist is unstowed post ET SEP (MM104) and is stowed post OMS-2 (MM106). When a Powered Flight cue card action requires follow-up action, the symbol ‘⇒’ addresses the entry point in the pocket checklist procedure. Additionally, the ‘♦’ icon indicates one should \MCC and if no comm continue with the procedure.

6. Steps are numbered sequentially to facilitate reference for orbiter/ground communications and for procedural cross-reference.

7. Applicable procedures from the A/E SYS book (i.e., Sections A1 thru E9) are placed before the APU/HYD section in the flight copies of this book.

8. Applicable procedures from the PL PWR book (i.e., Section 1) are placed at the end of the flight copies of this book.
**ASCENT POCKET CHECKLIST**

**LIST OF EFFECTIVE PAGES**

<table>
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<tr>
<th>GENERIC</th>
<th>04/07/87</th>
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<td>10/18/06</td>
<td>PCN-6</td>
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<tr>
<td>PCN-4</td>
<td>07/10/07</td>
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| Sign Off * | ALL/GEN N | 3-7 | ALL/GEN N,9 |
| ii .......... * | ALL/GEN N | 3-8 | ALL/GEN N |
| iii .......... * | ALL/GEN N | A3-9 | deleted |
| iv .......... * | ALL/GEN N | A3-10 | deleted |
| v .......... * | ALL/GEN N,9 | B3-9 | deleted |
| vi .......... * | ALL/GEN N,9 | B3-10 | deleted |
| vii .......... * | ALL/GEN N,9 | 3-9 | ALL/GEN N,9 |
| viii .......... * | ALL/GEN N,8 | 3-10 | ALL/GEN N,9 |
| ix .......... * | ALL/GEN N,3 | A4-1 | 3,4/GEN N |
| x .......... * | ALL/GEN N,2 | A4-2 | ALL/GEN N |
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| 1-1 .......... | ALL/GEN N | 4-3 | ALL/GEN N |
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| A3-3 .......... | deleted | 4-11 | ALL/GEN N,5 |
| A3-4 .......... | deleted | 4-12 | ALL/GEN N |
| B3-3 .......... | deleted | 4-13 | ALL/GEN N |
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| 3-6 .......... | ALL/GEN N,9 | 4-18 | ALL/GEN N,8 |

* – Omit from flight book

v APCL/ALL/GEN N,9
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</table>
APU SHUTDN
APU OPER – OFF
FU TK VLV – CL
√Shutdn (HYD PRESS < 200)
Report APU F7 lts
APU CNTLR PWR – OFF
⇒ √AUTO SHTDN (three) – ENA
√SPEED SEL (two) – NORM

APU SPD HI
⇒ If SPEED % exceeds 111:
Go to APU SHUTDN

APU OVERSPEED/UNDERSPEED
If SPEED % exceeds 129 or if APU has shut down:
Go to APU SHUTDN

APU OIL OVERTEMP
1. BLR CNTLR/HTR – B
√N2 SPLY – ON
⇒ If APU OIL OUT TEMP > 305 and OIL IN TEMP incr:
2. Perform APU SHUTDN
   If AOA:
      At M = 7:
3. Go to APU COOLDOWN (A/E SYS, PLT WND FB, APU/HYD)

APU PUMP LEAK P
1. √MCC
If not AOA:
   If AOA and two good APUs:
      At M = 7:
3. Go to APU COOLDOWN (A/E SYS, PLT WND FB, APU/HYD)

APU RESTART
♦ 1. √APU AUTO SHTDN – ENA
2. HYD MN PUMP PRESS – LO
3. APU CNTLR PWR – ON
4. OPER – INJ COOL (start watch)
   If after 1.5 min, APU TEMP INJ not decr:
5. HYD MN PUMP PRESS – NORM
   Go to APU SHUTDN >>
At 3.5 min:
6. APU FU TK VLV – OP
   OPER – START/RUN
   HYD MN PUMP PRESS – NORM
   If restart unsuccessful:
   7. Go to APU SHUTDN >>
8. √BLR N2 SPLY – ON
   √PWR – ON
   √CNTLR/HTR – A(B)
### SM0 THRM APU

<table>
<thead>
<tr>
<th>AFF TEMP</th>
<th>STATUS</th>
<th>ACTION</th>
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<td>APU GG/FU PMP HTR 1(2,3)</td>
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<td>A12 (Aff) APU HTR GAS GEN/FU PUMP – OFF &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>▼</td>
<td>A12 (Aff) APU HTR GAS GEN/FU PUMP – A AUTO &gt;&gt;</td>
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<tr>
<td>H, L, M</td>
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<td>No action &gt;&gt;</td>
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<tr>
<td>APU TK/FU LN HTR 1(2,3)</td>
<td>▲</td>
<td>A12 (Aff) APU HTR TK/FU LN/H2O SYS (two) – OFF &gt;&gt;</td>
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<td>▼</td>
<td>A12 (Aff) APU HTR TK/FU LN/H2O SYS (two) – AUTO &gt;&gt;</td>
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<td>H, L, M</td>
<td></td>
<td>No action &gt;&gt;</td>
</tr>
<tr>
<td>APU PUMP/VLV 1(2,3)</td>
<td>▲</td>
<td>If APU was running and now shut dn, do not attempt restart until aff temp cool</td>
</tr>
<tr>
<td></td>
<td>▼</td>
<td>H, L, M</td>
</tr>
</tbody>
</table>

---

**APU HEATER**

- GAS GEN/FUEL PUMP
- LUBE OIL LINE

- OF
- 1
- 2
- 3
- AUTO
- MID
- DOWN

- TANK/FUEL LINE/H2O SYS
- 1A
- 1B
- 2A
- 2B
- 3A
- 3B
- AUTO
- UP
- DOWN

---

1-3 APCL/ALL/GEN N,1
HYD PRESS (LOW)

1. √APU SPEED SEL (three) – NORM
   If not AOA:
   2. √APU AUTO SHTDN (three) – ENA
      Go to APU SHUTDN >>
   If AOA:
   3. Compare ‘PRL SYS X’ status and aff HYD PRESS
      (HYD/APU meter and CRT):

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<th>HYD PRESS</th>
<th>ACTION</th>
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<tr>
<td>↓</td>
<td>both meter and CRT P &lt; 300</td>
<td>Perform APU SHUTDN</td>
</tr>
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</table>
| blank   | either meter or CRT P > 2600 | No action reqd >>
| ‘?’     | ACUM P > 2800       | No action reqd >>

4. If aff APU running: (Aff) HYD MN PUMP PRESS – LO

If two good APU/HYD remain:
5. √APU AUTO SHTDN (three) – ENA
   At q = 1:
   6. HYD MN PUMP PRESS (two) – NORM
   At TAEM:
   7. APU SPEED SEL (two) – HI >>
If only one good APU/HYD remains:
8. √APU AUTO SHTDN (one) – INH
   HYD MN PUMP PRESS (one) – LO
   At q = 1:
   9. HYD MN PUMP PRESS (one) – NORM
      APU SPEED SEL (one) – HI
On MCC call:
10. (Degraded) HYD MN PUMP PRESS – NORM
**HYD RSVR QTY (LOW)**

1. (Aff) HYD MPS/TVC ISOL VLV SYS – CL (hold 5 sec, tb-CL)
   - BK ISOL VLV – CL (hold 5 sec, tb-CL)
   - If HYD sys 1 leaking:
     - LG EXTD ISO VLV – CL (hold 5 sec, tb-CL)
   - If qty still decr:
     2. If AOA:
        - (Aff) HYD MN PUMP PRESS – LO
          - If qty decr within 3 min:
            - Go to APU SHUTDN >>
          - If not AOA:
            - Go to APU SHUTDN

**HYD RSVR T**

1. BLR CNTLR/HTR – B(A)
   - If HYD RSVR T > 250:
     2. HYD MN PUMP PRESS – LO
        - If HYD RSVR T > 268 and incr:
          3. Perform APU SHUTDN
          - If AOA:
            - At M = 7:
              4. Go to APU COOLDOWN (A/E SYS, PLT WND FB, APU/HYD)

**HYD ACCUM P (LOW)**

HYD CIRC PUMP – ON
- If aff APU running:
  - HYD MN PUMP PRESS – NORM

**W/B QTY (LOW)**

1. BLR CNTLR/HTR – B
2. N2 SPLY – ON
- If W/B QTY = 0 >>
  Monitor W/B QTY for 2 min, then:
  - If W/B QTY change > 3:
    3. Go to APU SHUTDN
ICOM LOST

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

COMM LOST (mult pnls)

1. AUD CTR – 2
⇒
   If all ICOM and A/G failed (check three ATUs):
     2. √cb AUD CTR (two) – cl
     3. Go to step 11 (both AUD CTRs failed)

C3

4. S-BD PM CNTL – PNL,CMD
5. [BFS,GNC 51 OVERRIDE]
   Config for TDRS,STDN, or SGLS per COMM COVER (ASC):
   TDRS – ITEM 46 EXEC (*)
   STDN-HI – ITEM 47 EXEC (*)
   SGLS – ITEM 49 EXEC (*)
   If * not next to selected config:

A1

6. Config for STDN,SGLS, or TDRS per COMM COVER (ASC)

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<th>STDN/SGLS</th>
<th>TDRS</th>
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<td>STDN LO/SGLS</td>
<td>TDRS DATA</td>
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<td>NSP DATA RATE (two)</td>
<td>HI</td>
<td>HI</td>
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<tr>
<td>NSP CODING (two)</td>
<td>OFF</td>
<td>ON</td>
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C3

7. S-BD PM CNTL – PNL,CMD to effect reconfig

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

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

9. Attempt UHF PRI, ALT and G (say freq) per COMM COVER (ASC) (30 sec reqd for site reconfig)

10. Bypass encryption (1 min reqd for MCC reconfig):
A1L
NSP ENCRYPTION MODE – SEL
SEL – BYP

11. Confirm U/L CMD capability:
Cue MCC with: ITEM 88 +8 8 8 8 8
Check flashing U/L on PASS display
Ack with: ITEM 99 +9 9 9 9 9
Check abort light cycling ON/OFF (MCC ack)
Check no flashing U/L

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

13. If still no comm and no U/L CMD, perform MAL, COMM, 2.3a, NO S-BD COMM: TDRS as time permits, then:

14. Confirm GPS functioning properly:
[BFS, GNC 55 GPS STATUS]
\Stat = BLANK or BATT
\Mode = INS
\DG FAIL = BLANK
\P 1\sigma \leq 650 (can be > 650 for no more than 5 min)

* If GPS not functioning properly for 5 min, *
* complete all ASC C/L actions, then *
* perform REV 2 Deorb: LAUNCH DAY *
* DEORBIT PREP (ORBIT 2) (CONT *
* DEORB, LAUNCH DAY (ORBIT 2)), and *
* as time permits once in OPS 3, perform *
* GPS TROUBLE-SHOOTING (ENT PKT, *
* GNC) *
* *
* *
* * * * * *
* * * * * *
* * * * *
* * * * *
* * * * *

* If GPS recovered with troubleshooting, *
* return to step 15, following page, to *
* determine Deorbit opportunity *

Cont next page

2-3 APCL/ALL/GEN N
15. If GPS functioning properly for 10 min, complete all ASC C/L actions, then perform desired First Day PLS Deorbit considering weather forecasts, lighting conditions, and deorbit capability using PGSC-generated deorbit targets. Navigation accuracy will be maintained with automatic GPS updates once in OPS 2 or OPS 3.

If REV 2 Deorb: LAUNCH DAY DEORBIT PREP (ORBIT 2) (CONT DEORB, LAUNCH DAY (ORBIT 2))

If REV 3 Deorb: LAUNCH DAY DEORBIT PREP (ORBIT 3) (CONT DEORB, LAUNCH DAY (ORBIT 3))

If REV 5 or 6 Deorb: ORBIT 5/6 DEORBIT (POST INSERT, ORBIT 5/6 D/O)

If REV 7 Deorb: POST INSERTION PROCEDURES (POST INSERT, POST INSERTION), then DEORB, NOMINAL DEORBIT PREP PROCEDURES

Delta entry:
Add ‘GPS INCORPORATION (ENT PKT, GNC)’ at TIG -2:00 hours
DATA PROCESSING SYSTEM
DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – aff IDP
   If reqd to clean up display:
   2. (Aff) IDP/CRT PWR – OFF,ON

PASS DISPLAY FAIL

1. MDU PWR – OFF,ON; if recovered >>
2. GPC/CRT – same GPC/aff IDP; if recovered >>
3. BFC CRT SEL – aff IDP; if both IDPs OK go to step 9
4. – orig posn
5. Report MDU symptoms
   If MCC GO for pwr cycle:
   6. IDP/CRT PWR – OFF,ON; if recovered >>
   If MDU blank or autonomous:
   7. Set other MDU on same IDP to DPS Mode; if recovered >>
   8. Return other MDU to nominal config
9. Deassign aff IDP from PASS
10. GPC/CRT 04 EXEC
11. In PASS: GPC/CRT 44 EXEC

BFS DISPLAY FAIL

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
2. MDU PWR – OFF,ON; if recovered >>
3. BFC CRT SEL – unaff IDP; if both IDPs OK >>
4. – orig posn
5. BFC CRT DISPLAY – OFF,ON; if recovered >>
6. In PASS: GPC/CRT 5/X for aff IDP; if recovered >>
7. Report MDU symptoms
   If MCC GO for pwr cycle:
   8. IDP/CRT PWR – OFF,ON; if recovered >>
   If MDU blank or autonomous:
   9. Set other MDU on same IDP to DPS Mode; if recovered >>
   10. Return other MDU to nominal config
11. BFC CRT SEL – unaff IDP
12. Deassign aff IDP from PASS
13. GPC/CRT 04 EXEC
14. In PASS: GPC/CRT 44 EXEC

FLT INST DISPLAY ANOMALY

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

SUBSYS STATUS DISPLAY ANOMALY

1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON
BCE STRG X (no 'MDM OUTPUT' msg)

If IMU:

1. [GNC 51 OVERRIDE]
   Aff IMU(s) – desel
2. I/O RESET
3. If recovered: IMU – resel >>
4. [GNC 1 DPS UTILITY]
   Aff String – port mode
5. If recovered: Go to step 9
6. (Aff) MDM FF – OFF,ON
7. I/O RESET; if recovered: Go to step 9
8. [GNC 1 DPS UTILITY]
   Orig ports – resel
9. BFS I/O RESET
10. If IMU recovered:
    [GNC 51 OVERRIDE]
     Aff IMU(s) – resel >>

If 'BCE STRG 3 NSP':

11. I/O RESET; if recovered >>
   If msg repeats and LOS/no comm:
12. Go to COMM LOST, step 4 (COMM), 2-2 >>

If any other BCE BYP:

13. I/O RESET; if recovered: BFS I/O RESET >>
14. [GNC 1 DPS UTILITY]
    Aff String – port mode
15. BFS I/O RESET; if recovered or if GPS >>
16. (Aff) MDM FA/FF – OFF,ON
17. I/O RESET; if recovered:
    [BFS, GNC 51 OVERRIDE]
     If reqd: aff SURF feedback
     RGA or AA – resel >>
18. [GNC 1 DPS UTILITY]
    Orig ports – resel
19. BFS I/O RESET; if recovered >>

If msg repeats and is 'BCE STRG B/C/D':

20. If 'BCE STRG 1D(4D)': L(R) OMS – sel SEC GMBL
21. If 'BCE STRG B':
    [BFS, GNC 51 OVERRIDE]
     Aff AA – desel
22. If 'BCE STRG D':
    [BFS, GNC 51 OVERRIDE]
     Aff SURF feedback, RGA – desel
23. If 'BCE STRG 2C': Go to MPS VACUUM INERT (MPS), 9-3

APCL/ALL/GEN N,9

DISPLAY FAIL/ANOMALIES  3-3  BCE STRG X
MULT DATA PATH LOSS (non-Recov)

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

<table>
<thead>
<tr>
<th>FAILURE</th>
<th>TYPE</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPC/FF</td>
<td>I/O or B</td>
<td>No impact</td>
</tr>
<tr>
<td>GPC/FA 1,2</td>
<td>I/O</td>
<td>Preburn (TVC): L OMS ENG – OFF</td>
</tr>
<tr>
<td>GPC/FA 1,3 or 2,4</td>
<td>I/O</td>
<td>Preburn (IGN): R OMS ENG – OFF</td>
</tr>
<tr>
<td>GPC/FA 1,4 or 2,3</td>
<td>I/O</td>
<td>Preburn (IGN): L OMS ENG – OFF</td>
</tr>
<tr>
<td>GPC/FA 3,4</td>
<td>I/O</td>
<td>Preburn (TVC): R OMS ENG – OFF</td>
</tr>
</tbody>
</table>

**BFS GPC FAIL**

1. GPC MODE – STBY,HALT
   OUTPUT – TERM
   MODE – STBY

⇒
If BFS cannot drive an IDP:
2. GPC MODE – HALT, then go to step 10
3. PRO to OPS 106
4. BFS, OPS 000 PRO
5. PRO to OPS 302; load TGTs (PEG 7)
If BFS in desired MM (302):
6. GPC MODE – RUN
7. OUTPUT – B/U
8. Advise MCC BFS in BACKUP >>
9. √GPC MODE – STBY (BFS is SM only)
10. If no comm: sel best S-BD PM ANT

3-4 APCL/ALL/GEN N,9
PASS GPC (1st FAIL)

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

PASS GPC (2nd FAIL)

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

PASS GPC BITE

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

MULT DATA PATH LOSS
BFS GPC FAIL  3-5
PASS GPC (1st)
PASS GPC (2nd)/BITE
SUMWORD ICC

NOTE
If only one GPC annun message, prob is at that GPC annun message

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

FA MDM I/O ERROR

♦ 1. I/O RESET; if recovered: Go to step 18
⇒♦ 2. MPS PRPLT DUMP B/U LH2 VLV – OP
  3. If MDM FA1(4): L(R) OMS – sel SEC GMBL
If no BFS ‘BCE STRG X PASS’ (MDM prob):
  4. [GNC 1 DPS UTILITY]
     Aff String – port mode
  5. If recovered: Go to step 18
If OMS not burning and MCC GO for pwr cycle:
  6. MDM FA – OFF,ON
  7. I/O RESET
  8. If recovered: Go to step 18
  9. [GNC 1 DPS UTILITY]
     Orig ports – resel
 10. If recovered: Go to step 18
If not recovered:
  11. [BFS, GNC 51 OVERRIDE]
     Aff SURF feedback, RGA – desel
  12. BFS I/O RESET
  13. \MULT DATA PATH LOSS >>
If BFS ‘BCE STRG X PASS’ (GPC prob):
  14. \MULT DATA PATH LOSS
On MCC call:
  15. Restrings to swap aff String with String 4
      (if MDM FA4, swap Strings 3 and 4)
If GPC fails during restring:
  16. (Aff) GPC PWR – OFF
  17. Restrings, assigning failed GPC string to highest # GPC
  18. BFS I/O RESET
  19. (All good) FCS CH – AUTO

3-6 APCL/ALL/GEN N,9
FF MDM I/O ERROR

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

⇒ If no BFS 'BCE STRG X PASS' (MDM prob):

2. **GNC 1 DPS UTILITY**
   - Aff String – port mode
3. BFS I/O RESET; if recovered

If MCC GO for pwr cycle:
4. (Aff) MDM FF – OFF, ON
5. I/O RESET; if recovered
6. **GNC 1 DPS UTILITY**
   - Orig ports – resel
7. BFS I/O RESET; if recovered

8. **GNC 51 OVERRIDE**
   - Aff IMU – desel
9. If MDM FF 1(4): L(R) OMS – sel SEC GMBL
10. Go to step 11

If BFS 'BCE STRG X PASS' (GPC prob):
11. √MULT DATA PATH LOSS, then:

If no BFS 'BCE STRG X PASS' (MDM prob):
12. MDM FF1(2): CDR(PLT) disp sws – green dot
13. **BFS, GNC 51 OVERRIDE**
   - Aff AA – desel

If BFS 'BCE STRG X PASS' (GPC prob):

On MCC call:
14. Restring to swap aff String with String 4 (if MDM FF4, swap Strings 3 and 4)

If GPC fails during restring:
15. (Aff) GPC PWR – OFF
16. Restring, assigning failed GPC string to highest # GPC
17. BFS I/O RESET

APCL/ALL/GEN N,9

SUMWORD ICC
FA MDM I/O ERROR  3-7  FF MDM I/O ERROR
FF(FA) MDM OUTPUT

(Take action only if annun by entire set)

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

If both MDM FF and MDM FA annun:
2. I/O RESET
3. If reqd: BFS I/O RESET
   If msgs repeat:
   4. Go to PASS GPC (1st FAIL) >>
5. If reqd: (Aff) FCS CH – ORIDE,AUTO

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
2. GNC 1 DPS UTILITY
   PL1/2 – port mode
3. BFS I/O RESET; if recovered >>

If I/O Error PL for other PL MDM (GPC prob):
4. Repeat steps 2,3 if reqd to recover second PL MDM

If I/O Error PL repeats for same MDM and MCC GO for pwr cycle:
5. (Aff) MDM PL – OFF,ON
6. BFS I/O RESET; if recovered >>

If PL2 lost and no comm at AOS:
7. Sel best S-BD ANT

PCM I/O ERROR

1. OI PCMMU PWR – 2(1)

♦ BFS, SM SYS SUMM 1(2)
BFS GPC IPL (on MCC Call)

NOTE
√MCC for reapplication of GMEMs as reqd

Perform hardware dump:
1. GPC OUTPUT 5 – TERM
   MO42F
   MEM DUMP sel – 5
   MODE 5 – STBY
After 8 min:
2. GPC MODE 5 – HALT
   OUTPUT 5 – NORM
   MEM DUMP sel – OFF
3. IPL SOURCE – MMU 1
4. GPC PWR 5 – OFF, ON
   IPI 5 pb – push (tb-IPL, then bp within 2 min)
When tb – bp:
5. BFC CRT DISP – ON
   SEL – 3+1 (expect big ‘X’, POLL FAIL)
   IDP3 – LOAD
   GPC MODE 5 – STBY (tb remains bp; expect CAM)
   Verify GPC IPL MENU displayed (within 2 min)
On IPL MENU:
6. Press MSG RESET to cycle thru MSGS STILL IN LIST
7. Load BFS software – ITEM 2 EXEC (*)
When ‘BSL ... LOADED’ appears (within 2 min):
8. MSG RESET pb – push
When ‘KSC ... SET MMU SEL SW TO OFF’ appears (within 2 min):
9. IPL SOURCE – OFF
10. MSG RESET pb – push
    (repeat until ‘MSG STILL IN LIST’ = 0)
11. √GPC MODE 5 tb – RUN (BFS MEMORY appears within 15 sec):
12. Go to BFS GPC FAIL, step 5

ASC/AOA TRANSITION RESTRING

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASC</td>
<td>AOA</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Config MC1(3) NBAT as reqd</td>
</tr>
<tr>
<td>2.</td>
<td>√[G53] aff SURF FDBK – desel (*)</td>
</tr>
<tr>
<td>3.</td>
<td>ASAP, (aff) GPC(s) – STBY,HALT</td>
</tr>
<tr>
<td>4.</td>
<td>OPS Mode Recall: OPS XXX PRO</td>
</tr>
<tr>
<td>5.</td>
<td>BFS I/O RESET</td>
</tr>
<tr>
<td>6.</td>
<td>OPS 301 PRO</td>
</tr>
<tr>
<td>7.</td>
<td>BFS, OPS 301 PRO</td>
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3-9 APCL/ALL/GEN N.9
# EQUIPMENT COOLING MATRIX

<table>
<thead>
<tr>
<th>FORCED COOLING</th>
<th>FREE-FLOW</th>
</tr>
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<tbody>
<tr>
<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; DECORDER 1</td>
<td>CICU</td>
</tr>
<tr>
<td>AA 1,4</td>
<td>PCA(FWD) 1</td>
</tr>
<tr>
<td>TACAN 1</td>
<td>RJDF 1,1B</td>
</tr>
<tr>
<td>PROXIMITY SW INVERTER DIST &amp; CNTL</td>
<td>MCA(FWD) 1</td>
</tr>
<tr>
<td>TRK CNTL 1</td>
<td>P/L RECORDER</td>
</tr>
<tr>
<td>SMOKE DET A,B</td>
<td>CURRENT SNSR</td>
</tr>
<tr>
<td>ADTA 1,3</td>
<td></td>
</tr>
<tr>
<td><strong>AV BAY FAN A,B</strong></td>
<td><strong>AV BAY FAN A,B</strong></td>
</tr>
<tr>
<td><strong>AV BAY 2</strong></td>
<td><strong>AV BAY 2</strong></td>
</tr>
<tr>
<td>GPC 2,5 ①</td>
<td>BFC 2,3 (ENGAGE)</td>
</tr>
<tr>
<td>MLS RF &amp; DECORDER 2,3</td>
<td>AA 2,3</td>
</tr>
<tr>
<td>TACAN 2</td>
<td>LCA(FWD) 2</td>
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<tr>
<td>PROXIMITY SW INVERTER DIST &amp; CNTL</td>
<td>PCA(FWD) 2</td>
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<tr>
<td>TRK CNTL 2</td>
<td>MCA(FWD) 2</td>
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<tr>
<td>SMOKE DET A,B</td>
<td>MDM PL2,OF2,</td>
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<tr>
<td>CURRENT SNSR</td>
<td>COAX SW</td>
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<tr>
<td>ADTA 2,4</td>
<td>OPERATOR</td>
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<tr>
<td><strong>AV BAY FAN A,B</strong></td>
<td><strong>AV BAY FAN A,B</strong></td>
</tr>
<tr>
<td><strong>AV BAY 3A</strong></td>
<td><strong>AV BAY 3A</strong></td>
</tr>
<tr>
<td>GPC 3 ①</td>
<td>S-BAND EQUIP:</td>
</tr>
<tr>
<td>AV BAY FAN A,B</td>
<td>FM MLTPLXR</td>
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<tr>
<td>C/W LIMIT MODULE</td>
<td>QUAD ANT SW</td>
</tr>
<tr>
<td>SSOR ②</td>
<td>ASSEMBLY</td>
</tr>
<tr>
<td>S-BAND PA 1,2; PRE-AMP 1,2;</td>
<td>S-BAND RF SWITCH</td>
</tr>
<tr>
<td>CURRENT SNSR INVERTER DIST &amp; CNTL</td>
<td>FM RF SWITCH</td>
</tr>
<tr>
<td>SMOKE DET A,B</td>
<td>TACAN 3</td>
</tr>
<tr>
<td><strong>AV BAY 3B</strong></td>
<td><strong>AV BAY 3B</strong></td>
</tr>
</tbody>
</table>

10/13/04

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

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Cont next page **OV103,104**
### EQUIPMENT COOLING MATRIX (Continued)

<table>
<thead>
<tr>
<th>CABIN</th>
<th>ECLSS EQUIPMENT BAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDUs (eleven)</td>
<td>WATER PUMP 1A,1B</td>
</tr>
<tr>
<td>CAB FAN A,B</td>
<td>SEC</td>
</tr>
<tr>
<td>IMU 1,2,3</td>
<td>FLIGHT DECK</td>
</tr>
<tr>
<td>IMU FANS (3)</td>
<td></td>
</tr>
<tr>
<td>TV MONITORS</td>
<td></td>
</tr>
<tr>
<td>RCU</td>
<td></td>
</tr>
<tr>
<td>VSU</td>
<td></td>
</tr>
<tr>
<td>IDP 1,2,3,4</td>
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</tr>
<tr>
<td>MADS RCDR</td>
<td></td>
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<tr>
<td>MS &amp; PS STATION</td>
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</table>

#### FREON-COOLED

<table>
<thead>
<tr>
<th>BAY 4</th>
<th>BAY 5</th>
<th>BAY 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCA-1</td>
<td>LCA-2</td>
<td>LCA-3</td>
</tr>
<tr>
<td>PCA-1,4</td>
<td>PCA-2,5</td>
<td>PCA-3,6</td>
</tr>
<tr>
<td>MCA-1</td>
<td>MCA-2</td>
<td>MCA-3</td>
</tr>
<tr>
<td>MDM FA1</td>
<td>MDM FA2</td>
<td>MDM FA3,4</td>
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<tr>
<td>OA1</td>
<td>OA2</td>
<td>OA3</td>
</tr>
<tr>
<td>APU CNTLR 1</td>
<td>APU CNTLR 2</td>
<td>APU CNTLR 3</td>
</tr>
<tr>
<td>ATVC ELECT 1</td>
<td>ATVC ELECT 2</td>
<td>ATVC ELECT 3,4</td>
</tr>
<tr>
<td>EIU 1</td>
<td>EIU 2</td>
<td>EIU 3</td>
</tr>
<tr>
<td>MPS ULL P SC1</td>
<td>MPS ULL P SC2</td>
<td>MPS ULL P SC3</td>
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<tr>
<td>ASA 1</td>
<td>ASA 2</td>
<td>ASA 3,4</td>
</tr>
<tr>
<td>RGA 1</td>
<td>RGA 2</td>
<td>RGA 3,4</td>
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<tr>
<td>RJDA 1</td>
<td>RJDA 2</td>
<td>RJDA 2</td>
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<tr>
<td>MEC 1</td>
<td>MEC 2</td>
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<td>DSC OA1</td>
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<td>DBIA 2</td>
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<tr>
<td>PT SNSR</td>
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#### MIDBODY

<table>
<thead>
<tr>
<th>PCA(MID) 1,2,3</th>
<th>MCA(MID) 1,2,3,4</th>
<th>MDM PM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMA 1,2</td>
<td>FEA 1,2</td>
<td>SGS</td>
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<tr>
<td>H2/O2 CRYO HTR</td>
<td>FUEL CELLS 1,2,3</td>
<td>MIDBODY PIC</td>
</tr>
<tr>
<td>1A,1B,2A,2B</td>
<td>2 PMP A,B</td>
<td>CNTLR</td>
</tr>
<tr>
<td>FCL 1 PMP A,B</td>
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<td>DSC</td>
</tr>
<tr>
<td>1A,1B,2A,2B</td>
<td></td>
<td>OM1,OM2,OM3</td>
</tr>
</tbody>
</table>

---

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

<table>
<thead>
<tr>
<th>Air-Cooled</th>
<th>Water-Cooled</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AV Bay 1</strong></td>
<td><strong>AV Bay 1</strong></td>
</tr>
<tr>
<td>GPC 1,4, MLS RF &amp; DECODER 1</td>
<td>BFC 1 (Engage)</td>
</tr>
<tr>
<td>AA 1,4</td>
<td>CICU</td>
</tr>
<tr>
<td>PROXimity SW</td>
<td>PCA(FWD) 1</td>
</tr>
<tr>
<td>GPS 1</td>
<td>RJDF 1A,1B</td>
</tr>
<tr>
<td>INVERTER DIST &amp; CNTL</td>
<td>MCA(FWD) 1</td>
</tr>
<tr>
<td>SMOKE DET A,B</td>
<td>P/L RECORDER</td>
</tr>
<tr>
<td>CURRENT SNSR</td>
<td>ADTA 1,3</td>
</tr>
<tr>
<td><strong>AV Bay 2</strong></td>
<td><strong>AV Bay 2</strong></td>
</tr>
<tr>
<td>GPC 2,5, MLS RF &amp; DECODER 2,3</td>
<td>BFC 2,3 (Engage)</td>
</tr>
<tr>
<td>AA 2,3</td>
<td>CICU</td>
</tr>
<tr>
<td>PROXimity SW</td>
<td>PCA(FWD) 2</td>
</tr>
<tr>
<td>INVERTER DIST &amp; CNTL</td>
<td>RJDF 2A,2B</td>
</tr>
<tr>
<td>BRK CNTL 2</td>
<td>MCA(FWD) 2</td>
</tr>
<tr>
<td>SMOKE DET A,B</td>
<td>COAX SW</td>
</tr>
<tr>
<td>CURRENT SNSR</td>
<td>ADTA 2,4</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, MLS RF &amp; DECODER 2</td>
<td>S-BAND EQUIP:</td>
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<tr>
<td>AA 3, C/W LIMIT MODULE</td>
<td>FM MLTPLXR</td>
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<tr>
<td>SSOR</td>
<td>QUAD ANT SW</td>
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<tr>
<td>2</td>
<td>ASSEMBLY</td>
</tr>
<tr>
<td>GPS 3</td>
<td>FM SIG PRCSR</td>
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<tr>
<td>INVERTER DIST &amp; CNTL</td>
<td>CNTL ASSY</td>
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<tr>
<td>SMOKE DET A,B</td>
<td>FM RF SWITCH</td>
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<tr>
<td><strong>AV Bay 3B</strong></td>
<td><strong>AV Bay 3B</strong></td>
</tr>
<tr>
<td>MTU</td>
<td><strong>ECLS</strong></td>
</tr>
</tbody>
</table>

07/10/07

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

Cont next page

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B4-1

APCL/5/GEN N,4
### EQUIPMENT COOLING MATRIX (Continued)

<table>
<thead>
<tr>
<th>FORCED/CABIN</th>
<th>WATER-COOLED/FLIGHT DECK</th>
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</thead>
<tbody>
<tr>
<td>MDUs (eleven)</td>
<td>WATER PUMP 1A,1B SEC</td>
</tr>
<tr>
<td>CAB FAN A,B</td>
<td>MDM OF4</td>
</tr>
<tr>
<td>IMU 1,2,3</td>
<td>MTR/LTS/IND C/W ANNUN</td>
</tr>
<tr>
<td>IMU FANS (3)</td>
<td>C/W ANNUN</td>
</tr>
<tr>
<td>TV MONITORS</td>
<td>SPKR UNITS</td>
</tr>
<tr>
<td>RCU</td>
<td>ATUs</td>
</tr>
<tr>
<td>VSU</td>
<td>CAMCORDER</td>
</tr>
<tr>
<td>MCIU</td>
<td>COLOR PRINTER</td>
</tr>
<tr>
<td>IDP 1,2,3,4</td>
<td>VTR</td>
</tr>
<tr>
<td>MADS RCDR</td>
<td>CSA</td>
</tr>
<tr>
<td>MS &amp; PS STATION</td>
<td>CAB TEMP</td>
</tr>
<tr>
<td>MTR/LTS/IND</td>
<td>IMU FANS</td>
</tr>
<tr>
<td>C/W ANNUN</td>
<td>TV MONITORS</td>
</tr>
<tr>
<td>SPKR UNITS</td>
<td>RCU</td>
</tr>
<tr>
<td>ATUs</td>
<td>VSU</td>
</tr>
<tr>
<td>CAMCORDER</td>
<td>MCIU</td>
</tr>
<tr>
<td>COLOR PRINTER</td>
<td>IDP 1,2,3,4</td>
</tr>
<tr>
<td>VTR</td>
<td>MADS RCDR</td>
</tr>
<tr>
<td>CSA</td>
<td>MS &amp; PS STATION</td>
</tr>
<tr>
<td>CAB TEMP</td>
<td>MTR/LTS/IND</td>
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<tr>
<td>IMU FANS</td>
<td>C/W ANNUN</td>
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<tr>
<td>TV MONITORS</td>
<td>ATUs</td>
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### FREON-COOLED

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10/13/04

3 IMU FANS ARE LOCATED IN AVIONICS BAY 1 BUT CIRCULATE CABIN AIR RATHER THAN FLOW FROM AVIONICS BAY 1 THROUGH THE IMUs FOR COOLING.
CAB PRESS HIGH
(14.7 REGS Closed)
1. If incr: LES O2 – OFF, open visor
   If still incr:
   2. N2 SYS 1,2 REG INLET (two) – CL (tb-CL)
   3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
   ⇒ TROUBLESHOOT: MAL, ECLS, CABIN PRES ↑↓, 6.2b [T]

FREON FLOW LOW
1. Switch pumps in aff loop(s)
   If flow still low:
   2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)
   ⇒ If flow still low in both loops, and pre OMS 2:
      3. Go to LOSS OF 2 FREON LOOPS (AOA) (SYS AOA,
         2 FREON LOOPS (AOA)), TIME CRITICAL PROCEDES >>
      If flow still low in both loops and post OMS 2:
         4. Go to LOSS OF 2 FREON LOOPS (POST OMS-2)
            (PWRDN), 10-35, TIME CRITICAL PROCEDURES >>
      If flow still low in one loop:
         If RAD OUT T in good loop not incr in 3-5 min >>
         If RAD OUT T in good loop incr in 3-5 min:
   5. (Aff) FREON PUMP LOOP – OFF
   6. If FREON LOOP 1(2) deactivated:
   7. (√(In good loop)) FLOW PROP VLV LOOP – ICH
      If EVAP OUT T not ~39 degF and stable:
      8. FLASH EVAP CNTLR PRI A(B) – OFF

OV103,104
Cont next page
APCL/ALL/GEN N

PCS SCHEMATIC
EQUIP COOL (4-1) A4-5
CAB PRESS HIGH
FREON FLOW LOW
When EVAP OUT T stable:
9. FLASH EVAP CNTLR SEC – OFF
PRI A(B) – ON
10. Go to LOSS OF 1 FREON LOOP (PWRDN), 10-29
TROUBLESHOOT: MAL, ECLS, FREON FLOW LOW, 6.4b [1]

H2O LOOP PRESS LOW(HIGH)
⇒ BFS, SM SYS SUMM 1

1. Switch to Loop 1
2. Go to step 4
If press high in Loop 1:
3. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
Switch pumps
If press still < 45 psia and CABIN HX OUT T incr:
4. H2O PUMP LOOP 1 – OFF
If press was high in Loop 2:
5. Go to step 8
If press was low in Loop 2:
6. √cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
   H2O PUMP LOOP 2 – GPC
If CABIN HX OUT T not decr:
7. H2O PUMP LOOP 2 – OFF
8. MSTR MADS PWR – OFF
9. Use only one IDP/CRT with two MDUs
10. TACAN MODE sel (three) – OFF
11. √MLS (three) – OFF
12. HUM SEP A(B) – OFF
13. RDR ALTM (two) – OFF

Cont next page
OV103,104

A4-6
APCL/3,4/GEN N
If both H2O loops lost and pre OMS 2:
14. Go to LOSS OF 2 H2O LOOPS (AOA) (SYS AOA, 2 H2O LOOPS (AOA)), TIME CRITICAL PROCEDURES >>

If both H2O loops lost and post OMS 2:
15. Go to LOSS OF 2 H2O LOOPS (POST OMS-2) (PWRDN), 10-21, TIME CRITICAL PROCEDURES

**AV BAY TEMP HIGH**

1. (Aff) AV BAY FAN A,B (two) – ON
   If temp not decr:
   2. Switch H2O loops
   If temp not decr:
   3. H2O LOOP 1(2) BYP MAN – DECR (hold 40 sec)
   If temp still incr:
   4. Go to LOSS OF AV BAY COOLING/AV BAY FIRE (PWRDN), 10-7/10-10/10-13

TROUBLESHOOT: MAL, ECLS, AV BAY TEMP, 6.1b [T]

**AV BAY FAN ΔP**

1. AV BAY 1 FAN A – ON
2. AV BAY 1 FAN B – OFF
If AV Bay 2 aff:
3. AV BAY 2 FAN B – ON
4. AV BAY 2 FAN A – OFF
If AV Bay 3 aff:
5. AV BAY 3 FAN A – ON
6. AV BAY 3 FAN B – OFF
If FAN ΔP still high(low) and AV BAY TEMP decr, airflow is lost:
7. Go to LOSS OF AV BAY COOLING/AV BAY FIRE (PWRDN), 10-7/10-10/10-13

TROUBLESHOOT: MAL, ECLS, AV BAY FAN ΔP, 6.1c [T]

**OV103,104**

1. H2O LOOP P – A4-7
2. AV BAY TEMP/HIGH
3. AV BAY FAN ΔP

**APCL/3,4/GEN N,3**
CAB FAN FAIL

⇒ 1. Switch fans
   If no CAB FAN airflow:
   2. Go to LOSS OF 2 CAB FANS (PWRDN), 10-2
   TROUBLESHOOT: MAL, ECLS, CABIN FAN ∆P, 6.1a 1

EMER PLBD OPENING

R13L 1. PL BAY DR SYS (two) – ENA
   [X: BFS, SM 63 PL BAY DOORS]
CRTX 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 (*)
R13L 5. PL BAY DR SYS (two) – DSBL
L1 6. RAD CNTLR LOOP (two) – AUTO A
   Wait 10 sec:
      RAD BYP VLV MODE (two) – AUTO
      NOTE
      Do not perform RAD ACT in POST INSERTION

OV103,104

A4-8 APCL/ALL/GEN N,3
CAB PRESS HIGH
(14.7 REGS Closed)
1. If incr: LES O2 – OFF, open visor
   If still incr:
   2. N2 SYS 1,2 REG INLET (two) – CL (tb-CL)
   3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)
⇒ TROUBLESHOOT: MAL, ECLS, CABIN PRES ↑↓, 6.2b [1]

FREON FLOW LOW
1. Switch pumps in aff loop(s)
   If flow still low:
   2. (Aff) RAD BYP VLV MAN SEL – RAD FLOW (hold 5 sec)
⇒ If flow still low in both loops, and pre OMS 2:
   3. Go to LOSS OF 2 FREON LOOPS (AOA) (SYS AOA, 2 FREON LOOPS (AOA)), TIME CRITICAL PROCEDURES >>
If flow still low in both loops and post OMS 2:
   4. Go to LOSS OF 2 FREON LOOPS (POST OMS-2) (PWRDN), 10-35, TIME CRITICAL PROCEDURES >>
If flow still low in one loop:
   If RAD OUT T in good loop not incr in 3-5 min >>
   If RAD OUT T in good loop incr in 3-5 min:
   5. (Aff) FREON PUMP LOOP – OFF
   If FREON LOOP 1(2) deactivated:
   6. O2 SYS 1(2) SPLY – CL (tb-CL)
   7. (√(In good loop)) FLOW PROP VLV LOOP – ICH
   If EVAP OUT T not ~39 degF and stable:
   8. FLASH EVAP CNTLR PRI A(B) – OFF SEC – ON (HI LOAD ENA)
Cont next page
OV105
APCL/ALL/GEN N

PCS SCHEMATIC
EQUIP COOL (4-1)

CAB PRESS HIGH
FREON FLOW LOW

B4-5
When EVAP OUT T stable:
9. FLASH EVAP CNTLR SEC – OFF
   PRI A(B) – ON
10. Go to LOSS OF 1 FREON LOOP (PWRDN), 10-29
TROUBLESHOOT: MAL, ECLS, FREON FLOW LOW, 6.4b [1]

### H2O LOOP PRESS LOW(HIGH)

1. Switch to Loop 1
   If press high in Loop 1:
   2. Go to step 4
   If press < 45 psia in Loop 1:
   3. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
      Switch pumps
   If press still < 45 psia and CABIN HX OUT T incr:
   4. H2O PUMP LOOP 1 – OFF
      If press was high in Loop 2:
   5. Go to step 8
   If press was low in Loop 2:
   6. √cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
      H2O PUMP LOOP 2 – GPC
   If CABIN HX OUT T not decr:
   7. H2O PUMP LOOP 2 – OFF
   8. MSTR MADS PWR – OFF
   9. Use only one IDP/CRT with two MDUs
  10. √MLS (three) – OFF
  11. HUM SEP A(B) – OFF
  12. RDR ALTM (two) – OFF

Cont next page

OV105

B4-6

APCL/5/GEN N
If both H2O loops lost and pre OMS 2:
13. Go to LOSS OF 2 H2O LOOPS (AOA) (SYS AOA, 2 H2O LOOPS (AOA)), TIME CRITICAL PROCEDURES >>
If both H2O loops lost and post OMS 2:
14. Go to LOSS OF 2 H2O LOOPS (POST OMS-2) (PWRDN), 10-21, TIME CRITICAL PROCEDURES

AV BAY TEMP HIGH
⇒ 1. (Aff) AV BAY FAN A,B (two) – ON
If temp not decr:
2. Switch H2O loops
If temp not decr:
3. H2O LOOP 1(2) BYP MAN – DECR (hold 40 sec)
If temp still incr:
4. Go to LOSS OF AV BAY COOLING/AV BAY FIRE (PWRDN), 10-7/10-10/10-13
TROUBLESHOOT: MAL, ECLS, AV BAY TEMP, 6.1b

AV BAY FAN ∆P
⇒ If AV Bay 1 aff:
1. AV BAY 1 FAN A – ON
2. AV BAY 1 FAN B – OFF
If AV Bay 2 aff:
3. AV BAY 2 FAN B – ON
4. AV BAY 2 FAN A – OFF
If AV Bay 3 aff:
5. AV BAY 3 FAN A – ON
6. AV BAY 3 FAN B – OFF
If FAN ∆P still high(low) and AV BAY TEMP decr, airflow is lost:
7. Go to LOSS OF AV BAY COOLING/AV BAY FIRE (PWRDN), 10-7/10-10/10-13
TROUBLESHOOT: MAL, ECLS, AV BAY FAN ∆P, 6.1c

OV105
H2O LOOP P
B4-7
AV BAY TEMP/HIGH
AV BAY FAN ∆P
CAB FAN FAIL

⇒ 1. Switch fans
   If no CAB FAN airflow:
   2. Go to LOSS OF 2 CAB FANS (PWRDN), 10-2
   TROUBLESHOOT: MAL, ECLS, CABIN FAN ∆P, 6.1a [1]

EMER PLBD OPENING

R13L 1. PL BAY DR SYS (two) – ENA
   CRTX [X: BFS, SM 63 PL BAY DOORS]
   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 (*)
   R13L 5. PL BAY DR SYS (two) – DSBL
   L1  6. RAD CNTLR LOOP (two) – AUTO
      Wait 10 sec:
      RAD BYP VLV MODE (two) – AUTO

NOTE
Do not perform RAD ACT in POST INSERTION

OV105

B4-8
APCL/ALL/GEN N,3
1. Switch fans
   If AOA and no fans:
   2. IMU 1 – OFF
   3. [GNC 51 OVERRIDE]
      IMU 1 – desel
   4. Perform OMS/RCS POST BURN RECONFIG (ASC, POST D/O BURN), then:
   5. IMU 1 – ON
   6. [GNC 21 IMU ALIGN], wait for OPER * (~4 min), then:
      I/O RESET
   7. Align IMU 1,3, using IMU/IMU option with IMU 2 as REF
      When align complete:
   8. [GNC 51 OVERRIDE]
      IMU 1 – sel
   If no fans:
   After MM201 trans:
   9. IMU 1,2 – OFF
   10. [GNC 21 IMU ALIGN]
       IMU 1,2 – desel
   11. Perform IMU CONTINGENCY COOLING (IFM, PROCEDURES G THRU L), then:
   12. IMU 1,2 – ON
   13. [GNC 21 IMU ALIGN], wait for OPER * (~4 min), then:
       I/O RESET
   14. Align IMU 1,2 using IMU/IMU option with IMU 3 as REF
      When align complete:
   15. IMU 1,2 – sel
**EVAP OUT T HIGH**

If temp high in only one loop (snsr failed) >>
1. FLASH EVAP CNTLR PRI A(B) – OFF B(A) – ON (wait 30 sec)
If EVAP OUT T decr (FES PRI A lost) >>
If EVAP OUT T not decr:
2. FLASH EVAP CNTLR PRI B(A) – OFF SEC – ON (Hi Load ena) (wait 30 sec)

If EVAP OUT T decr (Topping Evap lost):
3. TOP EVAP HTR DUCT sel – A/B >>
If EVAP OUT T not decr:
4. HI LOAD EVAP – OFF (Topping Evap ena)
5. MSTR MADS PWR – OFF (wait 30 sec)

If EVAP OUT T decr (Hi Load Evap lost):
6. HI LOAD DUCT HTR sel – A/B
7. Go to LOSS OF HI LOAD EVAP (PWRDN), 10-33 >>

If EVAP OUT T not decr (FES lost):
8. TOP EVAP HTR NOZ (two) – OFF DUCT sel – OFF
9. HI LOAD DUCT HTR sel – OFF
10. √RAD BYP VLV MODE (two) – MAN MAN SEL (two) – RAD FLOW (hold 5 sec)

⇒ If HI LOAD EVAP only lost:
   11. Go to LOSS OF HI LOAD EVAP (PWRDN), 10-33 >>
If total FES lost:
12. FLASH EVAP CNTLR SEC – OFF
13. Perform EMER PLBD OPENING, then:
14. Go to LOSS OF FES/1 FC (PWRDN), 10-39
EVAP OUT T LOW

1. If temp low in only one loop (snsr failed) >>
2. FREON PUMP LOOP 1,2 (two) – OFF
3. H₂O PUMP LOOP 1 (two) – ON,B
4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
5. O₂ SYS 1,2 SPLY (two) – CL (tb-CL)
6. RAD BYP VLV MODE (two) – MAN
7. MAN SEL (two) – BYP (tb-BYP ~3 sec)
8. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
9. FREON PUMP LOOP 1,2 (two) – B
   NH₃ CNTLR A,B (two) – SEC/ON
Wait 3 min, then if any Freon Loop off:
10. FREON PUMP LOOP 1,2 (two) – B
When EVAP OUT T > 55 for at least 2 min (NH₃ depleted):
11. FLASH EVAP CNTLR PRI B – ON
12. O₂ SYS 1,2 SPLY (two) – OP (tb-OP)
13. NH₃ CNTLR A,B (two) – OFF

APCL/ALL/GEN N,5

EVAP OUT T HIGH 4-11 EVAP OUT T LOW
FREON LEAK

If accum qty < 12% and decr:
1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL (hold for 5 sec)
3. (Aff) FREON PUMP LOOP 1(2) – OFF
4. O2 SYS 1(2) SPLY – CL (tb-CL)
5. √(In good loop) FLOW PROP VLV LOOP – ICH (tb-ICH)

If EVAP OUT T not 39 degF and stable:
6. FLASH EVAP CNTLR PRI A(B) – OFF
   SEC – ON (HI LOAD – ENA)

   When EVAP OUT T stable:
   7. FLASH EVAP CNTLR SEC – OFF
      PRI A(B) – ON

8. Go to LOSS OF 1 FREON LOOP (PWRDN), 10-29

CAB PPO2 ABNORMAL

If PPO2 ≤ 2.70:
1. Check tabs, close visor, LES O2 – ON

If PPO2 ≥ 3.60:
2. LES O2 – OFF, open visor
3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)

TROUBLESHOOT: MAL, ECLS, PPO2 ↑↓, 6.2c [T]

4-12
APCL/ALL/GEN N
CAB PRESS LEAK

(14.7 REGS Closed)

1. CAB RELIEF A – CL (tb-CL), pause, B – CL (tb-CL)
2. √ VENT ISOL – ctr (tb-CL)
   √ VENT – ctr (tb-CL)
3. cb MNA VAC VENT ISOL VLV – cl
4. √ VAC VENT ISOL VLV BUS SEL – MNA
   CNTL – CL (tb-CL)

L2

5. NEG PRES RLF vlv cover (two) – push firmly
6. Remove urinal hose from hose block
7. Check center hole (between hose block filters) in hose block for airflow
   If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>
   10. Reinstall urinal hose

Side Hatch

5. NEG PRES RLF vlv cover (two) – push firmly

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

Side Hatch

5. NEG PRES RLF vlv cover (two) – push firmly
6. Remove urinal hose from hose block
7. Check center hole (between hose block filters) in hose block for airflow
   If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

Inner Hatch

5. NEG PRES RLF vlv cover (two) – push firmly
6. Remove urinal hose from hose block
7. Check center hole (between hose block filters) in hose block for airflow
   If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose

If airflow detected (EMU drain induced cabin leak):
   8. Using Gray Tape, block center hole in hose block (EMU drain)
   9. Go to MAL, ECLS, 6.2b, CABIN PRES ↑↓
      >>

10. Reinstall urinal hose
CABIN DEPRESS FOR CRACKED WINDOW PANE (10.2 PSIA Cabin Depress)

NOTE
If broken glass free in cab, crew should perform CABIN DEPRESS FOR HAZARDOUS ATMOSPHERE and should remain on LES O2 (visors down) to prevent ingestion of glass. Expect possible Klaxon during depress.

ML86B:A 1. cb MNA H2O LINE HTR A – cl
          :B VAC VENT ISOL VLV – cl
          MNB VAC VENT NOZ HTR – cl
ML31C 2. VAC VENT ISOL BUS SEL – MNA
          VLV CNTL – OP (tb-OP)
          NOZ HTR – ON
Middeck 3. CAB PURGE ISOL vlv – 0
          Floor vlv – MAX
R1 4. O2 TK 1,2,3 HTRS A,B (six) – AUTO
C5 Using DIRECT O2:
      5. Maintain PPO2 > 2.2 and O2 conc < 29%
Inner 6. Remove INNER HATCH cap (two)
Hatch 7. Equal vlv (two) – EMER
     8. Open INNER HATCH
AW82B 9. AIRLK DEPRESS vlv cap – vent, remove and stow
     10. AIRLK DEPRESS vlv – 5
When CAB PRESS = 10.2:
AW82B 11. AIRLK DEPRESS vlv – CL
ML31C 12. VAC VENT ISOL VLV CNTL – CL (tb-CL)
           NOZ HTR – OFF
Middeck 13. CAB PURGE ISOL vlv – CL
            Floor vlv – 0
14. Go to LAUNCH DAY DEORBIT PREP (ORBIT 2(3))
    (CONT DEORB, LAUNCH DAY ORBIT 2(3)) >>
CABIN DEPRESS FOR HAZARDOUS ATMOSPHERE (8.0 PSIA Cabin Depress)

NOTE
Expect possible Klaxon during depress. Procedure for fire, haz spill, internal O2 leak, or cracked window pane with glass in cabin

1. √LES O2 – ON, close visor
R1 2. O2 TK 1,2,3 HTRS A,B (six) – AUTO
ML86B:A 3. cb MNA H2O LINE HTR A – cl
: B
ML86B:B  cb MNA VAC VENT ISOL VLV – cl
VAC VENT ISOL BUS SEL – MNA
ML31C 4. √VAC VENT ISOL BUS SEL – MNA
VAC VENT ISOL VLV – cl (tb-OP)
NOZ HTR – ON

Middeck 5. CAB PURGE ISOL vlv – 0
Floor vlv – MAX

Inner 6. Remove INNER HATCH cap (two)
Hatch 7. Equal vlv (two) – EMER
8. Open INNER HATCH

L1 9. H2O LOOP 2 BYP MAN – DECR (30 sec)

If broken glass in cab, tox spill, or fire:
10. Go to MAL, ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL >>

If Unisolable O2 Leak:
11. Go to MAL, ECLS FRP-4, O2 LEAK CONTROL >>

SM0 THRM EVAP

<table>
<thead>
<tr>
<th>AFF TEMP</th>
<th>STATUS</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVAP HI LOAD</td>
<td>↑</td>
<td>L1 HI LOAD DUCT HTR sel – B &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td>L1 HI LOAD DUCT HTR sel – A/B &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H, L, M No action &gt;&gt;</td>
</tr>
<tr>
<td>EVAP TOP DUCT</td>
<td>↑</td>
<td>L1 TOP EVAP HTR DUCT sel – B &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>↓</td>
<td>L1 TOP EVAP HTR DUCT sel – A/B &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H, L, M No action &gt;&gt;</td>
</tr>
<tr>
<td>EVAP TOP NOZ L(R)</td>
<td>↑ or ↓</td>
<td>L1 (Aff) TOP EVAP HTR NOZ – B AUTO &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H, L, M No action &gt;&gt;</td>
</tr>
<tr>
<td>EVAP FDLN A(B)</td>
<td>↑ or ↓</td>
<td>L2 (Aff) FLASH EVAP FDLN HTR SPLY – 2 &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H, L, M No action &gt;&gt;</td>
</tr>
</tbody>
</table>

APCL/ALL/GEN N,2 FULL-UP FES (Over)

CABIN DEPRESS POST-FIRE CLEANUP (4-18)
SM0 THRM EVAP 4-15 FIRE/SMOKE (4-20)
FULL-UP FES FLUSHING

NOTE
Use proc on MCC call only. Duct temps only available in OPS 2. This proc assumes both HI LOAD and Topper cores in operation (FULL-UP FES)

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

HI LOAD CORE FLUSH
2. √ HI LOAD DUCT HTR sel – A/B
3. √ HI LOAD EVAP – ENA
4. FLASH EVAP CNTLR SEC – ON
   Wait 30 sec
   FLASH EVAP CNTLR SEC – OFF
   Wait 30 sec
5. Repeat step 4 two additional times (three total), then:
   FLASH EVAP CNTLR SEC – ON
6. Proceed on MCC call (wait minimum 7 min, then proceed when EVAP OUTs stable at 62 and HI LOAD DUCT temps > 170 degF)

* While waiting, if MCC reports HI LOAD DUCT * 
* temps < 40, Hi Load flush not successful. If * 
* Topping Core Flush to be performed, proceed * 
* to step 7; otherwise, proceed to POST- * 
* FLUSH FES CNTLR SELECTION * 

TOPPER CORE FLUSH
7. √ TOP EVAP HTR DUCT sel – A/B
8. HI LOAD EVAP – OFF
9. FLASH EVAP CNTLR SEC – ON
   Wait 30 sec
   FLASH EVAP CNTLR SEC – OFF
   Wait 30 sec
10. Repeat step 9 two additional times (three total), then:
    FLASH EVAP CNTLR SEC – ON
11. Proceed on MCC call (wait minimum 7 min, then proceed when EVAP OUTs stable at 62 and TOP FWD(AFT) DUCT temps > 120 degF)

* While waiting, if MCC reports TOP * 
* FWD(AFT) DUCT temps < 40, Topper * 
* Flush not successful. Proceed to * 
* POST-FLUSH FES CNTLR * 
* SELECTION * 

Cont next page
POST-FLUSH FES CNTLR SELECTION

If both Topper and HI LOAD core flushes successful:

12. FLASH EVAP CNTLR SEC – OFF
    HI LOAD EVAP – ENA
    FLASH EVAP CNTLR PRI B – ON (GPC)
    After 2.5 min, verify EVAP OUT temps ~39

If Topper flush not successful:

13. FLASH EVAP CNTLR SEC – OFF
    HI LOAD EVAP – ENA
    FLASH EVAP CNTLR SEC – ON

If HI LOAD flush not successful:

14. FLASH EVAP CNTLR SEC – ON
    HI LOAD EVAP – OFF
    Perform LOSS OF HI LOAD EVAP (PWRDN), 10-33
POST-FIRE CABIN CLEANUP (Cab and Av Bay Fires)

Continue from FIRE/SMOKE Cue Card:

NOTE
This proc is to be performed simo by three crewmembers

CM1
1. If Av Bay fire: Post OMS-1, perform LOSS OF AV BAY 1(2,3) COOLING/AV BAY 1(2,3) FIRE (PWRDN), 10-7/10-10/10-13

CM2
2. \text{\sqrt{CAB FAN A(B) – ON}}
3. Unstow CSA-CP
4. MODE pb – press, hold until 'RELEASE' displayed; wait ~1 min for nominal display
5. Sampling Pump sw – ON
6. Monitor cab atmosphere in vicinity of fire and report results to MCC
   If HCN > 2.1, HCL > 1.0, or CO > 18 ppm:
   7. If HCL < 5 ppm, install ATCO and one fresh LiOH canister
   8. If HCL > 5 ppm, install two fresh LiOH canisters
   9. cb MNA,MNB WCS CNTLR (two) – cl
   10. AC1,2 WCS FAN SEP 1,2 (six) – cl WCS
   11. FAN SEP SEL sw – 1
   If Av Bay 1 Fire:
   12. HOSE BLOCK to SEP 2
   13. FAN SEP SEL sw – 2
   14. MODE – COMMODE/MANUAL/EMU
   15. COMMODOE CNTL – PULL UP
       – PUSH FWD
   16. Go to MAL, ECLS FRP-2, POST-FIRE CABIN CLEANUP CONTINUATION

CM3
If Av Bay fire, set up for Av Bay purge:
16. Obtain from Cont Hose & Cable Kit (Window Shade Bag):
   Free Fluid Nozzle
   20-ft Y/Y Hose
   Gray Tape
17. Connect Free Fluid Nozzle to Y/Y Hose
18. Insert tip of Free Fluid Nozzle into fire port of Av Bay
19. Secure nozzle and hose with Gray Tape
20. Mate free end of Y/Y Hose to Vacuum Vent QD

Cont next page
21. VAC VLV – OP
ML86B: A 22. cb MNA(MNB) H2O LINE HTR A(B) – cl
 :B MNA,MNB VAC VENT ISOL VLV (two) – cl
     MNB VAC VENT NOZ HTR – cl
ML31C 23. √VAC VENT ISOL VLV BUS SEL – MNA
     NOZ HTR – ON
     ISOL VLV CNTL – OP (tb-OP)
24. Report to MCC: “Av Bay purge is initiated”
FIRE/SMOKE

If VISUAL SMOKE/FIRE, or
two SMOKE DETN lt, or
two CONC > 2, or
one SMOKE DETN lt and
other CONC > 2:
   1. Go to step 6
If single Av Bay SMOKE DETN A(B) lt and assoc CONC > 2:
   2. SMOKE DETN CKT TEST – B(A) (25 sec)
      If SMOKE DETN B(A) test good (lt on):
         3. SMOKE DETN CKT TEST – OFF
         4. SNSR – RESET >>
      If SMOKE DETN B(A) test bad (no lt):
         5. Go to step 6
If none of above >>
6. Check tabs, visors – CL
   LES O2 – ON

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

If CABIN FIRE:
   10. CAB FAN A,B (two) – OFF (max 20 min)
   11. Locate source (see matrix, facing page)
   12. Unpwr source of smoke
   If smoke persists or source cannot be unpwr:
      WARNING
      Discharge is propulsive
   13. Discharge handheld FIRE EXTINGHR
   If Ascent:
   14. Post MECO, go to POST-FIRE CABIN CLEANUP (ASC PKT, ECLS) >>
If Entry and prior to TIG:
   15. Go to ECLS FRP-3, FIRE/HAZ SPILL O2 CONTROL, step 3 (MAL)

Cont next page
OV103,104
21. VAC VLV – OP
   ML86B:A 22. cb MNA(MNB) H2O LINE HTR A(B) – cl
       :B     MNA, MNB VAC VENT ISOL VLV (two) – cl
       MNB VAC VENT NOZ HTR – cl
   ML31C 23. VAC VENT ISOL VLV BUS SEL – MNA
          NOZ HTR – ON
          ISOL VLV CNTL – OP (tb-OP)
   24. Report to MCC: “Av Bay purge is initiated”
### FIRE/SMOKE

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

**If single Av Bay SMOKE DETN A(B) It and assoc CONC > 2:**
  2. SMOKE DETN CKT TEST – B(A) (25 sec)
  3. SMOKE DETN CKT TEST – OFF
  4. SNSR – RESET >>

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

**If none of above >>**
  6. Check tabs, visors – CL

**LES O2 – ON**

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

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

If smoke persists or source cannot be unpwr:

**WARNING**
Discharge is propulsive

13. Discharge handheld FIRE EXTGHR

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

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

---

Cont next page

OV105

B4-20

APCL/5/GEN N,4
<table>
<thead>
<tr>
<th>ALARM SEQUENCE</th>
<th>SOURCE AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L(R) FLT DK</td>
<td>PS(MS), L(R) CONSOLE</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>L(R) FLT DK → CABIN</td>
<td></td>
</tr>
<tr>
<td>L(R) FLT DK</td>
<td>AFT FLT DK, MIDDECK</td>
</tr>
<tr>
<td>R FLT DK</td>
<td></td>
</tr>
<tr>
<td>CABIN</td>
<td>FWD FLT DK, WCS, LEB</td>
</tr>
</tbody>
</table>

- L(R) FLT DK
- R FLT DK
- CABIN
ELECTRICAL POWER SYSTEM

EPS
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)
      5. Perform BUS TIE (Cue Card), then:
   6. Go to PL_PWRDN >>
   7. (Aff) ESS BUS SOURCE FC – OFF
      FC/MN BUS – OFF (tb-OFF)

If aff FC VOLTS < 32 (FC short):
8. (Aff) FC REAC VLV – CL (tb-CL)
9. Go to FC SHUTDN (Cue Card) (do not stop FC until COOL P < 15 and STACK T < 243) >>
If FC VOLTS ≥ 32 (bus short):

   CAUTION
Do not bus tie to shorted bus

10. Go to aff MN BUS LOSS ACTION >>

If MN VOLTS < 26.4 and FC VOLTS > 32 and FC AMPS < 20
(FC disconnect, check APUs):
11. MSTR MADS PWR – OFF
If PL PRI BUS pwr lost due to FC disconnect:
12. PL PRI (three) – OFF (tb-OFF)
13. (Aff) FC/MN BUS – ON (tb-ON)
If PL PRI disconnected in step 12:
14. Perform PL_PWRDN, then:

Cont next page
If FC3 aff:
  15. PL PRI FC3 – ON (tb-ON)
      MNC – ON (tb-ON)
If first FC prob:
  16. Perform BUS TIE (Cue Card), then:
       If aff FC VOLTS still > 32:
           17. Go to FC SHUTDN (Cue Card) >>
           18. (Aff) AC BUS SNSR – OFF,AUTO TRIP
           19. GNC I/O RESET
If second FC failure and aff MN BUS not recovered:
  20. PL PRI (three) – OFF (tb-OFF)
  21. Go to 2nd FC SHUTDN
AC VOLTS (LOW or HIGH)

⇒ 1. If AC OVERLOAD F7 light or 'SM1 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:

Cont next page
total number of cbs to open

<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>
</tr>
<tr>
<td>ΦB</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>ΦC</td>
<td>13</td>
<td>3</td>
</tr>
</tbody>
</table>

5. Go to aff BUS LOSS ACTION >>
If multi Φ AC VOLTS < 110:
  6. (Aff) cb AC CONTR (three) – cl
     INV/AC BUS – OFF (tb-OFF)
     INV PWR – OFF (tb-OFF)
     cb AC CONTR (three) – op
  7. Go to aff BUS LOSS ACTION >>
If (aff) INV/AC BUS tb – ON (FPC bus loss):
  8. Go to aff BUS LOSS ACTION >>
If all AC VOLTS between 110 and 123:
  9. Go to MAL, EPS, AC VOLTS 1(2,3) ↓↑, 7.5a 6

APCL/ALL/GEN N

AC VOLTS (LOW or HIGH)  5-5
AC OVERLOAD

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

If single \( \Phi \):

1. (Aff) cb AC CONTR – cl
   - INV/AC BUS – OFF (tb-OFF)
   - INV PWR – OFF (tb-OFF)
   - cb AC CONTR – op
   - If other \( \Phi \) AC VOLTS < 110 or AC AMPS > 14:

2. Go to step 5

3. Isolate shorted \( \Phi \): Open all aff AC1(2,3) three-\( \Phi \) ganged cbs and all aff AC1(2,3) \( \Phi A(B,C) \) single-\( \Phi \) cbs as noted below:

<table>
<thead>
<tr>
<th>BUS</th>
<th>L4</th>
<th>MA73C</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC1 3( \Phi )</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>( \Phi A )</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>( \Phi B )</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>( \Phi C )</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>AC2 3( \Phi )</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>( \Phi A )</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>( \Phi B )</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>( \Phi C )</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>AC3 3( \Phi )</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>( \Phi A )</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>( \Phi B )</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>( \Phi C )</td>
<td>13</td>
<td>3</td>
</tr>
</tbody>
</table>

Cont next page
4. Go to aff 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 AC VOLTS between 110 and 123 and AC AMPS < 14:
   7. √AC BUS SNSR – MON
      Do not take snsr – AUTO
   8. Go to MAL, EPS, AC OVLD 1(2,3) ↓, 7.5b [6]
3Φ AC MOTORS STOPPED
(No AC VOLTS Alarm: Φ Shift)

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

1. Determine aff AC BUS:
   FC1 and FREON PUMP 2B: AC1
   FC2 and FREON PUMP 1B: AC2
   FC3 and CAB FAN A: AC3

2. (Aff) FC – STOP
   If AC3 aff:
      3. AV BAY 3 FAN B – OFF
         A – ON
            CAB FAN A – 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 aff 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 3Φs) BUS LOSS ACTION >>
   Bad Φ isolated:
      12. (Aff) INV PWR – OFF (tb-OFF)
          cb AC CONTR – op
          FC – START (10 sec or ΔP tb-gray)
      13. If AC3 aff: CAB FAN B – ON
      14. Go to aff Φ BUS LOSS ACTION

5-8 APCL/ALL/GEN N
ESS BUS VOLTS LOW

If verified by F9 voltmeter:

<table>
<thead>
<tr>
<th></th>
<th>1BC</th>
<th>2CA</th>
<th>3AB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If aff cb op</strong></td>
<td>MNA CONTR (pnl O15:B)</td>
<td>MNB CONTR (pnl O16:B)</td>
<td>MNC CONTR (pnl O14:B)</td>
</tr>
<tr>
<td>1. (Aff) cb – op</td>
<td>MNA CONTR (pnl O13:A)</td>
<td>MNB CONTR (pnl O13:C)</td>
<td>MNC CONTR (pnl O13:E)</td>
</tr>
<tr>
<td>2. (Aff) cb – cl</td>
<td>MNA CONTR (pnl O15:B)</td>
<td>MNB CONTR (pnl O16:B)</td>
<td>MNC CONTR (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]
4. Go to aff BUS LOSS ACTION (ESS)
**CNTL BUS V LOW/CNTL BUS RPC**  
**BFS, SM SYS SUMM 1**

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

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

1. Identify BUS (BUS LOSS ID)
   - If BC2:
     2. Perform COMM LOST, steps 4 and 5 (COMM), 2-2, then:

   * If critical (per MCC):
     3. Go to CNTL BUS V LOW/CNTL BUS RPC, step 2 (ORB PKT, EPS) >>

   * If one CNTL BUS RPC tripped (*):

     Aff CNTL BUS:
     **AB1(2,3)**

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

     **BC1(2,3)**

     | Tripped RPC (*) | Action (for RESET, hold w/sw reten device) |
     |-----------------|------------------------------------------|
     | B               | R1 CNTL BUS PWR MNC – RESET              |
     |                 | R14:B cb CNTL BUS BC1/2/3 – op           |
     | C               | R1 CNTL BUS PWR MNB – RESET              |
     |                 | R14:B cb CNTL BUS BC1/2/3 – op           |
If no CNTL BUS RPC tripped (no *):

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

For all CNTL V < 25.0:

13. Perform BUS LOSS ACTION (CNTL), then:

| If AOA >> |

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:

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

16. Hold crit function sw

For tripped RPC:

17. CNTL BUS PWR MNA(MNB,MNC) – RESET (1 sec), then dn
**FC COOLANT PUMP ∆P LOW**  [BFS, SM SYS SUMM 1]

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 ∆P tb-gray)
   If FC EXIT T > 164 and not decr or
   RDY tb – bp (30 sec after START) or
   (aff) FC PUMPS cb(s) – op:
   L4:C 3. Go to FC SHUTDN (Cue Card) >>
   If FC EXIT T norm, RDY tb – gray, no MCC in 5 min:
   O14 4. Note AC1(2,3) AMPS, then FC – STOP
   (O15,O16)
   If AMPS decr:
   If decr 0.7-0.9 amp/Φ:
   O14 5. FC – START (hold 30 sec if ∆P tb-bp)
   (O15,O16)
   6. If AMPS incr 0.7-0.9 amp/Φ >>
   7. Go to FC SHUTDN (Cue Card)

**FC REACTANT VLV CLOSED**  [BFS, SM SYS SUMM 1]

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

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

APCL/ALL/GEN N

FC COOL PUMP $\Delta$P LOW
FC REAC VLV CLOSED 5-13

FC COOL P
FC STACK T

1. MSTR MADS PWR – OFF
   If FC STACK TEMP > 243 degF and incr:
   2. If 2nd FC: Go to 2nd FC SHUTDN >>
   3. PL PRI (three) – OFF
   If aff FC amps < 190 or > 360:
   4. Go to MN BUS UNDervolts/FC VOLTS, step 7 >>
   ♦ 5. Perform BUS TIE (Cue Card), then:
   6. ESS BUS SOURCE FC – OFF
   7. FC/MN BUS – OFF
   If aff FC VOLTS < 32 or FC STACK TEMP not decr:
   8. (Aff) FC REAC VLV – CL
   9. After COOL P < 15 and FC STACK TEMP < 243 degF:
      FC – STOP
   10. √PWRDN

TROUBLESHOOT:
   MAL, EPS, FC STACK T 1(2,3) ↑↓, 7.1b [T]

FC EXIT T

1. MSTR MADS PWR – OFF
2. Perform BUS TIE (Cue Card), then:
   ⇒ If EXIT T > 164 and incr:
   | 3. Go to FC SHUTDN (Cue Card) >>
   If EXIT T < 131 and decr and no comm:
   4. Go to FC SHUTDN (Cue Card)

TROUBLESHOOT: MAL, EPS, FUEL CELL EXIT T ↑↓, 7.3d [T]
**FC pH 1(2,3)**

1. Perform BUS TIE (Cue Card), then:
   - If aff FC SS 1(2,3) $\Delta V > 150$:
     2. Go to FC SAFING >>
   - If aff FC SS 1(2,3) $\Delta V < 150$:
     3. FLASH EVAP CNTLR PRI A – OFF
        B – ON
        SEC (two) – B SPLY, OFF
        SPLY H2O TKA INLET – CL (tb-CL)
        TKB INLET – CL (tb-CL)
        TKC OUTLET – CL (tb-CL)
        TKD INLET – CL (tb-CL)
   4. Two min after bus tie: Record $\Delta$AMPS between aff and tied FC; monitor for 20 min
      - If no comm:
        - If change in $\Delta$AMPS > 12 or FC SS 1(2,3) $\Delta V \geq 150$:
          5. Go to FC SAFING >>
        - If change in $\Delta$AMPS $\leq 12$ and FC SS 1(2,3) $\Delta V < 150$:
          6. Remain bus tied to monitor FC performance
      - If comm avail:
        7. $\sqrt{MCC}$

TROUBLESHOOT: MAL, EPS, FC/H2O LINE pH HIGH, 7.3a [1]

**FC DELTA V 1(2,3)**

1. Perform BUS TIE (Cue Card), then:
   - If aff FC pH $\downarrow$ or FC $\Delta V$ incr:
     2. Go to FC SAFING >>
   - If no aff FC pH $\downarrow$ and FC $\Delta V$ not incr:
     3. Two min after bus tie: Record $\Delta$AMPS between aff and tied FC; monitor for 20 min
        - If change in $\Delta$AMPS > 12 or FC $\Delta V$ incr:
          4. Go to FC SAFING >>
        - If change in $\Delta$AMPS $\leq 12$ and FC $\Delta V$ not incr:
          5. Remain bus tied to monitor FC performance

TROUBLESHOOT:
   - If FC pH $\downarrow$: MAL, EPS, FC/H2O LINE pH HIGH, 7.3a [1]

**APCL/ALL/GEN N**

**FC STACK T/FC EXIT T** 5-15 **FC pH/FC DELTA V**
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 ΔP tb-bp or 1 sec)
4. FC REAC VLV – CL (tb-CL)
5. Go to LOSS OF FES/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. (Aff) ESS BUS SOURCE FC – OFF
   FC/MN BUS – OFF (tb-OFF)
   FC – STOP (COOL PUMP ΔP tb-bp or 1 sec)
6. FC REAC VLV – CL (tb-CL)
7. Go to LOSS OF 2nd FC (PWRDN), 10-43
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: \(\sqrt{\text{CAB FAN A(B) – ON }}\)

FC SAFING
\(\text{BFS, SM SYS SUMM 1}\)
If FC already SHUTDN:
1. \(\sqrt{\text{FC1(2,3) REAC – CL (O2,H2 tb-CL)}}\)
2. \(\text{FC1(2,3) – START (10 sec or } \Delta P \text{ tb-gray)}}\)
3. FC/MN BUS A(B,C) – ON (tb-ON)
   When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:
   4. FC/MN BUS A(B,C) – OFF (tb-OFF)
      When FC1(2,3) COOL P < 15, then:
      5. FC1(2,3) – STOP (\(\Delta P \text{ tb-bp or 1 sec} \) >>
If FC not SHUTDN:
6. MSTR MADS PWR – OFF
   If not already tied:
7. Perform BUS TIE (Cue Card), then:
8. FC1(2,3) REAC – CL (O2,H2 tb-CL)
   If either FC REAC tb still OP:
   C3
9. cb FC1(2,3) REAC VLV CL ENA – cl
10. FC REAC VLV 1(2,3) – CL
   If no joy:
   R1
11. Install sw reten device FC REAC sw
   When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:
   12. ESS BUS SOURCE FC1(2,3) – OFF
   13. FC/MN BUS A(B,C) – OFF (tb-OFF)
      When FC1(2,3) COOL P < 15, then:
      14. FC1(2,3) – STOP (\(\Delta P \text{ tb-bp or 1 sec} \) >>
15. Go to LOSS OF FES/1 FC (2nd FC) (PWRDN),
   10-39/10-43

APCL/ALL/GEN N

FC SHUTDN (1st)
2nd FC SHUTDN
BUS TIE/FC SAFING
CRYO O2(H2) (5-18)
CRYO O2(H2) PRESS/TEMP HIGH

(Aff) O2(H2) TK HTRS (two) – OFF

For O2(H2) PRESS, go to MAL, EPS, CRYO O2(H2) PRES, TK P↓↑, 7.6b [1] >>
For H2 TEMP HIGH, go to MAL, EPS, H2 HTR T, 7.6f [1] >>
For O2 TEMP HIGH, go to MAL, EPS, O2 HTR T, 7.6l [1]

CRYO O2(H2) LEAK

1. Use meter if CRT data OSL
   If multiple TK Ps low:
   2. O2(H2) MANF VLV TK1,TK2 (two) – CL
      TK1,TK2,TK3 HTRS (six) – AUTO
      If either MANF VLV fails to close:
      3. Hold sw in CLOSE posn (install sw reten device if reqd), then:
         ⇒ If TK 1 and 2 P decr slowly (HTR logic fail):
         4. O2(H2) MANF VLV TK1,TK2 (two) – OP
         5. Go to MAL, EPS, CRYO O2(H2) PRES, TK P↓↑, 7.6b [1] >>
         6. Perform aff BUS TIE (Cue Card), then:
            If O2(H2) TK1(2) aff (open unaff manf):
            7. O2(H2) MANF VLV TK2(1) – OP
            If O2 TK1(2) aff:
            8. O2 SYS 1(2) SPLY – CL, then:
               If O2 TK 1(2) P now incr (PCS leak):
               9. O2 MANF VLV TK1,TK2 (two) – OP >>
            10. Perform aff FC SHUTDN (Cue Card), then:
               If aff TK P not decr (FC leak):
               11. O2(H2) MANF VLV TK1,TK2 (two) – OP (ASAP if FC3) >>
               If aff TK P/MANF P decr (MANF leak):
               12. (Aff) TK HTRS A(B) (two) – OFF >>
               If only one TK P low (TK leak, xdcr, or cntlr fail):
               13. (Aff) TK HTRS A(B) (two) – OFF

⇒
<table>
<thead>
<tr>
<th>BUS LOSS</th>
<th>PAIRED</th>
<th>PAIRED</th>
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<tbody>
<tr>
<td></td>
<td>TK1</td>
<td>TK2</td>
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<tr>
<td></td>
<td>A</td>
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<td>3AB</td>
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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
## MAIN DC BUS LOSS ID TABLE

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>FPC1</th>
<th>MPC1</th>
<th>APC4</th>
<th>FPC2</th>
<th>MPC2</th>
<th>APC5</th>
<th>FPC3</th>
<th>MPC3</th>
<th>APC6</th>
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<tbody>
<tr>
<td>AC VOLTAGE (AC X Lost)</td>
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<tr>
<td>APU TEMP (~2 min if APU X ON &amp; BLR/CNTLR A sel)</td>
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<td>1</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>FREON LOOP (if cooling by FES X only)</td>
<td>B</td>
<td>B</td>
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<td>A</td>
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<tr>
<td>H2O LOOP (if Pump X Active)</td>
<td>1A</td>
<td>1B</td>
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<td>OMS TVC (During OMS PRI GM)</td>
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<td>OMS TVC (During OMS SEC GM)</td>
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<td>RCS JET (When Jet Commanded)</td>
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<td>DC AMPS XY * 0 (X: Fwd, Mid, Aft)</td>
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<td>MA</td>
<td>AA</td>
<td>FB</td>
<td>MB</td>
<td>AB</td>
<td>FC</td>
<td>MC</td>
<td>AC</td>
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<td>AA</td>
<td>AA</td>
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<td>FC</td>
<td>AC</td>
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<td>CTL BUS RPC X = * (X: A, B, C)</td>
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<td>B</td>
<td>C</td>
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<tr>
<td>PLB LOTS</td>
<td>PLS</td>
<td>FLOPPDS (Fwd, Mid, Aft, Port, Stbd, Docking)</td>
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<td>S-BAND</td>
<td>SYS X ORB voice &amp; PL PSP msg (X: 1, 2)</td>
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<td>ATM OZ SYS X SPLT tb - CL</td>
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<td>F6/8</td>
<td>LANDING GEAR X tb - bp (X: L, R, NOSE)</td>
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<td>OT</td>
<td>H2O PUMP OUT P X = 20 (Pump Loss)</td>
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<td>1B</td>
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<td>APT X RCS HE P Y tb - bp (X: 800H, L, R)</td>
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<td>BA</td>
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<td>RB</td>
<td>LB</td>
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<td>FWD RCS</td>
<td>TK ISOL X tb - bp (X: 1, 2, 3, 4, 5)</td>
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<td>R4</td>
<td>HYD BK (SOL, VLV) X tb - OP</td>
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<tr>
<td>RT</td>
<td>TROD ISO VALV tb - OP</td>
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<td>R13</td>
<td>RAD CNTL X tb - bp (X: PORT, STBD)</td>
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<td>RMS E (except DERIGID) tb - bp, MA LT - ON</td>
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<td>X RMS DPY/STO tb - bp (X: PORT, STBD)</td>
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<td>X RMS</td>
<td>RETEN LAT tb - bp (X: PORT, STBD)</td>
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<td>RMS ISOL X tb - bp (X: FWD, MID, AFT)</td>
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*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
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<th>MAIN DC BUS LOSS ID TABLE</th>
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<td>•</td>
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<tr>
<td><strong>FLOODS</strong> (L Seat, R Seat, CTR Cnsl, MS, OS, PS)</td>
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<td>LC</td>
<td>OS</td>
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<td><strong>MIDDECK FLOODS X (X: 1, 2, 3, 4, 5, 6, 7, 8)</strong></td>
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<td><strong>UHF SPLX PWR AMP</strong></td>
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<tr>
<td><strong>TIMERS</strong></td>
<td>X MISSION TIMER (X: Fwd, Aft)</td>
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<tr>
<td><strong>FWD MDUs</strong></td>
<td>A</td>
<td></td>
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<tr>
<td><strong>AFT MDU</strong></td>
<td>MDU</td>
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<tr>
<td><strong>FWD</strong></td>
<td>MFD2</td>
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<tr>
<td><strong>AFD1</strong></td>
<td>PLT1</td>
<td></td>
<td></td>
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<tr>
<td><strong>O1</strong></td>
<td>CAB dP/dt &lt; 0.45</td>
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<tr>
<td><strong>PPO2 SNSR X = 0 psia</strong></td>
<td>•</td>
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<tr>
<td><strong>R11L</strong></td>
<td>SPLY H2O TK X INLET tb – bp</td>
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<tr>
<td><strong>SPLY H2O TK X OUTLET tb – bp</strong></td>
<td>A</td>
<td></td>
<td></td>
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<tr>
<td><strong>SPLY H2O DUMP, XOVR, GALLEY SPLV LVY tb – bp</strong></td>
<td>•</td>
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<tr>
<td><strong>SPLY H2O DUMP ISOL, B SPLV ISOL LVY tb – bp</strong></td>
<td>•</td>
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<tr>
<td><strong>RCS/OMS PRPLT QTY Disp Blanks</strong></td>
<td>•</td>
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<tr>
<td><strong>A8U</strong></td>
<td>RMS EE (6), SAFING, S/W STOP tb – bp, BRAKES tb – OFF</td>
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<tr>
<td><strong>ML31C</strong></td>
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<tr>
<td><strong>WASTE H2O TK VLY tb – bp</strong></td>
<td>1</td>
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<tr>
<td><strong>WASTE H2O DUMP ISOL VLV tb – bp</strong></td>
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<tr>
<td><strong>SPLY H2O TK D X tb – bp (X: INLET, OUTLET)</strong></td>
<td>O</td>
<td>1</td>
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## ESS DC BUS LOSS ID TABLE

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>ESS1BC</th>
<th>ESS2CA</th>
<th>ESS3AB</th>
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<tbody>
<tr>
<td>MA, but no F7 C/W Lts</td>
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<td>•</td>
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</tr>
<tr>
<td>C/W</td>
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<tr>
<td>O2 PRESS</td>
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<tr>
<td>H2 PRESS</td>
<td>•</td>
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</tr>
<tr>
<td>FC REAC</td>
<td>•</td>
<td>•</td>
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</tr>
<tr>
<td>FC PUMP</td>
<td>•</td>
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</tr>
<tr>
<td>PRIMARY C/W (Cannot be Reset)</td>
<td>•</td>
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<tr>
<td>BACKUP C/W (Cannot be Reset)</td>
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<tr>
<td>F9 METER</td>
<td>•</td>
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<tr>
<td>SM1 All Voice via AUDIO CTR 1</td>
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<tr>
<td>X ATU, CCU, MIU (X: Cdr, Plt)</td>
<td>C</td>
<td>C</td>
<td>P</td>
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<tr>
<td>F7 C/W MATRIX</td>
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<tr>
<td>MA BULBS 2 of 4 per MA (except Lamp Test)</td>
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<tr>
<td>GPC STATUS LTS</td>
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<tr>
<td>X GLARESHIELD FLOOD (X: L, R)</td>
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<tr>
<td>O2 O2, H2 MANF VLV TK X QTY = 0% (X: 1, 2, 3, 4)</td>
<td>24</td>
<td>2</td>
<td>4</td>
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<tr>
<td>R1 FC/MN BUS X tb – OFF</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>PL PRI MNC tb – OFF</td>
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</tr>
<tr>
<td>INV PWR X tb – OFF (Inv OK)</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>INV/AC BUS X tb – OFF (Bus OK)</td>
<td>3</td>
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<td>3</td>
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<tr>
<td>O2, H2 MANF VLV TK X tb – CL</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>FC X REAC tb – CL</td>
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<tr>
<td>FC X RDY tb – bp</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>FC X COOL PUMP, D&amp; P tb – bp</td>
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</tr>
<tr>
<td>A12 FC3 STRUCT RTN tb – OFF</td>
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</tbody>
</table>

**DATE 05/23/00**
CNTL AB1
C/W – APU TEMP (~2 min if APU 1 ON and BLR/CNTLR 1B sel)
MDU CRT 1 Blanks
C/W – FREON LOOP if FES active (Pri B GPC)

CNTL AB2
C/W – APU TEMP (~2 min if APU 1 ON and BLR/CNTLR 1B sel)
L HUD lost
C/W – FREON LOOP if FES active (Pri B ON)

CNTL AB3
C/W – APU TEMP (~2 min if APU 1(3) ON and BLR/CNTLR 1A(3A) sel)
(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
C/W – APU TEMP (~2 min if APU 2 ON and BLR/CNTLR 2B sel)
(L1) – RAD BYP VLV MAN SEL 2 (tb-bp)
S-BD SYS 1 Comm
PL SYS 1
R HUD lost

CNTL BC2
C/W – APU TEMP (~2 min if APU 2 ON and BLR/CNTLR 2B sel)
MDU CRT 2 Blanks
C/W – H2O LOOP (if Pump 1B ON)
S-BD SYS 2 Comm
PL SYS 2

CNTL BC3
C/W – APU TEMP (~2 min if APU 1(2) ON and BLR/CNTLR 1A(2A) sel)
(O8) – FWD RCS MANF ISOL 2 (tb-bp)
C/W – H2O LOOP (if Pump 1B ON)

CNTL CA1
C/W – APU TEMP (~2 min if APU 3 ON and BLR/CNTLR 3B sel)
MDU CRT 3 Blanks
C/W – FREON LOOP if FES active (Pri A GPC)
C/W – H2O LOOP (if LOOP 2 GPC)

CNTL CA2
C/W – APU TEMP (~2 min if APU 3 ON and BLR/CNTLR 3B sel)
MDU CRT 4 Blanks
C/W – FREON LOOP if FES active (Pri A ON)

CNTL CA3
C/W – APU TEMP (~2 min if APU 2(3) ON and BLR/CNTLR 2A(3A) sel)
(O8) – FWD RCS TK ISOL 1/2 (tb-bp)
MANF ISOL 3 (tb-bp)
4 (tb-bp)
(L1) – RAD BYP VLV MAN SEL 1 (tb-bp)
FLOW PROP VLV LOOP 2 (tb-bp)

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

12/09/03
**BUS LOSS ACTION**

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<th>PAGE</th>
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<td>CNTL AB1 ................. 5-35</td>
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<tr>
<td>MNA DA1 (Entire Bus)</td>
<td>AB2 ................. 5-35</td>
</tr>
<tr>
<td>(Includes AC1) .................... 5-27</td>
<td>AB3 ................. 5-35</td>
</tr>
<tr>
<td>FPC1 ................................ 5-27</td>
<td>BC1 ................. 5-36</td>
</tr>
<tr>
<td>FLC1 ................................ 5-27</td>
<td>BC2 ................. 5-36</td>
</tr>
<tr>
<td>MPC1 ................................ 5-27</td>
<td>BC3 ................. 5-36</td>
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<tr>
<td>APC4 ................................ 5-28</td>
<td>CA1 ................. 5-37</td>
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<tr>
<td>APC1 ................................ 5-28</td>
<td>CA2 ................. 5-37</td>
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<tr>
<td>ALC1 ................................ 5-28</td>
<td>CA3 ................. 5-37</td>
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<tr>
<td>O14 .................................. 5-28</td>
<td>ESS 1BC DA1 (Entire Bus)</td>
</tr>
<tr>
<td>R14 .................................. 5-28</td>
<td>MPC1 (CIL) ........... 5-38</td>
</tr>
<tr>
<td>AC2 .................................. 5-29</td>
<td>FD (CIL) ............. 5-38</td>
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<tr>
<td>MNB DA2 (Entire Bus)</td>
<td>O13&amp;R14 ............ 5-38</td>
</tr>
<tr>
<td>(Includes AC2) ..................... 5-30</td>
<td>ESS 2CA DA2 (Entire Bus)</td>
</tr>
<tr>
<td>FPC2 ................................ 5-31</td>
<td>MPC2 (CIL) ........... 5-39</td>
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<tr>
<td>FLC2 ................................ 5-31</td>
<td>FD (CIL) ............. 5-39</td>
</tr>
<tr>
<td>APC5 ................................ 5-31</td>
<td>O13 ................. 5-40</td>
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<tr>
<td>ALC2 ................................ 5-31</td>
<td>ML86B ............... 5-40</td>
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<tr>
<td>O15 .................................. 5-31</td>
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<tr>
<td>AC3 .................................. 5-32</td>
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</tr>
<tr>
<td>MNC DA3 (Entire Bus)</td>
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<tr>
<td>(Includes AC3) .................... 5-33</td>
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</tr>
<tr>
<td>FPC3 ................................ 5-34</td>
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<tr>
<td>FLC3 ................................ 5-34</td>
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<td>MPC3 ................................ 5-34</td>
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<td>APC6 ................................ 5-34</td>
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<td>APC3 ................................ 5-34</td>
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<td>O16 .................................. 5-34</td>
<td></td>
</tr>
<tr>
<td>R14 .................................. 5-34</td>
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</tbody>
</table>

**NOTE**

Loss of electrical sub-buses difficult for crew to determine. MCC will pass this sub-bus loss data to crew, as well as reqd actions as noted in ASC PKT C/L. All pwrd flight major bus loss actions (including RTLS) will be performed only via Ascent Systems Cue Cards.
AC1 (2 or 3ΦS)

**WARNING**
FC1 will be lost within 9 min

C3
1. MSTR MADS PWR – OFF

⇒
If no MNA bus short:
2. Perform BUS TIE (Cue Card), then:
   If no MNA bus tie:
   3. Go to MNA DA1 >>

If MNA bus tie performed:
R2
4. BLR CNTLR/HTR 3 – B
5. Perform FC1 SHUTDN (Cue Card), then:

L1
6. AV BAY 3 FAN A – ON
   B – OFF
   FREON PUMP LOOP 2 – A

AC1 ΦA

⇒ L1
   FREON PUMP LOOP 2 – A

AC1 ΦB

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

AC1 ΦC

⇒ R2
   1. BLR CNTLR/HTR 3 – B
L1
   2. FREON PUMP LOOP 2 – A
MNA DA1 (Entire Bus) (Includes AC1)

NOTE
Loss of UHF SPLX Hi Pwr Xmit

⇒ R2
1. MPS PRPLT DUMP B/U LH2 VLV – OP
2. BLR CNTLR/HTR 3 – B
3. MSTR MADS PWR – OFF
4. AC BUS SNSR 1 – OFF
5. Perform FC1 SHUTDN (Cue Card), then:
   L1 6. √AV BAY 1 FAN B – ON
       3 FAN A – ON
       B – OFF
       FREON PUMP LOOP 2 – A
       TOP EVAP HTR NOZ L – B AUTO
       DUCT sel – B
       HI LOAD DUCT HTR sel – B
   L2 7. O2/N2 CNTLR VLV SYS 2 – OP
8. [XXXXX MNVR YYYY]
   L OMS – sel SEC GMBL
9. NWS – 2
   [OMS/MPS]
10. Use He PRESS for L,R OMS Qty est
   O6 11. ANNUN BUS SEL ACA 1 – MNB
   R1L 12. MS AUD CNTL sel – PS
   R1 13. √O2,H2 MANF VLV TK1,TK2 (four) – OP
       TK2 HTRS B (two) – AUTO
   14. [BFS C51]
       AA1 – desel
When BUS LOSS ACTION complete:
15. Go to LOSS OF FES/1 FC (PWRDN), 10-39

MNA FPC1
Go to AC1 (2 or 3Øs)

MNA FLC1

[GNC 23 RCS]
RCS FWD MANF VLVS 1 OVRD – ITEM 40
EXEC (CL)

MNA MPC1
L1 TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B
MNA APC4

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

MNA APC1

[XXXXX MNVR YYYY]  
L OMS – sel SEC GMBL

MNA ALC1

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

MNA O14

L2 1. O2/N2 CNTLR VLV SYS 2 – OP
2. NWS – 2
O6 3. ANNUN BUS SEL ACA 1 – MNB
F6,F8 4. RDR ALTM – 2
   [BFS G51]  
   AA1 – desel

MNA R14

NOTE
Loss of UHF SPLX Hi Pwr Xmit

R11L  MS AUD CNTL sel – PS (MS can’t talk)
AC2 (2 or 3Φs)

**WARNING**
FC2 will be lost within 9 min

C3
1. MSTR MADS PWR – OFF
⇒
If no MNB bus short:
2. Perform BUS TIE (Cue Card), then:
If no MNB bus tie:
3. Go to MNB DA2 >>
If MNB bus tie performed:

R2
4. BLR CNTLR/HTR 1 – B
5. Perform FC2 SHUTDN (Cue Card), then:

L1
6. HUM SEP A – ON
   B – OFF
   IMU FAN A – ON
   B – OFF
   AV BAY 1 FAN A – ON
   B – OFF
   2 FAN A – OFF
   B – ON
   FREON PUMP LOOP 1 – A

O17:C
7. SIG CONDR FREON A – AC3

AC2 ΦA

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

AC2 ΦB

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

AC2 ΦC

⇒
L1
FREON PUMP LOOP 1 – A
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

⇒

R2  1. MPS PRPLT DUMP B/U LH2 VLV – OP
     2. BLR CNTLR/HTR 1 – B
     C3  3. MSTR MADS PWR – OFF
     R1  4. AC BUS SNSR 2 – OFF
          5. Perform FC2 SHUTDN (Cue Card), then:
          L1  6. HUM SEP A – ON
               B – OFF
               IMU FAN A – ON
               B – OFF
               AV BAY 1 FAN A – ON
               B – OFF
               2 FAN A – OFF
               B – ON
               FREON PUMP LOOP 1 – A
               TOP EVAP HTR NOZ R – B AUTO
     O6  7. ANNUN BUS SEL ACA 2/3 – MNC
     O17:C  8. SIG CONDR FREON A – AC3
     R1  9. √O2,H2 MANF VLV TK1,TK2 (four) – OP
            TK1 HTRS B (two) – AUTO
       10. [BFS G51]
            AA2, RGA 2 – desel
      When BUS LOSS ACTION complete:
       11. Go to LOSS OF FES/1 FC (PWRDN), 10-39
CAUTION
Do not sw S-BD PM CNTL to PNL if subs Fault Msg – ‘BCE STRG 3 NSP’ or loss of comm

Go to AC2 (2 or 30s)

MNB FLC2

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

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

MNB APC5

⇒ R2
  1. MPS PRPLT DUMP B/U LH2 VLV – OP
  2. BLR CNTLR/HTR 1 – B
L1  3. TOP EVAP HTR NOZ R – B AUTO
  4. [BFS G51] RGA 2 – desel

MNB ALC2

⇒ R2
  1. MPS PRPLT DUMP B/U LH2 VLV – OP
  2. BLR CNTLR/HTR 1 – B
L1  3. TOP EVAP HTR NOZ R – B AUTO

MNB O15

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

⇒
AC3 (2 or 3Φs)

WARNING
FC3 will be lost within 9 min

C3 1. MSTR MADS PWR – OFF
⇒ If no MNC bus short:
   2. Perform BUS TIE (Cue Card), then:
      If no MNC bus tie:
         3. Go to MNC DA3 >>
      If MNC bus tie performed:
        R2 4. BLR CNTLR/HTR 2 – B
        L1 5. Perform FC3 SHUTDN (Cue Card), then:
          6. CAB FAN B – ON
             A – OFF
          7. AV BAY 3 FAN B – ON
          8. H2O PUMP LOOP 1 – ON
             2 – OFF
          O17:C 9. SIG CONDR FREON B – AC2

AC3 ΦA

⇒ R2 1. BLR CNTLR/HTR 2 – B
L1 2. H2O PUMP LOOP 1 – ON
     2 – OFF

AC3 ΦB

⇒ L1 1. H2O PUMP LOOP 1 – ON
     2 – OFF
O17:C 2. SIG CONDR FREON B – AC2

AC3 ΦC

⇒ L1 H2O PUMP LOOP 1 – ON
     2 – OFF
**MNC DA3** (Entire Bus) (Includes AC3)

**NOTE**
PS AUDIO lost

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

⇒ **R2**
2. BLR CNTLR/HTR 2 – B

⇒ **C3**
3. MSTR MADS PWR – OFF
   √ AUD CTR – 1

⇒ **R1**
4. AC BUS SNSR 3 – OFF
5. Perform FC3 SHUTDN (Cue Card), then:

**L1**
6. CAB FAN B – ON
   A – OFF

7. H2O PUMP LOOP 1 – ON
   2 – OFF
   √ AV BAY 2 FAN A – ON
   3 FAN B – ON

**O17:C**
8. SIG CONDR FREON B – AC2
9. XXXXX MNVR YYYYY

**R**
O MS – sel SEC GMBL

**C3**
10. S-BD PM CNTL – PNL,CMD
11. BFS, GNC 51 OVERRIDE

**R**
12. O2,H2 MANF VLV TK1,TK2 (four) – OP
    TK3 HTRS A,B (four) – AUTO

<table>
<thead>
<tr>
<th>OMS</th>
<th>MPS</th>
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<tbody>
<tr>
<td>BFS</td>
<td>GNC 51 OVERRIDE</td>
</tr>
<tr>
<td>RGA 3 – desel</td>
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</tbody>
</table>

When BUS LOSS ACTION complete:
15. Go to LOSS OF FES/1 FC (PWRDN), 10-39
MNC FPC3
C3 1. S-BD PM CNTL – PNL, CMD
2. [BFS, GNC 51 OVERRIDE]
   TDRS – ITEM 46 EXEC (*)
3. Go to AC3 (2 or 3Φs)

MNC FLC3
C3 1. S-BD PM CNTL – PNL, CMD
2. [BFS, GNC 51 OVERRIDE]
   TDRS – ITEM 46 EXEC (*)
3. [GNC 23 RCS]
   RCS FWD MANF VLVS 4 OVRD – ITEM
   43 EXEC (CL)

MNC MPC3
[BFS, GNC 51 OVERRIDE]
RGA 3 – desel

MNC APC6
⇒ R2 1. BLR CNTLR/HTR 2 – B
L1 2. FLASH EVAP CNTLR PRI A – OFF
    B – ON
3. [XXXXX MNVR YYYY]
   R OMS – sel SEC GMBL

MNC APC3
[XXXXX MNVR YYYY]
R OMS – sel SEC GMBL

MNC ALC3
⇒ R2 1. BLR CNTLR/HTR 2 – B
L1 2. FLASH EVAP CNTLR PRI A – OFF
    B – ON

MNC O16
[OMS/MPS] 1. Use He PRESS for L,R OMS Qty est
   F6,F8 2. HSI SEL SOURCE – not MLS 3

MNC R14
NOTE
PS AUDIO lost
C3 \√AUD CTR – 1
CNTL AB1

⇒ L1 1. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B
R1 2. √O2,H2 MANF VLV TK1,TK2 (four) – OP

CNTL AB2

L1 1. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B
2. [GNC 23 RCS]
   RCS FWD MANF VLVS 1 OVRD – ITEM 40 EXEC (CL)
⇒ R1 3. √O2,H2 MANF VLV TK1,TK2 (four) – OP

CNTL AB3

NOTE
CDR's BFS engage capability lost
If BFS engage reqd:
1. Use PLT's RHC, then:
O6 2. GPC MODE 1,2,4 (three) – STBY,HALT
3. BFS I/O RESET
L1 4. TOP EVAP HTR DUCT sel – B
HI LOAD DUCT HTR sel – B
⇒ Do not perform next step if AB1,2,3 unpwrd:
5. [GNC 51 OVERRIDE]
   RCS RM MANF CL OVRD – ITEM 41 EXEC
R2 6. BLR CNTLR/HTR 1,3 (two) – B
CAUTION
Do not sw S-BD PM CNTL to PNL if subs Fault Msg – 'BCE STRG 3 NSP' or loss of comm

CNTL BC1

⇒

L1
1. TOP EVAP HTR NOZ L – B AUTO
2. BFS, GNC 51 OVERRIDE
   RGA 2 – desel
R1
3. √O2,H2 MANF VLV TK1,TK2 (four) – OP

CNTL BC2

C3
1. S-BD PM CNTL – PNL,CMD
2. BFS, GNC 51 OVERRIDE
   TDRS – ITEM 46 EXEC (†)
3. GNC 23 RCS
   RCS FWD MANF VLVS 2 OVRD – ITEM 41 EXEC (CL)
⇒
R1
4. √O2,H2 MANF VLV TK1,TK2 (four) – OP
   TK2 HTRS B (two) – AUTO
If AOA:
L1
5. NH3 CNTLR B – OFF
   A – PRI/GPC

CNTL BC3

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

⇒ O6  ♦ 1. GPC OUTPUT 5 – TERM
     2. [BFS G51]
         RGA 3 – desel
L1  3. FLASH EVAP CNTLR PRI A – ON

CNTL CA2

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

CNTL CA3

⇒ R1  1. √O2,H2 MANF VLV TK1,TK2 (four) – OP
R2  2. BLR CNTLR/HTR 2,3 (two) – B
ESS 1BC DA1 ( Entire Bus )

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

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

ESS 1BC MPC1

Go to FC1 SHUTDN (Cue Card)

ESS 1BC FD

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

Go to FC1 SHUTDN (Cue Card)

ESS 1BC O13&R14

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

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

5-38 APCL/ALL/GEN N
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
O9 2. R AUD CNTL sel – L (PLT can’t talk)
⇒ 3. Perform FC2 SHUTDN (Cue Card), then:
   If add’l ltg reqd:
C3 4. EMER LTG – ON/OFF
R1 5. √O2,H2 MANF VLV TK1 (two) – OP
    TK1 HTRS A,B (four) – OFF
    TK2 HTRS B (two) – AUTO

ESS 2CA MPC2

Go to FC2 SHUTDN (Cue Card)

ESS 2CA FD

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

Go to FC2 SHUTDN (Cue Card)

ESS 2CA O13&R14

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

C3 1. AUD CTR – 2
O9 2. R AUD CNTL sel – L (PLT can’t talk)
⇒ 3. EMER LTG – ON/OFF
R1 4. √O2,H2 MANF VLV TK1,TK2 (four) – OP
    TK1 HTRS A,B (four) – OFF
    TK2 HTRS B (two) – AUTO
ESS 3AB DA3 (Entire Bus)

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

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

ESS 3AB MPC3

Go to FC3 SHUTDN (Cue Card)

ESS 3AB FD

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

Go to FC3 SHUTDN (Cue Card)

ESS 3AB O13

NOTE
Computer Status Matrix lost

ESS 3AB ML86B

R1 √O2,H2 MANF VLV TK1,2 (four) – OP
GUIDANCE, NAVIGATION, AND CONTROL
DISPLAY SW L(R)

1. L(R) disp sws – green dot

**ADTA RM**

- **PASS**
  - pwr off/commfault
  - desel
  - probe not deployed
  - or
  - downmode

- **4 ADTAs** → avg of L and R avgs
- **3** → avg of L(R) avg and R(L) single
- **2** → avg
dlma
- **1** → NAVDAD ($V_{rel} > 1500$) or default ($V_{rel} < 1500$)
- **0** → same as dlma

**BFS**

- pwr off/commfault
- ADTA BITE
- probe not deployed
- or
- downmode

- **4 ADTAs** → avg of ADTA 1 and 2
- **3** → avg of 1 from L and R
- **2 (L,R)** → avg
- **2 (same side)** → use low # ADTA
- **1** → use
- **0** → NAVDAD

**NOTE**

When BFS engaged, if failed ADTA candidate for selection, pull ADTA cb, or stow applicable probe
RM FAIL IMU, RGA, AA  

Aff LRU – desel

RM DLMA IMU

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

### IMU RM

**PASS**

- pwr off/commfault
- desel
- BITE (dlma)

| 3 IMUs | MVS vel, sel att set |
| 2      | avg vel, sel att set |
| 1      | use |

**BFS**

- pwr off/commfault
- H/W BITE
- man desel

| 3 IMUs | MVS vel, sel att set |
| 2      | use low # IMU |
| 1      | use |

APCL/ALL/GEN N

DISPLAY SW L(R) 6-3

RM FAIL IMU, RGA, AA

RM DLMA IMU
TACAN RM

PASS

- pwr off/no lock
- desel
- commfault
- self test fail (dlma)

or

downmode

3 TACANs
2
dlma
1

MVS
avg
do not use
use

BFS

pwr off/no lock
commfault
2 level miscompare (dlma)
man desel

or

downmode

3 TACANs
2
dlma
1

MVS
use low # TACAN
do not use
use (common CH reqd without regard to PWR/COMMFAULT status)

---

6-4 APCL/ALL/GEN N

---
GPS RM

PASS

commfault

desel

Data Good Fail

QA fail (1-4)

or

downmode

3 GPS

2

dlma

1

MVS

avg

do not use

prime select

BFS

commfault

desel

Data Good Fail

QA fail (1-4)

or

downmode

3 GPS

2

dlma

1

MVS

use lowest FOM; then

lowest LRU

do not use

prime select

APCL/ALL/GEN N

TACAN RM

6-5

GPS RM
OMS N2 TK P LOW

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

OMS N2 REG P LOW

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

**NOTE**
N2 REG P > 299 allows one OMS ENG start

OMS N2 REG P HIGH

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

OMS TK P (FU and OX) HIGH

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

OMS TK P (FU or OX) LOW

If sys not secured and corresp ENG IN P disagrees:
   1. When time permits: Go to MAL, OMS, L(R) OMS TK P, 11.1a 29 >>
⇒ If OMS 1 reqd:

**NOTE**
Do not open OMS XFDs for OMS-1

2. At TIG-2: (aff) He PRESS (two) – OP OMS ENG (two) – ARM/PRESS
   If FU IN P < 216 or OX < 151 prior to ign:
   3. Go to OMS SECURE >>
   4. At TIG-15 sec: RCS +X to TIG+1 sec
   5. Post Burn: Continue with step 6

Cont next page

7-2

APCL/ALL/GEN N,4
If pre-OMS 2:
6. Perform OMS SECURE, then:
   If corresp ENG IN P decr (OMS inlet line leak):
   7. OMS 2 burn single ENG, good Pod
   8. ENG cut off when ≥ MIN Hp >>
If OMS TK P decr (prop tk leak), dump ASAP:
9. LOAD ΔVY = [-600], TIG in ~4 min
10. ENG/TRIM CONFIG, LOAD TGTS, MNVR
11. (Good) OMS ENG – OFF
12. (Aff) OMS ENG – ARM/PRESS
At TIG-2:
13. FLT CNTLR PWR (two) – ON
14. (Aff) OMS He PRESS/VAP ISOL (two) – OP
   TK ISOL (two) – OP (tb-OP)
   If FU IN P < 216 or OX IN P < 151 prior to ign:
   15. Go to OMS SECURE >>
At TIG-15 sec:
16. RCS +X to TIG+1 sec
17. Burn to depletion (OMS ↓)
Postburn:
18. (Aff) OMS ENG – OFF
19. FLT CNTLR PWR (two) – OFF
20. Perform OMS SECURE, then:
21. Cut off OMS 2 when ≥ MIN Hp >>
If post-OMS 2:
22. Perform OMS SECURE, then:
   If OMS ENG IN P decr (OMS inlet line leak):
   23. \(\sqrt{\text{MCC}}\)
   If OMS TK P decr (prop tk leak):
   24. Go to LEAKING OMS PRPLT/He BURN
   (ORB PKT, OMS)

APCL/ALL/GEN N

OMS N2 TK/REG P
OMS TK P HIGH/LOW  7-3
OMS He TK P LOW

1. \( \sqrt{\text{He TK P}} < 1500 \) or decr (OMS/MPS and SPEC)

\[
\begin{array}{|c|c|}
\hline
\text{OMS-1 reqd} & 2. \text{OMS ENG (two) – ARM/PRESS} \\
\text{Blowdown Dump complete or He TK P < 640} & 3. \text{XFEED from (good) OMS} \\
\text{Blowdown Dump not complete} & 4. \text{XFEED from (leaking) OMS} \\
& 5. \Delta \text{to OMS He TK P LOW (Cue Card, OMS 1 BURN MONITOR):} \\
& \hspace{1cm} \text{Replace existing text with} \\
& \hspace{1cm} \text{“When He TK P < 640 or QTY } \leq 5\%, \text{ XFEED from (good) OMS”} \\
\text{Blowdown Dump not complete} & 6. \text{XFEED from (leaking) OMS} \\
\text{and He TK P > 640} & \\
\text{Good comm} & 7. \sqrt{\text{MCC for TGTs}} \\
& 8. \sqrt{\text{ENG/TRIM CONFIG, LOAD TGTs, MNVR}} \\
\text{Early In-plane Burn} & 9. \text{OMS ENG (two) – ARM/PRESS} \\
& \hspace{1cm} \text{When He TK P < 640:} \\
& \hspace{2cm} 10. \text{OMS ENG (two) – OFF} \\
\text{OMS 2 Burn} & 11. \Delta \text{to OMS He TK P LOW (Cue Card, OMS 2 BURN MONITOR):} \\
& \hspace{1cm} \text{Delete “or QTY } \leq 41\%” \\
\text{No comm or OOP Burn} & 12. \text{LOAD } \Delta VY = -500, \text{ TIG in } \sim4 \text{ min} \\
& 13. \sqrt{\text{ENG/TRIM CONFIG, LOAD TGTs, MNVR}} \\
& 14. \text{OMS ENG (two) – ARM/PRESS} \\
& \hspace{1cm} \text{When He TK P < 640 or QTY < 41\%:} \\
& \hspace{2cm} 15. \text{OMS ENG (two) – OFF} \\
\text{Blowdown Dump complete or He TK P < 640} & 16. \text{(Leaking) OMS TK ISOL (two) – CL} \\
\text{(OMS 2 Config)} & 17. \text{(Good) OMS TK ISOL (two) – OP} \\
& 18. L,R OMS XFEED (four) – OP \\
& \text{If no comm:} \\
& 19. \text{Cut off OMS 2 when } \geq \text{MIN Hp} \\
\hline
\end{array}
\]

7-4 APCL/ALL/GEN N
XFEED: L OMS PRPLT to R OMS ENG
1. √L OMS TK ISOL (two) – OP (tb-OP)
2. R OMS TK ISOL (two) – CL (tb-CL)
3. L,R OMS XFEED (four) – OP (tb-OP)

XFEED: R OMS PRPLT to L OMS ENG
1. √R OMS TK ISOL (two) – OP (tb-OP)
2. L OMS TK ISOL (two) – CL (tb-CL)
3. L,R OMS XFEED (four) – OP (tb-OP)

XFEED RETURN: OMS to OMS (N/A during I’CNCT)
L,R OMS XFEED (four) – CL (tb-CL)
TK ISOL (four) – OP (tb-OP)

OMS SECURE
(Aff) OMS ENG – OFF
( ) XFEED (two) – CL (tb-CL)
( ) TK ISOL (two) – CL (tb-CL)
( ) He PRESS/VAP ISOL (two) – CL

L(R) OMS GIMBAL

If first failure:
1. Aff gimbal – sel SEC GMBL >>

If second failure:
2. Go to OMS GMBL, appropriate BURN MONITOR (Cue Card)

SM0 THRM PRPLT

<table>
<thead>
<tr>
<th>AFF TEMP</th>
<th>STATUS</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTR</td>
<td>↑</td>
<td>A14 (Aff) RCS/OMS HTR POD – OFF &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>↓, H, L, M</td>
<td>No action &gt;&gt;</td>
</tr>
<tr>
<td>TEM</td>
<td>↑</td>
<td>A14 RCS/OMS HTR OMS CRSFD LN – B OFF &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>↓, H, L, M</td>
<td>No action &gt;&gt;</td>
</tr>
</tbody>
</table>

OMS He TK P LOW
OMS XFEEDS

OMS SECURE/GIMBAL

APCL/ALL/GEN N,9
DEORBIT MIXED XFD BURN PREP

NOTE
Do not use MSTR RCS XFEED sw

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

<table>
<thead>
<tr>
<th>ADD ID</th>
<th>DESIRIED</th>
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<tbody>
<tr>
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<td>30</td>
<td>0 3 E 1 3 31</td>
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<tr>
<td>32</td>
<td>0 3 E E 3 33</td>
</tr>
<tr>
<td>34</td>
<td>0 3 E 8 5 35</td>
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WRITE – ITEM 25 EXEC

4. BIT SET – ITEM 22 EXEC

<table>
<thead>
<tr>
<th>ADD ID</th>
<th>DESIRIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>0 3 D 9 1 29</td>
</tr>
<tr>
<td>30</td>
<td>0 3 E 1 7 31</td>
</tr>
<tr>
<td>32</td>
<td>0 3 E E 7 33</td>
</tr>
<tr>
<td>34</td>
<td>0 3 E 8 9 35</td>
</tr>
</tbody>
</table>

WRITE – ITEM 25 EXEC

5. Perform RECONFIG:
   L,R OMS TK ISOL (four) – GPC
   XFEED (four) – GPC
   (verify tb config from table)
   OMS BURN will be SE or +XRCS
   (ck tables for ENG)

6. During AOS: confirm vlv config w/MCC
7. Perform POST OMS 1 BURN PROCEDURES (ASC, POST OMS 1)
   EXCEPT:
   DO NOT RECONFIG OMS VLVS
   For deorbit burn:
   TGT AOA
   PRPLT = 0 (ITEM 18 +0)
   Use AOA DEORBIT MIXED XFD BURN, 7-7, for
   DEORBIT BURN
AOA DEORBIT MIXED XFD BURN

\(\sqrt{MM302}\) \(\sqrt{OMS\ L(R)\ or\ RCS}\)
Enter TGO + 10 sec
\(\sqrt{L,R\ OMS\ TK\ ISOL\ (four) – GPC}\)
\(\sqrt{XFEED\ (four) – GPC}\)
Verify tb config from table
\(\sqrt{DAP –\ AUTO(PASS)/DISC}\)
\(\sqrt{ADI – LVLH(REF)/HI/MED}\)
FLT CNTLR PWR (two) – ON
Man Repress to maintain good OMS TK Ps > 234 psi (simo)
If OMS BURN INITIATION:
  \(\sqrt{TRIM: P +0.4,\ LY +5.2,\ RY -5.2}\)
  TIG-2 (Good) OMS ENG – ARM/PRESS
  - :15 EXEC
  - :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
  :00 TIG Start watch (check Pc, \(\Delta VTOT\), ENG VLVs)
If RCS BURN INITIATION:
Man Repress L,R OMS > L,R RCS TK Ps
L,R RCS XFEED (four) – OP
  TK ISOL (six) – CL
TIG- :00 THC +X
Maintain PITCH ATT ERR \(\pm 3^\circ\)

OMS PRPLT LOW
AFT RCS RECONFIG at \(\Delta VTOT = \)
RCS COMPLETION

APCL/ALL/GEN N

D/O MXD BURN PREP
OMS UPHILL MXD XFD (7-10) 7-7
AOA D/O MXD BURN
TABLES 1-8 (7-12)
* OMS PRPLT FAIL:
* OMS ENG – OFF
* ITEM 18 +0 EXEC
* Secure L,R OMS
* √ADI – LVLH, center needles
* RCS COMPLETION

* OMS ENG FAIL:
* OMS ENG – OFF
* Man Repress L,R OMS > L,R RCS TK Ps
* L,R RCS XFEED (four) – OP
* TK ISOL (six) – CL
* √ADI – LVLH, center needles
* THC +X
* (check lowest OMS % vs RCS Burn Time)
* AFT RCS RECONFIG
* RCS COMPLETION

* RCS +X JET FAIL OFF:
* ITEM 18 +0 EXEC
* [G23] resel jet
* RCS COMPLETION: *
* If DIRECT INSERTION: *
  THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [□□□]% *
  THC +X to FLIP ΔV or *
  At AFT QTY 1 TOT AFT QTY 2 [□□□] % then *
  if CUR ΔVTOT: FRCS COMPLETION *
  FLIP ΔV FRCS COMPLETION *
  AFT ΔV THC +X to TGT ΔV *
  TGT ΔV *

* If w/OMS 1: *
  THC +X to TGT HP or TOT AFT QTY 1 [□□□]% *
  THC +X to FLIP HP or *
  At AFT QTY 1 TOT AFT QTY 2 [□□□] % then *
  if CUR HP: FRCS COMPLETION *
  FLIP HP FRCS COMPLETION *
  AFT HP THC +X to TGT HP *
  TGT HP *

* FRCS COMPLETION: *
* MNVR to -X Att (pitch up at 3°/sec to VGOz = +¼ ΔVTOT) *
* THC -X to ΔVTOT = 0 or FRCS depletion (JETS FAIL OFF) *

CUTOFF VGOx = 0, RELEASE THC
+ .02 OMS ENG(s) – OFF (If < 3 IMU, at [□□□] )
* AFT RCS RECONFIG if I’CNCT *
TRIM X,Z residuals < 2 fps (< 0.5 fps if shallow)
OMS-1/OMS-2 UPHILL MIXED XFD

NOTE
Do not use MSTR RCS XFEED sw

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

<table>
<thead>
<tr>
<th>ADD ID</th>
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</tbody>
</table>

From Tables 1-8

WRITE – ITEM 25 EXEC

5. BIT SET – ITEM 22 EXEC

<table>
<thead>
<tr>
<th>ADD ID</th>
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<tr>
<td>28</td>
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<td>34</td>
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</tr>
</tbody>
</table>

From Tables 1-8

WRITE – ITEM 25 EXEC

6. Perform RECONFIG:
   L,R OMS TK ISOL (four) – GPC
   XFEED (four) – GPC
   (verify tb config from table)
   BURN will be SE or +XRCS (ck tables for ENG)

7. During AOS: confirm vlv config, TGT w/MCC

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

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>554</td>
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<td>554</td>
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<tr>
<td>33</td>
<td>1000</td>
</tr>
<tr>
<td>35</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>ITEM</th>
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<tr>
<td>33</td>
<td>400</td>
</tr>
<tr>
<td>35</td>
<td>400</td>
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</table>

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

<table>
<thead>
<tr>
<th>ITEM</th>
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<td>550</td>
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<tr>
<td>33</td>
<td>1000</td>
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<tr>
<td>35</td>
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### TABLE 4
L OMS OX INLET AND R OMS FU TK FAILED

<table>
<thead>
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<th>ITEM</th>
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<tbody>
<tr>
<td>29</td>
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<tr>
<td>31</td>
<td>1144</td>
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<tr>
<td>33</td>
<td>400</td>
</tr>
<tr>
<td>35</td>
<td>400</td>
</tr>
</tbody>
</table>
RCS SECURE (FWD,AFT)

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

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

If (receiving) XFEED or OMS/RCS I’CNCT:
3. √RCS TK ISOL (three) – CL (tb-CL)
   He PRESS (two) – CL (tb-CL)

I’CNCT: L OMS to RCS

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

I’CNCT: R OMS to RCS

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

I’CNCT TK SWITCH

1. L(R) OMS XFEED (two) – OP (tb-OP)
   He PRESS/VAP ISOL (two) – OP
2. R(L) OMS XFEED (two) – CL (tb-CL)
   He PRESS/VAP ISOL (two) – CL
I'CNCT RETURN: OMS to RCS

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

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

If MANUAL XFEED:
4. L,R OMS XFEED (four) – CL (tb-CL)
5. RCS XFEED (four) – OP (tb-OP)
   He PRESS (two) – CL (tb-CL)
7. MSTR RCS XFEED – FEED FROM R

XFEED: L RCS to R RCS

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

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

XFEED RETURN: RCS to RCS

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

If MANUAL XFEED:
3. L,R RCS He PRESS (four) – OP (tb-OP)
   TK ISOL (six) – OP (tb-OP), GPC
   XFEED (four) – CL (tb-CL), GPC
4. MSTR RCS XFEED – OFF
RCS TK P HIGH (FU or OX)  
1. Check MANF P  
2. (Aff) RCS He PRESS (two) – CL (tb-CL)  
3. A – OP (tb-OP)  
If He P decr:  
4. (Aff) RCS He PRESS A – CL (tb-CL)  
5. B – OP (tb-OP)

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

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

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

RM DLMA MANF  
1. Check CRT to determine aff MANF  
If (aff) MANF tb – OP or sw not thrown:  
2. Ovrd (aff) RCS MANF VLVs STAT – OP  
3. If (aff) MANF tb – bp: (aff) MANF – GPC

XFEED: RCS to RCS XFEED RETURN  
RCS TK P HIGH RCS JET FAIL/RM DLMA
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. Check FU(OX) He P (O3 meter and CRT) decr
   3. DAP: INRTL/PULSE

When proc complete:
   4. DAP: as reqd

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

√SINGLE MANF
If only one MANF P decr:
   7. Return to normal config except leave aff MANF closed >>

√PRPLT TK LEG (√TWO MANF P)
If MANF 1,2 or MANF 3,4 P decr:
   8. Return to normal config except leave aff TK ISOL (1/2 or 3/4/5),
      aff MANFs, and corresp XFEED vlvs closed >>

√He TK
9. Check He P(s)
   If AFT decr:
   10. I’CNCT from OMS, then open good MANFs >>
   If FWD decr:
   11. Return to normal config
   12. When He P < 456: Go to RCS SECURE >>

Cont next page
√PRPLT TK
13. Check PRPLT TK P(s)
   If AFT decr:
      14. I'CNCT from OMS, then open aff MANFs >>
   If FWD decr:
      15. Leave FWD RCS secured >>

√He LEG
16. Open He PRESS A and B, check He P(s)
   If AFT decr:
      17. Close He PRESS A and B
         I'CNCT from OMS, then open aff MANFs >>
   If FWD decr:
      18. Return to normal config except close He PRESS A and B.
         Cycle to maintain PRPLT TK P 200-245
         When He TK P < 456:
      19. Go to RCS SECURE >>

√XFEED LINES
If aff RCS was feeding XFEED when leak occurred:
20. [GNC 23 RCS]
    RCS L – ITEM 2 EXEC
   If XFEED P decr or zero:
      21. L,R RCS He PRESS (four) – OP (tb-OP)
         TK ISOL (six) – OP (tb-OP)
         MANF ISOL (ten) – OP (tb-OP)
   22. MSTR RCS XFEED – OFF
   23. Do not XFEED/I'CNCT >>

√RCS MANF ISOL 5
24. If leak not found above: Assume RCS MANF ISOL 5 leak
25. Return to normal config except leave (aff) RCS MANF ISOL 5 –
    GPC (tb-CL)
This Page Intentionally Blank
MPS He P (Post ET Sep)

If He TK P < 1150 and decr:
♦ 1. (Aff) MPS He ISOL (two) – CL
   If/when second He TK P < 1150:
♦ 2. MPS PNEU He ISOL – CL

MPS VACUUM INERT

20 min after MPS dump complete:
   If LO2 MANF P > 30 psia, \MCC
   Otherwise, proceed with activation

A. ACTIVATION

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

   LH2 Inert
   5. MPS FILL/DRAIN LH2 OUTBD – CL
   6. INBD – CL
       Wait 15 sec, then:
   7. MPS FILL/DRAIN LH2 OUTBD – OP
   8. INBD – OP

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

B. TERMINATION

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

   LH2 Inert
   4. MPS FILL/DRAIN LH2 OUTBD – CL
       Wait 15 sec, then:
   5. MPS FILL/DRAIN LH2 OUTBD – GND
   6. INBD – GND
MPS LH2/O2 MANF

If LH2 MANF P > 65 psia:

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOSS OF 2 CAB FANS</td>
<td>10-2</td>
</tr>
<tr>
<td>AV BAY 1 COOLING/AV BAY 1 FIRE</td>
<td>10-7</td>
</tr>
<tr>
<td>2 COOLING/AV BAY 2 FIRE</td>
<td>10-10</td>
</tr>
<tr>
<td>3 COOLING/AV BAY 3 FIRE</td>
<td>10-13</td>
</tr>
<tr>
<td>CAB PRESS (MINOR PWRDN)</td>
<td>10-16</td>
</tr>
<tr>
<td>(MAJOR PWRDN)</td>
<td>10-17</td>
</tr>
<tr>
<td>2 H2O LOOPS (POST OMS-2)</td>
<td>10-21</td>
</tr>
<tr>
<td>1 FREON LOOP</td>
<td>10-29</td>
</tr>
<tr>
<td>HI LOAD EVAP</td>
<td>10-33</td>
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<tr>
<td>2 FREON LOOPS (POST OMS-2)</td>
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<td>FES/1 FC</td>
<td>10-39</td>
</tr>
<tr>
<td>2nd FC</td>
<td>10-43</td>
</tr>
</tbody>
</table>
LOSS OF 2 CAB FANS

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

C3
1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Perform PL PWRDN, then:

L1
4. √CAB FAN A,B (two) – OFF
   TEMP CNTLR – OFF
5. HUM SEP A,B (two) – OFF
6. Use only one FLT CNTLR PWR, PGSC

L4:L
7. cb ΦA CAB T CNTLR 1,2 (two) – op
8. Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry

O14:B
9. cb MNA EVENT TIMER AFT – op

O15:B
10. SMOKE DETN L/R FLT DK – op
11. MNB OI H2O BYP LOOP 2 SNSR – op
12. MSN TIMER AFT – op

O16:C
13. MNC SMOKE DETN CAB – op

L4:L
14. √cb AC3 ΦA SIG CONDR HUM SEP – op

Post OMS-2:

F6/F8
15. √FLT CNTLR PWR (two) – OFF

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

O16:E

W1-10 Install Window Shades or mnvr to tail Sun att:
If in OPS 1:
17. Manually mnvr to shade windows
If in OPS 3:
18. Obtain ATT data from MCC

[XXXXX MNVR YYYY]
NOTE
If uncomfortable, doff LES. Use QDM as needed to provide respiratory cooling. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON.

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

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

A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
   1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDUs; use one PGSC only if reqd
   2. Minimize ltg
   3. Minimize sun in cab (delay mnvr to burn att until TIG-15 if necessary)
   If orbit 2 deorb:
      4. APU HTRS & DED DISP ENT CONFIG 3
      5. Go to step 7
   If orbit 3 deorb:
      6. ENT FWD FLT DECK CONFIG 10
      7. In ENT SW LIST/VER, do not activate pwrdn items

B. Deltas to DEORBIT BURN (ENT)
   At TIG-25:
   If time permits, set up for cab purge:

   MO10W
      1. 14.7 CAB REG INLET SYS 1,2 vlv (two) – OP
      2. O2 REG INLET SYS 1 vlv – OP
         \sqrt{2} vlv – CL
   L2
      3. O2/N2 CNTLR VLV SYS 1 – AUTO (O2/N2)
         2 – OP (N2)
      4. \sqrt{2} SYS 1,2 SPLY (two) – OP (tb-OP)
   Inner Hatch
      5. Remove INNER HATCH Equal vlv cap (two)
      6. \sqrt{2} Equal vlv (two) – NORM
      7. Reinstall Equal vlv cap (two)
      8. Open INNER HATCH
   ML86B:B
      9. cb MNA VAC VENT ISOL VLV – cl
   ML31C
      10. VAC VENT ISOL VLV BUS SEL – MNA
          CNTL – OP (tb-OP)
          NOZ HTR – ON

LOSS OF 2 CAB FANS D/O PULLOUT PAGE

Cont next page OV103,104
At TIG-20:
11. Initiate cab purge

**WARNING**
Do not use WCS once constant cab purge has started (because of high N2 concentration)

MO32M, MO69M, C6
12. LEH O2 1(2,...8) vlv – OP (as reqd)
L2
13. O2 XOVR SYS 1 – CL
\[ \sqrt{2} \] – OP
AW82B
14. AIRLK DEPRESS vlv cap – vent, remove vlv – 5
15. Close INNER HATCH
At TIG-15:
16. Mnvr to deorb burn att
At TIG-4:
17. Use two IDP/CRTs with four MDUs for deorb burn
O14,O15, O16:E
18. cb DDU L,R (four) – cl, then:
F6,F8
19. L,R FLT CNTLR PWR (two) – ON

C. Deltas to POST BURN (ENT)
1. Use one IDP/CRT with two MDUs
F6,F8
2. L,R FLT CNTLR PWR (two) – OFF
O14,O15, O16:E
3. cb DDU L,R (four) – op

D. Deltas to ENTRY MANEUVERS (Cue Card)
At EI:
1. Use only two IDP/CRTs with four MDUs
O14,O15, O16:E
2. cb DDU L,R (four) – cl
F6
3. L FLT CNTLR PWR – ON
At Wheel Stop:
4. Open visor, LES O2 – OFF
5. Go to EXPEDITED PWRDN (ENT, POST LDG)
LOSS OF AV BAY 1 COOLING/AV BAY 1 FIRE

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

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

REASSIGN STRINGS TO GPCs 2,3 IN MC 1
4. ▢GNC 0 GPC MEMORY
   CONFIG – ITEM 1 +1 EXEC
   Modify MC 1 per table →

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<tr>
<th>CONFIG</th>
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<tbody>
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<td>4</td>
</tr>
<tr>
<td>PL</td>
<td>1/2</td>
</tr>
</tbody>
</table>

   NOTE
   The following must be an OPS MODE Recall

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

If AV BAY 1 fire:
7. Continue; otherwise go to step 30

NOTE
While performing proc, note any cbs open.
Equipment still pwrd in Av Bay following pwrdn:
   FPCA 1, FLCA 1, IMU FAN, MDM OF1,
   DSC OF1, and ACCU

Cont next page

OV103,104

A10-7
APCL/3,4/GEN N
R1  8. cb AC CONTR AC1 (three) – cl
9. INV/AC BUS 1 – OFF (tb-OFF)
   INV PWR 1 – OFF (tb-OFF)
   cb AC CONTR AC1 (three) – op
R2 10. √BLR CNTLR/HTR 1 – A
   3 – B
11. Perform FC1 SHUTDN, except PWRDN (Cue Card),
    then:
L1  12. FREON PUMP LOOP 2 – A
   AV BAY 3 FAN A – ON
   B – OFF
L4:G 13. cb AC2 AV BAY 1 FAN B (three) – op
O6  14. GPC PWR 1 – OFF
   4 – OFF
15. MDM FF1 – OFF
    PL1 – OFF
O8  16. RDR ALTM 1 – OFF
    √MLS 1 – OFF
    FWD RCS MANIF ISOL 2 – CL (tb-CL)
O13:A 17. cb ESS 1BC AC1 SNSR – op
   :E 3AB GPC STAT – op
O14:A 18. BRAKES MNA – OFF
   :E 19. cb MNA RDR ALTM 1 – op
   MLS 1 – op
   ADTA 1 – op
   ACCEL 1 – op
:F  20. MMU 1 – OFF
    RJDF 1B F1 LOGIC – OFF
    DRIVER – OFF
O15:F 21. RJDF 1A F2 LOGIC – OFF
    DRIVER – OFF
   ACCEL 4 – OFF
O16:A 22. BRAKES MNC – OFF
   :E 23. cb MNC ADTA 3 – op
A1L 24. PL DATA INTLVR PWR – OFF
   S-BD PL CNTL – PNL, CMD
A12 25. HYD CIRC PUMP PWR 1 – MNB
   2 – MNC
   3 – MNA
If visors reqd to remain down due to fire and rev 3 avail:

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

Otherwise:

For MM201 trans:

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

If orbit 7 deorbit:

31. Perform Deltas to nominal POST INSERT and DEORB PREP (POST INSERT, ORBIT 7 DEORB), then:

If AV BAY fire:

32. Go to AV BAY FIRE (ORB PKT, PWRDN) and complete remaining actions
LOSS OF AV BAY 2 COOLING/AV BAY 2 FIRE

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

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

If AV BAY 2 fire:
4. Continue; otherwise go to step 23

NOTE
While performing proc, note any cbs open.
Equipment still pwrd in Av Bay following pwrdn:
FPCA 2, FLCA 2, BFC 3A (when GPC 3 is pwrd), MDM OF2, and DSC OF2

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

Cont next page
O15:A 14. BRAKES MNB – OFF
:E 15. cb MNB RDR ALTM 2 – op
   MLS 2 – op
   ADTA 2 – op
   ACCEL 2 – op
:F 16. MMU 2 – OFF
O16:A 17. BRAKES MNC – OFF
:E  cb MNC MLS 3 – op
   ADTA 4 – op
O8 18. FWD RCS MANF ISOL 3,4 (two) – CL (tb-CL)
O16:F 19. RJDF 2A F3 LOGIC – OFF
       DRIVER – OFF
       RJDF 2B F4/F5 LOGIC – OFF
       F4 DRIVER – OFF
       ACCEL 3 – OFF
A1L 20. S-BD PM MODE sel – TDRS DATA
       √NSP DATA RATE XMIT – HI
       √RCV – HI
       CODING XMIT – ON
       √RCV – ON
       √PWR – 1
       S-BD PL PWR SYS – OFF
       CNTL – PNL,CMD
C3 21. S-BD PM CNTL – PNL,CMD
       √OI PCMMU PWR – 1
       FORMAT – GPC
MA73C:A 22. MCA LOGIC MNB FWD 2 – OFF

Cont next page  **OV103,104**
23. ASAP post OMS 2:

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

24. GNC 0 GPC MEMORY

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>ITEM 1 +1 EXEC</th>
<th>EXEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify MC 1 per table -- - -</td>
<td>CONFIG</td>
<td>1 12340</td>
</tr>
</tbody>
</table>

**NOTE**
The following must be an OPS MODE Recall

CRT 25. GNC, OPS 10X PRO

26. (BFS) GNC I/O RESET

GNC, OPS 106 PRO

000 PRO

C3 27. BFC CRT DISP – OFF

O6 28. GPC MODE 5 – STBY

(tb-RUN)

-HALT

OUTPUT 5 – NORM

C3 29. Sel best S-BD PM ANT until SM GPC is established

If AV BAY 2 fire:

O6 30. GPC PWR 2 – OFF

5 – OFF

MDM FF2, FF4 (two) – OFF

PL2 – OFF

If visors reqd to remain down due to fire and rev 3 avail:

31. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3)

with AV BAY FIRE CONTINGENCY DELTAS

(CONT DEORB, LAUNCH DAY (ORBIT 3)) >>

Otherwise:

For MM201 trans:

32. Go to MAL, DPS, GPC FRP-7, DPS RECONFIG

FOR LOSS OF AV BAY COOLING

(ASCENT/ORBIT) >>

If orbit 7 deorbit:

33. Perform Deltas to nominal POST INSERT and

DEORB PREP (POST INSERT, ORBIT 7 DEORB), then:

If AV BAY fire:

34. Go to AV BAY FIRE (ORB PKT, PWRDN) and

complete remaining actions

OV103,104
LOSS OF AV BAY 3 COOLING/AV BAY 3 FIRE

**WARNING**
There is no smoke detection or air cooling in AV BAY 3. Failure of any LRU still pwrd in AV BAY 3 may be indicative of fire in progress.

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

If AV BAY 3 fire:
4. Continue; otherwise go to step 20

**NOTE**
While performing proc, note any cbs open.
Equipment still pwrd in Av Bay following pwrdn:
  FPCA 3, FLCA 3, MDM OF3, DSC OF3, and active comm equipment

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

Cont next page  **OV103,104**
WARNING

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

NOTE

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

If no comm:

<table>
<thead>
<tr>
<th>A1L</th>
<th>12. S-BD PM MODE sel – TDLS DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>√NSP DATA RATE XMIT – HI</td>
</tr>
<tr>
<td></td>
<td>√RCV – HI</td>
</tr>
<tr>
<td></td>
<td>CODING XMIT – ON</td>
</tr>
<tr>
<td></td>
<td>√RCV – ON</td>
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<tr>
<td></td>
<td>√PWR – 1</td>
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<tr>
<td>C3</td>
<td>13. S-BD PM CNTL – PNL,CMD</td>
</tr>
<tr>
<td>O6</td>
<td>14. UHF MODE sel – OFF</td>
</tr>
<tr>
<td>C3</td>
<td>15. S-BD PM CNTL – PNL</td>
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<tr>
<td>A1L</td>
<td>ANT SW ELEC – OFF</td>
</tr>
<tr>
<td></td>
<td>PRE AMP – OFF</td>
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<tr>
<td></td>
<td>PWR AMPL STBY – OFF</td>
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<td></td>
<td>OPER – OFF</td>
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<tr>
<td></td>
<td>XPNDR – OFF</td>
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<tr>
<td></td>
<td>NSP PWR – OFF</td>
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<tr>
<td></td>
<td>ENCRYPTION SEL – BYP</td>
</tr>
<tr>
<td></td>
<td>PWR – OFF</td>
</tr>
</tbody>
</table>

| O6  | 16. √UHF MODE sel – SPLX        |
| A1L | 17. S-BD PL CNTL – PNL          |
|     | PL DATA INTLVR PWR – OFF        |

Cont next page **OV103,104**
  CNTL – PNL
MA73C:A 19. MCA LOGIC MNC FWD 3 – OFF

20. ASAP post OMS 2:

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

21. **GNC 0 GPC MEMORY**

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>GPC</th>
<th>1</th>
<th>12340</th>
</tr>
</thead>
<tbody>
<tr>
<td>STR</td>
<td></td>
<td>1</td>
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<td>2</td>
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<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>1/2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**
The following must be an OPS MODE Recall

22. GNC, OPS 10X PRO
23. (BFS) GNC I/O RESET
If AV BAY 3 fire:
24. GPC PWR 3 – OFF
    MDM FF3 – OFF

If visors reqd to remain dn due to fire and rev 3 avail:
25. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3) with AV BAY FIRE CONTINGENCY DELTAS
    (CONT DEORB, LAUNCH DAY (ORBIT 3))

Otherwise:
26. For MM201 trans:
    Go to MAL, DPS, GPC FRP-7, DPS RECONFIG
    FOR LOSS OF AV BAY COOLING
    (ASCENT/ORBIT) >>

If orbit 7 deorbit:
27. Perform Deltas to nominal POST INSERT and DEORB PREP (POST INSERT, ORBIT 7 DEORB), then:

If AV Bay fire:
28. Go to AV BAY FIRE (ORB PKT, PWRDN) and complete remaining actions

**OV103,104**
LOSS OF CAB PRESS (MINOR PWRDN)

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

1. Minimize ltg
2. √TACAN MODE sel (three) – OFF
3. √MLS (three) – OFF
4. Perform PL PWRDN, then:
5. √H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
6. √FLOW PROP VLV LOOP tb (two) – ICH
7. Use two IDP/CRTs with four MDUs
   If AOA:
   8. Deltas to ENTRY MANEUVERS (Cue Card)
      At V = 10K:
      TACAN 2,3 MODE sel (two) – GPC
      At M = 2.9:
      Use two HUDs, MLS, and RAs as reqd
      GNC I/O RESET
   9. Continue AOA PROCEDURES (ASC, AOA).
      Do not perform ENT PKT pwrdn >>
   If not AOA:
   10. Go to LOSS OF CAB PRESS (MAJOR PWRDN)
       (PWRDN), 10-17

OV103,104

A10-16 APCL/3,4/GEN N
LOSS OF CAB PRESS (MAJOR PWRDN)

NOTE
If EQ \( \frac{dP}{dT} > 0.6 \), CAB P will stabilize below 8 psia

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

If AOA:

If orbit 2 or 3 deorb:

OV103,104

A10-17 APCL/3,4/GEN N
NOTE
Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry.

If no comm or if CAB P stabilizes < 6 psia (MCC call), after OPS 301 transition:
PWRDN GPC 1 AND REASSIGN STRINGS TO REMAINING PASS GPCs IN MC 3

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

   CRT
   2. GNC, OPS 301 PRO
   3. GNC 50 HORIZ SIT
      Check runway sel
      Resel runway
   4. (BFS) GNC, OPS 301 PRO
   5. GPC MODE 1 – STBY (tb-bp)
      – HALT

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

   Initiate changes:
   If Orbit 2(3):
      6. Start with step A
   If AOA:
      7. Start with step B, 10-20

   A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
      1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDUs. Use one PGSC
      If orbit 2:
         2. APU HTRS & DED DISP ENT CONFIG 3
            Do not pwr MLS, TACANs
      If orbit 3:
         3. ENT FWD FLT DECK CONFIG 10
            Do not pwr MLS, TACANs
         4. In ENT FORWARD, AFT, MIDDECK, do not activate pwrdn items
B. Deltas to **DEORBIT BURN** (ENT)
   At TIG-4:
   1. Use two IDP/CRTs with four MDUs for deorb burn
   2. cb DDU L,R (four) – cl
   3. L,R FLT CNTLR PWR (two) – ON

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

D. Deltas to **ENTRY MANEUVERS** (Cue Card)
   At EI:
   1. Use only one IDP/CRT with two MDUs
   2. cb DDU L,R (four) – cl
   3. L FLT CNTLR PWR – ON
   4. cb ADTA (three) – cl
   5. (BFS) GNC I/O RESET
   At V = 15K:
      If CAB PRESS < 8 psia:
         6. Delete NAVAIDS callout
      If CAB PRESS ≥ 8 psia:
         7. Activate all TACANs, RAs, MLS
         8. GNC I/O RESET
         9. Disregard subs NAVAID callout DELTAS
   At V = 10K:
      10. TACAN 2,3 MODE sel (two) – GPC
   At M = 2.7:
      11. Use two HUDs, MLS, and RAs as reqd
      12. GNC I/O RESET
   At M < 1.0:
      13. ANTISKID – ON
      14. NWS – 1

---

**LOSS OF CAB PRESS**
**D/O PULLOUT PAGE**

**OV103,104**
LOSS OF 2 H2O LOOPS (POST OMS-2)

NOTES

• Loss of water loop cooling aff both water and air cooled equipment

• This proc assumes loss of both water loops occurs after AOA opportunity has passed, but before OPS 2 transition

• If orbit 2 deorb, this pwrdn leads into LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP). For all other launch day deorb, this pwrdn leads to LOSS OF 2 H2O LOOPS ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS)

• The LOSS OF 2 H2O LOOPS (ORB PKT, PWRDN) is used for MS pwrdn and comm config. This proc powers down all comm. If comm reqd, preferred comm config in order of heat production:
  1. UHF only
  2. STDN LO PWR if reqd
  3. TDRS only if mandatory

CAUTION
TDRS OR STDN – HI AOS may be limited to 10 min (pwr amp will overheat)
TIME CRITICAL PROCEDURES (execute simo)

1. Unstow ORB PKT, CONT DEORB, ORB OPS, and one PGSC. To pwr the PGSC:
   L4:B    cb UTIL PWR A15/MO13Q AC3 – cl, or
          F1/MO52J AC1 – cl

MS1   2. Perform MS OVHD PNL PWRDN (N2 qty not reqd by CDR in step 11 and omit step 14) (ORB PKT, PWRDN)

As part of MS OVHD PNL PWRDN perform the following:

O14:B    3. cb MNA OI SIG CONDR OF 1/4 A – op
        :E    cb MNA DDU AFT – op
O15:B    4. cb MNB OI SIG CONDR OF 1/4 B – op
          2/3 A – op
O16:B    5. cb MNC OI SIG CONDR OF 2/3 B – op
        :E    cb MNC DDU AFT – op

NOTE
Do not pwrdn MMU 1.

If orbit 2 deorb, do not pwrdn MTU.

If orbit 2 deorb and TIG > 1 hr, perform 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS)

MS2   6. Perform LOSS OF 2 H2O LOOPS, COMM PWRDN (ORB PKT, PWRDN), within 10 min

CDR and PLT perform following PWRDN ASAP:

CDR AND PLT PWRDN

C3    7. \MSTR MADS PWR – OFF
          Minimize ltg
F6,F8   8. Use only one IDP/CRT with one MDU
O7    9. FLT CNTLR PWR (two) – OFF, use one as reqd
          Perform PL PWRDN, then:
O8   10. \TACAN MODE sel (three) – OFF
L1   11. \RDR ALTM (two) – OFF
        \MLS (three) – OFF
L1   12. H2O PUMP LOOP 1,2 (two) – OFF (one ON if PUMP OUT P > 45 psia, or MCC call)
        HUM SEP A,B (two) – OFF (one ON if either H2O loop ON)
NOTE
If performing 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS), do not turn cab fan OFF. Record MET for fan OFF when DE/REPRESS complete

16. CAB FAN A,B (two) – OFF
   (one ON if either H2O LOOP ON)
   Rcd MET ___/___:__
   CAB TEMP CNTLR – OFF
17. FREON PUMP LOOP 1 – OFF
   2 – B
   √FLOW PROP VLV LOOP 1,2 (two) – ICH (tb-ICH)
18. √FLASH EVAP CNTLR PRI A – ON
   L2
19. O2 SYS 1 SPLY – CL (tb-CL)
20. ANTISKID – OFF
   NWS – OFF
21. FLASH EVAP FDLN HTR SPLY (two) – 2
   R2
22. HYD CIRC PUMP (three) – ON (to prevent MN BUS O/V)

RECONFIG DPS
O14:F
23. √MMU 1 – ON
24. GNC 0 GPC MEMORY

Reassign Strings to GPC 1 in MC 1
25. CONFIG – ITEM 1 +1 EXEC
   Modify MC 1 per table –
   →
   CONFIG GPC 1 12340
   STR 1 1
   2 1
   3 1
   4 1
   PL 1/2 1
   CRT 26. GNC, OPS 10X PRO
   →
   CRT 1 1
   2 1
   3 1
   4 0
   L 1 0
   2 0
   MM 1 1
   2 1

Cont next page OV103,104

A10-23 APCL/ALL/GEN N
O6 27. GPC MODE 2,3,4 (three) – STBY (tb-bp)  
  – HALT  
  – STBY (tb-RUN)  
  – HALT (tb-bp)  
CRT 28. (BFS) GNC, OPS 106 PRO  
  000 PRO  
O6 29. GPC MODE 5 – STBY (tb-RUN), HALT (tb-bp)  
  OUTPUT 5 – NORM  
C3 30. BFC CRT DISP – OFF  
L1 31. AV BAY 2,3 FANS (four) – OFF  
  \¼ FAN A – ON  
  B – OFF  
32. IMU FAN A – ON  
  B,C (two) – OFF  
33. If not orbit 2 deorb: Go to step 40  
Transition GPC 1 to GNC OPS 3:  
O14,O15, 34. √ RGA (four) – ON  
O16:A  
O14,O15:E  
√ cb ACCEL (two) – cl  
O15,O16:F  
√ ACCEL 3,4 (two) – ON  
O14,O15,  
√ ASA (four) – ON  
O16:F  
C3 35. √ FCS CH (four) – AUTO  
36. [GNC 0 GPC MEMORY]  
Reassign Strings to GPC 1 in MC 3  
37. CONFIG – ITEM 1 +3 EXEC  
  Modify MC 3 per table  
CRT 38. GNC, OPS 301 PRO  
  [GNC DEORB MNVR COAST]  
39. Go to step 43  
| CONFIG | 3 | GPC  | 10000 |  
| STR    | 1 | 1   |  
| 2      | 1 |  
| 3      | 1 |  
| 4      | 1 |  
| PL     | 1/2 | 1 |  
| CRT    | 1 | 1   |  
| 2      | 1 |  
| 3      | 1 |  
| 4      | 0 |  
| L      | 1 | 0   |  
| 2      | 0 |  
| MM     | 1 | 1   |  
| 2      | 1 |  

Cont next page  
OV103,104  
A10-24  
APCL/ALL/GEN N
RECONFIG DPS. TRANSITION TO OPS 2

40.  GNC 0 GPC MEMORY

Reassign Strings to GPC 1 in MC 2

41. CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table – – – – –

42. GNC, OPS 201 PRO

43. For any CRT that is OFF:
    GPC/CRT1/X EXEC

44. MMU 1 – OFF

45. Calculate DEORBIT TARGETS using PGSC

46. C/W MODE – ACK

    NOTE
    For F7 lts, hold F2 or F4 MA in

Repress SPLY H2O TKA:

47. SPLY H2O GN2 TK VENT vlv – PRESS
    TKA SPLY vlv – OP

    XOV VLV – OP (tb-OP)

48. Read notes below then go to step 69

49. GNC 21 IMU ALIGN
    IMU 1,3 (two) – desel

50. IMU 1,3 (two) – OFF

51. MDM FF1,3,4 (three) – OFF

52. Mnvr to shade windows from sun or install Window Shades until TIG-10 min, then go to step 61

53. Config DAPs A1,B1 with these exceptions:
    (A) ITEM 10 +1,0 0 EXEC
        ITEM 11 +3,0 0 EXEC
        ITEM 15 EXEC (TAIL)
        ITEM 16 EXEC (TAIL)
    (B) ITEM 30 +0,2 0 EXEC
        ITEM 31 +1,0 0 EXEC
        ITEM 35 EXEC (TAIL)
        ITEM 36 EXEC (TAIL)

Cont next page  OV103,104
Mnvr to tail Sun att:

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

Establish stabilized att:

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

Establish free drift:

56. DAP: FREE

O6

57. GPC MODE 1 – STBY (tb-bp), HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)
   PWR (five) – OFF

58. Record MET __ __/__ __.__ __

C2,R12L

59. Confirm all IDPs and MDUs – OFF

L1

60. AV BAY 1 FAN (two) – OFF

O8

61. FWD RCS MANF ISOL 1,2,3,4 (four) – CL (tb-CL)

O14:F

62. RJDF 1B F1 LOGIC – OFF

O15:F

63. 1A F2 DRIVER – OFF

LOGIC – OFF

O16:F

64. 2A F3, 2B F4 DRIVER (two) – OFF

F4/F5 LOGIC (two) – OFF

RJD MANF L5/F5/R5 DRIVER – OFF

L4:J

65. \cb AC3 \phi A SIG CONDR HUM SEP – op

:P

66. \phi A LG SNSR (two) – op

If H2O PUMP LOOP 1 A(B) ON:

MA73C

67. Leave MCA LOGIC MNA FWD 1 – ON

(MNB FWD 2 – ON)

MCA LOGIC MNA,B,C (thirteen) – OFF

If H2O PUMP LOOP 1 A,B OFF:

68. MCA LOGIC MNA,B,C (fourteen) – OFF
NOTE
30 min after deact, cycle one CAB FAN – ON (30 min ON, 30 min OFF) to control PPCO2 and for cooling.

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

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

Expect 100% cab humidity in ~2 hr.

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

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

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

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

70. Go to LOSS OF 2 H2O LOOPS ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS) >>
71. Go to LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP). Perform all steps although some activities may already have been performed.
LOSS OF 1 FREON LOOP

C3  1. MSTR MADS PWR – OFF
   2. Minimize ltg
   3. Use one IDP/CRT with two MDUs, FLT CNTLR PWR
O7  4. TACAN MODE sel (three) – OFF
O8  5. RDR ALTM (two) – OFF
L1  6. If reqd: Perform PL_PWRDN, then:
   7. √FLOW PROP VLV LOOP t (two) – ICH
   8. H2O LOOP 2(1) BYP MODE – MAN
      MAN – DECR (30 sec)
O14, O15, O16:A
O14, O15, O16:E
   9. BRAKES (three) – OFF
10. cb ADTA (four) – op

If FLT CNTLR PWR not reqd:
   11. cb DDU L,R,AFT (six) – op
   12. √(Aff) FREON PUMP – OFF
If FREON LEAK performed and leak isolated (accum qty > 3
   and not decr)(√MCC):
   13. Perform EMER PLBD OPENING (ECLS), 4-8
   14. Mnvr per MCC >>
If AOA:
   15. Deltas to AOA (ASC)
      At TIG-10 min:
      √cb DDU L,R (four) – cl
O14, O15, O16:E
   16. Deltas to AOA POST D/O BURN (ASC)
      Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn
F7,F8
O14, O15, O16:E
   17. Deltas to ENTRY SW CHECK (ENT, POST BURN)
      Pwr NAV AIDS per ENTRY MANEUVERS (Cue Card)
   18. Deltas to ENTRY MANEUVERS (Cue Card)
      Use DEORB PREP/ENTRY DELTAS PULLOUT
      PAGE, 10-31, starting with step D,1
      Continue with AOA (ASC) >>

Cont next page  OV103,104
If LAUNCH DAY DEORBIT:
19. Install Window Shades or mnvr to shade windows from sun
If orbit 5,7 deorb, after OPS 2 transition:
20. Go to LOSS OF 1 FREON LOOP (ORB PKT, PWRDN) >>
If orbit 2(3) deorb, continue with ASC, then:
21. Perform DEORB PREP/ENTRY DELTAS PULLOUT PAGE, 10-31, then:
22. At TIG-1:30(2:00) hr, go to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
1. Use one FLT CNTLR PWR, DDU, PGSC, and one IDP/CRT with two MDUs
2. Minimize ltg
3. Minimize sun in cab if possible
   If orbit 2:
   4. APU HTRS & DED DISP ENT CONFIG
      Do not pwr TACANs
   5. Go to step 7
   If orbit 3:
   6. ENT FWD FLT DECK CONFIG
      Do not pwr MLS, TACANs
   7. In ENT SW LIST/VER, do not activate TACANs, MLS, RA, ADTAs until indicated by ENTRY MANEUVERS (Cue Card) deltas

B. Deltas to DEORBIT BURN (ENT)
At TIG-15 min:
   1. Remove Window Shades/mnvr to deorb burn att
At TIG-10 min:
   2. \( \text{cb DDU L,R (four) – cl} \)
   3. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

C. Deltas to POST BURN (ENT)
F6,F8
   1. L,R FLT CNTLR PWR (two) – OFF
      O14,
      O15,
      O16:E
   2. cb DDU L,R (four) – op
   3. Use one IDP/CRT with two MDUs, as reqd

Cont next page
D. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   O14, 1. cb DDU L,R (four) – cl
   O15, 2. L FLT CNTLR PWR – ON
   O16:E 3. Use two IDP/CRTs with four MDUs, as reqd
   F6 4. BRAKES (three) – ON
   O14, 5. cb ADTA 1,2,3 (three) – cl
   O15, CRT 6. GNC I/O RESET
   O16:A At V = 15K:
   O14, 7. TACAN 1,2 MODE sel (two) – GPC
   O15, L1 8. NH3 CNTLR A(B) – OFF
   O16:E B(A) – PRI/GPC
   At V = 12K:
   If loop 1(2) lost:
   L1 9. Use two HUDs, MLS, and RAs
   O14, GNC I/O RESET
   O15,
LOSS OF HI LOAD EVAP

C3
1. √MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one PGSC and one IDP/CRT with two MDUs, as reqd

O7
4. TACAN MODE sel (three) – OFF
O8
5. RDR ALTM (two) – OFF
6. Perform PL PWRDN, then:
L1
7. H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
O14, O15, O16:A
8. √FLOW PROP VLV LOOP tb (two) – ICH
O14, O15, O16:E
9. BRAKES (three) – OFF
10. cb ADTA (four) – op

If FLT CNTLR PWR not reqd:
11. cb DDU L,R (four) – op
If AOA:
12. Deltas to AOA (ASC)
   At TIG-10:
   √cb DDU L,R (four) – cl
O14, O15, O16:E
   Use FLT CNTLR, and two IDP/CRTs with four
MDUs, as reqd for burn
F6,F8
13. Deltas to AOA POST D/O BURN (ASC)
   L,R FLT CNTLR PWR (two) – OFF
   cb DDU L,R (four) – op
O14, O15, O16:E
   Use two IDP/CRTs with four MDUs
O14, O15, O16:A
14. Deltas to ENTRY SW CHECK (ENT, POST BURN)
   BRAKES (three) – ON
   Do not pwr NAVAIDS, NWS
   Perform LOSS OF HI LOAD EVAP DEORB OR
   ENTRY PULLOUT PAGE (ENT PKT, PWRDN),
   then:

Cont next page  OV103,104
If not AOA:

After MPS pwrnd:

O17:A 15. ATVC (four) – OFF

:B 16. EIU (three) – OFF

:D 17. MEC 1 – OFF (wait 2 sec), then:

2 – OFF

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

After PLB doors open:

18. [SM 88 APU/ENVIRON THERM]

L1 19. H2O LOOP 2(1) BYP MODE – MAN

MAN – INCR, until FLOW = 950

20. On MCC call, go to FULL-UP FES FLUSHING (ECLS), 4-16
LOSS OF 2 FREON LOOPS (POST OMS-2)

WARNING

FC purge must be started and loads pwrd dn ASAP

Orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP with all three FCs running. This assumes three FCs are pwrd dn to a total level of 8 kW immed and are continuously purged

Earliest possible landing is reqd

NOTES

• Failure assumed to occur too late for an AOA and before OPS 2 transition

• FC purging and pwrdn should be performed ASAP after failure

• COMM proc (ORB PKT) should be used throughout this proc and CONT DEORB. Preferred comm config is:
  A. UHF only
  B. GSTDN S-BD if reqd
  C. Use TDRS only if mandatory
TIME CRITICAL PROCEDURES
1. MS initiate FC purge (step 4) and unstow ORB PKTs and PGSC, ASAP
2. MS perform LOSS OF 2 FREON LOOPS, COMM PWRDN (ORB PKT, PWRDN); delay 10 min max if AOS

CDR and PLT perform following steps ASAP:

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

RESTRI GPC 1/TRANSITION TO OPS 3
10. [GNC 0 GPC MEMORY]
    CONFIG – ITEM 1 +3 EXEC
    Modify MC 3 per table – – – – →
    GNC, OPS 301 PRO
   For any FWD IDP that is OFF:
   11. GPC/CRT1/X EXEC
    12. BFC CRT DISP – OFF
   13. GPC MODE 2,3,4 (three)
   14. BFC CRT Disp – OFF
   15. BFS GNC, OPS 106 PRO
   16. GPC MODE 5 – STBY (tb-RUN)
      – HALT (tb-bp)
      OUTPUT 5 – NORM
      PWR 5 – OFF

GNC 53 ENTRY CONTROLS
RGA 1,3,4 (three) – desel

17. Have MS perform MS OVHD AND AFT PNL PWRDN (ORB PKT, PWRDN), but leave RGA 2 pwrd until step 52
PLT

O7 19. √TACAN MODE sel (three) – OFF
O8 20. √RDR ALTM (two) – OFF
C3 22. FCS CH (four) – AUTO
R4 23. MPS MANF PRESS LO2,LH2 (two) – CL
R2 24. √HYD CIRC PUMP (three) – OFF

C3 25. MPS He ISOL (six) – CL
R2 26. Go to step 47

CDR

L1 27. HUM SEP A,B (two) – OFF
R4 28. √IMU FAN B – ON
R2 29. CAB FAN A,B (two) – OFF
R2 30. AV BAY 1,2,3 FAN A,B (five) – OFF
L2 31. √1 FAN B – ON

C3 32. FREON PUMP LOOP 1,2 (two) – OFF (one-ON, if any flow)

C3 33. √RAD CNTLR LOOP 1,2 (two) – OFF
C3 34. NH3 CNTLR A,B (two) – OFF

If no FREON PUMP ON:

L2 35. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
L1 36. FLASH EVAP CNTLR PRI A,B (two) – OFF
L1 37. TOP EVAP HTR NOZ (two) – OFF
L2 38. HI LOAD DUCT HTR sel – OFF
L2 39. FLASH EVAP FDLN HTR SPLY (two) – OFF

If one FREON PUMP ON:

L1 40. FLASH EVAP CNTLR PRI A – ON
L1 41. TOP EVAP HTR NOZ (two) – OFF
L2 42. HI LOAD DUCT HTR sel – ON
L2 43. FLASH EVAP FDLN HTR B SPLY – OFF
L1 44. NWS – OFF
O6 45. √S TRK PWR -Y,-Z (two) – OFF

Cont next page  OV103,104

A10-37  APCL/3,4/GEN N
47. **GNC 51 OVERRIDE**
IMU 1,2 (two) – desel

48. IMU 1,2 (two) – OFF

49. BRAKES (three) – OFF

50. All IDPs, MDUs – OFF (use IDP1 as reqd until CONT DEORB proc, 3 min OFF for each min ON)

51. DAP: INRTL/PULSE

52. RGA 2 – OFF

53. MDM FF1,4 (two) – OFF
FA1,4 (two) – OFF

54. CDR disp sws – green dot

55. FWD RCS MANF ISOL 1,2,3,4 (four) – CL (tb-CL)

56. MCA LOGIC MNA FWD 1 – ON

57. RJDA 1A,2A LOGIC,DRIVER (four) – OFF
RJDF 1B F1 LOGIC,DRIVER (two) – OFF

58. RJDA 1B LOGIC,DRIVER (two) – OFF
RJDF 1A F2 LOGIC,DRIVER (two) – OFF

59. RJDA 2B LOGIC,DRIVER (two) – OFF
RJDF 2A F3 LOGIC,DRIVER (two) – OFF
2B LOGIC,DRIVER (two) – OFF
RJD MANF L5/F5/R5 DRIVER – OFF

60. Go to LOSS OF 2 FREON LOOPS (ORB PKT, PWRDN), beginning at step 58 (Sel ELS TIG)
LOSS OF FES/1 FC

⇒ C3  1. √MSTR MADS PWR – OFF
  2. Minimize ltg
  3. Use only one IDP/CRT with two MDUs
     If FLT CNTLR PWR not reqd:

O14,  4. cb DDU L,R,AFT (six) – op
O15,  O16:E

O7  5. TACAN MODE sel (three) – OFF
O8  6. RDR ALTM (two) – OFF
L2  7. √FLASH EVAP FDLN HTR SPLY (two) – OFF
  8. NWS – OFF
  9. ANTISKID – OFF
L1  10. √CAB FAN A(B) – ON
  11. Perform PL PWRDN, then:
       If AOA and FES lost:
  12. √FLOW PROP VLV LOOP 1,2 tb (two) – ICH

MS perform pwrdn activities (steps 13-18)

O14,  13. Minimize ltg
O15,  14. BRAKES (three) – OFF
O16:A

O14,  15. cb ADTA (four) – op
O15,  O16:E

O14,  16. cb MSN TIMER FWD,AFT (two) – op
O15,  O16:B

O14,  17. EVENT TIMER AFT,FWD (two) – op
O15:F  18. MMU 1,2 (two) – OFF (MMU 2 ON for OPS
L1  19. H2O LOOP 2(1) BYP MODE – MAN
       MAN – DECR (hold 30 sec)

20. Continue with AOA (ASC):
    Do not perform LOSS OF FES (ENT PKT,
    PWRDN)
    Use ENTRY DELTAS PULLOUT PAGE,

Cont next page

OV103,104
If not AOA:

After APU/HYD SHUTDN and MPS PWRDN/ISOL:

21. ATVC (four) – OFF

22. EIU (three) – OFF

23. MEC 1 – OFF (wait 2 sec)

24. MEC 2 – OFF

If FES failed, after MM201 transition:

22. FLASH EVAP FDLN HTR A,B SPLY (two) – 1

23. On MCC call, go to FULL-UP FES FLUSHING (ECLS), 4-16 >>

If FC lost, after MM201 transition:

24. FLASH EVAP FDLN HTR A,B SPLY (two) – 1

25. Go to LOSS OF 1 FC (ORB PKT, PWRDN) >>

OV103,104

A10-40 APCL/3,4/GEN N,2
ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

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

A. Deltas to AOA (ASC)
   TIG-5 min:
   1. Use two IDP/CRTs with four MDUs
   O14, O15, O16:E
   F6, F8
   2. cb DDU L, R (four) – cl
   O14, O15, O16:E
   F6, F8
   3. L, R FLT CNTLR PWR (two) – ON

B. Deltas to POST D/O BURN (ASC)
   1. Use one IDP/CRT with two MDUs
   F6, F8
   2. L, R FLT CNTLR PWR (two) – OFF
   O14, O15, O16:E
   3. cb DDU L, R (four) – op
   O14, O15, O16:E
   4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
   At EI-7:
   5. Use two IDP/CRTs with four MDUs
   6. Perform EMER PLBD CLOSING (ENT PKT, ECLS)

C. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   L1
   1. NH3 CNTLR B(A) – SEC/ON
   O14, O15, O16:E
   F6, F8
   2. cb DDU L, R (four) – cl
   O14, O15, O16:E
   F6, F8
   3. L, R FLT CNTLR PWR (two) – ON
   O14, O15, O16:A
   O14, O15, O16:E
   4. BRAKES (three) – ON
   O15, O16:E
   5. cb ADTA (four) – cl
   O14, O15, O16:E
   6. GNC I/O RESET

Cont next page OV103,104
At V = 15K:
7. Delete NAVAIDS callout
8. TACAN MODE sel (three) – GPC

At V = 12K:
9. Delete ref to RAD FLOW

At V = 6K:
10. NH3 CNTLR B(A) – OFF
    A(B) – PRI/GPC

At M = 2.7:
11. Use two HUDs, three MLSs, and two RAs as reqd
12. GNC I/O RESET
13. ANTISKID – ON
14. NWS – 1

At post Wheel Stop:
15. Go to EXPEDITED PWRDN (ENT, POST LDG)
**LOSS OF 2nd FC**

1. \( \sqrt{\text{MSTR MADS PWR}} - \text{OFF} \)
2. Use one IDP/CRT with three MDUs
3. \( \sqrt{\text{TACAN MODE sel (three)}} - \text{OFF} \)
4. \( \sqrt{\text{RDR ALTM (two)}} - \text{OFF} \)

**NOTE**

Do not tie three main buses during ascent

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

**MS**

Perform MS OVHD AND AFT PNL PWRDN, 10-47, immed

5. Minimize ltg
6. Perform PL PWRDN, then:

**L1**

7. CAB FAN (two) – OFF
8. If in OPS 2: Go to step 15

**CONTRACT RS AND REASSIGN STRINGS TO GPC 1 IN MC 1**

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

![](image)

**NOTE**

The following must be an OPS MODE recall

**CRT**

10. GNC, OPS 10X PRO

For any CRT that is OFF:

11. GPC/CRT1/X EXEC

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</tbody>
</table>

Cont next page **OV103,104**
12. GPC MODE 2,3,4 (three) – STBY (tb-bp)
   - HALT
   - STBY (tb-RUN)
   - HALT (tb-bp)

   PWR 2,3 (two) – OFF

13. (BFS) GNC I/O RESET

14. Go to step 21

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

16. GNC 0 GPC MEMORY

17. GPC MODE 2 – STBY (tb-bp)
    - HALT
    PWR 2 – OFF

18. GPC MODE 3,5 (two) – HALT (tb-bp)
    PWR 3 – OFF

19. GPC MODE 3,5 (two) – HALT (tb-bp)
    PWR 3 – OFF

20. DAP: A/AUTO/PRI

21. When MPS Dump Complete:
    MPS ENG PWR (six) – OFF

22. GNC 51 OVERRIDE
    Any comm faulted IMU – desel

23. IMU FAN (one) – ON

24. H2O PUMP LOOP (one) – ON

25. AV BAY 1 FAN B(A) – ON

26. AV BAY 2 FAN A(B) – ON

If MNA unpwrdd:

27. FREON PUMP LOOP 1 – B
    2 – A

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

29. TOP EVAP HTR DUCT sel – B
    HI LOAD DUCT HTR sel – B

30. L OMS – sel SEC

Cont next page
If MNB(C) unpwrd:

L1  31. FREON PUMP LOOP 1,2 (two) – A(B)
32. TOP EVAP HTR DUCT sel – A
    HI LOAD DUCT HTR sel – A
If MNC unpwrd:
    33. FLASH EVAP CNTLR PRI B – ON
        PRI A – OFF
    34. R OMS – sel SEC
If no MANF leak:

R1  35. √O2,H2 MANF VLV TK1,TK2 (four) – OP
        TK1 HTRS B – AUTO (MNA or MNB ↓)
        or
        TK2 HTRS B – AUTO (MNC or no
        MN BUS ↓); then:

All others OFF
If MANF leak:
    36. √O2/H2 HTR LOSS TABLE (EPS), 5-20
    37. Sel one htr in one O2,H2 TK

R4  38. Activate PGSC if reqd
L2  39. √FLASH EVAP FDLN HTR A,B SPLY (two) – OFF
L4:L  40. cb ΦA CAB T CNTLR (two) – op
C3  41. C/W MODE – ACK
F6/F8  42. FLT CNTLR PWR (two) – OFF, use one as reqd

Post APU/HYD SHUTDN:

R2  43. BLR CNTLR/HTR (three) – OFF
        [GNC 23 RCS]
    44. √HYD CIRC PUMP (three) – OFF
        ITEM 1 EXEC (FRCS page)
        O8 Ovrd FRCS MANF 1,2,3,4 STAT (four) – CL
    O14,O15,  46. RJDF DRIVER,LOGIC (eight) – OFF
        √RJD MANF L5/F5/R5 DRIVER – OFF
If not MN BUS SHORT:
    47. Tie three MN buses, BUS TIE (Cue Card)

Post BUS TIE config check:

L1  48. CAB FAN A(B) – ON
    49. √AV BAY 1 FAN (one) – ON
    50. √AV BAY 2 FAN (one) – ON
F6/F8  51. √MS OVHD AND AFT PNL PWRDN complete, then
    continue:
If in OPS 2:
    52. Go to LOSS OF 2 FC LAUNCH DAY DEORBIT
        PREP (ORBIT 2 OR ORBIT 3) (CONT DEORB,
        LOSS OF 2 FC ORB 2 OR 3) (read notes) >>
    53. Set watch to count down to DEORBIT TIG (use PGSC
        or MCC for TIG time)
OPS 3 TRANSITION CONFIG – POST OMS 2

O14, O15, O16:F

54. ASA (four) – ON

55. √RGA 1,2,3 (three) – ON

O15, O16:A

56. √cb ACCEL (two) – cl

O14, O15: E

57. √ACCEL 3 – ON

C3

58. √FCS CH (four) – AUTO

TRANSITION GPC 1 TO GNC OPS 3

CRT1

59. [GNC 0 GPC MEMORY]

   CONFIG – ITEM 1 +3 EXEC
   Modify MC 3 per table—–→

CRT

60. GNC, OPS 301 PRO

61. GNC DEORB MNVR COAST

TRANSITION BFS GPC TO

GNC OPS 3

C3

62. BFC CRT DISP – ON

   √SEL – 3+1

CRT

63. (BFS) GNC OPS 301 PRO

O14, O15:F

64. MMU (two) – OFF

65. Go to LOSS OF 2 FC LAUNCH DAY DEORBIT PREP

   (ORBIT 2 OR ORBIT 3) (CONT DEORB, LOSS OF 2
   FC ORB 2 OR 3); DO NOT perform PRE DPS

TRANSITION SWITCH CONFIG [5] and DPS ENTRY

CONFIG

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A10-46

APCL/ALL/GEN N
MS OVHD AND AFT PNL PWRDN

1. BRAKES (three) – OFF
2. cb ADTA (four) – op
3. cb MNC RCS/OMS PRPLT QTY GAUGE – OP
4. cb DDU R (two) – op
5. Desel IMU – OFF (one of three IMUs OFF)
6. cb MNA MSN TIMER FWD – op
   EVENT TIMER AFT – op
7. MNB MSN TIMER AFT – op
   EVENT TIMER FWD – op

Post MPS pwrdn and APU/HYD SHUTDN:

8. ASA (four) – OFF
9. ATVC (four) – OFF
10. EIU (three) – OFF
11. MEC 1 – OFF (wait 2 sec), then
    2 – OFF
12. APU HTR LUBE OIL LN (three) – OFF
13. HYD HTR (eight) – OFF
14. GPS PWR – OFF
15. RCS/OMS HTR FWD RCS – OFF
    JET 1,2,3,4,5 (five) – OFF
    AFT RCS JET 5 (one) – OFF
16. SPLY H2O GN2 TK VENT vlv – PRESS
    TKA SPLY vlv – OP
<table>
<thead>
<tr>
<th>Description</th>
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<td>LOSS OF 2 CAB FANS</td>
<td>10-2</td>
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<tr>
<td>AV BAY 1 COOLING/AV BAY 1 FIRE</td>
<td>10-7</td>
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<tr>
<td>2 COOLING/AV BAY 2 FIRE</td>
<td>10-10</td>
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<tr>
<td>3 COOLING/AV BAY 3 FIRE</td>
<td>10-13</td>
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<tr>
<td>CAB PRESS (MINOR PWRDN)</td>
<td>10-16</td>
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<tr>
<td>(MAJOR PWRDN)</td>
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<tr>
<td>2 H2O LOOPS (POST OMS-2)</td>
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<tr>
<td>1 FREON LOOP</td>
<td>10-29</td>
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<tr>
<td>HI LOAD EVAP</td>
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<tr>
<td>2 FREON LOOPS (POST OMS-2)</td>
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<tr>
<td>FES/1 FC</td>
<td>10-39</td>
</tr>
<tr>
<td>2nd FC</td>
<td>10-43</td>
</tr>
</tbody>
</table>
LOSS OF 2 CAB FANS

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

C3 1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Perform PL PWRDN, then:

L1 4. √CAB FAN A,B (two) – OFF
TEMP CNTLR – OFF
5. HUM SEP A,B (two) – OFF
6. Use only one FLT CNTLR PWR, PGSC

L4:L 7. cb ΦA CAB T CNTLR 1,2 (two) – op
8. Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry

O14:B 9. cb MNA EVENT TIMER AFT – op
:O 10. SMOKE DETN L/R FLT DK – op
O15:B 11. MNB OI H2O BYP LOOP 2 SNSR – op
12. MSN TIMER AFT – op
O16:C 13. MNC SMOKE DETN CAB – op

L4:J 14. √cb AC3 ΦA SIG CONDR HUM SEP – op

Post OMS-2:
F6/F8 15. √FLT CNTLR PWR (two) – OFF
O14,O15, 16. cb DDU L,R,AFT (six) – op
O16:E

W1-10 Install Window Shades or mnvr to tail Sun att:
If in OPS 1:
17. Manually mnvr to shade windows
If in OPS 3:
18. Obtain ATT data from MCC

XXXXX MNVR YYYY

Cont next page

OV105
NOTE
If uncomfortable, doff LES. Use QDM as needed to provide respiratory cooling. If cab temp > 95 degF and no evaporative cooling is sensed, don LES, check tabs, close visor, LES O2 – ON.

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

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

A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDUs; use one PGSC only if reqd
2. Minimize ltg
3. Minimize sun in cab (delay mnvr to burn att until TIG-15 if necessary)
   If orbit 2 deorb:
   4. APU HTRS & DED DISP ENT CONFIG
   5. Go to step 7
   If orbit 3 deorb:
   6. ENT FWD FLT DECK CONFIG
   7. In ENT SW LIST/VER, do not activate pwrdn items

B. Deltas to DEORBIT BURN (ENT)
At TIG-25:
   If time permits, set up for cab purge:
   MO10W
   1. 14.7 CAB REG INLET SYS 1,2 vlv (two) – OP
   2. O2 REG INLET SYS 1 vlv – OP
   L2
   3. O2/N2 CNTLR VLV SYS 1 – AUTO (O2/N2)
   Inner Hatch
   4. √O2 SYS 1,2 SPLY (two) – OP (tb-OP)
   5. Remove INNER HATCH Equal vlv cap (two)
   6. √Equal vlv (two) – NORM
   7. Reinstall Equal vlv cap (two)
   8. Open INNER HATCH
   ML86B:B
   9. cb MNA VAC VENT ISOL VLV – cl
   ML31C
   10. VAC VENT ISOL VLV BUS SEL – MNA
       CNTL – OP (tb-OP)
       NOZ HTR – ON
At TIG-20:
11. Initiate cab purge

WARNING
Do not use WCS once constant cab purge has started (because of high N2 concentration)

MO32M, MO69M, C6
L2 12. LEH O2 1(2,...8) vlv – OP (as reqd)

AW82B 13. O2 XOVR SYS 1 – CL
\sqrt{2} – OP

14. AIRLK DEPRESS vlv cap – vent, remove vlv – 5

15. Close INNER HATCH

At TIG-15:
16. Mnvr to deorb burn att

At TIG-4:
17. Use two IDP/CRTs with four MDUs for deorb burn

O14,O15, O16:E
F6,F8 18. cb DDU L,R (four) – cl, then:

19. L,R FLT CNTLR PWR (two) – ON

C. Deltas to POST BURN (ENT)
   1. Use one IDP/CRT with two MDUs
   F6,F8 2. L,R FLT CNTLR PWR (two) – OFF
   O14,O15, O16:E 3. cb DDU L,R (four) – op

D. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   O14,O15, O16:E 1. Use only two IDP/CRTs with four MDUs
   F6 2. cb DDU L,R (four) – cl

   3. L FLT CNTLR PWR – ON

At Wheel Stop:
   4. Open visor, LES O2 – OFF
   5. Go to EXPEDITED PWRDN (ENT, POST LDG)

LOSS OF 2 CAB FANS
D/O PULLOUT PAGE  B10-6
OV105
APCL/ALL/GEN N
LOSS OF AV BAY 1 COOLING/AV BAY 1 FIRE

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

07 1. GPS 1 PWR – OFF
    PRE AMPL (two) – OFF

L1 2. √AV BAY 1 FAN A,B (two) – OFF

O6 3. GPC MODE 1,4 (two) – STBY (tb-bp)
    – HALT
    – STBY (tb-RUN)
    – HALT (tb-bp)

REASSIGN STRINGS TO GPCs 2,3 IN MC 1

4. [GNC 0 GPC MEMORY]
    CONFIG – ITEM 1 +1 EXEC
    Modify MC 1 per table – →

    CONFIG GPC
    1 12340

    STR 1 3
    2 2
    3 3
    4 2

    PL 1/2 2

    CRT 1 2
    2 2
    3 3
    4 0

    L 1 1
    2 2

    MM 1 2
    2 3

CRT 5. GNC, OPS 10X PRO

6. (BFS) GNC I/O RESET

7. Perform PL PWRDN, then:
   If AV BAY 1 fire:
   8. Continue; otherwise go to step 31

NOTE
While performing proc, note any cbs open.
Equipment still pwrd in Av Bay following pwrdn:
    FPCA 1, FLCA 1, IMU FAN, MDM OF1,
    DSC OF1, and ACCU
R1  9.  cb AC CONTR AC1 (three) – cl
10.  INV/AC BUS 1 – OFF (tb-OFF)
     INV PWR 1 – OFF (tb-OFF)
     cb AC CONTR AC1 (three) – op
R2  11.  √BLR CNTLR/HTR 1 – A
            3 – B
12.  Perform FC1_SHUTDOWN, except PWRDN (Cue Card),
     then:
L1  13.  FREON PUMP LOOP 2 – A
     AV BAY 3 FAN A – ON
            B – OFF
L4:G  14.  cb AC2 AV BAY 1 FAN B (three) – op
O6  15.  GPC PWR 1 – OFF
            4 – OFF
16.  MDM FF1 – OFF
     PL1 – OFF
O8  17.  RDR ALTM 1 – OFF
     √MLS 1 – OFF
     FWD RCS MANF ISOL 2 – CL (tb-CL)
O13:A  18.  cb ESS 1BC AC1 SNSR – op
            3AB GPC STAT – op
O14:A  19.  BRAKES MNA – OFF
            MLS 1 – op
            ADTA 1 – op
            ACCEL 1 – op
O15:F  20.  cb MNA RDR ALTM 1 – op
            MMU 1 – OFF
            RJDF 1B F1 LOGIC – OFF
            DRIVER – OFF
O16:A  21.  BRAKES MNC – OFF
            cb MNC ADTA 3 – op
A1L  22.  PL DATA INTLVR PWR – OFF
            S-BD PL CNTL – PNL,CMD
A12  23.  HYD CIRC PUMP PWR 1 – MNB
            2 – MNC
            3 – MNA

Cont next page
C3  27. √OI PCMMU FORMAT – GPC
    PWR – 2
MA73C:A  28. MCA LOGIC MNA FWD 1 – OFF
AW18H  29. √PWR/BATT CHGR EMU 1,2 BUS SEL (two) – OFF
If visors reqd to remain down due to fire and rev 3 avail:
   30. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3)
       with AV BAY FIRE CONTINGENCY DELTAS
       (CONT DEORB, LAUNCH DAY (ORBIT 3))  >>
Otherwise:
   For MM201 trans:
      31. Go to MAL, DPS, GPC FRP-7, DPS RECONFIG
           FOR LOSS OF AV BAY COOLING
           (ASCENT/ORBIT)  >>
If orbit 7 deorbit:
   32. Perform Deltas to nominal POST INSERT and
       DEORB PREP (POST INSERT, ORBIT 7
       DEORB), then:
If AV BAY fire:
   33. Go to AV BAY FIRE (ORB PKT, PWRDN) and
       complete remaining actions
LOSS OF AV BAY 2 COOLING/AV BAY 2 FIRE

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

L1 1. √AV BAY 2 FAN A,B (two) – OFF
O6 2. GPC MODE 2 – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)
3. Perform PL PWRDN, then:
   If AV BAY 2 fire:
   4. Continue; otherwise go to step 23

NOTE
While performing proc, note any cbs open. Equipment still pwrd in Av Bay following pwrdn:
   FPCA 2, FLCA 2, BFC 3A (when GPC 3 is pwrd), MDM OF2, and DSC OF2

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

15. cb MNB MLS 2 – op

16. MMU 2 – OFF

17. BRAKES MNC – OFF
  cb MNC MLS 3 – op
  ADTA 4 – op

18. FWD RCS MANF ISOL 3,4 (two) – CL (tb-CL)

19. RJDF 2A F3 LOGIC – OFF
    DRIVER – OFF
    RJDF 2B F4/F5 LOGIC – OFF
    F4 DRIVER – OFF
    ACCEL 3 – OFF

20. S-BD PM MODE sel – TDRS DATA
    \NSP DATA RATE XMIT – HI
    \RCV – HI
    CODING XMIT – ON
    \RCV – ON
    \PWR – 1
    S-BD PL PWR SYS – OFF
    CNTL – PNL,CMD

21. S-BD PM CNTL – PNL,CMD
    \OI PCMMU PWR – 1
    FORMAT – GPC

22. MCA LOGIC MNB FWD 2 – OFF
23. ASAP post OMS 2:

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

24. **GNC 0 GPC MEMORY**

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>GPC</th>
<th>STR</th>
<th>PL</th>
<th>CRT</th>
<th>O6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12340</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**NOTE**
The following must be an OPS MODE Recall

25. CRT

26. (BFS) GNC I/O RESET

GNC,OPS 106 PRO

000 PRO

27. BFC CRT DISP – OFF

O6

28. GPC MODE 5 – STBY

(tb-RUN)

− HALT

OUTPUT 5 – NORM

C3

29. crt

Sel best S-BD PM ANT until SM GPC is established

If AV BAY 2 fire:

O6

30. GPC PWR 2 – OFF

5 – OFF

MDM FF2,FF4 (two) – OFF

PL2 – OFF

If visors reqd to remain down due to fire and rev 3 avail:

31. Go to LAUNCH DAY DEORBIT PREP (ORBIT 3)

with AV BAY FIRE CONTINGENCY DELTAS

(CONT DEORB, LAUNCH DAY (ORBIT 3)) >>

Otherwise:

For MM201 trans:

32. Go to MAL, DPS, GPC FRP-7, DPS RECONFIG

FOR LOSS OF AV BAY COOLING

(ASCENT/ORBIT) >>

If orbit 7 deorbit:

33. Perform Deltas to nominal POST INSERT and

DEORB PREP (POST INSERT, ORBIT 7

DEORB), then:

If AV BAY fire:

34. Go to AV BAY FIRE (ORB PKT, PWRDN) and

complete remaining actions
LOSS OF AV BAY 3 COOLING/AV BAY 3 FIRE

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

O7 1. GPS 3 PWR – OFF
   PRE AMPL (two) – OFF

L1 2. √AV BAY 3 FAN A,B (two) – OFF

O6 3. GPC MODE 3 – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)

If AV BAY 3 fire:
4. Continue; otherwise go to step 20

NOTE
While performing proc, note any cbs open.
Equipment still pwrd in Av Bay following pwrdn:
   FPCA 3, FLCA 3, MDM OF3, DSC OF3,
   and active comm equipment

R1 5. cb AC CONTR AC3 (three) – cl
6. INV/AC BUS 3 – OFF (tb-OFF)
   INV PWR 3 – OFF (tb-OFF)
   cb AC CONTR AC3 (three) – op

R2 7. √BLR CNTLR/HTR 3 – A
    2 – B
8. Perform FC3 SHUTDN, except PWRDN (Cue Card), then:

L1 9. H2O PUMP LOOP 1 – ON
    2 – OFF
    CAB FAN B – ON
    A – OFF

L4:H 10. cb AC1 AV BAY 3 FAN B (three) – op

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

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

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

If no comm:
A1L 12. S-BD PM MODE sel – TDRS DATA
     √NSP DATA RATE XMIT – HI
     √RCV – HI
     CODING XMIT – ON
     √RCV – ON
     √PWR – 1
C3 13. S-BD PM CNTL – PNL, CMD
If S-BD comm avail:
O6 14. UHF MODE sel – OFF
If comm not recovered:
C3 15. S-BD PM CNTL – PNL
A1L ANT SW ELEC – OFF
     PRE AMP – OFF
     PWR AMPL STBY – OFF
     OPER – OFF
     XPNDR – OFF
     NSP PWR – OFF
     ENCRYPTION SEL – BYP
     PWR – OFF
O6 16. UHF MODE sel – SPLX
A1L 17. S-BD PL CNTL – PNL
     PL DATA INTLVR PWR – OFF

Cont next page
    CNTL – PNL
MA73C:A 19. MCA LOGIC MNC FWD 3 – OFF

20. ASAP post OMS 2:

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

21. **GNC 0 GPC MEMORY**
    CONFIG – ITEM 1 + EXEC
    Modify MC 1 per table

    | NOTE |
    | The following must be an OPS MODE Recall |

    | STR | 1 | 2 | 3 | 4 |
    | PL  | 1/2 | 1 |
    | CRT | 1 | 2 | 3 | 4 |
    | L   | 1 | 2 | 2 |
    | MM  | 1 | 1 | 2 |

22. GNC, OPS 10X PRO
23. (BFS) GNC I/O RESET
    If AV BAY 3 fire:
    24. GPC PWR 3 – OFF
        MDM FF3 – OFF

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

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

Otherwise:

For MM201 trans:

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

If orbit 7 deorbit:

27. Perform Deltas to nominal POST INSERT and DEORB PREP (POST INSERT, ORBIT 7 DEORB), then:

If AV Bay fire:

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

OV105

B10-15 APCL/ALL/GEN N
LOSS OF CAB PRESS (MINOR PWRDN)

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

1. Minimize ltg
O8
2. √MLS (three) – OFF
3. Perform PL PWRDN, then:
L1
4. √H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
5. √FLOW PROP VLV LOOP tb (two) – ICH
C3
6. Use two IDP/CRTs with four MDUs

If AOA:
7. Deltas to ENTRY MANEUVERS (Cue Card)
   At M = 2.9:
      Use two HUDs, MLS, and RAs as reqd
      GNC I/O RESET
8. Continue AOA PROCEDURES (ASC, AOA).
    Do not perform ENT PKT pwrdn >>

If not AOA:
9. Go to LOSS OF CAB PRESS (MAJOR PWRDN)
   (PWRDN), 10-17
LOSS OF CAB PRESS (MAJOR PWRDN)

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

1. Minimize ltg
2. √MLS (three) – OFF
3. MSTR MADS PWR – OFF
4. Perform PL PWRDN, then:
5. √H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
6. √FLOW PROP VLV LOOP tb (two) – ICH
7. Use one IDP/CRT with two MDUs
8. FLT CNTLR PWR (two) – OFF
   If FLT CNTLR PWR not reqd:
9. cb DDU L,R (four) – op
10. AFT (two) – op
11. ANTISKID – OFF
   NWS – OFF
12. HUM SEP B – OFF
13. cb MNC RCS/OMS PRPLT QTY GAUGE – op(cl) as reqd
   If AOA:
14. Continue AOA PROCEDURES (ASC, AOA)
   Do not perform ENT PKT pwrtn
   Use DEORB PREP/ENTRY DELTAS PULLOUT
   PAGE, 10-19, for changes >>
15. Continue ASC
   Use DEORB PREP/ENTRY DELTAS PULLOUT
   PAGE, 10-19, for changes

If orbit 2 or 3 deorb:
16. Continue ASC
   Use DEORB PREP/ENTRY DELTAS PULLOUT
   PAGE, 10-19, for changes >>
NOTE
Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry.

If no comm or if CAB P stabilizes < 6 psia (MCC call), after OPS 301 transition:
PWRDN GPC 1 AND REASSIGN STRINGS TO REMAINING PASS GPCs IN MC 3

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

   CRT
   2. GNC, OPS 301 PRO
   3. GNC 50 HORIZ SIT
      Check runway sel
      Resel runway
   4. (BFS) GNC, OPS 301 PRO
   5. GPC MODE 1 – STBY (tb-bp)
      – HALT

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

   Initiate changes:
   If Orbit 2(3):
     6. Start with step A
   If AOA:
     7. Start with step B, 10-20

A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
   1. Minimize use of IDPs, MDUs, FLT CNTRL PWR, DDUs. Use one PGSC
      If orbit 2:
      2. APU HTRS & DED DISP ENT CONFIG 3
         Do not pwr MLS
      If orbit 3:
      3. ENT FWD FLT DECK CONFIG 10
         Do not pwr MLS
      4. In ENT FORWARD, AFT, MIDDECK, do not activate pwrdrn items

Cont next page
B. Deltas to DEORBIT BURN (ENT)
   At TIG-4:
   1. Use two IDP/CRTs with four MDUs for deorb 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
   F6,F8
   2. L,R FLT CNTLR PWR (two) – OFF
   O14,O15, O16:E
   3. cb DDU L,R (four) – op
   F6,F8
   4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

D. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   1. Use only one IDP/CRT with two MDUs
   O14,O15, O16:E
   2. cb DDU L,R (four) – cl
   F6
   3. L FLT CNTLR PWR – ON
   O14,O15, O16:E
   4. cb ADTA (three) – cl
   O16:E
   5. (BFS) GNC I/O RESET

   At V = 15K:
   If CAB PRESS < 8 psia:
   6. Delete NAVAIDS callout
   If CAB PRESS ≥ 8 psia:
   7. Activate all RAs, MLS
   8. GNC I/O RESET
   9. Disregard subs NAVAID callout DELTAS

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

   At M < 1.0:
   L2
   12. ANTISKID – ON
   13. NWS – 1
LOSS OF 2 H2O LOOPS (POST OMS-2)

NOTES

• Loss of water loop cooling aff both water and air cooled equipment

• This proc assumes loss of both water loops occurs after AOA opportunity has passed, but before OPS 2 transition

• If orbit 2 deorb, this pwrnd leads into LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP). For all other launch day deorb, this pwrnd leads to LOSS OF 2 H2O LOOPS ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS)

• The LOSS OF 2 H2O LOOPS (ORB PKT, PWRDN) is used for MS pwrnd and comm config. This proc powers down all comm. If comm reqd, preferred comm config in order of heat production:
  1. UHF only
  2. STDN LO PWR if reqd
  3. TDRS only if mandatory

  CAUTION
  TDRS OR STDN – HI AOS may be limited to 10 min (pwr amp will overheat)
TIME CRITICAL PROCEDURES (execute simo)

1. Unstow ORB PKT, CONT DEORB, ORB OPS, and one PGSC. To pwr the PGSC:
   L4:B  cb UTIL PWR A15/MO13Q AC3 – cl, or
   F1/MO52J AC1 – cl
   MS1 2. Perform MS OVHD PNL PWRDN (N2 qty not reqd by CDR in step 11 and omit step 13) (ORB PKT, PWRDN)

As part of MS OVHD PNL PWRDN perform the following:

O14:B 3. cb MNA OI SIG CONDR OF 1/4 A – op
    :E  cb MNA DDU AFT – op
O15:B 4. cb MNB OI SIG CONDR OF 1/4 B – op
    2/3 A – op
O16:B 5. cb MNC OI SIG CONDR OF 2/3 B – op
    :E  cb MNC DDU AFT – op

NOTE

Do not pwrdn MMU 1.

If orbit 2 deorb, do not pwrdn MTU.

If orbit 2 deorb and TIG > 1 hr, perform 20 MINUTE DE/REPRESS MS PULLOUT PAGE (CONT DEORB, LOSS OF 2 H2O LOOPS)

MS2 6. Perform LOSS OF 2 H2O LOOPS, COMM PWRDN (ORB PKT, PWRDN), within 10 min

CDR and PLT perform following PWRDN ASAP:

CDR AND PLT PWRDN

C3  7. √MSTR MADS PWR – OFF
     Minimize ltg
F6,F8  8. Use only one IDP/CRT with one MDU
O7  9. FLT CNTLR PWR (two) – OFF, use one as reqd
O8 10. Perform PL PWRDN, then:
L1 11. GPS PWR (three) – OFF
O8 12. √RDR ALTM (two) – OFF
L1 13. √MLS (three) – OFF
L1 14. H2O PUMP LOOP 1,2 (two) – OFF (one ON if PUMP OUT P > 45 psia, or MCC call)
L1 15. HUM SEP A,B (two) – OFF (one ON if either H2O loop ON)

Cont next page

OV105

B10-22
NOTE
If performing 20 MINUTE DE/REPRESS MS
PULLOUT PAGE (CONT DEORB, LOSS OF
2 H2O LOOPS), do not turn cab fan OFF.
Record MET for fan OFF when DE/REPRESS
complete

16. CAB FAN A,B (two) – OFF
   (one ON if either H2O LOOP ON)
   Rcd MET __ / __: __: __
   CAB TEMP CNTLR – OFF
17. FREON PUMP LOOP 1 – OFF
   2 – B
   √FLOW PROP VLV LOOP 1,2 (two) – ICH (tb-ICH)
18. √FLASH EVAP CNTLR PRI A – ON
19. O2 SYS 1 SPLY – CL (tb-CL)
20. ANTISKID – OFF
   NWS – OFF
21. FLASH EVAP FDLN HTR SPLY (two) – 2
22. HYD CIRC PUMP (three) – ON (to prevent MN
BUS O/V)

RECONFIG DPS
O14:F
23. √MMU 1 – ON
24. GNC 0 GPC MEMORY

Reassign Strings to GPC 1 in MC 1
25. CONFIG – ITEM 1 +1 EXEC
Modify MC 1 per table – – –
   
   NOTE
   The following must be
an OPS MODE Recall

   CONFIG
   GPC 1
   12340
   STR 1 1
   2 1
   3 1
   4 1
   PL 1/2 1

   CRT 26. GNC, OPS 10X PRO

   CRT 1 1
   2 1
   3 1
   4 0
   L 1 0
   2 0
   MM 1 1
   2 1

Cont next page

OV105
27. GPC MODE 2,3,4 (three) – STBY (tb-bp)
   - HALT
   - STBY (tb-RUN)
   - HALT (tb-bp)
28. (BFS) GNC, OPS 106 PRO 000 PRO
29. GPC MODE 5 – STBY (tb-RUN), HALT (tb-bp)
   OUTPUT 5 – NORM
30. BFC CRT DISP – OFF
31. AV BAY 2,3 FANS (four) – OFF
   √1 FAN A – ON
   B – OFF
32. IMU FAN A – ON
   B,C (two) – OFF
33. If not orbit 2 deorb: Go to step 40
   Transition GPC 1 to GNC OPS 3:
O14,O15, 34. √RGA (four) – ON
O16:A
O14,O15:E √cb ACCEL (two) – cl
O15,O16:F √ACCEL 3,4 (two) – ON
O14,O15, √ASA (four) – ON
C3 O16:F
C3 35. √FCS CH (four) – AUTO
36. [GNC 0 GPC MEMORY]
37. Reassign Strings to GPC 1 in MC 3
   CONFIG – ITEM 1 +3 EXEC
   Modify MC 3 per table
   Configure GPC 3
   EXEC
CRT 38. GNC, OPS 301 PRO
   [GNC DEORB MNVR COAST]
39. Go to step 43
Cont next page

OV105

B10-24
APCL/ALL/GEN N
RECONFIG DPS, TRANSITION TO OPS 2

40. **[GNC 0 GPC MEMORY]**

Reassign Strings to GPC 1 in MC 2

41. **CONFIG – ITEM 1 +2 EXEC**
   - Modify MC 2 per table

42. **GNC, OPS 201 PRO**

43. **For any CRT that is OFF:**
   - GPC/CRT1/X EXEC

44. **MMU 1 – OFF**

45. **Calculate DEORBIT TARGETS**
   - using PGSC

46. **C/W MODE – ACK**

**NOTE**
- For F7 lts, hold F2 or F4 MA in

Repress SPLY H2O TKA:

47. **SPLY H2O GN2 TK VENT vlv – PRESS**
   - TKA SPLY vlv – OP


**IF** time to CONUS TIG < 50 min:

49. **GNC 21 IMU ALIGN**
   - IMU 1,3 (two) – desel

50. **IMU 1,3 (two) – OFF**

**IF** time to CONUS TIG > 50 min, continue:

51. **MDM FF1,3,4 (three) – OFF**

**IF** orbit 2 deorb:

52. **Mnvr to shade windows from sun or install Window Shades until TIG-10 min, then go to step 61**

**IF** not orbit 2 deorb:

53. **Config DAPs A1,B1 with these exceptions:**
   - **(A)** ITEM 10 +1,0 0 EXEC
     - ITEM 11 +3,0 0 EXEC
     - ITEM 15 EXEC (TAIL)
     - ITEM 16 EXEC (TAIL)
   - **(B)** ITEM 30 +0,2 0 EXEC
     - ITEM 31 +1,0 0 EXEC
     - ITEM 35 EXEC (TAIL)
     - ITEM 36 EXEC (TAIL)

Cont next page
Mnvr to tail Sun att:

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

Establish stabilized att:

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

Establish free drift:

56. **DAP**: FREE

57. **GPC MODE 1** – STBY (tb-bp), HALT
   - STBY (tb-RUN)
   - HALT (tb-bp)
   - **PWR** (five) – OFF

58. Record **MET** __ __/____ __. __

59. Confirm all IDPs and MDUs – OFF

60. **AV BAY 1 FAN** (two) – OFF

61. **FWD RCS MANF ISOL 1,2,3,4** (four) – CL (tb-CL)

62. **RJDF 1B F1 LOGIC** – OFF
   - **DRIVER** – OFF

63. **1A F2 DRIVER** – OFF
   - **LOGIC** – OFF

64. **2A F3, 2B F4 DRIVER** (two) – OFF
   - **F4/F5 LOGIC** (two) – OFF
   - **RJD MANF L5/F5/R5 DRIVER** – OFF

65. √cb AC3 ΦA SIG CONDR HUM SEP – op
   - P
   - ΦA LG SNSR (two) – op

If **H2O PUMP LOOP 1 A(B)** ON:

66. Leave **MCA LOGIC MNA FWD 1** – ON
    - **(MNB FWD 2** – ON)
    - **MCA LOGIC MNA,B,C** (thirteen) – OFF

If **H2O PUMP LOOP 1 A,B** OFF:

67. **MCA LOGIC MNA,B,C** (fourteen) – OFF

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

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

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

Expect 100% cab humidity in ~2 hr.

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

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

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

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

70. Go to LOSS OF 2 H2O LOOPS ON-ORBIT WAIT (CONT DEORB, LOSS OF 2 H2O LOOPS)  >>

71. Go to LOSS OF 2 H2O LOOPS DEORBIT PREP/ENTRY (CONT DEORB, LOSS OF 2 H2O LOOPS D/O PREP). Perform all steps although some activities may already have been performed

OV105
LOSS OF 1 FREON LOOP

C3
1. MSTR MADS PWR – OFF
2. Minimize ltg
3. Use one IDP/CRT with two MDUs, FLT CNTLR PWR
   If not AOA:
4. GPS 1,3 PWR (two) – OFF
5. RDR ALTM (two) – OFF
6. If reqd: Perform PL_PWRDN, then:
7. FLOW PROP VLV LOOP tb (two) – ICH
8. H2O LOOP 2(1) BYP MODE – MAN
7. MAN – DECR (30 sec)
9. BRAKES (three) – OFF
10. cb ADTA (four) – op

If FLT CNTLR PWR not reqd:
11. cb DDU L,R,AFT (six) – op
12. (Aff) FREON PUMP – OFF
If FREON LEAK performed and leak isolated (accum qty > 3
    and not decr)(\MCC):
13. Perform EMER PLBD OPENING (ECLS), 4-8
14. Mnvr per MCC >>
If AOA:
15. Deltas to AOA (ASC)
   At TIG-10 min:
   \cb DDU L,R (four) – cl
16. Deltas to AOA POST D/O BURN (ASC)
   FLT CNTLR PWR (two) – OFF
   cb DDU L,R (four) – op

Use one IDP/CRT with two MDUs
17. Deltas to ENTRY SW CHECK (ENT, POST BURN)
   Pwr NAV AIDS per ENTRY MANEUVERS (Cue Card)
18. Deltas to ENTRY MANEUVERS (Cue Card)
   Use DEORB PREP/ENTRY DELTAS PULLOUT
   PAGE, 10-31, starting with step D,1
   Continue with AOA (ASC) >>

Cont next page

B10-29
If LAUNCH DAY DEORBIT:

19. Install Window Shades or mnvr to shade windows from sun

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

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

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

21. Perform DEORB PREP/ENTRY DELTAS PULLOUT PAGE, 10-31, then:

22. At TIG-1:30(2:00) hr, go to LAUNCH DAY ORBIT 2(3) (CONT DEORB)
DO NOT DISCARD; USE TO LANDING

**A. Deltas to LAUNCH DAY ORBIT 2(3) (CONT DEORB)**
1. Use one FLT CNTLR PWR, DDU, PGSC, and one IDP/CRT with two MDUs
2. Minimize ltg
3. Minimize sun in cab if possible
   If orbit 2:
   4. APU HTRS & DED DISP ENT CONFIG
      Do not pwr GPS
   5. Go to step 7
   If orbit 3:
   6. ENT FWD FLT DECK CONFIG
      Do not pwr MLS
   7. In ENT SW LIST/VER, do not activate GPS, MLS, RA, ADTAs until indicated by POST BURN (ENT) and ENTRY MANEUVERS (Cue Card) deltas

**B. Deltas to DEORBIT BURN (ENT)**
At TIG-15 min:
1. Remove Window Shades/mnvr to deorb burn att
At TIG-10 min:
   2. √cb DDU L,R (four) – cl
   3. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

**C. Deltas to POST BURN (ENT)**
F6,F8
1. L,R FLT CNTLR PWR (two) – OFF
O14,
O15,
O16:E
2. cb DDU L,R (four) – op

At EI-15 min:
O7
3. Use one IDP/CRT with two MDUs, as reqd
4. 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. cb DDU L,R (four) – cl
2. L FLT CNTLR PWR – ON
3. Use two IDP/CRTs with four MDUs, as reqd
4. BRAKES (three) – ON
5. cb ADTA 1,2,3 (three) – cl

At V = 12K:

If loop 1(2) lost:

6. NH3 CNTLR A(B) – OFF
   B(A) – PRI/GPC

At M = 2.7:

7. Use two HUDs, MLS, and RAs
   GNC I/O RESET
LOSS OF HI LOAD EVAP

C3 1. √MSTR MADS PWR – OFF
   2. Minimize ltg
   3. Use one PGSC and one IDP/CRT with two MDUs, as reqd

O8 4. RDR ALTM (two) – OFF
   5. Perform PL_PWRDN, then:

L1 6. H2O LOOP 2(1) BYP MODE – MAN
   MAN – DECR (hold 30 sec)
   7. √FLOW PROP VLV LOOP tb (two) – ICH
   8. BRAKES (three) – OFF
   9. cb ADTA (four) – op

If FLT CNTLR PWR not reqd:
10. cb DDU L,R (four) – op

If AOA:
11. Deltas to AOA (ASC)
   At TIG-10:
   √cb DDU L,R (four) – cl
   Use FLT CNTLR, and two IDP/CRTs with four MDUs, as reqd for burn

F6,F8
12. Deltas to AOA POST D/O BURN (ASC)
   L,R FLT CNTLR PWR (two) – OFF
   cb DDU L,R (four) – op

   Use two IDP/CRTs with four MDUs

O14, 13. Deltas to ENTRY SW CHECK (ENT, POST BURN)
   O15, BRAKES (three) – ON
   O16:A

Do not pwr NAVAIDS, NWS
Perform LOSS OF HI LOAD EVAP DEORB OR
ENTRY PULLOUT PAGE (ENT PKT, PWRDN),
then:

Cont next page

OV105
B10-33
APCL/5/GEN N
If not AOA:
  After MPS pwrdsn:
    O17:A 14. ATVC (four) – OFF
    :B 15. EIU (three) – OFF
    :D 16. MEC 1 – OFF (wait 2 sec), then:
              2 – OFF
If launch day deorbit: Go to LOSS OF HI LOAD EVAP (ORB PKT, PWRDN) >>
After PLB doors open:
  17. SM 88 APU/ENVIRON THERM
  18. H2O LOOP 2(1) BYP MODE – MAN
     MAN – INCR, until FLOW = 950
  19. On MCC call, go to FULL-UP FES FLUSHING (ECLS), 4-16
LOSS OF 2 FREON LOOPS (POST OMS-2)

**WARNING**
- FC purge must be started and loads pwrd dn ASAP
- Orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP with all three FCs running. This assumes three FCs are pwrd dn to a total level of 8 kW immed and are continuously purged
- Earliest possible landing is reqd

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

Cont next page
TIME CRITICAL PROCEDURES

1. MS initiate FC purge (step 4) and unstow ORB PKTs and PGSC, ASAP

2. MS perform LOSS OF 2 FREON LOOPS, COMM PWRDN (ORB PKT, PWRDN); delay 10 min max if AOS

CDR and PLT perform following steps ASAP:

C3 3. MSTR MADS PWR – OFF

MS R11U 4. √ FC PURGE HTR – ON

√ VLVS (three) – OP

5. Perform PL PWRDN, then:

6. Minimize ltg

CRTX 7. Use only one FWD IDP/CRT with one MDU (save IDP3 for entry)

8. Use only one PGSC

F6/F8 9. √ FLT CNTLR PWR (two) – OFF

RESTRING TO GPC 1/TRANSITION TO OPS 3

10. [GNC 0 GPC MEMORY]

   CONFIG – ITEM 1 +3 EXEC
   Modify MC 3 per table – – – – – – –

11. GNC, OPS 301 PRO

   For any FWD IDP that is OFF:
   12. GPC/CRT1/X EXEC

C3 13. BFC CRT DISP – OFF

O6 14. GPC MODE 2,3,4 (three)

   – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)

   PWR 2,3,4 (three) – OFF

15. BFS GNC, OPS 106 PRO

000 PRO

16. GPC MODE 5 – STBY (tb-RUN)

   – HALT (tb-bp)

OUTPUT 5 – NORM

PWR 5 – OFF

17. [GNC 53 ENTRY CONTROLS]

   RGA 1,3,4 (three) – desel

18. Have MS perform MS OVHD AND AFT PNL PWRDN (ORB PKT, PWRDN), but leave RGA 2 pwrd until step 52

Cont next page
PLT

O7. GPS PWR (three) – OFF
    PRE AMPL (six) – OFF
O8. √ RDR ALTM (two) – OFF
20. √MLS (three) – OFF
C3. FCS CH (four) – AUTO
R4. MPS MANF PRESS LO2, LH2 (two) – CL
R2. √ HYD CIRC PUMP (three) – OFF
25. MPS He ISOL (six) – CL
    PNEU He ISOL – CL
    L ENG He XOVR – CL
26. Go to step 47

CDR

L1. HUM SEP A,B (two) – OFF
27. √ IMU FAN B – ON
    A,C (two) – OFF
29. CAB FAN A,B (two) – OFF
30. AV BAY 1,2,3 FAN A,B (five) – OFF
31. √1 FAN B – ON
32. FREON PUMP LOOP 1,2 (two) – OFF (one-ON, if any flow)
33. √ RAD CNTLR LOOP 1,2 (two) – OFF
34. NH3 CNTLR A,B (two) – OFF
If no FREON PUMP ON:
L2. O2 SYS 1,2 SPLY (two) – OP (tb-OP)
L1. √ FLASH EVAP CNTLR PRI A,B (two) – OFF
37. TOP EVAP HTR NOZ (two) – OFF
    DUCT sel – OFF
38. HI LOAD DUCT HTR sel – OFF
L2. √ FLASH EVAP FDLN HTR SPLY (two) – OFF
If one FREON PUMP ON:
L1. FLASH EVAP CNTLR PRI A – ON
41. TOP EVAP HTR NOZ (two) – OFF
    DUCT sel – ON
42. HI LOAD DUCT HTR sel – ON
L2. FLASH EVAP FDLN HTR B SPLY – OFF
44. NWS – OFF
O6. √ TRK PWR -Y,-Z (two) – OFF
46. ANNUN BUS SEL ACA 2/3 – OFF

Cont next page
47. **GNC 51 OVERRIDE**
   IMU 1, 2 (two) – desel
O14, O15:A

48. IMU 1, 2 (two) – OFF
O14, O15, O16:A

49. BRAKES (three) – OFF

50. All IDPs, MDUs – OFF (use IDP1 as reqd until CONT DEORB proc, 3 min OFF for each min ON)
O15:A

51. DAP: INRITL/PULSE
O6

52. RGA 2 – OFF
F6

53. MDM FF1,4 (two) – OFF
MDM FA1,4 (two) – OFF
O8

54. CDR disp sws – green dot
O14:F

55. FWD RCS MANF ISOL 1, 2, 3, 4 (four) – CL (tb-CL)
MA73C: 56. √
A,B 

57. RJDA 1A,2A LOGIC, DRIVER (four) – OFF
    RJDF 1B F1 LOGIC, DRIVER (two) – OFF
O14:F

58. RJDA 1B LOGIC, DRIVER (two) – OFF
    RJDF 1A F2 LOGIC, DRIVER (two) – OFF
O15:F

59. RJDA 2B LOGIC, DRIVER (two) – OFF
    RJDF 2A F3 LOGIC, DRIVER (two) – OFF
    2B LOGIC, DRIVER (two) – OFF
    RJD MANF L5/F5/R5 DRIVER – OFF
O16:F

60. Go to LOSS OF 2 FREON LOOPS (ORB PKT, PWRDN), beginning at step 58 (Sel ELS TIG)
LOSS OF FES/1 FC

⇒ C3

1. √MSTR MADS PWR – OFF
2. Minimize ltg
3. Use only one IDP/CRT with two MDUs
   If FLT CNTLR PWR not reqd:
   O14, 4. cb DDU L,R,AFT (six) – op
   O15,
   O16:E
   O8
5. RDR ALTM (two) – OFF
L2
6. √FLASH EVAP FDLN HTR SPLY (two) – OFF
7. NWS – OFF
8. ANTISKID – OFF
L1
9. √CAB FAN A(B) – ON
10. Perform PL PWRDN, then:
   11. √FLOW PROP VLV LOOP 1,2 (two) – ICH
   If AOA and FES lost:
      MS perform pwrdn activities (steps 12-17)
      12. Minimize ltg
      O14, 13. BRAKES (three) – OFF
      O15,
      O16:A
      O14, 14. cb ADTA (four) – op
      O15,
      O16:E
      O14, 15. cb MSN TIMER FWD,AFT (two) – op
      O15:B
      O14, 16. EVENT TIMER AFT,FWD (two) – op
      O15:F
      O14, 17. MMU 1,2 (two) – OFF (MMU 2 ON for OPS
      TRANSITION, then OFF)
      L1
      18. H2O LOOP 2(1) BYP MODE – MAN
          MAN – DECR
          (hold 30 sec)
      19. Continue with AOA (ASC):
          Do not perform LOSS OF FES (ENT PKT,
          PWRDN)
          Use ENTRY DELTAS PULLOUT PAGE,
If not AOA:

After APU/HYD SHUTDN and MPS PWRDN/ISOL:

O17:A  
20. ATVC (four) – OFF

:B  
EIU (three) – OFF

:D  
MEC 1 – OFF (wait 2 sec)
2 – OFF

If FES failed, after MM201 transition:

L2
21. FLASH EVAP FDLN HTR A,B SPLY (two) – 1

22. On MCC call, go to FULL-UP FES FLUSHING (ECLS), 4-16 >>

If FC lost, after MM201 transition:

23. FLASH EVAP FDLN HTR A,B SPLY (two) – 1

24. Go to LOSS OF 1 FC (ORB PKT, PWRDN) >>
ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

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

A. Deltas to AOA (ASC)
   TIG-5 min:
   1. Use two IDP/CRTs with four MDUs
   O14, O15, O16: E
   2. cb DDU L,R (four) – cl
   F6, F8
   3. L,R FLT CNTLR PWR (two) – ON

B. Deltas to POST D/O BURN (ASC)
   1. Use one IDP/CRT with two MDUs
   F6, F8
   2. L,R FLT CNTLR PWR (two) – OFF
   O14,
   3. cb DDU L,R (four) – op
   O15,
   O16: E
   4. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
   At EI-7:
   5. Use two IDP/CRTs with four MDUs
   6. Perform EMER PLBD CLOSING (ENT PKT, ECLS)

C. Deltas to ENTRY MANEUVERS (Cue Card)
   At EI:
   L1
   1. NH3 CNTLR B(A) – SEC/ON
   O14,
   2. cb DDU L,R (four) – cl
   O15,
   O16: E
   3. L,R FLT CNTLR PWR (two) – ON
   F6, F8
   4. BRAKES (three) – ON
   O14,
   O15,
   O16: A
   O14,
   O15,
   O16: E
   5. cb ADTA (four) – cl
   6. GNC I/O RESET

Cont next page

LOSS OF FES/1 FC
ENTRY PULLOUT PAGE
At V = 15K:
7. Delete NAVAIDS callout

At V = 12K:
8. Delete ref to RAD FLOW

At V = 6K:
9. NH3 CNTLR B(A) – OFF
    A(B) – PRI/GPC

At M = 2.7:
10. Use two HUDs, three MLSs, and two RAs as reqd
11. GNC I/O RESET
12. ANTISKID – ON
13. NWS – 1

At post Wheel Stop:
14. Go to EXPEDITED PWRDN (ENT, POST LDG)
LOSS OF 2nd FC

⇒ C3 1. √MSTR MADS PWR – OFF
2. Use one IDP/CRT with three MDUs
O7 3. GPS PWR (three) – OFF
   PRE AMPL (six) – OFF
O8 4. √RDR ALTM (two) – OFF

NOTE
Do not tie three main buses during ascent

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

MS 5. Perform MS OVHD AND AFT PNL PWRDN, 10-47, immed
6. Minimize ltg
7. Perform PL PWRDN, then:
8. If in OPS 2: Go to step 15

L1 CONTRACT RS AND REASSIGN STRINGS TO
GPC 1 IN MC 1
9. CONFIG – ITEM 1 +1 EXEC
   Modify MC 1 per table

   NOTE
   The following must be an OPS MODE recall

CRT 10. GNC, OPS 10X PRO
For any CRT that is OFF:
11. GPC/CRT1/X EXEC

Cont next page
12. GPC MODE 2,3,4 (three) – STBY (tb-bp)
   – HALT
   – STBY (tb-RUN)
   – HALT (tb-bp)

13. (BFS) GNC I/O RESET
14. Go to step 21
15. **GPC 0 GPC MEMORY**
    CONFIG – ITEM 1 +2 EXEC
    Modify MC 2 per table
    GPC – ITEM 44 +1 EXEC
16. **GNC, OPS 201 PRO**
17. GPC MODE 2 – STBY (tb-bp)
    – HALT
    PWR 2 – OFF
18. √GPC MODE 3,5 (two) – HALT
    (tb-bp)
    PWR 3 – OFF
19. **GNC 20 DAP CONFIG**
    P OPTION – ITEM 15 EXEC
    Y OPTION – ITEM 16 EXEC

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20. DAP: A/AUTO/PRI
21. When MPS Dump Complete:
    MPS ENG PWR (six) – OFF
22. **GNC 51 OVERRIDE**
    Any comm faulted IMU – desel
23. √IMU FAN (one) – ON
24. √H2O PUMP LOOP (one) – ON
25. AV BAY 1 FAN B(A) – ON
26. AV BAY 2 FAN A(B) – ON

If MNA unpwr’d:
27. FREON PUMP LOOP 1 – B
    2 – A
28. FLASH EVAP CNTLR PRI A – ON
    B – OFF
29. TOP EVAP HTR DUCT sel – B
    HI LOAD DUCT HTR sel – B
30. L OMS – sel SEC

Cont next page

OV105
If MNB(C) unpwrd:

L1 31. FREON PUMP LOOP 1,2 (two) – A(B)
32. TOP EVAP HTR DUCT sel – A
   HI LOAD DUCT HTR sel – A
If MNC unpwrd:

33. FLASH EVAP CNTLR PRI B – ON
    A – OFF
34. R OMS – sel SEC

If no MANF leak:

R1 35. √O2,H2 MANF VLV TK1,TK2 (four) – OP
   TK1 HTRS B – AUTO (MNA or MNB ↓) or
   TK2 HTRS B – AUTO (MNC or no
   MN BUS ↓); then:
   All others OFF
If MANF leak:

36. √O2/H2 HTR LOSS TABLE (EPS), 5-20
37. Sel one htr in one O2,H2 TK
R4 38. Activate PGSC if reqd
L2 39. √FLASH EVAP FDLN HTR A,B SPLY (two) – OFF
L4:L 40. cb ΦA CAB T CNTLR (two) – op
C3 41. C/W MODE – ACK
F6/F8 42. FLT CNTLR PWR (two) – OFF, use one as reqd

Post APU/HYD SHUTDN:
R2 43. BLR CNTLR/HTR (three) – OFF
44. √HYD CIRC PUMP (three) – OFF
45. [GNC 23 RCS]
   ITEM 1 EXEC (FRCS page)
O8 46. Ovrd FRCS MANF 1,2,3,4 STAT (four) – CL
O14,O15, 47. RJDF DRIVER,LOGIC (eight) – OFF
O16:F 48. √RJD MANF L5/F5/R5 DRIVER – OFF
If not MN BUS SHORT:
49. Tie three MN buses, BUS TIE (Cue Card)
Post BUS TIE config check:
L1 50. CAB FAN A(B) – ON
51. √AV BAY 1 FAN (one) – ON
52. √AV BAY 2 FAN (one) – ON
53. MS OVHD AND AFT PNL PWRDN complete, then
   continue:
If in OPS 2:
52. Go to LOSS OF 2 FC LAUNCH DAY DEORBIT
    PREP (ORBIT 2 OR ORBIT 3) (CONT DEORB,
    LOSS OF 2 FC ORB 2 OR 3) (read notes) >>
53. Set watch to count down to DEORBIT TIG (use PGSC
    or MCC for TIG time)
OPS 3 TRANSITION CONFIG – POST OMS 2

O14, O15, O16:F

54. ASA (four) – ON

55. $\sqrt{\text{RGA 1,2,3 (three)}}$ – ON

56. $\sqrt{\text{cb ACCEL (two)}}$ – cl

57. $\sqrt{\text{ACCEL 3}}$ – ON

58. $\sqrt{\text{FCS CH (four)}}$ – AUTO

TRANSITION GPC 1 TO GNC OPS 3

CRT1

59. GNC 0 GPC MEMORY

CONFIG – ITEM 1 +3 EXEC

Modify MC 3 per table – – – – – – – –

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

CRT

60. GNC, OPS 301 PRO

61. GNC DEORB MNVR COAST

TRANSITION BFS GPC TO GNC OPS 3

C3

62. BFC CRT DISP – ON

\$\sqrt{\text{SEL}}$ – 3+1

| CRT | 1 |
|     | 1 |
|     | 2 |
|     | 3 |
|     | 4 |

<table>
<thead>
<tr>
<th>PL</th>
<th>1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPC</td>
<td>1</td>
</tr>
</tbody>
</table>

CRT

63. (BFS) GNC OPS 301 PRO

O14, O15:F

64. MMU (two) – OFF

| L    | 1 |
|      | 0 |
|      | 2 |

| MM   | 1 |
|      | 0 |
|      | 2 |

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

OV105
MS OVHD AND AFT PNL PWRDN

O14, O15, 1. BRAKES (three) – OFF
O16:A
O14, O15, 2. cb ADTA (four) – op
O16:E
O14:A 5. Desel IMU – OFF (one of three IMUs OFF)
O14:O15
O16:E 3. cb MNC RCS/OMS PRPLT QTY GAUGE – OP
O15
O16:E 4. cb DDU R (two) – op
O16:E
O15 7. MNB MSN TIMER AFT – op
O17:A 9. ATVC (four) – OFF
O16:F
O17:A 10. EIU (three) – OFF
O16:F
O17:A 11. MEC 1 – OFF (wait 2 sec), then
O17:A 12. APU HTR LUBE OIL LN (three) – OFF
O17:A 13. HYD HTR (eight) – OFF
A12 14. RCS/OMS HTR FWD RCS – OFF
A14 15. SPLY H2O GN2 TK VENT vlv – PRESS
ML26C 16. SPLY H2O GN2 TKA SPLY vlv – OP

Post MPS pwrdn and APU/HYD SHUTDN:

O14, O15, 8. ASA (four) – OFF
O16:F
O17:A 12. APU HTR LUBE OIL LN (three) – OFF
A12 13. HYD HTR (eight) – OFF
A14 14. RCS/OMS HTR FWD RCS – OFF
A14 15. SPLY H2O GN2 TK VENT vlv – PRESS
ML26C 16. SPLY H2O GN2 TKA SPLY vlv – OP

LOSS OF 2nd FC
ASCENT
MS PAGE  B10-47
OV105
APCL/5/GEN N
ASCENT PKT CHECKLIST

OV ALL

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

Flight Cover (trim bottom to expose tabs)