International Space Station
Multi-Purpose Logistics
Module Book

Mission Operations Directorate
Operations Division

20 JUN 05

This publication replaces all previous publications.

These procedures are available electronically on the SODF Homepage at http://mod.jsc.nasa.gov/do3

National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
Houston, Texas
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OBJECTIVE:
Measure the MPLM temperature and pressure.

NOTE
1. Ground is prime for this procedure.
2. Verify shuttle APCU power is active.
3. Wait 5 minutes after applying ISS power to ensure MPLM MDM bootup is complete.

PCS
1. MDM MPLM I/O CHECK
Wait 5 minutes after applying ISS power.

Task:
- Task Nav
  - ‘Multi-flight Task Displays’

  sel MPLM Act-Deact

  MPLM Act-Deact
  - ‘MDM Control’

  sel MPLM MDM

  MDM MPLM

  √ MDM ID MPLM Frame Count – incrementing
  √ MDM ID MPLM Sync Status – In Sync

2. PDB ACTIVATION AND CHECKOUT

  MPLM Act-Deact
  - ‘PDB Control’

  sel PDB Details

  PDB Details

  cmd APS – On

  √ APS Posn – On
  √ PDB Input Voltage (Orbiter) ≥ 116V
  √ PDB Current: 0.5 to 1.0A

  MPLM Act-Deact
  - ‘PDB Control’

  √ RPC 01 MDM – Cl
  √ All other RPCs – Op
3. MPLM CAB FAN ACTIVATION

3.1 Smoke Detector Activation
   MPLM: ECLSS: Smoke Detector
   MPLM Smoke Detector

   sel MPLM PDB RPC 13

   PDB Details

   cmd RPC 13 – Close (Verify DSD RPC Posn – Cl)

   MPLM Smoke Detector
   ‘Active BIT’

   cmd Initiate

   Wait 5 seconds.
   ‘Passive BIT’

   √ Lens Status – Clean
   √ Degraded – blank

   ‘Smoke Status’

   √ Smoke Status – No Smoke

3.2 Cab Fan Activation
   MPLM: ECLSS: Cab Fan
   MPLM Cabin Fan

   sel MPLM PDB RPC 11

   PDB Details

   cmd RPC 11 – Close (Verify CFA RPC Posn – Cl)

   MPLM Cabin Fan
   ‘State – On’

   cmd On

   √ State – On
   √ Speed: 3056 to 4048 rpm
4. **MPLM ENVIRONMENT CHECK**

   Wait 15 minutes after fan activation to mix MPLM air.

   **Checking Pressure and Temperature**

   MPLM: ECLSS

   ‘Cabin Air T’

   Record Cabin Air Temperature ________ deg C
   Record GMT __________________

   ‘Cab P Avg’

   Record Average Cabin Air Pressure ______ mmHg

   If only one APCU 1(2) providing power to MPLM

   **Task:**
   - Task Nav
     - ‘Multi-flight Task Displays’
   - sel MPLM Act-Deact
   -/MPLM Act-Deact
     - ‘PDB Control’
   - sel PDB Details
   - PDB Details
   - cmd All GLAs – ON

5. **MPLM CAB FAN DEACTIVATION**

5.1 **Cabin Fan Deactivation**

   MPLM: ECLSS: Cab Fan

   ‘Off’

   **cmd** Arm
   **cmd** Off

   √State – Off
   √Speed: 2000 rpm

   sel MPLM PDB RPC 11

   PDB Details

   **cmd** RPC 11 – Open (√CFA RPC Posn – Op)
5.2 Smoke Detector Deactivation

**PDB Details**

**cmd** RPC 13 – Open (√DSD RPC Posn – Op)

6. **MPLM PDB DEACTIVATION**

If GLA lights are On

**PDB Details**

**cmd** All GLAs – OFF

**NOTE**
PDB data becomes unchanging and invalid when PDB Aux Pwr is removed in next step.

Commanding APS Off

**PDB Details**

**cmd** APS – Off

√APS Posn – Off
OBJECTIVE:
Utilize Internal Sampling Adapter (ISA), Vacuum Access Jumper (VAJ), Scopemeter, Scopemeter Pressure Probe to verify integrity of pressure in Node 1 Deck to MPLM Vestibule, post MPLM mating.

LOCATION:
Node 1 Deck Hatch

DURATION:
30 min

CREW:
One

PARTS:
None

MATERIALS:
9V Alkaline Battery (if Battery changeout required)
Ear Plugs

TOOLS:
Internal Sampling Adapter (ISA)   P/N 97M55830-1
5 ft VAJ   P/N 683-17111-1
Scopemeter and Accessories Kit:  P/N SJG33115340-301
Scopemeter   P/N SEG39129678-303
ISA Scopemeter Pressure Probe   P/N 97M55830-1
ISS IVA Toolbox:
Drawer 3
#0 Phillips Screwdriver (if Battery change out required)

1. SETTING UP SCOPEMETER

NOTE
ISA has two identical ISA VAJ Ports. To ensure proper Scopemeter Accuracy Verification, one ISA VAJ Port must be capped.

1.1 Gamah Cap ← ISA VAJ Port
   √Gamah Cap → remaining ISA VAJ Port
   Hand tighten.

1.2 √ ISA Scopemeter Pressure Probe → ISA

NOTE
Plug marked "COM" must be inserted in COM jack on Scopemeter; plug marked “V” must be inserted in EXT mV jack. ISA Scopemeter Pressure Probe slide switch will be facing away from user.
1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK
(MPLM/LF1 - ALL/FIN 6) Page 2 of 7 pages

1.3 ISA Scopemeter Pressure Probe COM plug →|← COM jack (black)
on top of Scopemeter
V plug of ISA Scopemeter Pressure Probe →|← EXT mV jack of
Scopemeter
Refer to Figure 1.

Figure 1.- ISA Scopemeter Pressure Probe
Connected to Scopemeter.

1.4 √ISA Scopemeter Pressure Probe slide switch – OFF

1.5 While holding down F5, press and release ON/OFF.
Listen for two beeps, release F5.

1.6 Set up Scopemeter for pressure measurement.
F5 → Press (to select EXT.mV)
F1 → Press (to select CLOSE)

1.7 Verify voltage reading > 80 mVDC (good ISA Scopemeter Pressure
Probe battery indication).

If voltage reading < 80 mVDC, ISA Scopemeter Pressure Probe
battery must be replaced.

Replace 9V Battery by removing noncaptive screw on back of
probe (#0 Phillips Screwdriver).

1.8 Select mmHg on ISA Scopemeter Pressure Probe using slide
switch.
2. **VERIFYING ISA SCOPEMETER PRESSURE PROBE ACCURACY**

**NOTE**
ISA Scopemeter Pressure Probe displays 1 mV of output per pressure unit. Ex. 0.760 V = 760 mV = 760 mmHg

2.1 Record ISA Scopemeter Pressure Probe P1: ________ mmHg

PCS 2.2 US Lab: ECLSS

Record Cab Press P2: ________ mmHg

* If \( \Delta P = |P1-P2| \) > 20 mmHg
* Notify MCC-H ISA Scopemeter Pressure Probe inaccurate.
* MCC-H for further instructions

3. **CONNECTING VAJ, ISA, MANUAL PRESSURE EQUALIZATION VALVE (MPEV)**

Node 1 3.1 Node 1 Deck MPEV – CLOSED

Deck Hatch 3.2 Cap \( \leftrightarrow \) ISA Sampling Port

\( \sqrt{\text{ISA Sampling Port Valve – CLOSED}} \)

Refer to Figure 2.

![Image of ISA Sampling Port Valve](image)

Figure 2.- ISA Sampling Port Valve.

3.3 Gamah Cap \( \leftrightarrow \) 5 ft VAJ (both ends)

Inspect seals for any visible damage.

\( \sqrt{\text{MCC-H}} \) if any damage noted to seals
3.4 5 ft VAJ (straight end) →|← ISA VAJ Port
     Hand tighten.
     Refer to Figure 3.

Figure 3.- ISA/VAJ/MPEV Connection.

Node 1 3.5 Cap ←|→ Node 1 Deck MPEV
Deck Hatch 5 ft VAJ (bent end) →|← Node 1 Deck MPEV
     Hand tighten.
     Refer to Figure 3.

WARNING
VAJ will move when pressurized or evacuated. Failure to secure
ISA/VAJ Assembly may result in injury to crew and/or damage to
equipment.

3.6 Secure ISA/VAJ Assembly.
4. **CHECKING ISA/VAJ CONNECTION FOR LEAKS**

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<td>Opening the MPEV will start the pressurization of the ISA/VAJ setup and may cause a loud hissing noise. Crew in the vicinity should don Ear Plugs.</td>
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4.1 Don Ear Plugs.

4.2 **ON MCC-H Go**

Node 1 Deck Hatch

- Node 1 Deck MPEV → OPEN
  - Wait 5 minutes.

4.3 Node 1 Deck MPEV → CLOSED

  - Wait 3 minutes, then monitor ISA/VAJ pressure for 5 minutes.

* If $\Delta P > 5$ mmHg during 5 minute monitoring period
* Notify MCC-H of suspected ISA/VAJ leak.
* MCC-H for further instructions

5. **PRESSURIZING VESTIBULE**

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<td>1. Opening the ISA Sampling Port Valve will start the pressurization of the vestibule and may cause a loud hissing noise. Ear Plugs are required for crew in the vicinity.</td>
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<tr>
<td>2. Keep clear of inlet of ISA Sampling Port Valve when opened.</td>
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5.1 Node 1 Deck MPEV → OPEN

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<td>1. To obtain accurate measurements, pressure readings should be taken only when ISA Sampling Port Valve is CLOSED.</td>
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<td>2. Pressure readings should be noted every 2 minutes, but do not need to be recorded or reported to MCC-H.</td>
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<tr>
<td>3. Vestibule should pressurize to 550 mmHg in approximately 8 minutes.</td>
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5.2 ISA Sampling Port Valve → OPEN

  - Wait 2 minutes.
  - Refer to Figure 2.

5.3 ISA Sampling Port Valve → CLOSED

  - Note Scopemeter Pressure Probe reading.
5.4 Repeat steps 5.2 to 5.3 until Scopemeter Pressure Probe P ~ 550 mmHg (~8 minutes).

5.5 ISA Sampling Port Valve → CLOSED

5.6 Doff Ear Plugs.

6. PERFORMING GROSS LEAK CHECK

6.1 Record Scopemeter Pressure Probe P1: ________ mmHg
   Record GMT ____/____:____:____ GMT
   Notify MCC-H pressure reading.

6.2 Wait 10 minutes for thermal stabilization.

6.3 Record Scopemeter Pressure Probe P2: ________ mmHg
   Record GMT ____/____:____:____ GMT
   Notify MCC-H pressure reading.

6.4 Wait 10 minutes.

6.5 Record Scopemeter Pressure Probe P3: ________ mmHg
   Record GMT ____/____:____:____ GMT
   Notify MCC-H pressure reading.

* If ∆P |P2-P3| > 4 mmHg during monitoring period
* Notify MCC-H of suspected vestibule leak.
* MCC-H for further instructions

7. EQUALIZING VESTIBULE PRESSURE POST LEAK CHECK

---

**WARNING**

Opening the ISA Sample Port and MPEV will equalize ISS with the vestibule and may cause a loud hissing noise.
Crew in the vicinity should don Ear Plugs.

7.1 Don Ear Plugs.

Node 1 Deck Hatch

7.2 Node 1 Deck MPEV → CLOSED

7.3 ISA Sampling Port Valve → Open
   Wait 10 seconds.

7.4 5 ft VAJ (bent end) ←|→ Node 1 Deck MPEV
   Gamah Cap →|← 5 ft VAJ (bent end)
1.102 NODE 1 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK
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7.5 Node 1 Deck MPEV → OPEN

PCS

7.6 US Lab: ECLSS
   Lab: ECLSS

   When dp/dt ~0 (approximately 30 seconds)
   Node 1 Deck MPEV → CLOSED

7.7 Doff Ear Plugs.

8. **POST MAINTENANCE**

8.1 ON/OFF → Press (to power down Scopemeter)

8.2 Scopemeter Pressure Probe slide switch → OFF

8.3 Scopemeter ←|→ Scopemeter Pressure Probe on ISA

8.4 5 ft VAJ (straight end) ←|→ ISA VAJ Port
     Gamah Cap →|← 5 ft VAJ (straight end)
     Gamah Cap →|← ISA VAJ Port

8.5 √ISA Sampling Port Valve – OPEN
     Cap →|← ISA Sampling Port
     Refer to Figure 2

8.6 Check for FOD within 3' radius.

8.7 Notify **MCC-H** of task completion.

8.8 Stow tools, materials.
     Update IMS with stowage location of hardware.
1.103 MPLM ACTIVATION
(MPLM/ULF1 - ALL/FIN 3) Page 1 of 11 pages

OBJECTIVE:
Activate the MPLM in preparation for ingress. This procedure is performed in parallel with S&M/1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS.

√MCC-H for MPLM manual or automatic activation preference

WARNING
MPLM power umbilical mating operations must be complete prior to performing MPLM activation to avoid electrical shock hazard.

NOTE
1. Verify with crewmembers performing S&M/1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS that MPLM Power (one) and 1553 Data Jumpers (two) are installed, associated C&DH buses have been reconfigured, and they are ready for MPLM activation up through completion of auto(manual) activation part 1.

2. Wait 5 minutes after applying ISS power to ensure MPLM MDM bootup is complete.

3. MCC-H: Expect ‘I/O Card BIT Status Fail’ message due to smoke detector being powered off.

*********************************************************************************
* If activating MPLM on APCU power, go to step 3.  
*********************************************************************************

PCS 1. ACTIVATING MPLM ON ISS POWER
1.1 Verify MPLM Power Inhibits No Longer Required
Verify with ISS IV crew that MPLM power jumper installation is complete.

1.2 Verify RPCM LA2A3B D On
US Lab: EPS: Lab Rack LAB1O6
Lab Rack LAB1O6

sel RPCM LA2A3B D

RPCM_LA2A3B_D

√Integ Counter – incrementing
√Bus Voltage, V: 120.2 to 128.8V
2. **CLOSING RPC TO APPLY POWER TO MPLM**

RPCM_LA2A3B_D

sel RPC 4

**RPCM_LA2A3B_D_RPC_04**

**cmd** Close Cmd – Enable (√ – Ena)

**cmd** RPC Position – Close (Verify – Cl)

* If activating MPLM on ISS power, go to step 4.

3. **ACTIVATING MPLM ON APCU POWER**

3.1 Verify APCU Input Power

R1

√tb PL PRI MNC – On

3.2 Verify APCU Control Power

√PL CAB – MNA

√PL AUX – On

3.3 Verify APCU Switch Power

L12U

√cb SW PWR 1 – Cl (cb2)

**CAUTION**

To prevent damage to internal converter and relay, APCU output relay must not be opened or closed under load (CONV – On (tb – gray)).

3.4 Verify APCU 1,2 Deactivated

√APCU 1,2 CONV (two) – Off

√tb APCU 1,2 CONV (two) – bp

3.5 Close APCU Output Relays

Verify with ISS IV crew that **{1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS} (SODF: S&M: NOMINAL: VESTIBLE)** is complete through step 20.

Notify ISS IV crew that APCU power is coming ON.

APCU 1 OUTPUT RLY (two) → Close

3.6 Turn APCU Converters On

APCU 1,2 CONV (two) → On

√tb APCU 1,2 CONV (two) – gray

√tb APCU 1 OUTPUT RLY – gray

**SM 200 APCU STATUS**

√APCU 1,2 OUT VOLTS RES LOW (two) 120 to 128V
4. **LOADING MPLM LOCATION PPL**

To build and uplink data load command to the Primary INT SYS MDM, DRAM, perform **{1.231 CCS BUILD DATA LOAD COMMAND}**, all (SODF: GND AVIONICS: C&DH: NOMINAL), then:

- Input Load Image file – intr2_ppl_0060_4_a_00002.lif
- Input Ops name – MPLM attached to Node 1

**PCS**

CDH: INT PRIMARY: PPL Version IDs

<table>
<thead>
<tr>
<th>Primary Int PPL Version IDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘MPLM Location’</td>
</tr>
</tbody>
</table>

- Version Number – 60
- Version ID – 2

5. **ENABLING INTSYS MDM TO MPLM MDM I/O**

Wait 5 minutes after applying ISS power, then:

**Task:**
- **Task Nav**
  - ‘Multi-flight Task Displays’

- **sel MPLM Act-Deact**
  - ‘MDM Control’

- **sel Primary Int MDM**

- **sel LB SYS HAB 1**

- **sel RT Status**

  - **cmd 17 MPLM-1 RT Status – Enable** _Execute_

  - √17 MPLM-1 RT Status – Ena

  - **cmd 17 MPLM-1 RT FDIR Status – Enable FDIR** _Execute_

  - √17 MPLM-1 RT FDIR Status – Ena

  - **MPLM Act-Deact**
    - ‘MDM Control’

  - **sel MPLM MDM**
6. PDB ACTIVATION AND CHECKOUT

MPLM Act-Deact
‘PDB Control’

sel PDB Details

PDB Details

`cmd` APS – On

**NOTE**
MPLM can be powered from either the orbiter APCU or USOS ISS power. While powered from either orbiter APCU or ISS power, the MPLM PDB Input Voltage telemetry will show on the PCS in the PDB Input Voltage (Orbiter) field.

APS Posn – On
PDB Input Voltage (Orbiter) $\geq$ 116V
PDB Current: 0.5 to 1.0A

MPLM Act-Deact
‘PDB Control’

Verify RPC 01 MDM Posn – Cl

All other RPCs Posn – Op

7. ACTIVATING MPLM ISS SHELL HEATERS

MCC-H if MPLM air temperature is estimated to be <10° F above the calculated ISS dew point, perform the following:

‘PDB Control’

sel PDB Details

PDB Details

`cmd` RPC 23 – Close

Verify RPC 23 Shell Htr Posn – Cl
Verify RPC 23 Shell Htr Voltage, V: 115 to 130V
8. **VERIFYING MPLM CONFIGURATION FOR ACTIVATION**

8.1 **Powering and Enabling Node 1 IMV Valve**

<table>
<thead>
<tr>
<th>MPLM Act-Deact</th>
<th>‘IMV and SDS’</th>
</tr>
</thead>
<tbody>
<tr>
<td>sel Node 1 IMV Deck Aft</td>
<td></td>
</tr>
<tr>
<td>Node 1 IMV Deck Aft Vlv</td>
<td></td>
</tr>
<tr>
<td>sel RPCM N13B B RPC 15</td>
<td></td>
</tr>
<tr>
<td>RPCM_N13B_B_RPC_15</td>
<td></td>
</tr>
</tbody>
</table>

√Close Cmd – Ena

cmd RPC Position – Close (Verify – Cl)

| Node 1 IMV Deck Aft Vlv |
| ‘Enable’ |

cmd Arm (√Arm Status – Armed)
cmd Enable (√State – Enabled)

8.2 **Verifying MPLM Configuration**

Task:

| Task Nav |
| ‘Multi-flight Task Displays’ |

<table>
<thead>
<tr>
<th>sel MPLM Act-Deact</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPLM Act-Deact</td>
</tr>
</tbody>
</table>

√Node 1 IMV Deck Aft Vlv Posn – Cl
√MPLM IMV Aft, Fwd Vlv Posn (two) – Cl
√MPLM SDS Isov Vlv Posn – Cl

‘DA and PPRA’

√DA1 Inbd,Outbd Vlv Posn (two) – Cl
√DA2 Inbd,Outbd Vlv Posn (two) – Cl
√PPRA 1,2,3 Vlv Posn (three) – Op

‘Automatic Control – Auto Activate’

√Part 1 Activate Status – Idle√Part 2 Activate Status – Idle

‘Automatic Control – Auto Deactivate’
1.103 MPLM ACTIVATION
(MPLM/ULF1 - ALL/FIN 3) Page 6 of 11 pages

√Deactivate Status – Idle

For MANUAL ACTIVATION PART 1, go to step 10.

9. AUTO ACTIVATION PART 1
‘Automatic Control – Auto Activate’

  cmd Part 1 – Arm

  √Part 1 Arm Status – No Error
  √Part 1 Activate Status – Armed

  cmd Part 1 – Activate

  √Part 1 Activate Status – Activating

  When Part 1 Activate Status – Idle (75 seconds from Activate command), continue

  ‘PDB Control’

  √RPC 11 Cab Fan Posn – Cl
  √RPC 13 SD Posn – Cl

  ‘SD, Cab Fan, and Pressure’

  √SD Status – No Fire
  √Cab Fan Spd: 3056 to 4048 rpm

10. AUTO ACTIVATION PART 2
Verify with crewmembers performing {1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS} (SODF: S&M: NOMINAL: VESTIBULE) that the Node 1 to MPLM IMV Supply Jumper (Aft) is installed and is ready for MPLM AUTO ACTIVATION PART 2.

If MCC-H directs MANUAL ACTIVATION PART 2, go to step 11.

Task:

  Task Nav
  ‘Multi-flight Task Displays’

  sel MPLM Act-Deact

  [MPLM Act-Deact]
  ‘Automatic Control – Auto Activate’

  cmd Part 2 – Arm

  √Part 2 Arm Status – No Error
  √Part 2 Activate Status – Armed

  cmd Part 2 – Activate
1.103 MPLM ACTIVATION
                  (MPLM/ULF1 - ALL/FIN 3) Page 7 of 11 pages

√Part 2 Activate Status – Activating

When Part 2 Activate Status – Idle (2 minutes from Activate command), continue

‘IMV and SDS’

√MPLM IMV Aft, Fwd Vlv Posn (two) – Op

‘DA and PPRA’

√PPRA 1,2,3 Vlv Posn (three) – Cl

‘PDB Control’

Verify RPC 02 Gen Lt 1 Posn – Cl
Verify RPC 03 Gen Lt 2 Posn – Cl
Verify RPC 04 Gen Lt 3 Posn – Cl
Verify RPC 05 Gen Lt 4 Posn – Cl
Verify RPC 06 Gen Lt 5 Posn – Cl
Verify RPC 07 Gen Lt 6 Posn – Cl
Verify RPC 08 Gen Lt 7 Posn – Cl
Verify RPC 09 Gen Lt 8 Posn – Cl
Verify RPC 10 Emer Lts Posn – Cl

√Converter 1,2 Status (two) – Off

Report to MCC-H, “MPLM AUTO ACTIVATION is complete.” >>

11. MANUAL ACTIVATION PART 1

   NOTE
   This step required only if MPLM ACTIVATION PART 1 not performed using automatic macro command.

11.1 Activate SD
    Task:
    Task Nav
    ‘Multi-flight Task Displays’

    sel MPLM Act-Deact

    [MPLM Act-Deact]
    ‘PDB Control’

    sel PDB Details

    [PDB Details]

    cmd RPC 13 – Close (Verify DSD RPC Posn – Cl)
11.2 **Activate Cab Fan**

Task:

- **Task Nav**
  - ‘Multi-flight Task Displays’

sel MPLM Act-Deact

- **MPLM Act-Deact**
  - ‘PDB Control’

sel PDB Details

- **PDB Details**

**cmd** RPC 11 – Close (Verify CFA RPC Posn – Cl)

sel MPLM SD

- **MPLM SD**

**cmd** Initiate

Wait 5 seconds.

√ Smoke Status – No Smoke

- **Smoke Status** – No Smoke

- **Pressure**

- **SD, Cab Fan, and Pressure**

sel MPLM Cab Fan

- **MPLM Cabin Fan**
  - ‘State – On’

**cmd** On

- **State** – On
- **Speed:** 3056 to 4048 rpm
## 12. MANUAL ACTIVATION PART 2

### NOTE

1. Verify with crewmembers performing 1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS that the Node 1 to MPLM IMV Supply Jumper (Aft) is installed and is ready for MPLM MANUAL ACTIVATION PART 2.

2. This step is required only if MPLM ACTIVATION PART 2 is not performed using automatic macro command.

### 12.1 Enable MPLM IMV Valve Power

**Task:**

- Task Nav
- ‘Multi-flight Task Displays’

```plaintext
sel MPLM Act-Deact

MPLM Act-Deact
‘PDB Control’

sel PDB Details

PDB Details
```

**cmd**

- Converter 02 – On (√Posn – On)
- RPC 15 – Close (Verify ISOV1 RPC Posn – Cl)
- RPC 16 – Close (Verify ISOV2 RPC Posn – Cl)

### 12.2 Open MPLM IMV Valves

**Task:**

- Task Nav
- ‘Multi-flight Task Displays’

```plaintext
sel MPLM Act-Deact

MPLM Act-Deact
‘IMV and SDS’

sel MPLM IMV Aft

MPLM IMV Ovhd Aft Vlv
‘Position – Open’

cmd Open (√Position – Open)

MPLM Act-Deact
‘IMV and SDS’

sel MPLM IMV Fwd```
1.103 MPLM ACTIVATION
(MPLM/ULF1 - ALL/FIN 3)

12.3 Remove Power from IMV
Task:
- Task Nav
  - ‘Multi-flight Task Displays’

  sel MPLM Act-Deact

  **MPLM Act-Deact**
  - ‘PDB Control’

  sel PDB Details

  **PDB Details**

  **cmd** RPC 15 – Open (√ISOV1 RPC Posn – Op)
  **cmd** RPC 16 – Open (√ISOV2 RPC Posn – Op)
  **cmd** Converter 02 – Off (√Posn – Off)

12.4 Enabling PPRA Motorized Valve Power
**cmd** Converter 01 – On (√Posn – On)
**cmd** RPC 27 – Close (Verify PPRA All RPC Posn – Cl)

12.5 Close PPRA Motorized Valves
Task:
- Task Nav
  - ‘Multi-flight Task Displays’

  sel MPLM Act-Deact

  **MPLM Act-Deact**
  - ‘DA and PPRA’

  sel MPLM PPRA

  **MPLM PPR Assemblies**

  **cmd** PPRA 1,2,3 (three) – Close

  √PPRA 1,2,3 Valve Position (three) – Closed

12.6 Remove Power from PPRAs
Task:
- Task Nav
  - ‘Multi-flight Task Displays’

  sel MPLM Act-Deact

  **MPLM IMV Ovhd Fwd Vlv**
  - ‘Position – Open’

  **cmd** Open (√Position – Open)
1.103 MPLM ACTIVATION
(MPLM/ULF1 - ALL/FIN 3) Page 11 of 11 pages

MPLM Act-Deact
‘PDB Control’

sel PDB Details

PDB Details

**cmd** RPC 27 – Open (√PPRA All RPC Posn – Op)
**cmd** Converter 01 – Off (√Posn – Off)

12.7 Configuring General Lighting

PDB Details
‘All GLAs’

**cmd** All GLAs – ON

Verify RPC 02 GLA1 Posn – Cl
Verify RPC 03 GLA2 Posn – Cl
Verify RPC 04 GLA3 Posn – Cl
Verify RPC 05 GLA4 Posn – Cl
Verify RPC 06 GLA5 Posn – Cl
Verify RPC 07 GLA6 Posn – Cl
Verify RPC 08 GLA7 Posn – Cl
Verify RPC 09 GLA8 Posn – Cl

12.8 Enable Power to Emergency Egress Lights

**cmd** RPC 10 – Close (Verify ELPS RPC Posn – Cl)

√RPC 10 ELPS Voltage, V: 116 to 130V

Report to **MCC-H**, “MPLM MANUAL ACTIVATION is complete.”
OBJECTIVE:
Ingress and configure the MPLM for on-orbit operations.

EQUIPMENT REQUIRED:
Unstow:
- R&MA's
- PBA
- PFE
- Air Sample Bottle
- Surgical Masks
- Eye Protection

CAUTION
Wear Surgical Masks and Eye Protection if
initial MPLM ingress.

1. INGRESSING MPLM

MPLM 1.1 Open Hatch per decal.

MPEV – CLOSED

MPLM 1.2 Visually inspect MPLM for condensation, atmosphere quality,
general condition, etc.
Report condition to **MCC-H**.

1.3 Collect one air sample inside the MPLM and label location and GMT
of sample.

1.4 Stow Air Sample Bottle for return to Houston.

2. OPENING NODE 1 DECK AFT IMV VLV

PCS 2.1 Task:
- **Task Nav**
  'Multi-flight Task Displays'

sel MPLM Act-Deact

- **MPLM Act-Deact**
  'IMV and SDS'

sel Node 1 IMV Deck Aft

- **Node 1 IMV Deck Aft Vlv**
  'RPCM N13B B RPC 15'
1.104 MPLM INGRESS
(MPLM/LF1 - ALL/FIN 4/SPN)    Page 2 of 4 pages

"RPC Position – Closed
‘State’
√State – Enabled

2.2 ‘Open’

**cmd** Arm (√Status – Armed)
**cmd** Open (√Position – In Transit)

Wait 25 seconds.

√Position – Open

NOD1 S4-02

2.3 Node 1 RAMV Temperature Control → Full Warm (□)

3. R&MA AND LIGHTING SETUP
3.1 Alcove R&MA Restraint Assy, Foot-Anchor → Install

3.2 Manually adjust GLA Intensity dial for comfort.

Ovhd Aft Alcove

3.3 Remove Emergency Lighting Power Supply access cloth cover (Velcro).

sw EEL → TEST (hold 3 to 5 seconds)

Verify TEST Lamp illuminates.

sw EEL → Enable

Ovhd Aft Alcove

Reinstall Emergency Lighting Power Supply access cloth cover (Velcro).

4. VERIFYING NPRV COVERS CLOSED

Ovhd Fwd Alcove

4.1 √NPRV Covers (three) – Cl

Velcro cloth closeout cover in closed position.

MPLM Deck Endcone

4.2 √NPRV Covers (two) – Cl

5. INSTALLING PFE AND PBA

5.1 Retrieve PFE from NOD1P2-14 and stow in MPLM Stbd Alcove.

5.2 Retrieve PBA from NOD1P2-14 and stow in MPLM Fwd Alcove.
6. **ESTABLISHING MCA SAMPLING OF MPLM**

Opening SDS Valve

Task:

- **Task Nav**
  - ‘Multi-flight Task Displays’

- sel MPLM Act-Deact

  - **MPLM Act-Deact**
  - ‘IMV and SDS’

- sel MPLM SDS Isov

  - **MPLM SDS Isov**
  - ‘Master’

**cmd** Open (√Position – Open)

Report to **MCC-H**, “MPLM Ingress is complete.”

**NOTE**

**MCC-H** will perform steps 7 and 8 from the ground.

**MCC-H** 7. **VERIFYING MPLM LOCATION PPL**

**PCS**

CDH: INT PRIMARY: PPL Version IDs

- **Primary Int PPL Version IDs**
  - ‘MPLM Location’

Verify Version Number – 60
Verify Version ID – 2

**MCC-H** 8. **AUTOSEQUENCE CHANGE INITIATION**

**NOTE**

1. Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, but the fan state is off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored. Conversely if the fan state is on and the valve is closed there will be no notice the MCA is no longer able to sample the MPLM.

2. When the MPLM is present, the nominal autosequence list will include the Lab, Node, Airlock, and MPLM modules

**PCS**

US Lab: ECLSS: AR Rack

- **LAB AR Rack Overview**
  - ‘MCA’

√State – Operate (Standby)
Per SPN 3572 (5A - x2 INTR3), the MCA can get out of sync with the INT SYS after an autosequence command. To prevent this, a Standby Immediate command should be issued first.

If State ≠ Standby

‘Standby Immediate’

**cmd** Standby Immediate

\\sqrt{State – Standby}

If desired autosequence list is LAB/Node1/Airlock/MPLM or LAB/Node1/Airlock, LAB/Node1

---

**NOTE**

Expect transient ‘**MCA Pressure Out of Tolerance - LAB**’ caution. Refer to PRACA 3660.

---

**US Lab: ECLSS: AR Rack**

**LAB AR Rack Overview**

‘**MCA**’

‘**Auto Sequence**’

**cmd** LAB/Node1/Airlock/MPLM (LAB/Node1/Airlock) (LAB/Node1)

\\sqrt{State – Operate}

**US Lab: ECLSS: AR: MCA: Additional Tlm**

**LAB MCA Additional Tlm**

\\sqrt{Invalid Sequence – blank}

If another autosequence list is desired, go to **(2.301 MCA AUTO SEQUENCE LIST CHANGE)**, all (SODF: ECLSS: NOMINAL: ARS).
OBJECTIVE:
Remove all ISS items from the MPLM and configure the MPLM for final closeout.

MPLM EQUIPMENT TRANSFER
1. Visually inspect MPLM crew compartment to verify all contents are secure.
2. Remove any R&MA’s which were brought from ISS.
   Stow in ISS (leave Alcove in place).
   Stow R&MA’s in Node 1 and LAB as desired.
3. Stbd Alcove → PFE → Remove
   Stow in Node 1 spare PFE locker.
4. Fwd Alcove → PBA → Remove
   Stow in Node 1 spare PBA locker.
5. Report to MCC-H, “MPLM PFE and PBA have been removed.”

FINAL CLOSEOUT

CAUTION
Failure to leave the NPRV Cover open upon MPLM egress could cause degraded MPLM NPR performance and deformation of MPLM Closeout Panels during reentry.

6. Ovhd Fwd Alcove → MPLM NPRV Closeout Cover → Release cloth Closeout Cover from Velcro
   → Fold cover back → Velcro open

7. Ovhd Aft Alcove → Remove Emergency Lighting Power Supply access cloth cover with Velcro.
   EEL → Disable

8. Ovhd Aft Alcove → Reinstall Emergency Lighting Power Supply access cloth cover with Velcro.
   Do not depress RCA OFF button when exiting module.
   Ground control of MPLM GLAs may be required for MPLM environment checks in orbiter Payload Bay.

8. Alcove R&MA equipment → Remove
   Stow in Node 1 or LAB as desired.
MPLM HATCH CLOSURE

CAUTION
To prevent possible interference between Hatch Kicker Pin and MPLM bulkhead, kicker pins (eight) position must be verified to be clear of the bulkhead structure prior to hatch closure. Failure to comply could result in hardware damage to pin/bulkhead and FOD.

9. Perform MPLM Hatch Close per decal steps 1 to 3 to partially close hatch, allow access to Hatch Kicker Pins (eight).

NOTE
1. Hatch Kicker Pins may already be in correct position; therefore, step 10 is required only if visual inspection shows re-positioning is necessary.
2. Hatch Kicker Pins known to be stiff, may be difficult to move.

10. Check Hatch kicker pins (eight) slid toward the closest Hatch corner. Refer to Figure 1, slide in direction of red arrows.

![Figure 1.- Hatch Kicker Pin Location.](image)

11. Fully close MPLM Hatch per decal.
√ MPEV – Closed

TERMINATING IMV WITH NODE

NOD1 12. Node 1 RAMV Temperature Control → Full Cool (or for crew comfort)
S4-02
1.105 MPLM EGRESS
(MPLM/LF1 - ALL/FIN 3/SPN)    Page 3 of 4 pages

CLOSED IMV DECK AFT IMV VLV

PCS

13. Task:
   Task Nav
   ‘Multi-flight Task Displays’

   sel MPLM Act-Deact

   MPLM Act-Deact
   ‘IMV and SDS’

   sel Node 1 IMV Deck Aft

   Node 1 IMV Deck Aft Vlv

   √ State – Enabled

   ‘Close’

   cmd Arm (√ Status – Armed)
   cmd Close (√ Position – In Transit)

Wait 25 seconds, then:
   √ Position – Closed

14. NODE 1 IMV DECK AFT VALVE DEACTIVATION

14.1 sel RPCM N13B B RPC 15

RPCM_N13B_B_RPC_15

   √ Open Cmd – Ena

   ‘RPC Position’

   cmd Open (√ – Op)

PCS

15. Terminating MCA Sampling of MPLM

US Lab: ECLSS: AR Rack

LAB AR Rack Overview

   ‘MCA’

   √ State – Operate
The nominal autosequence list will include Node, Airlock, and Lab modules when MPLM is not available.

If desired autosequence list is LAB/Node1/Airlock, or LAB/Node1

Per SPN 3572 (5A - x2 INTR3), the MCA can get out of sync with the INT SYS after an autosequence command. To prevent this, a Standby Immediate command should be issued first.

`Standby Immediate`

**cmd** Standby Immediate

\> State – Standby

`Auto Sequence`

**cmd** LAB/Node1/Airlock (LAB/Node1)

\> State – Operate

US Lab: ECLSS: AR Rack: MCA: Additional Tlm

LAB MCA Additional Tlm

\> Invalid Sequence – blank

If another autosequence list is desired, go to **2.301 MCA AUTO SEQUENCE LIST CHANGE**, all (SODF: ECLSS: NOMINAL: ARS).
OBJECTIVE:
Deactivate the MPLM in preparation for closeout and unberthing.

√MCC-H for Manual or Automatic Deactivation preference

1. **CHECKING MPLM SOFTWARE CONFIGURATION**
   Task:
   - Task Nav
     'Multi-flight Task Displays'
   - sel MPLM Act-Deact
   - [MPLM Act-Deact]
     'Automatic Control – Auto Activate'
   - √Part 1 Activate Status – Idle
   - √Part 2 Activate Status – Idle
     'Automatic Control – Auto Deactivate’
   - √Deactivate Status – Idle

   For Manual Deactivation, go to step 3.

2. **DEACTIVATING AUTOMATIC MPLM**
   - [MPLM Act-Deact]
     'Automatic Control – Auto Deactivate’

   cmd Arm

   √Arm Status – No Error
   √Deactivate Status – Deact Armed

   cmd Deactivate (√Deactivate Status – Deactivating)

   When Deactivate Status – Idle (2 minutes from Deactivate command),
   continue
   - ‘PDB Control’
   - √Converter 1,2 Status (two) – Off
     ‘SD, Cab Fan, and Pressure’
   - √Cab Fan Spd: 2000 rpm
     ‘IMV and SDS’
1.106 MPLM DEACTIVATION
(MPLM/LF1 - ALL/FIN 4) Page 2 of 6 pages

1.106 MPLM DEACTIVATION
(MPLM/LF1 - ALL/FIN 4) Page 2 of 6 pages

√MPLM IMV Aft, Fwd Vlv Posn (two) – Cl
√MPLM SDS Isov Vlv Posn – Cl
‘DA and PPRA’
√PPRA 1,2,3 Vlv Posn (three) – Op

Go to step 4.

3. DEACTIVATING MANUAL MPLM

NOTE
This step required only if MPLM deactivation not performed using automatic macro command.

3.1 Enabling MPLM IMV Valve Power

MPLM Act-Deact
‘PDB Control’

sel PDB Details

PDB Details

cmd Converter 02 – On (√Posn – On)

3.2 Closing MPLM IMV Valves

MPLM Act-Deact
‘IMV and SDS’

sel MPLM IMV Aft

MPLM IMV Ovhd Aft Vlv
‘Position – Close’

cmd Close (√Position – Closed)

MPLM Act-Deact
‘IMV and SDS’

sel MPLM IMV Fwd

MPLM IMV Ovhd Fwd Vlv
‘Position – Close’

cmd Close (√Position – Closed)
3.3 Removing Power from IMV

MPLM Act-Deact
‘PDB Control’

sel PDB Details

PDB Details

**cmd** RPC 15 – Open (√ISOV1 RPC Posn – Op)
**cmd** RPC 16 – Open (√ISOV2 RPC Posn – Op)
**cmd** Converter 02 – Off (√Posn – Off)

3.4 Closing SDS Valve

MPLM Act-Deact
‘IMV and SDS’

sel MPLM SDS Isov

MPLM SDS Isov
‘Master’

**cmd** Close

‘Position’

√Position – Closed

3.5 Shutting Down Cabin Fan and DSD

MPLM Act-Deact
‘SD, Cab Fan, and Pressure’

sel MPLM Cab Fan

MPLM Cabin Fan
‘State – Off’

**cmd** Arm

**cmd** Off

√Speed decreases to 2000 rpm

MPLM Act-Deact
‘PDB Control’

sel PDB Details
PDB Details

**cmd** RPC 11 – Open (√CFA RPC Posn – Op)
**cmd** RPC 13 – Open (√DSD RPC Posn – Op)

3.6 Enabling PPRA Motorized Valve Power

**PDB Details**

**cmd** Converter 01 – On (√Posn – On)
**cmd** RPC 27 – Close (Verify PPRA All RPC Posn – Cl)

3.7 Opening PPRA Motorized Valves

**MPLM Act-Deact**
‘DA and PPRA’

sel MPLM PPRA

**MPLM PPR Assemblies**

**cmd** PPRA 1,2,3 Valve (three) – Open (√Valve Position – Open)

3.8 Removing Power from PPRAs

**MPLM Act-Deact**
‘PDB Control’

sel PDB Details

**PDB Details**

**cmd** RPC 27 – Open (√PPRA All RPC Posn – Op)
**cmd** Converter 01 – Off (√Posn – Off)

3.9 Removing Power from GLA and ELPS

**cmd** All GLAs – OFF

√RPC 02-09 (GLAs 1-8) RPC Posn – Op

**cmd** RPC 10 – Open (√ELPS RPC Posn – Op)

4. DEACTIVATING MPLM PDB

**NOTE**
PDB data becomes unchanging and invalid when PDB Aux Pwr Supply (APS) is removed in next step.

Task:

**Task Nav**
‘Multi-flight Task Displays’
1.106 MPLM DEACTIVATION
(MPLM/LF1 - ALL/FIN 4) Page 5 of 6 pages

sel MPLM Act-Deact
MPLM Act-Deact
‘PDB Control’

sel PDB Details
PDB Details

cmd APS – Off (√Posn – Off)

5. INHIBITING I/O WITH MPLM MDM
MPLM Act-Deact
‘MDM Control’

sel Primary Int MDM
Primary Int MDM

sel LB SYS HAB 1
LB SYS HAB1

sel RT Status
LB SYS HAB 1 RT Status

cmd 17 MPLM-1 RT FDIR Status – Inhibit FDIR Execute

√17 MPLM-1 RT FDIR Status – Inh

cmd 17 MPLM-1 RT Status – Inhibit Execute

√17 MPLM-1 RT Status – Inh

************************************************************************
* If MPLM operating on APCU power, go to step 7.  
************************************************************************

6. OPENING RPC TO REMOVE POWER FROM MPLM
US Lab: EPS: Lab Rack LAB106
Lab Rack LAB106

sel RPCM LA2A3B D
RPCM_LA2A3B_D

sel RPC 4
RPCM_LA2A3B_D_RPC_04

cmd RPC Position – Open (Verify – Op)
cmd Close Cmd – Inhibit (Verify – Inh)

**CAUTION**

To prevent damage to internal converter and relay, APCU output relay must not be opened or closed under load (Converter – On (tb – gray)).

7. **TURNING APCU OFF TO REMOVE POWER FROM MPLM**

L12U

7.1 Turning APCU Converters Off

APCU 1,2 CONV (two) → Off

√APCU 1,2 CONV tb (two) – bp

7.2 Opening APCU Output Relays

APCU 1 OUTPUT RLY → Open

√APCU 1,2 OUTPUT RLY tb – bp

Report to **MCC-H**, “MPLM deactivation is complete.”

**NOTE**

**MCC-H** will perform step 8 from the ground.

**MCC-H**

8. **LOADING MPLM NOT PRESENT PPL**

To build and uplink data load command to the Primary INT SYS MDM, DRAM only, perform **{1.231 CCS BUILD DATA LOAD COMMAND}**, all (SODF: GND AVIONICS: C&DH: NOMINAL), then:

input Load Image file – intr2_ppl_0060_4_a_00001.lif
input Ops name – MPLM not present

PCS

CDH: INT PRIMARY: PPL Version IDs

Primary Int PPL Version IDs

‘MPLM Location’

√Version Number- 60
√Version ID - 1
OBJECTIVE:
Depress the Node 1 MPLM vestibule in preparation for MPLM unberthing.

TOOLS AND EQUIPMENT REQUIRED:
IMS
MPEV Internal Sampling Adapter (ISA)  P/N 97M55830-1
Scopemeter  P/N SEG39129678-303
Vacuum Access Jumper (VAJ) 35 ft  P/N 683-17111-2
Vacuum Access Jumper (VAJ) 5 ft  P/N 683-17111-1

1. ISA/SCOPEMETER SETUP AND ACTIVATION
   1.1 Uncap one ISA-VAJ port.
   1.2 √ Other ISA-VAJ port (1of 2) is capped
       
      NOTE
      Scopemeter will be face down with respect to ISA Pressure Module, if installed properly.

   1.3 Attach Scopemeter to ISA Pressure Module.
   1.4 √ COM-COM and V-V on Scopemeter to ISA Pressure Module connection
   1.5 On Scopemeter, while holding down the F5 button, press and release the ON/OFF button only, listen for two beeps, then release F5. This will perform a Scopemeter master reset.
   1.6 Press F5 to highlight EXT.mV mode, then:
      If required, press F1 to close mode change message.

2. PRESSURE MODULE BATTERY VERIFICATION
   2.1 √ ISA Pressure Module – OFF
   2.2 Verify V reading is > 100 mV DC (ISA Pressure Module battery reading).
      If reading < 100 mV DC, ISA Pressure Module should be swapped with a spare or the battery must be replaced.

3. PRESSURE VERIFICATION
   3.1 ISA Pressure Module → mmHg

   3.2 Record ISA pressure: __________ mmHg
      (1mV = 1 mmHg, readout X 1000 = mmHg)
PCS  3.3 US Lab: ECLSS

Record Cab Press: __________ mmHg
Calculate $\Delta P$ (ISA Pressure – Cab Press): __________ mmHg

If $\Delta P > 20$ mmHg
√MCC-H for instructions >>

4. ISA/VAJ/MPEV SETUP

4.1 $\sqrt{\text{Node 1 Deck MPEV - CLOSED}}$

4.2 Uncap Node 1 Deck MPEV and ends of 5 ft VAJ hose. Inspect soft seals to verify they are properly seated and in good condition (no nicks or cuts).

4.3 Connect bent end of 5 ft VAJ to Node Deck MPEV.

4.4 Connect other end of 5 ft VAJ to ISA. Refer to Figure 1.

4.5 Uncap PCA Vacuum Access Port (LAB1DO-02) and ends of 35 ft VAJ hose. Inspect soft seals to verify they are properly seated and in good condition (no nicks or cuts).

Attach bent end of 35 ft VAJ to Lab PCA Vacuum Access Port. Attach other end of 35 ft VAJ to second ISA VAJ Port.
WARNING
Hoses will move when pressurized or evacuated. Failure to secure ISA/VAJ assembly may result in injury to crew and/or damage to equipment.

4.6 Secure ISA/VAJ assembly to seat track with bungees and anchors.

NOTE
The following caution message will be received after PPR is inhibited
‘Positive P Relief Failure - LAB’
No action required. This message will return to normal once PPR is reenabled in step 10.

5. PPR INHIBITING
On MCC-H GO
PCS
US Lab: ECLSS: PCA: PCA Commands
LAB PCA Commands
‘Positive Press Relief’
‘Inhibit’

cmd Arm (√Status – Armed)
cmd Inhibit

√Positive Pressure Relief State – Inhibited

WARNING
Opening the VRIV will vent the ISA and VAJs to space and may cause a loud hissing noise. Crew in the vicinity should don ear plugs.

6. ISA/VAJ CONNECTION LEAK CHECK
NODE
6.1 √ISA SAMPLE PORT VALVE – CLOSED
Refer to Figure 2.

Figure 2.- ISA Sample Port Valve.
6.2 Open PCA VRIV
Don earplugs.

PCS
US Lab: ECLSS: PCA
[Lab ACS]
‘Pressure Control Assembly’

sel VRIV

[LAB PCA VRIV]
‘Open’

cmd Arm (√Status – Armed)
cmd Open
√Position – Open
√Open Indicator – √

Wait 10 minutes.
Doff ear plugs.

6.3 Close PCA VRIV
US Lab: ECLSS: PCA
[Lab ACS]
‘Pressure Control Assembly’

sel VRIV

[LAB PCA VRIV]
‘Close’

cmd Close
√Position – Closed
√Closed Indicator – √

Wait 2 minutes.

6.4 Monitoring For ISA/VAJ Leak
Monitor ISA pressure for 5 minutes.

If ISA pressure increases > 10 mmHg during monitoring period
suspect ISA/VAJ leak.
√MCC-H for instructions >>
7. **VESTIBULE DEPRESS**
   7.1 Don ear plugs.

PCS

7.2 US Lab: ECLSS: PCA
   ‘Pressure Control Assembly’

   sel VRIV

   [LAB PCA VRIV 'Open']

   cmd Arm (√Status – Armed)
   cmd Open

   √Position – Open
   √Open Indicator – √

7.3 Node 1 Deck MPEV → OPEN

7.4 Wait 30 minutes for depressurization or until ISA Press < 2 mmHg.
   √ISA Press < 2 mmHg

7.5 Node 1 Deck MPEV → CLOSED
   Wait an additional 10 minutes for thermal stabilization.

7.6 Doff ear plugs.

8. **CLOSING PCA VRIV**

PCS

US Lab: ECLSS: PCA
   ‘Pressure Control Assembly’

   sel VRIV

   [LAB PCA VRIV 'Close']

   cmd Close

   √Position – Closed
   √Closed indicator – √
8.1 Node 1 Deck MPEV → OPEN

Record ISA Pressure P1: _____ mmHg
Record GMT ___/___:___:___ GMT

8.2 Node 1 Deck MPEV → CLOSED

8.3 Wait 30 minutes.

8.4 Node 1 Deck MPEV → OPEN

8.5 Record ISA Pressure P2: _____ mmHg
Record GMT ___/___:___:___ GMT

8.6 If ISA ΔP (P2-P1) > 2 mmHg, suspect Node 1 Deck Hatch leak. √MCC-H for instructions >>

8.7 During next ground comm opportunity, report all pressures and times from previous steps to MCC-H (Lab Cab Press, ISA Pressure, P1, P2).

9. RESIDUAL VESTIBULE VENT
If P2 reading > 2 mmHg
Repeat steps 7 & 8 to vent vestibule pressure.

10. ENABLING PPR
On MCC-H GO

PCS
US Lab: ECLSS: PCA: PCA Commands
LAB PCA Commands
‘Positive Press Relief’

cmd Enable (√Positive Pressure Relief State – Enabled)

11. DETACHING AND STOWING EQUIPMENT
11.1 Node 1 Deck MPEV → CLOSED

11.2 ISA PRESSURE MODULE → OFF

11.3 SCOPEMETER → OFF, Detach from ISA PRESSURE MODULE

11.4 Uncap ISA Sample Port Valve.

11.5 ISA SAMPLE PORT VALVE → OPEN

11.6 Disconnect all VAJs and install all VAJ caps.

11.7 Cap all ISA-VAJ Ports.
11.8 Close and Cap ISA Sample Port Valve.

11.9 Cap Node 1 Deck MPEV.

11.10 Inspect Cap Seal on PCA Vacuum Access Port.
    Replace if necessary.
    Install cap, hand-tighten.

11.11 Stow ISA, Scopemeter, and VAJs in location from which retrieved.
1.111 MPLM CLOSEOUT DEWPOINT READINGS
(MPLM/ULF1 - ALL/FIN)  Page 1 of 2 pages

OBJECTIVE:
Measure the MPLM, SM, and Orbiter dewpoint using the Velocicalc for MPLM closeout.

TOOLS AND EQUIPMENT REQUIRED
LAB1P5_A2  Velocicalc with probe (P/N 8386A)
If batteries need to be replaced
FGB 424  4 AA batteries
Ziplock bag for used batteries

1. BATTERY INSTALLATION
Install 4 AA batteries per the drawing on the inside of the battery compartment.

2. VELOCICALC SETUP

CAUTION

1. Metal probe is conductive and contains delicate sensors. Damage may cause electronics to overheat and/or off-gas. Do not contact power sources or use out-of-visual scope. Do not expose to temperatures greater than 140°F.

2. Do not breathe near the sensor/probe tip. This will bias dewpoint readings.

2.1 Remove Red Probe Sensor Protector.
Press the ON/OFF key.
Wait for powerup to complete (~30 sec). If the unit has not been used for at least 2 weeks, allow the unit to rest for 5 minutes.

2.2 If display reads LO, replace batteries per the drawing on the inside of the battery compartment.
Stow used batteries in ziplock bag and label bag as USED.
Stow bag in trash bag.

2.3 Extend the probe to full extension (bending the probe to a 90° angle is not necessary).

3. SAMPLING DEWPOINT IN THE MPLM, SM, AND ORBITER

NOTE
Take sampling after all crew have exited the MPLM, just prior to hatch closing. Do not reenter MPLM after readings are taken.

3.1 Press and release the HUMIDITY key to toggle display between %RH (humidity), DEWPT (dewpoint), and WETBULB (wet bulb).
Set display to read dewpoint.
DEWPT will be displayed in the lower right corner.
1.111 MPLM CLOSEOUT DEWPOINT READINGS

(MPLM/ULF1 - ALL/FIN)  Page 2 of 2 pages

Node/MPLM Vest  3.2 To obtain a dewpoint reading, position the instrument in the Node 1/ MPLM Vestibule and extend the probe as far as possible into the MPLM and wait for reading to stabilize (approximately 2 minutes).

MPLM dewpoint =___________

3.3 Report dewpoint reading to **MCC-H**. Do not reenter MPLM.

SM/Orbiter  3.4 Take a dewpoint reading in the Service Module near the gas analyzer and in the Orbiter flight deck (allow a 2-minute stabilization for each location).

Service Module dewpoint = ___________

Orbiter flight deck dewpoint = ___________

3.5 Report dewpoint readings to **MCC-H**.

3.6 Press the ON/OFF key to turn unit off. Replace Red Probe Sensor Protector.

4. **STOWAGE**

4.1 After completion of task, remove batteries from Velocicalc and stow with instrument.

4.2 Stow unit after use.
OBJECTIVE:
Measure the Lab CCAA outlet air dewpoint using the Velocicalc to determine the dewpoint of the air supplying the MPLM.

TOOLS AND EQUIPMENT REQUIRED
LAB1P5_A2 VELOCICALC with probe (P/N 8386A)
If batteries need to be replaced
FGB 424 4 AA batteries
Ziplock bag for used batteries

1. BATTERY INSTALLATION
Install 4 AA batteries per the drawing on the inside of the battery compartment.

2. VELOCICALC SETUP

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Metal probe is conductive and contains delicate sensors. Damage may cause electronics to overheat and/or off-gas. Do not contact power sources or use out-of-visual scope. Do not expose to temperatures greater than 140°F.</td>
</tr>
<tr>
<td>2. Do not breathe near the sensor/probe tip. This will bias dewpoint readings.</td>
</tr>
</tbody>
</table>

2.1 Remove Red Probe Sensor Protector.
Press the ON/OFF key.
Wait for powerup to complete (~30 sec). If the unit has not been used for at least 2 weeks, allow the unit to rest for 5 minutes.

2.2 If display reads LO, replace batteries per the drawing on the inside of the battery compartment.
Stow used batteries in ziplock bag and label bag as USED.
Stow bag in trash bag.

2.3 Extend the probe to full extension (bending the probe to a 90° angle is not necessary).

3. SAMPLING DEWPOINT IN THE LAB
3.1 Press and release the HUMIDITY key to toggle display between %RH (humidity), DEWPT (dewpoint), and WETBULB (wet bulb).
Set display to read dewpoint.
DEWPT will be displayed in the lower right corner.
3.2 To obtain a dewpoint reading, extend the probe 1 foot from Lab Air diffuser location and wait for reading to stabilize (approximately 2 minutes).

Lab dewpoint = ______________

3.3 Report dewpoint reading to MCC-H.

3.4 Press the ON/OFF key to turn unit off. Replace Red Probe Sensor Protector.

4. **STOWAGE**

4.1 After completion of task, remove batteries from Velocicalc and stow with instrument.

4.2 Stow unit after use.
Table 1. Cabin Fan/MDM Information

<table>
<thead>
<tr>
<th>(A) Function</th>
<th>(B) Data Type</th>
<th>(C) MDM</th>
<th>(D) Card Type</th>
<th>(E) Slot</th>
<th>(F) Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabin Fan On/Off Cmd</td>
<td>MPLM</td>
<td>DIO #2</td>
<td>4</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>Cabin Fan Speed Cmd</td>
<td>MPLM</td>
<td>AIO #1</td>
<td>3</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>Cabin Fan Speed Tlm</td>
<td>MPLM</td>
<td>AIO #1</td>
<td>3</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>Cabin Fan dP Tlm</td>
<td>MPLM</td>
<td>HLA #2</td>
<td>6</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

1. All displays in this procedure are on the PCS.
2. Cabin Fan Failure message will not be present in C&W Summary if the Summary was closed. The MPLM automatically shuts down the Cabin Fan after a failure, causing the message to return to normal. The message can be found in Log Viewer.
3. Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, but the fan state is off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored.
4. After setting the Cabin Fan Ovld FDI to manual, the Fan will run with dP and RPC current unchecked by the MDM. However, the motor controller (firmware) will not let the Fan temperature exceed 105°C (221°F).
5. The two FDI manual commands must be sent within 10 minutes of each other.
6. Motor windings have internal thermistor for overheat protection. Controller will remove power from motor above 105°C (221°F). Motor requires cool down to recover function. Fan may be restarted when motor temp cools to below 91°C (196°F).
The Fan has three speed sensors that are averaged together that the motor controller uses to control speed. Only one of these sensors is reported to the MDM and the averaged value is not. If the sensor that reports to the MDM drifts or fails, the motor controller will adjust the fan speed to keep the averaged value constant which will result in a difference in the indicated speed and the commanded speed. Depending on exactly how the sensor failed, the difference may be as much as 50%.
The Fan has three speed sensors that are averaged together so that the motor controller uses to control speed. Only one of the sensors is reported to the MDM and the averaged value is not. If a sensor that does not report to the MDM drifts or fails the motor controller will adjust the fan speed to keep the averaged value constant. The speed indicated will be the true speed of the fan.

12. Check current recorded in block 5.  
0.5 < current < 1.0 Amps? 

Yes

13. Transient failure. 
Nominal speed and current.

14. Reactivate FDIR
MPLM: ECLSS: Cab Fan 
MPLM Cabin Fan 
set FDIR Commands 
MPLM FDI Status 
‘FDI Command Status’ 
cmd Automated 
’sState – Auto Enabled 
‘Cabin Fan Ovld’ 
cmd Automated 
’sState – Auto

15. Check current recorded in block 5. 
1.0 < current < 1.3 Amps? 

Yes

Fan motor controller is not controlling speed correctly.

17. Deactivate Fan 
• Perform [3.103 MPLM CABIN FAN ACTIVATION/DEACTIVATION], 
step 2 (SODF: MPLM: CORRECTIVE), then:

18. Non-MDM Speed Sensor failure. Fan will still operate, but speed feedback may be incorrect.

19. MCC-H 
On MCC GO 
• Go to [3.201 ECLSS MPLM SSR 1: MPLM LOSS OF VENTILATION], all 
(SODF: MPLM: CORRECTIVE: SSRs).
1 Determine Failure Cause

Did Failure occur while commanding IMV vlv?

Yes → 2

No → 3

2 Reset Valve and Attempt Open Cmd

- Perform (3.106 MPLM IMV Valve Reconfiguration), step 1.3, then step 1.1 (SODF: MPLM: CORRECTIVE), then:
  - MPLM: ECLSS: IMV B
  - MPLM IMV B Vlv 'Open'
  - cmd Open
  - Position

3 Reset Valve and Reattempt Command

- Perform (3.106 MPLM IMV Valve Reconfiguration), step 1.3, then step 1.1, and reattempt command that failed (SODF: MPLM: CORRECTIVE), then:

4 Sensor Fail High.

Invalid status caused by both sensors reporting true.

5 Transient failure.

6 Check Valve Position

- MPLM: ECLSS: IMV B
  - MPLM IMV B Vlv
  - Position

7 Cmd vlv Closed

8 Sensor Fail High.

Invalid status caused by both sensors reporting true.

9 Determine which sensor has failed.

Was the close command sent in block 3?

Yes → 10

No → 11

10 Close sensor failure.

This failure will not appear until valve is commanded to OPEN.

11 Reposition valve to desired position.

- Continue normal operations.
- To unpower the valve, go to (3.106 MPLM IMV Valve Reconfiguration), step 1.3. (SODF: MPLM CORRECTIVE).

12 Open sensor failure.

This failure will not appear until valve is commanded to CLOSE.

13 To unpower the valve, perform (3.106 MPLM IMV Valve Reconfiguration), step 1.3, (SODF: MPLM: CORRECTIVE), then:

- Use manual override to position IMV valve.

See Table 1 for B and Z references.

Table 1. MPLM IMV Valve MDM/PDB Information

<table>
<thead>
<tr>
<th>Module</th>
<th>Location</th>
<th>Converter</th>
<th>RPC</th>
<th>Valve Driver</th>
<th>MDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPLM</td>
<td>Aft</td>
<td>2</td>
<td>15</td>
<td>VMDS 7</td>
<td>MPLM</td>
</tr>
<tr>
<td>MPLM</td>
<td>Fwd</td>
<td>2</td>
<td>16</td>
<td>VMDS 8</td>
<td>MPLM</td>
</tr>
</tbody>
</table>

All displays in this procedure are on the PCS.

If the valve was manually repositioned, the IMV Vlv Failure caution will sound, because the valve is not in the expected position.

The position of the valve as seen by the MDM is derived from two discrete position sensors at the ends of the valve stroke. When one sensor fails or the valve does not reach the end of its stroke, the software cannot accurately compute the valve’s position. When a sensor detects the presence of the poppet, the sensor reads “true.” When the sensor detects the absence of the poppet, the sensor reads “false.”
14 Reposition
- To send the opposite command from the one sent in block 3, perform [3.106 MPLM IMV VALVE RECONFIGURATION] (SODF: MPLM: CORRECTIVE), then:

Did alarm return to norm?

Yes

15 Sensor fail low. In transit status caused by both sensors reporting false.

No

16 • Determine which sensor has failed.

Was the OPEN command sent in block 14?

Yes

17 Close sensor failure. This failure will not appear until valve is commanded to CLOSE.

No

18 Open sensor failure. This failure will not appear until valve is commanded to OPEN.

19 Degraded Ops

Valve will probably travel its full stroke.

20 Cmd vlv closed

MPLM IMV B Vlv
- 'Close'
  • cmd Close
  • Position

Closed

5

In Transit

Invalid

21 Sensor fail low. In transit status caused by both sensor reporting false.

22 Cmd vlv Closed

MPLM IMV B Vlv
- 'Close'
  • cmd Close (Verify – Closed)

23 Open sensor failure. This failure will not appear until valve is commanded to OPEN.

24 Close sensor failure. This failure will not appear until valve is commanded to CLOSE.

25 • To unpower the valve, perform [3.106 MPLM IMV VALVE RECONFIGURATION] step 1.3, (SODF: MPLM: CORRECTIVE), then:
  • Use manual override to position IMV valve.
2.102 MPLM IMV VALVE FAILURE
(MPLM/UF2 - ALL/FIN 5)  Page 3 of 3 pages

26  Reattempt failed command
   • Expect C&W Alarm to repeat.
   • To send the same command as the one sent in block 3, perform (3.106 MPLM IMV VALVE RECONFIGURATION) (SODF: MPLM: CORRECTIVE), then:
   • Check physical indicator on manual override handle of failed valve.

27  Confirmed sensor failure.

28  • To unpower the valve, perform (3.106 MPLM IMV VALVE RECONFIGURATION) step 1.3 (SODF: MPLM: CORRECTIVE), then:
   • Use manual override to position IMV valve.

29  Manual Override
   • MPLM IMV B Valve Handle → Pull
   • Rotate handle to desired position.
   • If actuator valve does not turn freely, valve is stuck.

30  Failed Motor/Actuator.

31  • To unpower the valve, perform (3.106 MPLM IMV VALVE RECONFIGURATION) step 1.3 (SODF: MPLM: CORRECTIVE), then:
   • Use manual override to position IMV valve.
   • Automatic MPLM isolation is not possible.

32  Sensor failure.

33  • MCC-H

Yes

No
This is a ground only step. The command can only be sent from command inventory.

With the link lost between the PDB and the MDM, the only communications will be to and from the MDM. If this is a passive flight, the pressure, temperature, and smoke detection are being monitored directly by the MDM.

1. Reset PDB Serial I/F
   - Send from command inventory
   - IMDM01SM0383K
   - MPLM MDM Reset PDB Serial IO
   Does the caution disappear?
   Yes
   No

2. Power cycle APS
   - MPLM: EPS: PDB Details
     - PDB Details
     - cmd APS Off
     - cmd APS On
   Does the caution disappear?
   Yes
   No
   Continue operations.

3. Serial Interface failure. The link between the MDM and the PDB has been lost.
A loss of the APS means there is no power being fed to the microcontroller. Commands cannot be sent to the MDM. However, the MDM still has power and it will stay in its last configuration.

CAUTION

MPLM PDB Auxiliary Pwr Failure - MPLM

If APS status changes from On to Off.

Nominal Config: MPLM is activated.

1 Power cycle APS
   MPLM: EPS: PDB Details
   • cmd APS Off
   • cmd APS On
   Does the caution disappear?
   Yes → 2 Errorneous caution, the APS is working correctly.
   No → 3 Check Commanding Status
   MPLM: EPS: PDB Details
   • cmd RPC 02 GLA 1
     – Close
   or
   • cmd RPC 02 GLA 1
     – Open
   Has RPC 02 GLA 1 responded correctly?
   Yes → 4 APS status failure.
   No → 5 Continue operations.
   1 APS has failed.
   Power is not available to the microcontroller.
A microcontroller failure results in a loss of communication with the PDB. Therefore, no telemetry or commanding capabilities exist with the PDB. The deactivation procedure will now be a manual reconfiguration.
Two RPCs are connected to Converter 1 (RPC26 to DA and RPC27 to PPRA). It is preferable to use RPC27 for safety reasons. If we use RPC26 we would be one failure away from depressurizing the module. Converter 2 has 5 RPCs connected to it. Selecting any RPC would be OK; there is no safety concern, but for simplicity, RPC 15 is preferable.
Any RPC downstream of the converter cannot be commanded to close unless the converter is commanded on.

Operating the MPLM with the converter failed on should not have an impact to downstream loads. In order for these loads to operate prematurely, it requires a failed closed RPC and an inadvertent Open/Close command.

11 Possible converter failed on or sensor has shifted or failed.

12 Check for Comm
   Is Comm available?
   No
   Yes
   MCC-H for further instructions

14 Turn Affected Converter On
   PDB Details
   • cmd converter 1(2) – On

15 Close an RPC
   PDB Details
   Converter 1:
   • cmd RPC 27 Close or
     Converter 2:
   • cmd RPC 15 Close

16 Turn Affected Converter Off
   PDB Details
   • cmd Converter 1(2) – Off

17 Check Caution Message
   CW SUMM
   Caution & Warning Summary
   Is PDB RPC Failure Message received?
   No
   Yes
   Sensor has shifted or failed. Continue with operations.

19 Converter has failed On. Continue with operations.

20 Terminate RPC Ops
   PDB Details
   • cmd RPC 27(15) – Open

21 MCC-H for further instructions
The Caution 'MPLM PDB RPC Failure - MPLM' is a generic C&W message. Refer to advisory log to determine a specific RPC failure.

There are two spare 120VDC RPCs and they are RPCs 12 and 14. There is one spare 28VDC RPC, and it is RPC 28.

When multiple RPCs indicate <X> most likely the problem is caused by PDB input power source (Input voltage is > 130 or < 106.5 volts).

CAUTION

ALARM

MPLM PDB RPC Failure - MPLM

For any 120V RPCs Voltage \( \leq 106.5 \text{ V} \) or Voltage \( \geq 131 \text{ V} \) OR For Any 28V RPCs Voltage \( \leq 24 \text{ V} \) or Voltage \( \geq 30 \text{ V} \)

ADVISORY

MPLM Load name RPC XX Failure - MPLM

Nominal Config: MPLM Module is activated.

---

### 2.107 MPLM PDB RPC FAILURE - MPLM

(MPLM/UF2 - ALL/FIN 4) Page 1 of 7 pages

1. **PDB Health**
   - Is PDB Controller OK?
   - Yes
   - No

2. **All data from the PDB is suspect.**

3. **Identify Suspect RPC**
   - Any RPC shows <X> indication:
     - No <X> indication for any RPC
     - PDB Details
     - 'Fail'

4. **Transient Caution message.**

5. **Compare Voltages**
   - Does affected RPC Voltage = PDB Input Voltage USOS/Orbiter?
   - Yes
   - No

6. **Check MCC-H for further instruction.**

7. **Problem with MPLM input power feed. This could result in loss of Power to MPLM.**

8. **Select Power Source**
   - MPLM: EPS: PDB Details
   - Does affected RPC Voltage = PDB Input Voltage USOS/Orbiter?
   - Yes
   - No

9. **Voltage sensor failed off scale high or off scale low or sensor shift.**

10. **Voltage sensor failed off scale high or off scale low or sensor shift.**

11. **Continue with MPLM Ops.**

---

**3.108 MPLM MDM FAILURE QUICK RESPONSE**, all (SODF: MPLM: CORRECTIVE)

**2.105 MPLM PDB CONTROLLER FAILURE**, all (SODF: MPLM: MALFUNCTION)

- For any 120 volt RPCs Voltage \( \leq 106.5 \text{ V} \) or Voltage \( \geq 131 \text{ V} \) OR
- For any 28 volt RPCs Voltage \( \leq 24 \text{ V} \) or Voltage \( \geq 30 \text{ V} \)

- More than one 120 volt RPC indicating <X>

- Transient Caution message.

- Check Frame Count

- Voltage sensor failed off scale high or off scale low or sensor shift.

---


**APCU VOLTS \( \uparrow \downarrow \)** (SODF: ASSY OPS: MALFUNCTION: APCU), then:

- If PDB Input Voltage (orbiter) >130 or < 106.5 Volt then APCU 1 and/or 2 supplying power to MPLM • Perform **APCU VOLTS \( \uparrow \downarrow \)** (SODF: ASSY OPS: MALFUNCTION: APCU), then:

- If PDB Input Voltage (USOS) >130 or < 106.5 Volt then RPCM LA062A3B supplying power to MPLM • Go to **3.209 RPCM TRIP (POST CCS)** (SODF: EPS: MALFUNCTION: SECONDARY POWER SYSTEM).
2.107 MPLM PDB RPC FAILURE - MPLM
(MPLM/UF2 - ALL/FIN 4)  Page 2 of 7 pages

3

12 Check RPC Op/Cl Status
MPLM:EPS: PDB Details
PDB Details 'Posn'
Is affected RPC Open?
Yes

13 For evidence of fire
Was there evidence of smoke or fire following the
RPC Failure?
Yes

14 Command RPC Open
MPLM: EPS: PDB Details
PDB Details
• cmd RPC X - Open

29

15 \RPC Upper Limit
MPLM: EPS: PDB Details
PDB Details 'Voltage'
Is affected RPC Voltage ≥ 131VDC?
Yes

16 Compare Voltages
MPLM: EPS: PDB Details
PDB Details
Is affected RPC Voltage = PDB Input Voltage
(USOS)?
Yes

21 Compare Voltages
MPLM: EPS: PDB Details
PDB Details
Is affected RPC Voltage = PDB Input Voltage
USOS/Orbiter?
Yes

17 \RPC Lower Limit
MPLM: EPS: PDB Details
PDB Details 'Voltage'
Is affected RPC Voltage ≤ 106.5VDC?
No

18 Sensor failed Off
Scale High or sensor shift.

20 Transient caution message.

22 Failure Isolation
• Determine if this is a sensor failure or RPC failure or downstream load failure
Power on at load?
Yes

23 Sensor failed Off
Scale Low or sensor shift.

25

24 Cycle affected RPC
MPLM: EPS: PDB Details
PDB Details
• cmd RPC X – Open
• cmd RPC X – Close
• \RPC X Posn – Cl

26 Power Status
Power on at load?
No

27 Possible RPC has failed open or load failure.

28 Transient and/or telemetry failure.
See Table 1 for proper FDI name.
Converter 1 provides power to RPC26 and 27. Converter 2 provides power to RPC 15, 16, 29, 30 and 31.

When the 28VDC RPC is open and the voltage reading is > 1 volt the MDM will trigger the caution message 'MPLM PDB RPC Failure'.
Reference Table 1 for affected RPC downstream load.

53 Failure Isolation
Was affected RPC downstream load operating nominally?

46

54 Sensor failed Off
Scale Low or sensor shift.
Continue with MPLM Ops.

55 Cycle Affected RPC
MPLM: EPS: PDB Details
PDB Details

• cmd RPC X – Open
• cmd RPC X – Close
• RPC X Posn – Cl

56 Failure Isolation
Check MCC-H for commanding the associated valve Open or Close.

57 Possible RPC has failed or load failure.

58 Transient and/or telemetry failure.
Table 1. RPC Type and Trip Current

<table>
<thead>
<tr>
<th>RPC Number</th>
<th>Output voltage</th>
<th>RPC Load</th>
<th>Power Max (W)</th>
<th>Surge Current</th>
<th>Rate Current</th>
<th>Lower Threshold Current (A)</th>
<th>Upper Threshold Current (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120</td>
<td>MDM</td>
<td>80</td>
<td>0.75</td>
<td>2.8</td>
<td>1.0</td>
<td>2.60</td>
</tr>
<tr>
<td>2 to 9</td>
<td>120</td>
<td>GLA 1 to 8</td>
<td>30</td>
<td>&lt; 3.80</td>
<td>4.2</td>
<td>1.0</td>
<td>3.80</td>
</tr>
<tr>
<td>10</td>
<td>120</td>
<td>ELPS</td>
<td>5</td>
<td>&lt; 3.52</td>
<td>4.2</td>
<td>1.0</td>
<td>3.80</td>
</tr>
<tr>
<td>11</td>
<td>120</td>
<td>Cabin Fan</td>
<td>345</td>
<td>11.90</td>
<td>12.60</td>
<td>---</td>
<td>11.90</td>
</tr>
<tr>
<td>12</td>
<td>120</td>
<td>Spare</td>
<td>1.5</td>
<td>&lt; 0.05</td>
<td>1.4</td>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>13</td>
<td>120</td>
<td>DSD</td>
<td>1.5</td>
<td>&lt; 0.05</td>
<td>1.4</td>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>14</td>
<td>120</td>
<td>Spare</td>
<td>1.5</td>
<td>&lt; 0.05</td>
<td>1.4</td>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>15</td>
<td>28</td>
<td>ISOV#1</td>
<td>7</td>
<td>&lt; 1.0</td>
<td>7.0</td>
<td>1.4</td>
<td>4.0</td>
</tr>
<tr>
<td>16</td>
<td>28</td>
<td>ISOV#2</td>
<td>7</td>
<td>&lt; 1.0</td>
<td>7.0</td>
<td>1.4</td>
<td>4.0</td>
</tr>
<tr>
<td>17</td>
<td>120</td>
<td>DA#1Htr</td>
<td>250</td>
<td>0</td>
<td>2.8</td>
<td>---</td>
<td>2.60</td>
</tr>
<tr>
<td>18</td>
<td>120</td>
<td>DA#2Htr</td>
<td>250</td>
<td>0</td>
<td>2.8</td>
<td>---</td>
<td>2.60</td>
</tr>
<tr>
<td>19</td>
<td>120</td>
<td>R/FR#1</td>
<td>1050</td>
<td>&lt; 9.3</td>
<td>9.8</td>
<td>---</td>
<td>9.30</td>
</tr>
<tr>
<td>20 to 22</td>
<td>120</td>
<td>R/FR#2-4</td>
<td>598</td>
<td>&lt; 5.3</td>
<td>5.6</td>
<td>---</td>
<td>5.30</td>
</tr>
<tr>
<td>23</td>
<td>120</td>
<td>R/FR#5/HCU</td>
<td>1050</td>
<td>&lt; 9.3</td>
<td>9.8</td>
<td>---</td>
<td>9.30</td>
</tr>
<tr>
<td>24</td>
<td>120</td>
<td>HCU</td>
<td>60</td>
<td>1.0</td>
<td>2.80</td>
<td>0.80</td>
<td>2.60</td>
</tr>
<tr>
<td>25</td>
<td>120</td>
<td>WPP</td>
<td>100</td>
<td>&lt; 7.90</td>
<td>8.4</td>
<td>---</td>
<td>7</td>
</tr>
<tr>
<td>26</td>
<td>28</td>
<td>DA#1(Vlv1,2)/DA#2(Vlv1,2)</td>
<td>7</td>
<td>&lt; 1.0</td>
<td>7.0</td>
<td>1.40</td>
<td>4.00</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
<td>PPRRA#1,2,3</td>
<td>7</td>
<td>&lt; 1.0</td>
<td>7.0</td>
<td>1.40</td>
<td>4.00</td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td>Spare</td>
<td></td>
<td>7.0</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>29</td>
<td>28</td>
<td>SSOV</td>
<td>7</td>
<td>&lt; 1.0</td>
<td>7.0</td>
<td>1.40</td>
<td>4.00</td>
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<tr>
<td>30</td>
<td>28</td>
<td>WOV</td>
<td>20</td>
<td>&lt; 3.0</td>
<td>7.0</td>
<td>1.40</td>
<td>4.00</td>
</tr>
<tr>
<td>31</td>
<td>28</td>
<td>WMV</td>
<td>20</td>
<td>&lt; 3.0</td>
<td>7.0</td>
<td>1.40</td>
<td>4.00</td>
</tr>
</tbody>
</table>
Table 2. Fault Detection and Isolation (FDI) Over Current Algorithms

<table>
<thead>
<tr>
<th>RPC Number</th>
<th>FDI Name</th>
<th>Software Lower Limit (A)</th>
<th>Software Upper Limit (A)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>GLA1</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>3</td>
<td>GLA2</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>4</td>
<td>GLA3</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>5</td>
<td>GLA4</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>6</td>
<td>GLA5</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>7</td>
<td>GLA6</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>8</td>
<td>GLA7</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>9</td>
<td>GLA8</td>
<td>–</td>
<td>0.4</td>
<td>Open RPC</td>
</tr>
<tr>
<td>10</td>
<td>ELPS</td>
<td>–</td>
<td>0.15</td>
<td>Open RPC</td>
</tr>
<tr>
<td>11</td>
<td>Cabin Fan Ovld</td>
<td>0.326</td>
<td>2.8</td>
<td>Stop Fan</td>
</tr>
<tr>
<td>13</td>
<td>Smk Det Ovld</td>
<td>–</td>
<td>0.05</td>
<td>Open RPC</td>
</tr>
<tr>
<td>17</td>
<td>DPRS Assy 1</td>
<td>–</td>
<td>2.5</td>
<td>Open RPC &amp; SSW1</td>
</tr>
<tr>
<td>18</td>
<td>DPRS Assy 1</td>
<td>–</td>
<td>2.5</td>
<td>Open RPC &amp; SSW2</td>
</tr>
<tr>
<td>19</td>
<td>RFRCK1</td>
<td>–</td>
<td>9.66</td>
<td>Open RPC</td>
</tr>
<tr>
<td>20</td>
<td>RFRCK2</td>
<td>–</td>
<td>5.2</td>
<td>Open RPC</td>
</tr>
<tr>
<td>21</td>
<td>RFRCK3</td>
<td>–</td>
<td>5.2</td>
<td>Open RPC</td>
</tr>
<tr>
<td>22</td>
<td>RFRCK4</td>
<td>–</td>
<td>5.2</td>
<td>Open RPC</td>
</tr>
<tr>
<td>23</td>
<td>RFRCK5</td>
<td>–</td>
<td>9.66</td>
<td>Open RPC</td>
</tr>
<tr>
<td>24</td>
<td>HCU</td>
<td>–</td>
<td>0.65</td>
<td>Open RPC</td>
</tr>
<tr>
<td>31</td>
<td>WMV</td>
<td>–</td>
<td>0.35</td>
<td>None</td>
</tr>
</tbody>
</table>
1. MPLM Location
   Is MPLM attached to ISS?
   - Yes
   - No

2. PPRAs cannot be commanded while MPLM is in orbiter Payload Bay. Nothing further can be done to troubleshoot the PPRAs until MPLM is attached to station.

3. Check MPLM Interface
   Task:
   - Task Nav
   - Multi-flight Task Displays
   - sel MPLM Act-Deact
   - MPLM Act-Deact
   - MDM Control

   MPLM I/F Scenario – USOS?
   - Yes
   - No

4. MPLM C&DH caps J06 and J18 were not removed after berthing MPLM to Station. The J06 cap acts as a hardware interlock, preventing the PPRA RPC from closing.

5. MPLM PPR Assemblies
   - sel MPLM PDB RPC 27
   - Convertor 01– On
   - RPC 27 Posn – Cl

6. MPLM Cap Removal
   Is MPLM C&DH J06 cap removed?
   - Yes
   - No

7. Advisory Triggers:
   - PPRA position is in transition (not open, not closed)
   - OR
   - PPRA position is unknown (open and closed)
   - OR
   - PPRA is commanded open but remains closed

8. Check Failure Indications
   MPLM: ECLSS: PPRA 1
   - MPLM PPR Assemblies
   - PPRAs 1(2,3)

   Valve Position – Open?
   - Yes
   - No

9. Valve Position – Closed?
   - No
   - Yes

10. MPLM C&DH caps J06 and J18 were not removed after berthing MPLM to Station. The J06 cap acts as a hardware interlock, preventing the PPRA RPC from closing.

11. Did Alarm condition return to normal?
   - No
   - Yes

12. Notify MCC-H.
   - Use non-failed Assy 1(2,3).
   - Use manual override to operate failed PPRA.
13 PPRA recovered.

14
- Notify MCC-H.

15
- MPLM PPR Assemblies
- sel MPLM PDB RPC 27
- cmd RPC 27 – Open (Verify Posn – Open)
- cmd Convertor 01 – Off (Verify – Off)
Table 1. MPLM Smoke Detector MDM Information

<table>
<thead>
<tr>
<th>(A) Function</th>
<th>(B) Data Type</th>
<th>(C) MDM</th>
<th>(D) Card Type</th>
<th>(E) Slot</th>
<th>(F) Chnl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke Det. Active Bit</td>
<td>Cmd</td>
<td>MPLM</td>
<td>DIO #1</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Smoke Det. Obscuration</td>
<td>Tim</td>
<td>MPLM</td>
<td>HLA #1</td>
<td>7</td>
<td>09</td>
</tr>
<tr>
<td>Smoke Det. Scatter</td>
<td>Tim</td>
<td>MPLM</td>
<td>HLA #1</td>
<td>7</td>
<td>08</td>
</tr>
</tbody>
</table>

1. Expect repeat C&W.

2. When Smoke Detector FDI is in manual, the Smoke Detector will still annunciate, a fire and isolation will still occur; however, no Smoke Detector failure C&W messages will be annunciated, nor will a high current (> 0.05 A) automatically unpower the Smoke Detector.

CAUTION

ALARM

ADVISORY

ALARM

C&W Summ
C&W Summary
Loss of Smoke Detection
- MPLM

C&W Summ
C&W Summary
Smoke Detector Overcurrent
- MPLM

C&W Summ
C&W Summary
Smoke Detector Failure – MPLM

Caution Triggers:
Passive/Active BIT failed
OR
RPC 13 current > 0.05 A
Overcurrent Advisory Trigger:
Current > 0.05 A
Smoke Detector Failure Advisory Triggers:
Passive Bit Lens Status – Dirty OR
Failure – Contaminated (not visible on PCS)

Nominal Config:
No CDH failures in MDM
Cards D, Slots E, Chnls F
PDB operating nominally
MPLM PDB RPC 13 closed (open if overcurrent advisory received) and not tripped, current = 0.02 A (0.0A if overcurrent advisory received).
Lens Status - Clean Degraded - Blank Smoke Status – No Smoke
Fire Status – No Fire FDI Recovery – Auto
9 Transient failure.

11 Transient failure.

12 Reenable FDIR

- MPLM Smoke Detector
- sel FDIR Commands
- MPLM FDI Status
- FDI Command Status
- cmd Automated
- Verify – Auto Enabled
  ‘Smk Det Ovld’
- cmd Automated
- Verify – Auto

13 Transient failure.

14 Continue nominal operations
  Report results to MCC-H.

5 6 8 9

15 Smoke detector failure.

16 Deactivate Smoke Detector

- MPLM Smoke Detector
- sel MPLM PDB RPC 13
- PDB Details
- cmd RPC 13 Open
  (Verify – Op)

17 MCC-H
2.110 MPLM PDB INTERNAL HIGH TEMPERATURE
(MPLM/LF1 - ALL/FIN 2)  

1. Verify PDB Health
   - MPLM: EPS
   - MPLM EPS

   'Controller Status'
   - Is Controller Status = OK?

   No

2. All data from the PDB is suspect.

3. Verify Number
   - MPLM: EPS
   - MPLM EPS

   Only one sensor > 70 °C
   - Two or more sensor > 70 °C

4. Temp sensor failed or shifted. Continue with nominal operations.

5. "MCC-H for trend data"

6. Possible PDB internal short or PDB overload.

7. Warning Procedure
   - Has PDB Internal High Temperature Warning procedure been performed by the crew?

   No

8. Check Power to MPLM
   - Is MPLM Powered by ISS?

   No

9. MPLM Powered by APCU
   - Go to {APCU DEACTIVATION}, all (SODF: ASSY OPS: APCU).

   Yes

10. MPLM Powered by ISS
    - LAB: EPS: Lab rack LAB1O6
    - Lab rack LAB1O6
    - sel RPCM LA2A3B D
    - RPCM LA2A3B D
    - sel RPC 04
    - RPC 04
    - 'RPC Position'
    - cmd Open (Verify – Op)

11. "MCC-H for further instructions"

12. Fire or Smoke:
    - (2.1 FIRE ALARM OR FIRE OBSERVED - INITIAL RESPONSE), all (SODF: EMER-1: FIRE)

   Burning Odor:
   - (2.3 CREW OBSERVED BURNING ODOR - INITIAL RESPONSE), all (SODF: EMER-1: FIRE)

Nominal Config: MPLM is activated

If:
   - Converter is On:
PDB Temp 1, 2 or 3 > 70 °C

CAUTION

PDB Internal High Temperature

Verify PDB Health

MPLM: EPS
MPLM EPS

Controller Status'
Is Controller Status = OK?

All data from the PDB is suspect.

Verify Number
MPLM: EPS
MPLM EPS

Only one sensor > 70 °C
Two or more sensor > 70 °C

Temp sensor failed or shifted. Continue with nominal operations.

Possible PDB internal short or PDB overload.

Warning Procedure
Has PDB Internal High Temperature Warning procedure been performed by the crew?

Check Power to MPLM
Is MPLM Powered by ISS?

MPLM Powered by APCU
Go to {APCU DEACTIVATION}, all (SODF: ASSY OPS: APCU).

MPLM Powered by ISS
LAB: EPS: Lab rack LAB1O6
Lab rack LAB1O6
sel RPCM LA2A3B D
RPCM LA2A3B D
sel RPC 04
RPC 04
'RePC Position'
cmd Open (Verify – Op)

For Evidence of Fire
Was there evidence of fire, smoke or burning odor?

Fire or Smoke:
(2.1 FIRE ALARM OR FIRE OBSERVED - INITIAL RESPONSE), all (SODF: EMER-1: FIRE)

Burning Odor:
(2.3 CREW OBSERVED BURNING ODOR - INITIAL RESPONSE), all (SODF: EMER-1: FIRE)
**Table 1. MPLM Depress Assembly Valve PDB Information**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (Inboard)</td>
<td>VMDS 2</td>
<td>1</td>
<td>PDB 26</td>
</tr>
<tr>
<td>2</td>
<td>2 (Outboard)</td>
<td>VMDS 1</td>
<td>1</td>
<td>PDB 26</td>
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<td>1 (Inboard)</td>
<td>VMDS 4</td>
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<td>PDB 26</td>
</tr>
<tr>
<td>2</td>
<td>2 (Outboard)</td>
<td>VMDS 3</td>
<td>1</td>
<td>PDB 26</td>
</tr>
</tbody>
</table>

**Table 2. MPLM Depress Assembly Heater MDM/PDB Information**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MPLM DIO 2</td>
<td>7, 8</td>
<td>LLA 5</td>
<td>12, 29</td>
<td>PDB 17</td>
</tr>
<tr>
<td>2</td>
<td>MPLM DIO 4</td>
<td>8, 9</td>
<td>LLA 5</td>
<td>5, 30</td>
<td>PDB 18</td>
</tr>
</tbody>
</table>
All displays in this procedure are on the PCS.

Per PRACA 2703, Depress Assembly valves can indicate “In transit” when they are really closed. This happens when the vlv is commanded closed, and it bounces off of the microswitch sensor. The close command should be sent again.

The DA valves have two position sensors per valve. The indication of “Fail Open” means valve has been commanded to close and has remained open. “Fail Close” is the opposite. “Fail Unknown” indicates that the valve sensors indicate open and closed at the same time. “Fail In Transit” is when sensors show valve to be in neither position.

Nominal Config:
(if using DA)
Converter 1 – On
PDB RPC [Y], [Z] posn – Closed
All C&DH cards good.
MPLM IMV Vlvs – Closed
MPLM SSOV – Closed

(if not using DA)
Converter 1 – Off
PDB RPC [Y], [Z] posn – Open
All C&DH cards good.
MPLM MDM is good.

1 Power DA
If Failed DA not in use, power it on
MPLM: EPS: PDB Details
PDB Details
‘Converter’
‘cmd 01 – On (\Posn – On)’
‘RPC’
‘cmd RPC 26 – Close (\Posn – Cl)’

2 Reattempt Close cmd
If below command is not successful, DA caution will reannunciate.

MPLM: ECLSS: DA 1
MPLM Depress Assemblies
‘Depress Assembly 1(2)’
‘cmd Inbd (Outbd) Isov – Close’

3 Transient failure.

4 Valve is failed.

5 Determine Failure
MPLM: ECLSS: DA 1: DA Details
MPLM DA Details
‘Depress Assembly 1(2)’
‘Inbd (Outbd) Isov’

Fail Open – X
Fail Close – X
Fail Unknown – X
Fail In Transit – X

8 Command vlv to Desired Position
If below command is not successful, DA caution will reannunciate.

MPLM: ECLSS: DA 1
MPLM Depress Assemblies
‘Depress Assembly 1(2)’
‘cmd Inbd (Outbd) Isov – Open (Close)’

Position – desired position?

9 Desired position sensor failed or valve stuck in transition.

10
• If desired position is closed, use secondary valve in depress assembly to provide seal.
• If desired position is open, use MPLM pressure insight to determine if valve is truly open.
• If pressure does not drop, use other depress assembly.

11 Transient failure.

12

6
Use secondary valve in depress assembly to provide seal.

13

7 Valve is physically stuck in the open position and has failed to close.
Per PRACA 2703, Depress Assembly valves can indicate “In transit” when they are really closed. This happens when the valve is commanded closed, and it bounces off of the microswitch sensor. The close command should be sent again.

1. Position sensor failed to “True.” Valve is in expected position.

2. Determine Failed Sensor
   - What is expected position
     - Open
     - Closed
   - Open position sensor failed to “True.”

3. Valve is physically stuck in the closed position and has failed to open.

4. Reattempt Open cmd
   - If below command is not successful, DA caution will reannunciate.
   - MPLM: ECLSS: DA 1
     - MPLM Depress Assemblies
       - Depress Assembly 1(2)
       - cmd Inbd (Outbd) Isov – Open
   - Position – Open?
     - Yes
     - No

5. Transient failure.

6. Valve is failed.

7. Use other Depress Assembly.

8. Safe Valve
   - MPLM: ECLSS: DA 1
     - MPLM Depress Assemblies
       - Depress Assembly 1(2)
       - cmd Inbd (Outbd) Isov – Close
       - Position – Closed
3.101 APCU TO MPLM EPS JUMPER RECONFIGURATION

WARNING
Failure to remove power can result in electrical shock hazard.

1. VERIFYING APCU 1 AND 2 DEACTIVATED

   CRT
   SM 200 APCU Status
   Verify APCU1,2 OUT VOLTS LOW RES: 0.0 ± 2V
   SSP1
   Verify APCU1,2 CONV tb – bp
   Verify APCU1,2 OUTPUT RLY tb – bp

2. VERIFYING ISS POWER SOURCE RPC TO MPLM OPEN

   PCS
   LAB: EPS: Lab Rack LAB1O6
       Lab Rack LAB1O6
       ‘Power Bus 2A3B’
   sel RPCM LA2A3B D
   RPCM LA2A3B D
   Verify Integ Counter – incrementing
   sel RPC 04
   RPCM LA2A3B D RPC 04
   √RPC Position – Op
   √Close Cmd – Inh)
   RPCM LA2A3B D
   sel RPC 03
   RPCM LA2A3B D RPC 03
   √RPC Position – Op
   √Close Cmd – Inh)

   Report at completion.
3.101 APCU TO MPLM EPS JUMPER RECONFIGURATION
(MPLM/UF2 - ALL/FIN 3)  Page 2 of 3 pages

Figure 1.- LAB Aft External Bulkhead (view from inside Node 1).

**CAUTION**
Care must be taken while working in the vicinity of Hatch Seal to avoid rubbing, scratching, or placing any type of direct pressure upon Seal. Damaging Hatch Seal could prevent Hatch from maintaining pressure when closed.

3. **REMOVING AXIAL PORT CLOSEOUT (IF REQUIRED)**
Detach Velcro strips.

Remove Closeout, loosen 1/4-turn fasteners.
Roll Closeout from loose end toward attached end.

Temporarily stow Closeout.
4. **REMOVING ISS TO MPLM EPS JUMPER**
   W2018P13 ←→ J13
   W2018P16 ←→ J16

5. **INSTALLING POWER 2/3 JUMPER FROM LAB TO NODE 1 VESTIBULE**
   W2004P13 →|← J13
   W2004P16 →|← J16

6. Inform **MCC-H** of task completion.
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WARNING
Failure to remove power can result in electrical shock hazard.

1. **VERIFYING APCU 1 AND 2 DEACTIVATED**

   **CRT**
   - SM 200 APCU Status
   - Verify APCU1,2 OUT VOLTS LOW RES: 0.0 ± 2V

   **SSP1**
   - Verify APCU1,2 CONV tb – bp
   - Verify APCU1,2 OUTPUT RLY tb – bp

2. **VERIFYING ISS POWER SOURCE RPC TO MPLM OPEN**

   **PCS**
   - LAB: EPS: Lab Rack LAB1O6
   - Lab Rack LAB1O6
   - ‘Power Bus 2A3B’
   - sel RPCM LA2A3B D
   - RPCM LA2A3B D
   - Verify Integ Counter – incrementing
   - sel RPC 04
   - RPCM LA2A3B D RPC 04
   - Verify RPC Position – Op
   - Verify Close Cmd – Inh
   - RPCM LA2A3B D
   - sel RPC 03
   - RPCM LA2A3B D RPC 03
   - Verify RPC Position – Op
   - Verify Close Cmd – Inh

   Report at completion.
3.102 ISS TO MPLM EPS JUMPER RECONFIGURATION
(MPLM/UF2 - ALL/FIN 3)  Page 2 of 3 pages

Figure 1.- LAB Aft External Bulkhead (view from inside Node 1).

CAUTION

Care must be taken while working in the vicinity of Hatch Seal to avoid rubbing, scratching, or placing any type of direct pressure upon Seal. Damaging Hatch Seal could prevent Hatch from maintaining pressure when closed.

3. REMOVING AXIAL PORT CLOSEOUT (IF REQUIRED)
Detach Velcro strips.

Remove closeout, loosen 1/4-turn fasteners.
Roll closeout from loose end toward attached end.

Temporarily stow closeout.
4. **REMOVING POWER 2/3 JUMPER FROM LAB TO NODE 1 VESTIBULE**
   - W2004P13 ←→ J13
   - W2004P16 ←→ J16

5. **INSTALLING ISS TO MPLM EPS JUMPER**
   - W2018P13 → J13
   - W2018P16 → J16

6. Inform **MCC-H** of task completion.
OBJECTIVE:
Activates and deactivates the MPLM Cabin Fan and Smoke Detector.

1. CABIN FAN ACTIVATION
1.1 Smoke Detector Activation
MPLM: ECLSS: Smoke Detector

MPLM Smoke Detector
sel MPLM PDB RPC 13

PDB Details

**cmd** RPC 13 Close (Verify – Cl)

MPLM Smoke Detector
‘Active BIT’

**cmd** Initiate
Wait 5 seconds.

‘Passive BIT’
Verify Degraded – Blank

‘Smoke Status’
Verify Smoke Status – No Smoke

1.2 Cab Fan Activation
MPLM: ECLSS: Cab Fan

MPLM Cabin Fan
sel MPLM PDB RPC 11

PDB Details

**cmd** RPC 11 Close (Verify – Cl)

MPLM Cabin Fan
‘On’

**cmd** On
Verify State – On
Verify Speed: 3056 to 4048 rpm
3.103 MPLM CABIN FAN ACTIVATION/DEACTIVATION

NOTE
Per SPN 29905, INT software incorrectly uses MPLM cabin fan state instead of MPLM SDS position to verify MCA sample location. Should the valve be open, and the fan state off, the INT will think the MPLM sample location is inaccessible and set the Location Accessible Flag to False, which can be ignored.

2. CABIN FAN DEACTIVATION
2.1 Cabin Fan Deactivation
MPLM: ECLSS: Cab Fan
MPLM Cabin Fan
'Off'

**cmd** Arm
**cmd** Off

Verify State – Off
Verify Speed: 2000 rpm

sel MPLM PDB RPC 11

**PDB Details**

**cmd** RPC 11 Open (Verify – Op)

2.2 Smoke Detector Deactivation
MPLM: ECLSS: Smoke Detector
MPLM Smoke Detector

sel MPLM PDB RPC 13

**PDB Details**

**cmd** RPC 13 Open (Verify – Op)
3.104 MPLM CABIN FAN SAFING
(MPLM/LF1- ALL/FIN 5) Page 1 of 1 page

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MPLM cabin smoke detection is lost when Cabin Fan fails.</td>
</tr>
<tr>
<td>2. Crew in the MPLM should be alert to symptoms resulting from excessive heat, humidity, and CO2. Leave the MPLM if symptoms develop.</td>
</tr>
</tbody>
</table>

1. **MONITORING MPLM ATMOSPHERE**
   
   **MPLM**
   
   Deploy CDM in MPLM, perform {2.5.280 CARBON DIOXIDE MONITOR: CDM - OPERATIONS FOR CARBON DIOXIDE MONITORING}, all (SODF: MED OPS: NOMINAL: EHS), then:

2. **TROUBLESHOOTING MPLM CABIN FAN**
   
   **PCS**
   
   Go to {2.101 MPLM CABIN FAN FAILURE}, all (SODF: MPLM: MALFUNCTION).
1. **CHANGING FAN SPEED IN MDM MEMORY**

   MPLM: ECLSS: Cab Fan
   [MPLM Cabin Fan]
   ‘Speed’

   Enter new speed in Set Target rpm field.

   **NOTE**
   Expect ‘Cabin Fan Speed out of tolerance - MPLM’ advisory message after sending the Set Speed command.

   cmd Set Speed [Template]

2. **COMMANDING CABIN FAN TO NEW SPEED**

   MPLM: ECLSS: Cab Fan
   [MPLM Cabin Fan]
   ‘On’

   **NOTE**
   Expect ‘Cabin Fan Speed out of tolerance - MPLM’ advisory message to return to normal when the “On” Cmd is received.

   cmd On

   Verify Speed, rpm: New commanded speed ± 496 rpm
**OBJECTIVE:**
To open or close the MPLM IMV valves.

| NOTE | Refer to Table 1 for [X] and [Y] references that follow. |

### Table 1. IMV Valve Information

<table>
<thead>
<tr>
<th>[X] Location</th>
<th>[Y] RPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aft</td>
<td>15 ISOV1</td>
</tr>
<tr>
<td>Fwd</td>
<td>16 ISOV2</td>
</tr>
</tbody>
</table>

#### 1. MPLM IMV ACTIVATION

1.1 Enabling Power to MPLM IMV Vlvs

PCS

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

`sel` MPLM PDB RPC [Y]

PDB Details

`cmd` Converter 02 – On (√Posn – On)

`cmd` RPC [Y] Close (Verify [Y] RPC Posn – Cl)

1.2 Opening MPLM IMV [X] Vlv

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

‘Position – Open’

`cmd` Open (√Position – Open)

1.3 Inhibiting Power to MPLM IMV Vlvs

MPLM IMV Ovhd [X] Vlv

`sel` MPLM PDB RPC [Y]

PDB Details


`cmd` Converter 02 – Off (√Posn – Off)

#### 2. MPLM IMV DEACTIVATION

2.1 Enabling Power to MPLM IMV Vlvs

MPLM: ECLSS: IMV [X]

MPLM IMV Ovhd [X] Vlv

`sel` MPLM PDB RPC [Y]

PDB Details
3.106 MPLM IMV VALVE RECONFIGURATION
(MPLM/ULF1 - ALL/FIN 1) Page 2 of 2 pages

2.2 Closing MPLM IMV [X] Vlv
MPLM: ECLSS: IMV [X]
MPLM IMV Ovhd [X] Vlv
'Position – Close'

**cmd** Close (√Position – Closed)

2.3 Inhibiting Power to MPLM IMV Vlvs

<table>
<thead>
<tr>
<th>MPLM IMV Ovhd [X] Vlv</th>
</tr>
</thead>
</table>

sel MPLM PDB RPC [Y]

PDB Details

**cmd** Converter 02 – Off (√Posn – Off)
1. **POWERING ON PDB POWER OUTLET DEDICATED TO MPLM ISS HEATERS**

PCS MPLM: EPS: PDB Details

PDB Details

‘RPC’

**cmd** 23 – Close (Verify Posn – Cl)

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Each of the 19 MPLM ISS Heater circuits is thermostatically controlled. The power draw after the upstream RPC is closed is between 15 and 976 watts.</td>
</tr>
<tr>
<td>2. Expected initial power draw is 976 watts.</td>
</tr>
<tr>
<td>3. <strong>MCC-H</strong> will monitor individual heater currents to verify proper operation of RPC.</td>
</tr>
</tbody>
</table>

2. **POWER OFF PDB POWER OUTLET DEDICATED TO MPLM ISS HEATERS**

PCS MPLM: EPS: PDB Details

PDB Details

‘RPC’

**cmd** 23 – Open (Verify Posn – Op)

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Each of the 19 MPLM ISS Heater circuits is thermostatically controlled. The power draw before the upstream RPC is opened is between 15 and 976 watts.</td>
</tr>
<tr>
<td>2. After the RPC is opened, the power draw is expected to be 0 watts.</td>
</tr>
<tr>
<td>3. <strong>MCC-H</strong> will monitor individual heater currents to verify proper operation of RPC.</td>
</tr>
</tbody>
</table>
NOTE
This procedure will be executed for the following messages:
Caution: 'MPLM MDM Fail - MPLM, Event Code 8531'

1. If in progress, discontinue rack transfer ops.

2. Check MPLM air diffuser outlets for air flow.
   Verify the MPLM Cabin Fan can be heard running.

   If MPLM Cabin Fan is not running
   Deploy battery-powered Fans (4) in MPLM, then:
   Deploy CDM in MPLM, perform {2.5.280 CARBON DIOXIDE
   MONITOR: CDM - OPERATIONS FOR CARBON DIOXIDE
   MONITORING}, all (SODF: MED OPS: NOMINAL: EHS), then:

   Check **MCC-H** for MPLM ventilation reconfiguration actions.
1. **VERIFYING MPLM MDM RT STATUS ENABLED**

   PCS
   
   CDH: Primary INT
   
   Verify Frame Count – incrementing
   Verify MDM ID – INT 2(1)
   Verify Processing State – Operational

   sel LB SYS HAB 1
   sel RT Status

   LB SYS HAB 1 RT Status

   √17 MPLM-1 RT Status – Ena

   If MPLM MDM has been previously verified in Diagnostic, go to step 4.

2. **SUPPRESSING NUISANCE CAUTION EVENT (IF DESIRED)**

   **NOTE**
   
   The ‘Primary INT MDM Detected Loss of Sync with MPLM MDM-LAB’ Caution may go into alarm when the MDM RT I/O is enabled. Suppressing the Caution will prevent annunciation of a tone, if desired.

   C&W Summ
   
   Caution & Warning Summary
   ‘Event Code Tools’

   sel Suppress

   Suppress Annunciation of an Event

   input Event Code – 6 7 4 3 (‘Primary INT MDM Detected Loss of Sync with MPLM MDM-LAB’)

   cmd Arm
   cmd Execute

   input Event Code – 8 5 3 1 (‘MPLM MDM Fail-MPLM’)

   cmd Arm
   cmd Execute
3. **VERIFYING MPLM MDM IS IN DIAGNOSTIC**

CDH: Primary INT

**Primary Int MDM**

Verify Frame Count – incrementing

**NOTE**

After the MDM has been transitioned to Diagnostic, the only way to verify that it is in Diagnostic is to send a Mode Code command.

‘Software Control’

sel Transmit Mode Code

**Primary Int Transmit Mode Code**

Verify RT Address ≠ 17

If RT Address is 17, clear Mode Code

‘Transmit Mode Code Commands’

- input RT Address – 1
- input Bus ID – 8
- input Mode Code – 2

**cmd Set Execute**

Verify Subsystem Flag Set – No
Verify RT Address: 13

‘Transmit Mode Code Commands’

- input RT Address – 1
- input Bus ID – 3
- input Mode Code – 2

**cmd Set Execute**

Verify Subsystem Flag Set – Yes
Verify RT Address: 17
4. **REINITIALIZING MPLM MDM**

**MPLM: CDH: MDM Utilities**

MPLM MDM Utilities

`‘Reinitializations’`

√ **MCC** for how the MDM should be reinitialized

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In nominal cases, the EEPROM option below should be selected.</td>
</tr>
<tr>
<td>2. SPN 2794, the MDM reinitialization commands may cause the MDM to fail to an unknown state. Power cycling the MPLM module is the only option for recovery.</td>
</tr>
</tbody>
</table>

If Reinitialization is from EEPROM

`cmd` Reinitialize EEPROM **Execute**

If Reinitialization is from DRAM

`cmd` Reinitialize DRAM **Execute**

Wait 5 minutes for MDM to go through Bootup and Post.

**MDM MPLM**

Verify Frame Count – incrementing

If there is no Frame Count after the Reinitialization

**On MCC GO** power cycle MPLM module.

Perform {1.106 MPLM DEACTIVATION}, all (SODF: MPLM: NOMINAL), then:

Perform {1.103 MPLM ACTIVATION}, all (SODF: MPLM: NOMINAL), then:

5. **ENABLING RT FDIR FOR MPLM MDM**

**CDH: Primary INT**

Primary Int MDM

Verify Frame Count – incrementing

sel LB SYS HAB 1

sel RT Status

**LB SYS HAB 1 RT Status**

`cmd` 17 MPLM-1 RT FDIR Status – Enable FDIR **Execute**

√ 17 MPLM-1 RT FDIR Status – Ena
6. **RE-ENABLE CAUTION EVENT (AS REQUIRED)**

C&W Summ

**Caution & Warning Summary**

‘Event Code Tools’

sel Enable

[Enable an Event]

input Event Code – 6 7 4 3 (‘Primary INT MDM Detected Loss of Sync with MPLM MDM-LAB’)

**cmd Execute**

input Event Code – 8 5 3 1 (‘MPLM MDM Fail-MPLM’)

**cmd Execute**
3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC
(MPLM/LF1 - ALL/FIN 1) Page 1 of 3 pages

1. INHIBITING RT FDIR FOR MPLM MDM

PCS

Verify Frame Count – incrementing
Verify MDM ID – INT 2(1)
Verify Processing State – Operational

sel LB SYS HAB 1
sel RT Status

LB SYS HAB 1 RT Status

(cmd 17 MPLM-1 RT FDIR Status – Inhibit FDIR Execute
√17 MPLM-1 RT FDIR Status – Inh

2. SUPPRESSING NUISANCE CAUTION EVENT (IF DESIRED)

NOTE
The ‘MPLM MDM Fail-MPLM Caution’ will go into alarm when the MDM RT I/O is enabled. Suppressing the Caution will prevent annunciation of a tone, if desired.

C&W Summ

Caution & Warning Summary
‘Event Code Tools’

sel Suppress

Suppress Annunciation of an Event

input Event Code – 8 5 3 1 (‘MPLM MDM Fail-MPLM’)

(cmd Arm
(cmd Execute

3. TRANSITIONING MPLM MDM TO DIAGNOSTIC

MPLM: CDH
MDM MPLM

Verify Frame Count – incrementing

NOTE
Sending the following commands will cause the ‘MPLM MDM Fail-MPLM’ caution message and ‘Primary INT Detected Static Frame Count MPLM MDM – MPLM’ advisory message to annunciate. No action required.

21 DEC 04 115
3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC
(MPLM/LF1 - ALL/FIN 1)   Page 2 of 3 pages

sel Processing State

MPLM Processing State Transitions
‘Commanded Transition To Diag Status’

**cmd** Arm  **Execute**

√ Command Transition To Diag Status – Arm

**cmd** Transition  **Execute**

Wait 5 minutes.

**MDM MPLM**

Verify Frame Count – not incrementing

4. **VERIFYING MPLM MDM IN DIAGNOSTIC**

**NOTE**
After the MDM has been transitioned to Diagnostic, the only way to verify that it is in Diagnostic is to send a Mode Code command.

**CDH: Primary INT**

**Primary Int MDM**

Verify Frame Count – incrementing

‘Software Control’

sel Transmit Mode Code

**Primary Int Transmit Mode Code**

Verify RT Address ≠ 17

If RT Address is 17, clear Mode Code.

‘Transmit Mode Code Commands’

input RT Address – 13
input Bus ID – 8
input Mode Code – 2

**cmd** Set  **Execute**

Verify Subsystem Flag Set – No
Verify RT Address: 13
3.110 MPLM MDM TRANSITION B: MPLM MDM TRANSITION TO DIAGNOSTIC
(MPLM/LF1 - ALL/FIN 1) Page 3 of 3 pages

'Transmit Mode Code Commands'
input RT Address – 1
input Bus ID – 3
input Mode Code – 2

cmd Set Execute

Verify Subsystem Flag Set – Yes
Verify RT Address: 17
1. **ENABLING MPLM PPR FUNCTION**

1.1 Enabling PPRA Motorized Valve Power

MPLM: ECLSS: PPRA1

**MPLM PPR Assemblies**

sel MPLM PDB RPC 27

PDB Details

**cmd** Converter 01 – On (Verify – On)

**cmd** RPC 27 – Close (Verify Posn – Cl)

1.2 Opening PPRA Motorized Valves

**MPLM PPR Assemblies**

**cmd** All Open

Verify PPRA 1,2,3 Valve Position (three) – Open

1.3 Removing Power from PPRAs

MPLM: ECLSS: PPRA1

**MPLM PPR Assemblies**

sel MPLM PDB RPC 27

PDB Details

**cmd** RPC 27 – Open (Verify Posn – Op)

**cmd** Converter 01 – Off (Verify – Off)

2. **INHIBITING MPLM PPR FUNCTION**

2.1 Enabling PPRA Motorized Valve Power

MPLM: ECLSS: PPRA1

**MPLM PPR Assemblies**

sel MPLM PDB RPC 27

PDB Details

**cmd** Converter 01 – On (Verify – On)

**cmd** RPC 27 – Close (Verify Posn – Cl)

2.2 Closing PPRA Motorized Valves

**MPLM PPR Assemblies**

**cmd** All Closed

Verify PPRA 1,2,3 Valve Position (three) – Closed
2.3 Removing Power from PPRAs
MPLM: ECLSS: PPRA1
MPLM PPR Assemblies
sel MPLM PDB RPC 27

PDB Details

**cmd** RPC 27 – Open (Verify Posn – Op)
**cmd** Converter 01 – Off (Verify – Off)
1. **SMOKE DETECTOR ACTIVATION**
   
   1.1 **RPC Closure**
   MPLM: ECLSS: Smoke Detector
   MPLM Smoke Detector
   
   sel MPLM PDB RPC 13
   
   **cmd** RPC 13 Close (Verify Posn – Cl)
   
   1.2. **Active Bit Enabling**
   MPLM: ECLSS: Smoke Detector
   MPLM Smoke Detector
   'Active BIT'
   
   **cmd** Initiate
   
   Wait 5 seconds.
   
   'Passive BIT'
   
   Verify Degraded – blank
   
   'Smoke Status'
   
   Verify Smoke Status – No Smoke

2. **SMOKE DETECTOR DEACTIVATION**

2.1 **Opening RPC**
MPLM: ECLSS: Smoke Detector
MPLM Smoke Detector

sel MPLM PDB RPC 13

**cmd** RPC 13 Open (Verify Posn – Op)
TOOLS AND EQUIPMENT REQUIRED

VOK CTB:
- 12” x 12” Ziplock Bag (two) P/N 528-50000-5
- IMV Return Jumper P/N 683-13870-17

Kit D:
- 5/32” Hex Head, 1/4” Drive
- 1/8” Hex Head, 1/4” Drive

Kit E:
- Driver Handle, 1/4” Drive
- Ratchet, 1/4” Drive
- 3/8” to 1/4” Adapter

Kit F:
- 7/16” Deep Socket, 1/4” Drive

Kit G:
- (30-200 in-lbs) Trq Wrench, 3/8” Drive

IMV Cap O-Ring Replacement Kit
- Lubricant
- Cleaning Pads
- Bore O-Ring (1)

1. RECONFIGURING MPLM IMV FOR LOSS OF MPLM CABIN FAN
   1.1 If the Node 1 to MPLM Fwd IMV Jumper is not installed, perform
      {1.108 MPLM VESTIBULE - CONFIGURE FOR INGRESS}, steps
      26 to 31 for Deck Fwd (A11) IMV Jumper (SODF: S&M: NOMINAL:
      VESTIBULE), then:

   1.2 To open the MPLM Overhead Fwd IMV Valve, perform {3.106
      MPLM IMV VALVE RECONFIGURATION}, step 1 (SODF: MPLM:
      CORRECTIVE), then:

2. RECONFIGURING NODE 1 IMV FOR LOSS OF MPLM CABIN FAN
   2.1 To open Node Deck Fwd IMV Valve, perform [2.506 IMV VALVE
      RECONFIGURATION POST CCS], steps 1 to 2 (SODF: ECLSS:
      NOMINAL: THC), then:

   NOD1  2.2 Remove Closeout Seam Supports (two) in front of Closeout Panel
         NOD1OP2-23 (Driver Handle, 1/8” Hex Head).
         Temporarily stow.

   NOD1  2.3 Remove Panel NOD1OP2-23 (Driver Handle, 5/32” Hex Head).
         Node 1 Duct Valve 4 → Closed
         Replace Panel.

   2.4 Replace Closeout Seam Supports (two) in front of Closeout Panel
         NOD1OP2-23 (Driver handle, 1/8” Hex Head).

   NOD1  2.5 Remove Panel NOD1O1-01 (Driver Handle, 5/32” Hex Head).
         Node 1 Duct Valve 2 → Closed
         Replace Panel.
3.201 ECLSS MPLM SSR 1: MPLM LOSS OF VENTILATION
(MPLM/LF1 - ALL/FIN 6) Page 2 of 2 pages

2.6 Node 1 RAMV Temperature Control → full warm

2.7 Remove Panel NOD1D3-02 (Driver Handle, 5/32" Hex Head).

2.8 √Node 1 Duct Valve 3 – Closed

2.9 Replace Panel.

3. RECONFIGURING LAB IMV FOR LOSS OF MPLM CABIN FAN

3.1 To activate Lab Aft Port IMV Fan, perform {1.504 IMV FAN ACTIVATION/DEACTIVATION POST CCS}, steps 1 to 2 (SODF: ECLSS: ACTIVATION AND CHECKOUT: THC), then:

3.2 On MCC-H GO
Go to {2.502 LAB CCAA DUAL OPERATIONS, LAB1S6 CONDENSING}, all (SODF: ECLSS: NOMINAL: THC).
OBJECTIVE:
To partially depress the MPLM in a contingency using one Depress Assembly (DA).

1. CONFIGURING MPLM AND NODE 1 HATCH

MPLM Hatch
- Hatch open
- If Hatch closed
  - MPEV – open

Node 1 Hatch
- Hatch closed
- MPEV closed

2. OPENING PPRA

To open PPRAs, perform [3.111 MPLM POSITIVE PRESSURE RELIEF ASSEMBLY ENABLE/DISABLE], step 1 (SODF: MPLM: CORRECTIVE), then:

3. CONFIRMING ISOLATION (VALVES CLOSED)

PCS Task: MPLM Act-Deact
- MPLM Act-Deact
- ‘IMV and SDS’
- ‘MPLM IMV’

- IMV Aft, Fwd valves (both) – Cl
- ‘Node 1’

- IMV Deck Aft, Deck Fwd valves (both) – Cl
- ‘MPLM SDS’

- SDS Isov valve – Cl

4. CHECKING TARGET PRESSURE

NOTE
Valid software target pressure for partial depress is 14 psia to 5 psia (724 mmHg to 259 mmHg).

MCC-H for target pressure and which Depress Assembly to use.

Target P __________ mmHg  Estimate Time to Target P __________

NOTE
Per SPN 1226, only one Depress Assembly should be used for a Partial Depress. Attempts to use both DA1 and DA2 at the same time will make one DA unresponsive. In step 5, DA1 heater power is RPC 17 and DA2 heater power is RPC 18.
5. **ACTIVATING DEPRESS ASSEMBLY**

**PCS**

**MPLM: EPS: PDB Details**

<table>
<thead>
<tr>
<th>PDB Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Converter’</td>
</tr>
</tbody>
</table>

**cmd** 01 – On (√Posn – On)

‘RPC’

**cmd** RPC 26 – Close (√Posn – Cl)

**cmd** RPC 17(18) – Close (√Posn – Cl)

**NOTE**

1. If depressing to a pressure below 698 mmHg, expect the following Warning:
   ‘Cabin Press Low - MPLM’

2. The Cabin Fan will deactivate when the pressure gets below 465 mmHg and the GLAs and DSD will deactivate when the pressure gets below 259 mmHg.

6. **COMMANDING DEPRESS**

**PCS**

**MPLM: ECLSS: DA1(2)**

<table>
<thead>
<tr>
<th>MPLM Depress Assemblies</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Depress Assembly 1(2)’</td>
</tr>
<tr>
<td>‘Partial Depress’</td>
</tr>
</tbody>
</table>

Enter target pressure between 724 mmHg to 259 mmHg in Start field.

**cmd** Start

Verify Partial Depress State – Active

Report to **MCC-H**, “MPLM Partial Depress State Active.”

**NOTE**

Controlled depress will continue until target pressure is reached, or until the Stop command is received.

************************************************************
* To immediately stop the depressurization
* ‘Depress Assembly 1(2)’
* **cmd** Stop
* **Verify Stop Cmd State – Stopped**
************************************************************
PCS  7. MPLM: ECLSS

\[ \sqrt{\text{Cab P Avg}} = \text{Target Pressure} \pm 20 \text{ mmHg} \]

8. **DEACTIVATING DEPRESS ASSEMBLY**

PCS

MPLM: EPS: PDB Details

PDB Details

‘RPC’

**cmd** RPC 17(18) – Open (\(\sqrt{\text{Posn}} – \text{Op}\))

**cmd** RPC 26 – Open (\(\sqrt{\text{Posn}} – \text{Op}\))

‘Converter’

**cmd** 01 – Off (\(\sqrt{\text{Posn}} – \text{Off}\))
NOTE
1. The MPLM software is designed to turn off its equipment when
the average MPLM pressure is reached per Table 1.
However, it is possible to deactivate the MPLM equipment
individually using the commands below.

2. It is recommended that Fire Detection remain active during
depress.

Table 1. Equipment Pressure

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Pressure (psia)</th>
<th>Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMV (valves)</td>
<td>10</td>
<td>517</td>
</tr>
<tr>
<td>SDS (sample valve)</td>
<td>10</td>
<td>517</td>
</tr>
<tr>
<td>CFA (fan)</td>
<td>9</td>
<td>466</td>
</tr>
<tr>
<td>DSD (smoke detector)</td>
<td>5</td>
<td>259</td>
</tr>
<tr>
<td>GLA (lighting)</td>
<td>5</td>
<td>259</td>
</tr>
</tbody>
</table>

1. **CLOSING MPLM IMV VALVES**
   Task:
   Task Nav
   ‘Multi-flight Task Displays’

   sel MPLM Act-Deact

   MPLM Act-Deact
   ‘IMV and SDS’

   sel MPLM IMV Aft

   MPLM IMV Ovhd Aft Vlv
   ‘Position’
   ‘Close’

   cmd Master Close

   MPLM Act-Deact
   ‘IMV and SDS’

   Position Aft, Fwd IMV Vlv – Cl

2. **CLOSING SDS VALVE**
   Task:
   Task Nav
   ‘Multi-flight Task Displays’
3. SHUTTING DOWN CABIN FAN AND DSD

Task:
- Task Nav
  - ‘Multi-flight Task Displays’

sel MPLM Act-Deact

MPLM Act-Deact
- ‘IMV and SDS’

sel MPLM SDS Isov

MPLM SDS Isov
- ‘Master’

**cmd** Close

‘Position’

√ Position – Closed

3. SHUTTING DOWN CABIN FAN AND DSD

Task:
- Task Nav
  - ‘Multi-flight Task Displays’

sel MPLM Act-Deact

MPLM Act-Deact
- ‘SD, Cab Fan, and Pressure’

sel MPLM Cab Fan

MPLM Cabin Fan
- ‘State’
  - ‘Off’

**cmd** Arm

**cmd** Off

√ Speed decreases to 0 rpm

MPLM Act-Deact
- ‘PDB Control’

sel PDB Details

PDB Details

**cmd** RPC 11 Open (√Posn – Op)

**cmd** RPC 13 Open (√Posn – Op)
4. REMOVING POWER FROM GLA AND ELPS

Task:
- Task Nav
- ‘Multi-flight Task Displays’

sel MPLM Act-Deact

- MPLM Act-Deact
- ‘PDB Control’

sel PDB Details

- PDB Details

**cmd** All GLAs OFF

\(√\) RPC 02–09 (GLAs 1 to 8) – Op

**cmd** RPC 10 Open (\(√\) Posn – Op)
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