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International Space Station Ground Handbook Specific

ISS-2A.2B

Mission Operations Directorate
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Final, Revision A
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National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
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INTERNATIONAL SPACE STATION GROUND HANDBOOK - SPECIFIC ISS-2A.2B

FINAL, REVISION A
June 9, 2000

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This document is under the configuration control of the Systems Operations Data File Control Board (SODFCB).

Incorporates the following:	
CR:	Ground Handbook U_86 Ground Handbook U_144

INTERNATIONAL SPACE STATION
GROUND HANDBOOK - SPECIFIC

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C&DH PROCEDURES

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INITIAL CONDITIONS:

MDM N1-2 Primary state
MDM N1-1 Secondary state
NCS Bus/RT Configuration (Bus - BC/RT, RT - enabled, disabled)
Config #1 - used for flight 2A to 1R
Config #2 - used for flight 1R to 3A

FGB MDM 2 is Remote Terminal, communicating as RT to MDM N1-2 (bus controller) on UB ORB-N1-2 (RS Bus 18).
FGB MDM 1 is Off.
ECOMM is available for USOS commanding.
Successful and confirmed docking of the service module to FGB.
1553B data buses not connected between SM and FGB.
SMCC is On, in Free Running (autonomous) mode.

NOTE
The transition from FGB to SM interface to the Node MDM N1-2 will require a coordinated set of commanding activities from the **MCC-M** and **MCC-H**. Some activities must occur over Russian ground stations. Steps 1 --- 3 can all be performed (1 --- 2 hours) prior to the KCP commanding.

1. **MCC-M**: VERIFYING FGB AND SMCC CONFIGURATION

√FGB MDM 2 Frame Count – <incrementing>
√SMCC 1,2,3 Frame Count – <incrementing>
√SMCC Mode – Free Running

NOTE
Free Running (autonomous) mode waiting to respond to data acquisition requests.

√1553B data buses (buses 3 and 4) not connected between SM and FGB

2. **MCC-H**: VERIFYING MDM STATUS

Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify State – Primary

√Configuration – [1]

Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify State – Secondary

√Configuration – [1]

FGB: C&DH: MDM FGB
FGB MDM FGB

Verify Frame Count – <incrementing>
Verify MDM ID – FGB-2

3. **MCC-H**: CONFIGURING FGB/NODE FOR CONFIGURATION CHANGE
Inhibit Load Shed

<Cmd Inv: Prim_NCS_Ena_In_App_Tmplt – (M1DD96IM0003K)>

Input Resource Management
Inhibit True **Uplink**

Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1

sel Applications
sel EPS

Verify Resource Management – Inh
Inhibit FGB FDIR

<Cmd Inv: Prim_NCS_Ena_In_RT_FDIR Tmplt – (M1DD96IM0011K)>

Input Bus ID – 1
RT-24 – (FGB-2)
Inhibit Flag – Inhibit True **Uplink**

2A.1 v 5 C&DH Overview

Verify RT 24 FDIR – Inh

NOTE
Disabling the FGB MDM FDIR on the UB_ORB_N1-2 Bus will mitigate a Telemetry Sink condition during the Transition.

4. **MCC-M**: CONFIGURING FGB TOSM KCP
cmd FGB KCP ____ to connect buses 7 and 8 (CB GNC-1 and CB GNC-TBD)
Establishes connectivity between SMCC and N1 MDMs.

√Buses 7 and 8 connectivity

5 **MCC-H**: CHANGING PRIMARY NCS CONFIGURATION
<Cmd Inv: Prime NCS Sel Config Tmplt – (M1DD96IM0022K)>

Input Configuration – [2] **Uplink**

2A.1 v 5 C&DH Overview

FGB Verify Frame Count is static.

NOTE
The ground will experience static telemetry for 30 seconds due to the MDM performing a software refresh.

6. **MCC-H**: VERIFYING PRIMARY NCS CONFIGURATION
Node 1: C&DH: Primary MDM
Primary NCS MDM: Node 1

√MDM ID – N1-2
√MDM State – Primary
√Frame Count – <incrementing>

'Configuration'

√Configuration – [2]

7. **MCC-H**: VERIFYING SMCC VIA NCS TELEMETRY
2A_2 C&DH Overview

BUS SUMMARY
Verify GNC-2 Bus Error Counters are static

SMCC
Verify SMCC Frame Count – <incrementing>
Verify SMCC Processing State – Active
Verify Loss-of-Sync Detected Counter is static.
Verify Busy Detected Counter is static.
Verify Frame Fail Detected Counter is static.
Verify Lane Change Initiated Counter is static.

GNC-2
√SMCC -24 – Enabled
√SMCC -23, 22 – Inhibited

8. **MCC-M**: VERIFYING NODE MDM FRAME COUNT FROM SMCC TELEMETRY

√N1-2 – Enabled
√SMCC Synch Status – In Synch
√N1-2 Frame Count – <incrementing>
√N1-1 Frame Count – <incrementing>

9. **MCC-H**: CHANGING SECONDARY NCS CONFIGURATION

<Cmd Inv: Sec NCS Sel Config Tmplt – (M1DD96IM0023K)>

Input Configuration – [2] **Uplink**

NOTE
Expect C&W alarm message '**PMA-1 N1-2 Detected RT Loss of Comm with N1-1 MDM**'. Wait 30 seconds. The secondary MDM will perform a warm restart. Possible '**Loss of Synch**' message.

2A.1 v 5 C&DH Overview

√MDM ID – N1-1
√State – Secondary
√Frame Count – <incrementing>

'Configuration'

√Configuration – [2]

10. **MCC-H**: VERIFYING STATUS OF CONFIGURATION

2A.2 C&DH_Overview

UB_ORB_N1_2 bus	RT	FDIR
Verify RT 8 –	Ena	INH
Verify RT 24 –	INH	INH
CB_GNC_ 2 bus		
Verify RT 24 –	Ena	Ena
Verify RT 22 –	INH	INH
Verify RT 23 –	INH	INH
UB_EPS_N1_14 bus		
Verify RT 18 –	Ena	Ena
Verify RT 19 –	Ena	Ena
Verify RT 20 –	Ena	Ena

UB_EPS_N1_23 bus

Verify RT 18 –	Ena	Ena
Verify RT 19 –	Ena	Ena
Verify RT 20 –	Ena	Ena

11. **MCC-H**: CHANGING DRAM APID TABLES IN MDMs

NOTE
The stored backup APID Table is the 1R-AC APID table which contains the Service Module Computer as a valid command destination.

<Cmd Inv: Prim NCS Select APID TABLE 2 – (M1DD95SM1018K)>
Uplink

Perform IAND DATA DUMP MANAGEMENT (SODF: GND: C&DH) to verify the current APID Table N1-2.

Verify N1-2 Current APID (Mem Address: 2004AC) – 0010

<Cmd Inv: Sec NCS Select APID TABLE 2 – (M1DD95SM1020k)>
Uplink

Perform IAND DATA DUMP MANAGEMENT (SODF: GND: C&DH) to verify the Current APID Table N1-1.

Verify N1-1 Current APID (Mem Address: 2004AC) – 0010

12. **MCC-M**: VERIFYING SMCC CONFIGURATION

√Service Module Terminal Computer (SMTC) – Synchronized to SMCC
√Matching Units (MUs) – Synchronized to SMCC

NOTE
SMCC/SMTC/MU synchronization is lost when SMCC is commanded to synchronize with MDM N1-2. SMCC synchronization process is accomplished within 5 minutes.

13. **MCC-M**: CONFIGURING SMCC TO FGB I/O

cmd SM KCP _____ to connect buses 3 and 4

NOTE
Establishes communications between the SMCC and the FGB.

Verify buses 3 and 4 connectivity via SMCC data.

cmd SMCC to initiate I/O transactions between SMCC and FGB-2

Verify FGB-2 – Synchronizes to SMCC

14. **MCC-H**: CONFIGURING NODE MDM LOAD SHED AND LANE CHANGE RESPONSE

Enable Load Shed

<Cmd Inv: Prim_NCS_Ena_In_App_Tmplt – (M1DD96IM0003K)>

Input Resource Management
Inhibit False **Uplink**

Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1

sel Applications
sel EPS

Verify Resource Management – Ena

15. **MCC-H**: PERFORMING SERVICE MODULE TO NCS COMMAND TEST #1

NOTE
NCS Commands will be issued from **MCC-H** to **MCC-M** through Russian ground site via Near Real-Time Capability.

<Cmd Inv: Prim_NCS_ CB_GNC_2_Sel_Ch_B – (M1DD96IM1402K)>
Uplink

<Cmd Inv: ECOM_Spare_3 – ( )> **Uplink**

2A.2 C&DH_Overview

Verify CB GNC-2 – B

16. **MCC-M**: PERFORMING NCS TO SERVICE MODULE COMMAND TEST #2

TBD

NOTE
Service module commands will be issued from **MCC-M** to **MCC-H** through Early Comm System.

17. **MCC-H**: CHANGING DEFAULT EEPROM APID TABLES AND NCS CONFIGURATIONS

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new APID Table PPL for MDM N1-2 EEPROM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new APID Table PPL for MDM N1-1 EEPROM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new APID Table PPL for MDM N1-2 DRAM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new APID Table PPL for MDM N1-1 DRAM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new Station Configuration 2 PPL for MDM N1-2 EEPROM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using new Station Configuration 2 PPL for MDM N1-1 EEPROM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using Russian Control Vehicle Patch for MDM N1-1 DRAM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using Russian Control Vehicle Patch for MDM N1-1 EEPROM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using Russian Control Vehicle Patch for MDM N1-2 DRAM, then:

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using Russian Control Vehicle Patch for MDM N1-2 EEPROM, then:

NOTE

The following steps are for redundancy checkout and are not time-critical operations. Therefore, they can be executed at any time following the primary switchover process.

18. **MCC-H**: CHECKING MDM AND BUS REDUNDANCY

Perform FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) using MDM FDIR Limits PPL for MDM N1-2 DRAM, then:

Perform A. TRANSITIONING N1-2 TO DIAGNOSTIC/STANDBY/OFF FROM PRIMARY AND N1-1 TO PRIMARY FROM SECONDARY, all (SODF: GND: C&DH) to transition N1-2 to standby and N1-1 to primary, then:

19. **MCC-H**: PERFORMING SERVICE MODULE TO NCS COMMAND TEST #3

<Cmd Inv: Prim_NCS_ CB_GNC_1_Sel_Ch_B – (M1DD96IM1396K)>
Uplink

<Cmd Inv: ECOM_Spare_3 – ( )> **Uplink**

2A.2 C&DH_Overview

Verify CB GNCGNC-1-B

NOTE
NCS commands will be issued from **MCC-H** to **MCC-M** through Russian ground site via near real time capability.

20. **MCC-M**: PERFORMING NCS TO SERVICE MODULE COMMAND TEST #4

TBD

NOTE
Service module commands will be issued from **MCC-M** to **MCC-H** through Early Comm system.

21. **MCC-H**: RECONFIGURING N1-2 TO PRIMARY AND N1-1 TO SECONDARY

Perform B. TRANSITIONING N1-2 TO PRIMARY FROM OFF/ DIAGNOSTIC/STANDBY WHILE N1-1 IS PRIMARY, all (SODF: GND: C&DH) to transition N1-2 to primary and N1-1 to secondary.

1. BUILDING NCS R2 LOADS FOR N1-2 MDM

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-2 for N1-2 I/O Configuration Table to N1-2 MDM EEPROM, then:

   File location: /mcc/rcn/ISS005/load_image/ncs25/250N12EEPROMCF.LIF

   Cmd Ops Name: N1_2_MDM_NCS_R2_IO_Config_EEPROM_Load

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-2 for N1-2 Full Software Load to N1-2 MDM EEPROM, then:

   File location: /mcc/rcn/ISS005/load_image/ncs25/ 250N12EEPROMUASPPL…?

   Cmd Ops Name: N1_2_MDM_NCS_R2_UAS_SW_EEPROM_Load

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-2 for N1-2 Checksums to N1-2 MDM DRAM, then:

   File location: /mcc/rcn/ISS005/ncs_patch/ncs_adt_checksum_table_2d

   Cmd Ops Name: N1_2_MDM_NCS_R2_Cksum_Patch_DRAM_Load

2. BUILDING NCS R2 LOADS FOR N1-1 MDM

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-1 for N1-1 I/O Configuration Table to N1-1 MDM EEPROM, then:

   File location: /mcc/rcn/ISS005/load_image/ncs25/ 250N11EEPROMCF.LIF

   Cmd Ops Name: N1_1_MDM_NCS_R2_IO_Config_EEPROM_Load

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-1 for N1-1 Full Software Load to N1-1 MDM EEPROM, then:

   File location: /mcc/rcn/ISS005/load_image/ncs25/ ncs25/250N11EEPROMUASPPL…?

   Cmd Ops Name: N1_1_MDM_NCS_R2_UAS_SW_EEPROM_Load

   Perform NCS DATA LOAD, all (SODF: GND: C&DH) to N1-1 for Checksum Matching file to N1-1 MDM DRAM, then:

   File location: /mcc/rcn/ISS005/ncs_patch/ ncs_adt_checksum_table_1d

   Cmd Ops Name: N1_1_MDM_NCS_R2_Cksum_Patch_DRAM_Load

3. VERIFYING MDM STATES
Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify State – Primary

Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify State – Secondary

Verifying RS State
If NCS interface is SM Central Computer
sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)

FGB_MDM

Verify FGB Frame Count – <incrementing>

4. VERIFYING OIU TELEMETRY FORMAT PPL VERSION IDs

4.1 N1-2 MDM OIU Telemetry Format Version ID
Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1
'Software Control'

sel PPL Version ID

Prim_NCS_PPL_Version_Ids

√OIU Telemetry Format: 5

4.2 N1-1 MDM OIU Telemetry Format Version ID
Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1
'Software Control'

sel PPL Version IDs

Sec_NCS_PPL_Version_Ids

√OIU Telemetry Format: 5

5. PREPARING FOR UAS SOFTWARE LOAD TO N1-2 MDM EEPROM

5.1 Recording Checksums and Data Load Command Data

ODIN: NCS Displays: Primary Checksums

Primary NCS Checksums

RECORD NCS UAS Checksum _____

NCS Total Checksum _____

Data Load Accept Counter _____

Data Load Response Counter _____

5.2 Disabling N1-2 MDM Checksum Safing

<Cmd Inv: Prim NCS Inh Cksum Sfng – (M1DD95SM1047K) > **Uplink**

ODIN: NCS Displays: Primary Checksums

Primary NCS Checksums

Verify NCS Total Checksum Safing – Disabled

5.3 Disabling N1-2 MDM Auto Transition to Diagnostic

<Cmd Inv: Prim NCS Inh Auto Xtion To Diag – (M1DD95SM1055K) > **Uplink**

C&DH Overview

Verify Auto Xtion Diag – Inh

6. PERFORMING UAS SOFTWARE LOAD TO N1-2 MDM EEPROM

6.1 Loading N1-2 EEPROM

'FMT Uplink Manager'

sel N1_2_MDM_NCS_R2_UAS_SW_EEPROM_Load
sel Uplink **Uplink**

6.2 While load is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

6.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: XXX

6.4 Verify the following
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Error Detected – Yes

7. PREPARING FOR I/O CONFIGURATION LOAD TO N1-2 MDM EEPROM

ODIN: NCS Displays: Primary Checksums

Primary NCS Checksums

RECORD	NCS UAS Checksum	_____
	NCS Total Checksum	_____
	Data Load Accept Counter	_____
	Data Load Response Counter	_____

8. PERFORMING I/O CONFIGURATION LOAD TO N1-2 MDM EEPROM

8.1 Loading N1-2 EEPROM
'FMT Uplink Manager'

sel N1_2_MDM_NCS_R2_IO_Config_EEPROM_Load
sel Uplink **Uplink**

8.2 While load is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

8.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: XXX

8.4 Verify the following
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Error Detected – Yes

9. PERFORMING CHECKSUM PATCH LOAD TO N1-2 MDM DRAM

9.1 Loading N1-2 DRAM
'FMT Uplink Manager'

sel N1_2_MDM_NCS_R2_Cksum_Patch_DRAM_Load
sel Uplink **Uplink**

9.2 While load is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

9.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: 71DF

9.4 Loading is successful if
Cycle Counter – <incrementing>
Error Counter – <not incrementing>
Error Detected – No

10. CLEARING LATCH DATA COMMAND

<Cmd Inv: Prim_NCS_CLR_Lat_Data – (M1DD95SM1027K)> **Uplink**

ODIN: NCS Displays: Primary Checksums

Primary NCS Checksums

Verify Checksum fault – No

11. INHIBITING NCS AUTO RETRY IN THE SECONDARY MDM
<Cmd Inv: Sec_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2618K)>
Uplink

C&DH Overview

Verify Auto Retry – Inh

12. COMMANDING N1-2 MDM TO DIAGNOSTIC STATE

NOTE

1. Sending the following command will cause the loss of PCS2, Early Comm, and OIU telemetry until OIU reconfiguration and PCS1 reconnection are done.

2. Possible '**PDI DECOM Fail**' message.

3. When the N1-2 MDM is commanded to the diagnostic state from primary, the NCS Shutdown sequence will execute. The sequence will command all IMVs to close and will set all heaters to their default states.

4. The following C&W messages are expected as N1-2 MDM is sent to diagnostic:
'**MDM N1-1 Detected RT Fail N1-2**'
'**Prim NCS Detect OIU Fail**'

C&DH Overview Display

√Prim_NCS_Auto_Xsitn_to_Dgnstc_Inh – blank (Enable)

If X (Inhibit)
<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_To_Diag – (M1DD95SM1053K)>

√Prim_NCS_Auto_Xsitn_to_Dgnstc_Inh – blank (Enable)

<Cmd Inv: N1-2_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1011K)>
Uplink

<Cmd Inv: N1-2_Xtion_Diag_State – (M1DD95SM1009K)> **Uplink**

Wait 60 seconds.

Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1

Verify Frame Count – <static>

NOTE
N1-1 should begin to transition to primary after 42 seconds of not detecting a BC. When N1-1 becomes primary, the UB EPS buses may switch channels and the N1-1 MDM may also switch from UB EPS N1-14 to UB EPS N1-23 attempting to communicate with the N1-2 MDM.

EPCS will lose telemetry.
To get PCS telemetry, crew must reconnect to ISS by performing EPCS SETUP, steps 4 --- 6 (SODF: ISS OPS: C&DH).

13. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

BUS 4 BC – ITEM 15 EXEC
BUS 3 RT – ITEM 10 EXEC
Change OIU N1 Physical Device to N1-1 – ITEM 18 +4 EXEC
Reload OIU FORMAT 2 – ITEM 1 +2 EXEC

14. VERIFYING MDM STATES
Nav to MSID Displays

Verify PHY ID PRI MDM – N1-1
Verify State – PRI
Verify Fail – blank
Verify Frame Count – <incrementing>

Verifing RS State
If NCS interface is SM Central Computer
sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)

FGB_MDM

Verify FGB Frame Count – <incrementing>

15. VERIFYING N1-2 MDM IS IN DIAGNOSTIC
<Cmd Inv: N1-1_MDM_Xmit_Mode_Code_Tmplt – (M1DD95SM0026K)>

Bus ID: 2
RT Address: 5
Mode Code: 2

sel Store Cmd in Cmd Inv **Uplink**

'1553 Status Word'

√RT Address: 5
√Subsystem Flag Set – X (Set)

16. INHIBITING NODE 1 A HEATERS
Node1: TCS
Node1: TCS
'NODE 1'

If any Node1 A Htr Availability – Ena Opr or Ena BU, inhibit the heater per the following example for Node1 Htr1A.

sel Htr Availability

NODE1 Htr16 Avail

cmd Htr1A – Inhibit

√Htr1A – Inh

17. INHIBITING PMA1 A HEATERS
Node1: TCS
Node1: TCS
'PMA 1'

If any PMA1 A Htr Availability – Ena Opr or Ena BU, inhibit the heater per the following example for PMA1 Htr1A.

sel Htr Availability

PMA1 Htr Availability

cmd Htr1A – Inhibit

√Htr1A – Inh

18. REINITIALIZING N1-2 MDM FROM EEPROM
<Cmd Inv: N1_2_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2507K)>
Uplink

Wait 1 minute for MDM to reinitialize.

Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

****
If N1-2 Frame Count – <static>
Malfunction Section - TBD
****

19. CHECKING OUT NCS R2 SOFTWARE

19.1 Matching MDM R2 Checksum Values
Verify NCS Total Checksum: XXX
Verify NCS UAS Checksum: XXX

19.2 Verifying MDM BST A
TBD

19.3 Verifying OIU Telemetry PPL Version Number
Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1
'Software Control'

sel PPL Version IDs

Prim_NCS_PPL_Version_Ids

√OIU Telemetry Format: 1

19.4 Verifying NCS R2 Software Version ID
NCS R2 S/W Version ID = NCS 1.8.4 (???)

20. COMMANDING N1-1 TO SECONDARY (N1-2 SHOULD GO TO PRIMARY)

NOTE
1. Sending the following command will cause the loss of PCS1, Early Comm, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.
2. The SM Computer will lose Node MDM Frame Count for 52 seconds while N1-1 is transitioning to primary.
3. Possible '**PDI DECOM Fail**' message.

<Cmd Inv: N1-1 MDM Xtion Sec State – (M1DD95SM2541K)> **Uplink**

Verify Primary Frame Count – <static> (loss of PCS1 telemetry)

Wait 30 seconds.

NOTE

1. N1-2 should begin transition to primary in 20 seconds if no BC is detected. The SM Computer will lose Node MDM Frame Count.

2. Telemetry may not be valid until GC changes to the FEP to format 2N.

21. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

BUS 3 BC – ITEM 11 EXEC
BUS 4 RT – ITEM 14 EXEC
Change OIU N1 Physical Device to N1-2 – ITEM 18 +2 EXEC
Reload OIU FORMAT 2 – ITEM 1 +3 EXEC
Load TFL/DFL Configuration 769

22. VERIFYING MDM STATES
Nav to MSID Displays

Verify PHY ID PRI MDM – N1-2
Verify State – PRI
Verify Fail – blank
Verify Frame Count – <incrementing>

23. CONFIGURING GROUND FOR 2N FORMAT
GC PERFORM FEP OVERIDE

NOTE
The MDMs are running in a mixed configuration with N1-2 (R2) AND N1-1 (R1) software.

Verify NCS R2 Data in N1-2 MDM.

24. VERIFYING AND RESTORING NORMINAL CONFIGURATION FOR N1-2 MDM

24.1 Verifying MDM States
Node 1: C&DH: MDM N1-2
PRIMARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify State – Primary

Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify State – Secondary

24.2 Verifing RS State
If NCS interface is SM Central Computer
sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)

FGB_MDM

Verify FGB Frame Count – <incrementing>

24.3 Enabling Secondary NCS Auto Retry
<Cmd Inv: Sec_NCS_Ena_NCS_Auto_Retry –
(M1DD95SM????K)> **Uplink**

C&DH Overview

Verify Auto Retry – ENA

25. RESTORING NODE B HEATER CONFIGURATION
Perform the following step for each Node 1 B heater.

NOTE

1. Availability and setpoint commands should be sent for each Node 1 B heater using the following example for display navigation and commanding steps.
2. Individual heater setpoint values can be found in Table 1. PMA 1/ NODE 1 B Heater Ingress Setpoints.
3. It will be necessary to send setpoint commands to both heater sensors in Node zones 1, 3, 5, 6, and 7.

CDDT Node 1: TCS

NODE1: TCS

'NODE1'

sel Htr Availability

NODE1 HtrAvailability

cmd Htr1B – Inhibit

√Htr1B – Inh

sel NODE1 HtrB Setpoints

NODE1 HtrB Setpoints

sel Htr1B Snsr1 – Chng Setpt

NODE1 Htr1B Setpoint Snsr1

Input Failure Upper Limit, degC: 40
Upper Setpoint, degC: 28
Lower Setpoint, degC: 21
Failure Lower Limit, degC: -17
Cyclic Load Delta, degC: 5

cmd Execute Change

NODE1 HtrB Setpoints

√Htr1B Failure Upper Limit, degC: 40
√Upper Setpoint, degC: 28
√Lower Setpoint, degC: 21
√Failure Lower Limit, degC: -17
√Cyclic Load Delta, degC: 5

26. RESTORING PMA B HEATER CONFIGURATION

Perform the following step for each PMA B heater.

NOTE

1. Availability and setpoint commands should be sent for all PMA B heaters (four) using the following example for display navigation and commanding steps.

2. Individual heater setpoint values can be found in Table 1. PMA 1/ Node 1 B Heater Ingress Setpoints.

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability
PMA1 HtrAvailability

cmd Htr1B – Inhibit

√Htr1B – Inh

sel PMA1 HtrB Setpoints

PMA1 HtrB Setpoints

sel Htr1B – Chng Setpt

PMA1 Htr1B Setpoint

Input Failure Upper Limit, degC: 40
Upper Setpoint, degC: 24
Lower Setpoint, degC: 21
Failure Lower Limit, degC: -17
Cyclic Load Delta, degC: 5

cmd Execute Change

PMA1 HtrB Setpoints

√Htr1B Failure Upper Limit, degC: 40
√Upper Setpoint, degC: 24
√Lower Setpoint, degC: 21
√Failure Lower Limit, degC: -17
√Cyclic Load Delta, degC: 5

27. PERFORMING SHELL WARMUP AND MAINTENANCE PROCEDURE
Perform NODE 1/PMA 1 SHELL WARMUP AND MAINTENANCE, all (SODF: ISS OPS: TCS) every 4 hours until the NCS R2 upload to N1-1 is complete, using only B heaters in step 2 prioritization.

Finish N1-2 MDM NCS R2 Load.
Perform NCS R2 Loads for N1-2 MDM at GMT ????.

29. PREPARING FOR UAS SOFTWARE LOAD TO N1-1 MDM EEPROM
29.1 Recording Checksums and Data Load Command Data
ODIN: NCS Displays: Secondary Checksums

Secondary NCS Checksums

RECORD NCS UAS Checksum _____

NCS Total Checksum _____

Data Load Accept Counter _____

Data Load Response Counter _____

29.2 Disabling N1-1 MDM Checksum Safing
<Cmd Inv: Sec NCS Inh Cksum Sfng – (M1DD95SM1048K) > **Uplink**

ODIN: NCS Displays: Secondary Checksums

Secondary NCS Checksums

Verify NCS Total Checksum Safing – Disabled

29.3 Disabling N1-2 MDM Auto Transition to Diagnostic
<Cmd Inv: Prim NCS Inh Auto Xtion To Diag –
(M1DD95SM1055K) > **Uplink**

C&DH Overview

Verify Auto Xtion Diag – Inh

30. PERFORMING UAS SOFTWARE LOAD TO N1-1 MDM EEPROM

30.1 Loading N1-1 EEPROM
'FMT Uplink Manager'

sel N1_1_MDM_NCS_R2_UAS_SW_EEPROM_Load
sel Uplink **Uplink**

30.2 While loading is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

30.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: XXX

30.4 Verify the following
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Error Detected – Yes

31. PREPARING FOR I/O CONFIGURATION LOAD TO N1-1 MDM EEPROM
ODIN: NCS Displays: Secondary Checksums

Secondary NCS Checksums

RECORD NCS UAS Checksum _____

NCS Total Checksum _____

Data Load Accept Counter _____

Data Load Response Counter _____

32. PERFORMING I/O CONFIGURATION LOAD TO N1-1 MDM EEPROM

32.1 Loading N1-1 EEPROM
'FMT Uplink Manager'

sel N1_1_MDM_NCS_R2_IO_Config_EEPROM_Load
sel Uplink **Uplink**

32.2 While load is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

32.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: XXX

32.4 Verify the following
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Error Detected – Yes

33. PERFORMING CHECKSUM PATCH LOAD TO N1-1 MDM DRAM

33.1 Loading N1-1 DRAM
'FMT Uplink Manager'

sel N1_1_MDM_NCS_R2_Cksum_Patch_DRAM_Load
sel Uplink **Uplink**

33.2 While load is in process
Cycle Counter – <incrementing>
Error Counter – <incrementing>
Checksum Fault – Yes
Error Detected – Yes (may occasionally toggle to No)

33.3 Loading is completed when
% Complete: 100 %
Packets Transmitted – Packets in this Load
Packets Received – Packets in this Load
Packets Remaining: 0
Packets Missing: 0
NCS UAS Checksum: XXX
NCS Total Checksum: 71DF

33.4 Verify the following
Cycle Counter – <incrementing>
Error Counter – <not incrementing>
Error Detected – No

34. CLEARING LATCH DATA COMMAND
<Cmd Inv: Sec_NCS_CLR_Lat_Data – (M1DD95SM1028K)> **Uplink**

ODIN: NCS Displays: Secondary Checksums

Secondary NCS Checksums

Verify Checksum Fault – No

35. INHIBITING NCS AUTO RETRY IN THE PRIMARY MDM
<Cmd Inv: Prim NCS Inh NCS Auto Retry – (M1DD95SM2502K)> **Uplink**

C&DH Overview

Verify Prim NCS Auto Retry – Inh

36. COMMANDING N1-1 MDM TO DIAGNOSTIC STATE

NOTE
1. UB EPS buses may switch channels and the N1-1 MDM may also switch from UB EPS N1-14 to UB EPS N1-23 attempting to communicate with the N1-1 MDM.
2. The C&W message '**MDM N1-2 Detected RT Fail N1-1**' is expected as N1-1 MDM is sent to diagnostic.

C&DH Overview Display

√Sec_NCS_Auto_Xsitn_to_Dgnstc_Inh – blank (Enable)

If X (Inhibit)
<Cmd Inv: Sec_NCS_Ena_Auto_Xtion_To_Diag – (M1DD95SM????K)>

√Sec_NCS_Auto_Xsitn_to_Dgnstc_Inh – blank (Enable)

<Cmd Inv: N1-1_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1010K)>
Uplink

<Cmd Inv: N1-2_Xtion_Diag_State – (M1DD95SM1008K)> **Uplink**

Wait 60 seconds.

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

Verify Frame Count – <static>

<Cmd Inv: Prim NCS Inh Auto Xtion To Diag – (M1DD95SM1055K)>
Uplink

C&DH Overview

Verify Auto Xtion Diag – Inh

37. VERIFYING N1-1 MDM IS IN DIAGNOSTIC
<Cmd Inv: N1-1_MDM_Xmit_Mode_Code_Tmplt – (M1DD95SM0026K)>

Bus ID: 2
RT Address: 6
Mode Code: 2

sel Store Command in Command Inventory **Uplink**

'1553 Status Word'

√RT Address: 5
√Subsystem Flag Set – X (Set)

38 REINITIALIZING N1-1 MDM FROM EEPROM
<Cmd Inv: N1_1_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2505K)>
Uplink

Wait 1 minute for MDM to reinitialize, then:

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify N1-1 Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Standby

****
If N1-1 Frame Count – <static>
Malfunction Section - TBD
****

39. CHECKING OUT NCS R2 SOFTWARE

39.1 Matching MDM R2 Checksum Values
Verify NCS Total Checksum – Reference
Verify NCS UAS Checksum – Reference

39.2 Verifying MDM BST A
TBD

39.3 Verifying OIU Telemetry PPL Version Number
Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1
'Software Control'

sel PPL Version IDs

Prim_NCS_PPL_Version_Ids

√OIU Telemetry Format: 1

39.4 Verifying NCS R2 Software Version ID
NCS R2 S/W Version ID – NCS 1.8.4 (???)

40. COMMANDING N1-1 TO SECONDARY
<Cmd Inv: N1-1 MDM Xtion Sec State – (M1DD95SM2541K)>

C&DH Overview

Verify N1-1 MDM Frame Count – <static>

Wait 30 seconds.

41. VERIFYING AND RESTORING NOMINAL CONFIGURATION FOR N1-1 MDM

41.1 Verifying MDM State
Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify State – Secondary

41.2 Enabling Primary NCS Auto Retry
<Cmd Inv: Prim_NCS_Ena_NCS_Auto_Retry – (M1DD95SM????K) > **Uplink**

C&DH Overview

Verify Auto Retry – Ena

42. PERFORMING HEATER RECOVERY AND WARMUP PROCEDURES
Perform the NODE 1/PMA 1 HEATER RECOVERY, all (SODF: GND: TCS) for all Node 1 and PMA 1 A heaters only, then:

Perform NODE 1/PMA 1 SHELL WARMUP AND MAINTENANCE, all (SODF: ISS OPS: TCS).

Table 1. PMA 1/Node 1 B Heater Ingress Setpoints

PMA 1 Heaters - All Temperatures in °C (°F)

HEATER	FAILURE UPPER LIMIT	UPPER SETPOINT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
2B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
3B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
5B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)

Node 1 Heaters - All Temperatures in °C (°F)

HEATER (SENSOR)	FAILURE UPPER LIMIT	UPPER SETPOINT	LOWER SETPOINT	FAILURE LOWER LIMIT	CYCLIC LOAD DELTA
1B (Snsr 1)	40(104)	28(82.4)	21(69.8)	-17(1.4)	5(9)
1B (Snsr 2)	40(104)	28(82.4)	21(69.8)	-17(1.4)	5(9)
2B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
3B (Snsr 1)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
3B (Snsr 2)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
4B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
5B (Snsr 1)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
5B (Snsr 2)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
6B (Snsr 1)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
6B (Snsr 2)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
7B (Snsr 1)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
7B (Snsr 2)	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
8B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)
9B	40(104)	24(75.2)	21(69.8)	-17(1.4)	5(9)

43. RESTORING NOMINAL PPL CONFIGURATIONS

Perfrom FMT MANAGER DATA LOAD MANAGEMENT, all (SODF: GND: C&DH) for the following PPLs as required.

MDM N1-2 Load Shed Table 2
MDM N1-1 Load Shed Table 2
MDM N1-2 Heater Set Posting PPL
MDM N1-1 Heater Set Posting PPL

NODE 1 MDM CARD FAILURE

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 2 pages

Attention Symbol Will Appear on Card

Nominal Config:
Comm Via Early Comm or OIU

1 Identify Card

Node 1: C&DH: MDM N1-2(1)

Primary(Secondary) NCS MDM Node1

- √ ! Symbol appears on any card
  - SPD (Slot 0,1)
  - DIO (Slot 2,4)
  - SDO (Slot 3)
  - AIO (Slot 6)
  - LLA (Slot 5,7,9)
  - HLA (Slot 8)
- Record card with !

Is the symbol on either SPD card in N1-1 MDM? or Is the symbol on either SPD card in N1-2 MDM?

Yes → 1553 BUS FAILURE (SODF: ISS MAL: C&DH)

No

2 Check IOCC

Primary(Secondary) NCS MDM Node1

- sel MDM BIT Status

Primary(Secondary) NCS BIT Summary Table A

- Word 5: Soft Fail
- √IOCC HW Error - X

Is there an IOCC HW Error (X)?

Yes → **3** IOCC hardware failure. → 7

No

4 Check Channel Status and Card Bit

Primary(Secondary) NCS MDM Node1

- sel I/O card with !

Is there an X by Handshake Test or Parity Test, as well as Channel?

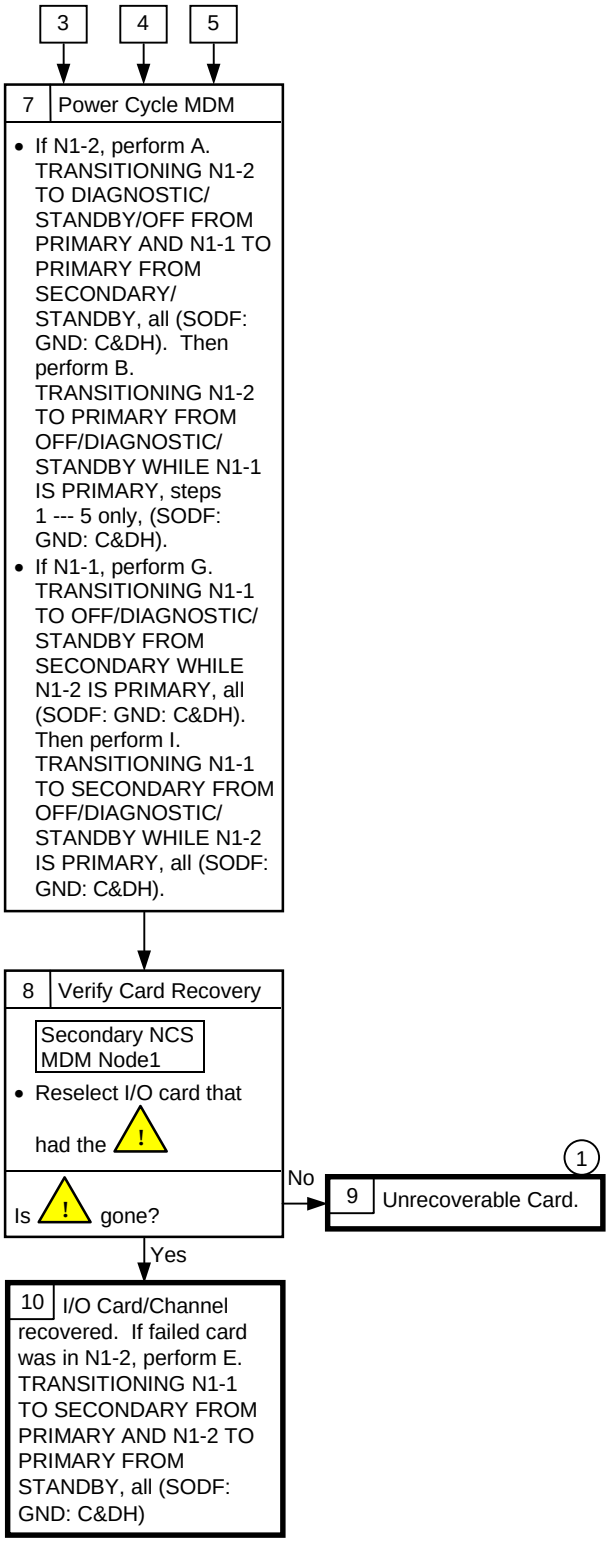
No → **5** Channel failure only. → 7

Yes

6 Entire card failure. → 7

NODE 1 MDM CARD FAILURE

(GND/2A.2A - 2A.2B/FIN A) Page 2 of 2 pages



(1) Configure for degraded MDM operations or configure for loss of MDM. Schedule remove and replace of MDM if spare is available.

NOTE

1. This procedure is used to reconfigure the Node 1 MDMs after an Auto Retry Condition has occurred where the Auto Retry function reconfigures the MDMs back to the nominal states of N1-2 Primary and N1-1 Secondary.

2. N1-2 recovered: perform steps 1, 2, and 3.3
   N1-1 recovered: perform steps 1 and 3

1. VERIFYING MDM STATES

PCS2

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary

Verifying RS State
If NCS interface is SM Central Computer
sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)
FGB MDM

Verify FGB Frame Count – <incrementing>

2. RECONFIGURING THE NODE 1-2 MDM

2.1 Clearing MDM BST Error Latch

PCS

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

'Clear Latched Data in BST A'

cmd Clear **Execute**

<Cmd Inv: Prim_NCS_Clr_Lat_Data – (M1DD95SM1027K)>

Primary NCS MDM Node 1

sel MDM BIT States

√BST Errors – blank
(errors cleared)

2.2 Configuring MDM Heaters Controlled by the N1-2 MDM

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

If Open
sel RPC 4

RPCM_N1RS2_C_RPC_4

cmd Close

<Cmd Inv: RPCM_N1RS2_C_RPC_4_N1_1_MDM_SDO_1B_Cl – (M1PR95SM1598K)>

√RPC 4 Position – Cl

'N1-1 Heaters'

√Sur – Ena BKUP

If Sur – Ena Opr
sel N1-2 Heater Sur

N1_2_MDM_Survival_Heaters
'Command Status'

cmd Ena_BKUP

<Cmd Inv: MDM_N1_1_Ena_Bu_Srv_Htr – (M1TH96IM0273K)>

√Availbty – Ena BKUP

√Opr – Ena Opr

2.3 Reconfiguring N1-2 MDM EPS Remote Terminals

CRT SM 200 APCU

√APCU1 OUT VOLTS RES LOW ≥ 121

If APCU1 OUT VOLTS RES LOW ≥ 121

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1

sel LB Sys Lab – 2
sel RT Status

LB_SYS_LAB_RT_Status

cmd 18_RPCM_N13B_C RT Status – Enable **Execute**
cmd 19_RPCM_N13B_B RT Status – Enable **Execute**
cmd 20_RPCM_N13B_A RT Status – Enable **Execute**

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_C – (M1DD95SM1179K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_B – (M1DD95SM1180K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_A – (M1DD95SM1181K)>

LB_SYS_LAB_RT_Status

√RT Status 18, 19, 20 – ENA

cmd 18_RPCM_N13B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N13B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N13B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_C – (M1DD95SM1342K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_B – (M1DD95SM1343K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_A – (M1DD95SM1344K)>

LB_SYS_LAB_RT_Status

√RT FDIR Status 18, 19, 20 – ENA

2.4 Resetting NCS Auto Retry Counter
On MCC-H GO

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel MDM Utilities

If Auto Retry Counter - 1
cmd Reset **Execute**

<Cmd Inv: Sec_NCS_Rset_NCS_Retry_Cntr – (M1SDD95SM2619K)>

√Auto Retry Counter – 0

2.5 Subsystem Reconfiguration
As required, reactivate the following MDM N1-2 equipment.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Smoke Detector 2.
Node 1 Port Fwd IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Port Fwd IMV Fan only.
Node 1 Stbd Aft IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Stbd Aft IMV Fan only.
Node 1 Fwd Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Port IMV Valve only.
Node 1 Fwd Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Stbd IMV Valve only.

2.6 Resetting ACS Moding
If during Docked Ops, go to ACS PRE-DEPARTURE MODING for N1-2, all (SODF: ISS OPS: MCS).

3. RECONFIGURING THE NODE 1-1 MDM

3.1 Clearing MDM BST Error Latch
Perform NCS MDM BST CLEAR LATCHED DATA, for the Secondary N1-1 MDM, (SODF: GND: C&DH).

3.2 Configuring MDM Heaters Controlled by the N1-1 MDM

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'RPCM N1RS1 A'

√RPC 5 Position – Cl

If Open
sel RPC 5

RPCM_N1RS1_A_RPC_5

cmd Close

<Cmd Inv: RPCM_N1RS1_A_RPC_5_SDO_1A_N1_1_Cl – (M1PR95SM1329K)>

√RPC 5 Position – Cl

'N1-1 Heaters'

√Opr – ENA OPR

'N1-2 Heaters'

√Sur – Ena BKUP

If Sur – Ena BKUP
sel N1-1 Heaters, Sur

N1_1_Survival Heater

cmd Enable BKUP

<Cmd Inv: N1_2_Srv_Htr_Ena_BU – (M1TH96IM0271K)>

√Availbty – Ena BKUP

3.3 Reconfiguring N1-1 MDM EPS Remote Terminals

CRT SM 200 APCU

√APCU2 OUT VOLTS RES LOW ≥ 121

If APCU2 OUT VOLTS RES LOW ≥ 121

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1

sel LB Sys Lab – 1
sel RT Status

LB_SYS_LAB_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

LB_SYS_LAB_RT_Status

√RT Inhibited 18, 19, 20 – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

LB_SYS_LAB_RT_Status

√RT FDIR Status 18, 19, 20 – ENA

3.4 Resetting NCS Auto Retry Counter
On MCC-H GO

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel MDM Utilities

If Auto Retry Counter – 1
cmd Reset **Execute**

<Cmd Inv: Prim_NCS_Rset_NCS_Retry_Cntr – (M1DD95SM2500K)>

√Auto Retry Counter – 0

3.5 Subsystem Reconfiguration
As required, reactivate the following MDM N1-1 equipment.

√**MCC-H** for proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Cabin Fan	NODE 1 CABIN FAN ACTIVATION, (SODF: ISS OPS: ECLSS)	This procedure will start up the Cabin Fan and both Node 1 Smoke Detectors.
Node 1 Smoke Detector 1	NODE 1 SMOKE DETECTOR ACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Activation not performed.
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION (SODF:ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Activation not performed.
Node 1 Aft Port IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Port IMV Fan only.
Node 1 Aft Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Port IMV Valve only.
Node 1 Aft Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Stbd IMV Valve only.

3.6 Resetting ACS Moding
If during Docked Ops, perform ACS PRE-DEPARTURE MODING for N1-1, all (SODF: ISS OPS: MCS).

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NOTE
1. The command to reinitialize the MDM is sent while an MDM is in Diagnostic. The other MDM must be in Primary.

2. If reinitializing N1-1, use the parameters in parentheses.

1. VERIFYING MDM STATE AND ID

PCS1(2) Node 1: C&DH: MDM N1-1(2)
Primary NCS MDM Node 1

√Frame Count – <incrementing>
√MDM ID – N1-1(2)
√MDM State – Primary

Node 1: C&DH: MDM N1-2(1)
Secondary NCS MDM Node 1

√Frame Count static

2. VERIFYING MDM N1-1(2) IS IN DIAGNOSTICS MODE

If MDM has already been verified as being in Diagnostic, go to step 3.

NOTE
It is necessary to identify the EPS bus that the Node 1 MDMs are using to communicate with each other to determine the Bus ID for the Transmit Mode Code command that will be sent to verify the MDM is in Diagnostic.

PCS1(2) Node 1: C&DH: MDM N1-1(2)
Primary NCS MDM Node 1

sel UB EPS N1-14
sel RT Status

UB_EPS_N1_14_RT_Status

If 05 MDM N1-1 RT status – ENA
Use Bus ID 2 in template command.

If 05 MDM N1-2 RT status – INH
Primary NCS MDM Node 1

sel UB EPS N1-23
sel RT Status

UB_EPS_N1_23_RT_Status

√05 MDM N1-2 RT status – ENA

Use Bus ID 3 in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

'Transmit Mode Code Commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 5
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

√Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is set, N1-2(1) MDM is in Diagnostic and is ready to accept diagnostic commands. If not, √**MCC**.

3. REINITIALIZING MDM FROM EEPROM

PCS1(2) Node 1: C&DH: MDM N1-1(2)
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary NCS MDM Utilities

NOTE
1. Reinitializing MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configuration.

2. All UAS and default Configuration Tables will be loaded from EEPROM.

3. Normal POST will also be performed.

cmd N1_2(1)_MDM_Reinitialize_EEPROM **Execute**

<Cmd Inv: N1_2(1)_MDM_Re_Init_MDM_EEPROM –
(M1DD95SM2507K) (M1DD95SM2505K)>

NOTE
Wait 1 minute for the MDM to reinitialize.

4. VERIFYING MDM STATE AFTER REINITIALIZATION

PCS1(2) Node 1: C&DH: MDM N1-2(1)
Secondary NCS MDM Node 1

√Frame Count – <incrementing>
√MDM ID – N1-2(1)
√MDM State – Standby

****
If state is not Standby, √**MCC-H**.
****

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RPCM N13B/N14B DISABLE
(GND/2A.2A - 2A.2B/FIN A) Page 1 of 2 pages

1. INHIBITING N13B RT AND FDIR
   Node 1: C&DH: MDM N1-2
   Primary NCS MDM Node1

   sel LB Sys Lab – 2
   sel RT Status
   cmd 18_RPCM_N13B_C RT FDIR Status – Inhibit FDIR **Execute**
   cmd 19_RPCM_N13B_B RT FDIR Status – Inhibit FDIR **Execute**
   cmd 20_RPCM_N13B_A RT FDIR Status – Inhibit FDIR **Execute**

   <Cmd Inv: N1_2_MDM_Inhib_FDIR_RPCM_N13B_C – (M1DD95SM1363K)>

   <Cmd Inv: N1_2_MDM_Inhib_FDIR_RPCM_N13B_B – (M1DD95SM1364K)>

   <Cmd Inv: N1_2_MDM_Inhib_FDIR_RPCM_N13B_A – (M1DD95SM1365K)>

   √RT FDIR Status Inhibit 18, 19, 20 – Inh (all three)

   cmd 18_RPCM_N13B_C RT Status – Inhibit **Execute**
   cmd 19_RPCM_N13B_B RT Status – Inhibit **Execute**
   cmd 20_RPCM_N13B_A RT Status – Inhibit **Execute**

   <Cmd Inv: N1_2_MDM_Inhib_RPCM_N13B_C – (M1DD95SM1200K)>

   <Cmd Inv: N1_2_MDM_Inhib_RPCM_N13B_B – (M1DD95SM1201K)>

   <Cmd Inv: N1_2_MDM_Inhib_RPCM_N13B_A – (M1DD95SM1202K)>

   √RT Status 18, 19, 20 – Inhibit (all three)

2. INHIBITING N14B RT AND FDIR
   Node 1: C&DH: MDM N1-1
   Secondary NCS MDM Node1

   sel LB Sys Lab – 1
   sel RT Status
   cmd 18_RPCM_N14B_C RT FDIR Status – Inhibit FDIR **Execute**
   cmd 19_RPCM_N14B_B RT FDIR Status – Inhibit FDIR **Execute**
   cmd 20_RPCM_N14B_A RT FDIR Status – Inhibit FDIR **Execute**

<Cmd Inv: N1_1_MDM_Inhib_FDIR_RPCM_N14B_C – (M1DD95SM1321K)>

<Cmd Inv: N1_1_MDM_Inhib_FDIR_RPCM_N14B_B – (M1DD95SM1322K)>

<Cmd Inv: N1_1_MDM_Inhib_FDIR_RPCM_N14B_A – (M1DD95SM1323K)>

√RT FDIR Status 18, 19, 20 – Inh (all three)

cmd 18_RPCM_N14B_C RT Status – Inhibit **Execute**
cmd 19_RPCM_N14B_B RT Status – Inhibit **Execute**
cmd 20_RPCM_N14B_A RT Status – Inhibit **Execute**

<Cmd Inv: N1_1_MDM_Inhib_RPCM_N14B_C – (M1DD95SM1158K)>

<Cmd Inv: N1_1_MDM_Inhib_RPCM_N14B_B – (M1DD95SM1159K)>

<Cmd Inv: N1_1_MDM_Inhib_RPCM_N14B_A – (M1DD95SM1160K)>

√RT Status 18, 19, 20 – Inh (all three)

1. ENABLING N13B RT AND FDIR

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node1

sel LB Sys Lab – 2
sel RT Status

LB_SYS_LAB_RT_Status

cmd 18_RPCM_N13B_C RT Status – Enable **Execute**
cmd 19_RPCM_N13B_B RT Status – Enable **Execute**
cmd 20_RPCM_N13B_A RT Status – Enable **Execute**

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_C – (M1DD95SM1179K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_B – (M1DD95SM1180K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_A – (M1DD95SM1181K)>

LB_SYS_LAB_RT_Status

√RT Status 18, 19, 20 – ENA

cmd 18_RPCM_N13B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N13B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N13B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_C – (M1DD95SM1342K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_B – (M1DD95SM1343K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_A – (M1DD95SM1344K)>

LB_SYS_LAB_RT_Status

√RT FDIR Status 18, 19, 20 – ENA

2. ENABLING N14B RT AND FDIR

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node1

sel LB Sys Lab – 1
sel RT Status

LB_SYS_LAB_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

LB_SYS_LAB_RT_Status

√RT Status 18, 19, 20 – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_ Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_ Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_ Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

LB_SYS_LAB_RT_Status

√RT FDIR Status 18, 19, 20 – ENA

A. TRANSITIONING N1-2 TO DIAGNOSTIC/STANDBY/OFF FROM PRIMARY I AND N1-1 TO PRIMARY FROM SECONDARY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 10 pages

NOTE
This procedure changes the Primary NCS to ЦВМ (SM Central Computer) interface from N1-2 to N1-1; therefore, **MCC-M** must be notified prior to the execution of this procedure.

On MCC GO

1. VERIFYING MDM STATE

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary/Standby

2. CONFIGURING MDM HEATERS

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

NOTE
When MDM N1-2 is in Diagnostic/Standby/Off, the N1-2 Operational Heater is not available and the N1-2 Survival Heater is required to maintain the MDM within temperature limits.

'N1-1 Heaters'

Verify Opr – Ena Ops

'RPCM_N1_RS1_A'

√RPC 5 Position – Cl

'N1-2 Heaters'

Verify Sur – Ena BU

NOTE
The MDM Surivival Heaters default to Ena Ops in NCS R2. Ground will configure heates as desired.

3. DISABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities

√Auto_Retry_Status – INH

If Auto_Retry_Status – ENA
cmd Inhibit **Execute**

<Cmd Inv: Second_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2618K)>

√Auto_Retry_Status – INH

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel Processing State

Secondary_NCS Processing State Tranditions
'Secondary MDM State Transitions'

√Auto Transition to Diag State – INH

If Auto Transition to Diag State – ENA
cmd Inhibit **Execute**

<Cmd Inv: Second_NCS_Inh_Auto_Xtion_to_Diag – (M1DD95SM1056K)>

√Auto Transition to Diag State – INH

4. SUBSYSTEM RECONFIGURATION

The following equipment must be shut down as required prior to executing the MDM N1-2 transition.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Smoke Detector 2 only.
Node 1 Port Fwd IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Port Fwd IMV Fan only.
Node 1 Stbd Aft IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Stbd Aft IMV Fan only.
Node 1 Fwd Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Fwd Port IMV Valve only.
Node 1 Fwd Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Fwd Stbd IMV Valve only.

5. COMMANDING N1-2 MDM TO DIAGNOSTIC

NOTE
N1-2 MDM must be transitioned to Diagnostic before going to Standby because if it is commanded directly to Standby, it will transition back to Primary before N1-1 can become BC.

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel Processing State

Primary NCS Processing State Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_To_Diag – (M1DD95SM1053K)>

√Auto Transition to Diag State – ENA

√Manual Transition to Diag State – ENA

If Manual Transition to Diag State – INH
'N1-2 MDM Transition'
'Manual Transition to Diag State'

cmd Arm **Execute**

<Cmd Inv: N1_2_MDM_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1011K)>

NOTE
1. Sending the following command will cause the loss of PCS2, Early Comm, and OIU telemetry until OIU reconfiguration and PCS1 reconnection are done.

2. Possible '**PDI DECOM Fail**' message.

cmd Transition **Execute**

<Cmd Inv: N1_2_MDM_Xtion_Diag_State – (M1DD95SM1009K)>

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

NOTE
N1-2 transition to Diagnostic takes 2 minutes. There will be a loss of telemetry on PCS2.

Verify Frame Count – static

NOTE
1. N1-1 transition to Primary will take 1 minute. N1-1 should begin to transition to Primary after 50 seconds of not detecting a BC.

2. When N1-1 becomes Primary, UB EPS buses will switch channels and N1-1 MDM will also switch from UB EPS N1-14 to UB EPS N1-23 attempting to communicate with N1-2 MDM.

6. RECOVERING TELEMETRY ON PCS1

NOTE
The following procedure is called to power up the PCS, start the CDS, and start the displays. Execute as required.

Perform EPCS SETUP, steps 4 --- 6 (SODF: ISS OPS: JOINT OPERATIONS), then:

NOTE
C&W tone and '**MDM N1-1 Detected RT Fail MDM N1-2 PMA-1 C&W**' message will be generated as N1-1 becomes Primary and detects N1-2 fail.

7. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

CRT SM 212 OIU

BUS 4 BC – ITEM 15 EXEC
BUS 3 RT – ITEM 10 EXEC
Change OIU N1 Physical Device to N1-1 – ITEM 18 +4 EXEC
Reload OIU FORMAT 2 – ITEM 1 +2 EXEC

SM 210 NODE

Verify PHY ID PRI MDM – N1-1
Verify STATE – PRI
Verify FAIL – blank
Verify FRM CTR – <incrementing>

8. VERIFYING N1-1 MDM STATE

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Primary

9. VERIFYING RS STATE

If NCS interface is ЦВМ (SM Central Computer)
'Software Contol'

sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)
FGB_MDM

Verify FGB Frame Count – <incrementing>

10. VERIFYING N1-2 IS IN DIAGNOSTIC STATE

PCS1

Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – static

NOTE
Steps below will determine which bus and Bus ID to use in template for Mode code.

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1_14_RT_Status

If 05 MDM N1-2 RT Status – ENA
Use Bus ID 2 in template command.

If 05 MDM N1-2 RT Status – INH
Primary NCS MDM Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_ N1_23_RT_Status

Verify 05 MDM N1-2 RT Status – ENA

Use Bus ID 3 in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transmit Mode Code Commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 5
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is '**YES**', N1-2 MDM is in Diagnostic and is ready to accept diagnostic commands.

11. VERIFYING MDM AND SHELL HEATERS CONFIGURATIONS

PCS1 Node 1: EPS: RPCM N1RS2 C
RPCM N1RS2 C

√RPC 15 Position – Op

Notify **MCC-H** to perform NODE 1/PMA 1 HEATER RECOVERY (SODF: GND GEN: TCS).

12. RECONFIGURING N1-1 MDM EPS REMOTE TERMINALS

CRT SM 200 APCU

√APCU2 OUT VOLTS RES LOW ≥ 121

If APCU2 OUT VOLTS RES LOW ≥ 121

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

sel LB_SYS_LAB_1

LAB_SYS_LAB_1

sel RT Status

LB_SYS_LAB_1_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

√RT 18, 19, 20 - RT FDIR Status – ENA

13. CLEARING MDM BST ERROR LATCH
On MCC GO

Node 1: C&DH: Primary NCS MDM
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

'Clear Latched Data in BST A'

cmd Clear **Execute**

If transitioning N1-2 to Diagnostic >>

If powering off N1-2, go to step 18.

14. REINITIALIZING MDM FROM EEPROM TO TRANSITION TO STANDBY

PCS1 Node 1: C&DH: MDM N1-1
Primary_NCS_MDM_Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

NOTE

1. Reinitilizing MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configuration.
2. All UAS and default Configuration Tables will be loaded from EEPROM.
3. Normal POST will also be performed.

'N1-2 MDM'

cmd Reinitilize_EEPROM **Execute**

<Cmd Inv: N1_2_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2507K)>

Wait 1 minute for MDM to reinitialize.

15. VERIFYING N1-2 IN STANDBY STATE

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

16. ENABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto Retry Status – ENA

If Auto Retry Status – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Retry – (M1DD95SM2501K)>

√Auto Retry Status – ENA

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing State_Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transitio to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Auto_Ena_Xtion_To_Diag – (M1DD95SM1053K)>

√Auto Transition to Diag State – ENA

17. CLEARING MDM BST ERROR LATCH
On MCC GO

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

If transitioning N1-2 to Standby >>

18. POWERING OFF N1-2 MDM

PCS1 Node 1: EPS: RPCM N1RS2 C
RPCM N1RS2 C

sel RPC 13

RPCM_N1RS2_C_RPC_13

√RPC Position – Cl

Verify Open Cmd – Ena

cmd RPC Position – Open (Verify – Op)

<Cmd Inv: RPCM_N1RS2_C_RPC_13_N1_2_MDM_Op – (M1PR95SM2255K>

B. TRANSITIONING N1-2 TO PRIMARY FROM OFF/DIAGNOSTIC/STANDBY WHILE N1-1 IS PRIMARY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 11 pages

NOTE

This procedure changes the Primary NCS to ЦВМ (SM Central Computer) interface from N1-2 to N1-1; therefore, **MCC-M** must be notified prior to the execution of this procedure.

On MCC GO

1. VERIFYING MDM STATES

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Primary

Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

If frame count incrementing, go to step 5.

2. APPLYING POWER TO THE N1-2 MDM IF IT IS OFF

PCS1 Node 1: EPS: N1RS2 C
RPCM_N1RS2_C

sel RPCM 13

RPCM_N1RS2_C_RPC_13

√RPC Position – Op

If RPC Position – Op
Go to step 3.

'Close Cmd'

cmd Enable

<Cmd Inv: RPCM_N1RS2_C_RPC_13_Nod_1-2_CL_Inhibit_off – (M1PR95SM1643K)>

'RPC Position'

cmd Close **Execute**

<Cmd Inv: RPCM_N1RS2_C_RPC_13_N1_2_MDM_Cl – (M1PR95SM1607K)

√RPC Position – CI

Wait 90 seconds.

NOTE
Requires at least 90 seconds for MDM to start up, finish POST, and go to Standby state.

Go to step 5.

3. VERIFYING N1-2 IS IN DIAGNOSTIC
If required, perform this step to verify N1-2 is in Diagnostic only.

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – static

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

NOTE
The following steps determine which bus and Bus ID to use in template command for Mode code.

sel UB_EPS_N1_14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1_14_RT_Status

If 05 MDM N1-2 RT Status – ENA
Use Bus ID 2 in template command.

If 05 MDM N1-2 RT Status – INH

Primary NCS MDM Node 1

sel UB_EPS_N1_23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

If 05 MDM N1-2 RT Status – ENA
Use Bus ID 3 for use in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transmit Mode Code Commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 5
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is YES, N1-2 MDM is in Diagnostic and is ready to accept diagnostic commands.

4. BRINGING N1-2 TO STANDBY FROM DIAGNOSTICS MODE

PCS1 Node 1: C&DH: MDM N1-1

Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

NOTE
1. Reinitializing MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current bus, RT, and application configurations.
2. All UAS and default Configuration Tables will be loaded from EEPROM.
3. Normal POST will also be performed.

'N1-2 MDM'

cmd Reinitialize EEPROM **Execute**

<Cmd Inv: N1_2_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2507K)>

Wait 1 minute.

NOTE
It will take 60 seconds for MDM to reinitialize.

5. VERIFYING N1-2 IS IN STANDBY STATE

PCS1 Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

****
If state is not Standby, MDM N1-1 detected
MDM RT N1-2 failure.

√**MCC-H**
****

6. COMMANDING N1-1 TO SECONDARY (N1-2 SHOULD GO TO PRIMARY)

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

NOTE
1. N1-2 should begin transition to Primary in 20 seconds if no BC is detected after the following command is sent. 2. Sending the following command will cause the loss of PCS1, Early Comm, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done. 3. Possible '**PDI DECOM Fail**' message.

sel Processing State

Primary_NCS_Processing_State_Transitions
'N1-1 MDM Transitions'

cmd Transition to Secondary State **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Second_State – (M1DD95SM2541K)>

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – static (loss of PCS1 telemetry)

NOTE
N1-2 should begin to transition to Primary after 20 seconds of no BC detected.

7. TELEMETRY RECOVERY ON PCS2

NOTE
The following steps power up the PCS, start the CDS, and start the displays. Execute as required.

Perform EPCS SETUP, steps 4 --- 6 (SODF: ISS OPS: JOINT OPERATIONS), then:

8. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

CRT SM 212 OIU

BUS 3 BC – ITEM 11 EXEC
BUS 4 RT – ITEM 14 EXEC
Change OIU N1 Physical Device to N1-2 – ITEM 18 +3 EXEC
Reload OIU FORMAT 2 – ITEM 1 +2 EXEC

SM 210 NODE

Verify PHY ID PRI MDM – N1-2
Verify STATE – PRI
Verify FAIL – blank
Verify FRM CTR – <incrementing>

9. VERIFYING MDM STATES

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary

****
If states are not correct or no N1-2 TLM, √**MCC-H**.
****

10. VERIFYING RS STATE

If NCS interface is ЦВМ (SM Central Computer)
Primary NCS MDM Node 1
'Software Control'

sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)
FGB MDM

Verify FGB Frame Count – <incrementing>

11. ENABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities

√Auto Retry Status – ENA

If Auto Retry Status – INH
cmd Enable **Execute**

<Cmd Inv: Second_NCS_Ena_NCS_Auto_Retry – (M1DD95SM2617K)>

√Auto Retry Status – ENA

Secondary NCS MDM Node 1

sel Processing State

Secondary_NCS_Processing_State_Transitions
'Secondary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Second_NCS_Auto_Ena_Xtion_Diag – (M1DD95SM1054K)>

√Auto Transition to Diag State – ENA

12. CLEARING MDM BST ERROR LATCH
On MCC GO

PCS1 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

13. CONFIGURING MDM HEATER
PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM - N1RS2-'

√RPC 4 Position – Cl

If RPC 4 Position – Op
sel RPC 4

RPCM_N1RS2_C_RPC_04
'RPC Position'

cmd Close

<Cmd Inv: RPCM_N1RS2_C_RPC_4_N1_1_MDM_SDO_1B_Cl – (M1PR95SM1598K)>

√RPC Position – Cl

'N1-1 Heaters'

Verify Sur – Ena BU

NOTE
The MDM Survival Heaters default to Ena Ops in NCS R2. Ground will configure heaters as desired.

'N1-2 Heaters'

Verify Opr – ENA Ops
Verify Sur – ENA BU

Notify **MCC-H** to perform NODE 1/PMA 1 HEATER RECOVERY, all (SODF: GND GEN: TCS), then:

14. RECONFIGURING N1-2 MDM EPS REMOTE TERMINALS

CRT SM 200 APCU

√APCU1 OUT VOLTS RES LOW ≥ 121

If APCU1 OUT VOLTS RES LOW ≥ 121

PCS Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel LB Sys Lab – 2

LB_SYS_LAB_2

sel RT Status

LB_SYS_LAB_2_RT_Status

cmd 18 RPCM_N13B_C RT Status – Enable **Execute**
cmd 19 RPCM_N13B_B RT Status – Enable **Execute**
cmd 20 RPCM_N13B_A RT Status – Enable **Execute**

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_C – (M1DD95SM1179K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_B – (M1DD95SM1180K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_A – (M1DD95SM1181K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18 RPCM_N13B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19 RPCM_N13B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20 RPCM_N13B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_C – (M1DD95SM1342K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_B – (M1DD95SM1343K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_A – (M1DD95SM1344K)>

√RT 18, 19, 20 - RT FDIR Status – ENA

15. RECONFIGURING N1-1 MDM EPS REMOTE TERMINALS

CRT SM 200 APCU

√APCU2 OUT VOLTS RES LOW ≥ 121

If APCU2 OUT VOLTS RES LOW ≥ 121

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel LB SYS LAB – 1

LB_SYS_LAB_1

sel RT Status

LB_SYS_LAB_1_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

√RT 18, 19, 20 - RT Status – ENA

16. SUBSYSTEM RECONFIGURATION
As required, reactivate the following MDM N1-2 equipment.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Smoke Detector 2.
Node 1 Port Fwd IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Port Fwd IMV Fan only.
Node 1 Stbd Aft IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Stbd Aft IMV Fan only.
Node 1 Fwd Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Port IMV Valve only.
Node 1 Fwd Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Stbd IMV Valve only.

17. RESETTING ACS MODING
If during Docked Ops, go to ACS PRE-DEPARTURE MODING, all (SODF: ISS OPS: MCS).

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D. TRANSITIONING N1-2 TO DIAGNOSTIC/OFF FROM STANDBY WHILE N1-1 IS PRIMARY

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1. VERIFYING MDM STATES AND MDM IDs

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Primary

Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

2. CONFIGURING MDM HEATERS

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

NOTE
When MDM N1-2 is in Diagnostic/Standby/Off, the N1-2 Operational Heater is not available and the N1-2 Survival Heater is required to maintain the MDM within temperature limits.

'RPCM N1RS1 A'

√RPC 5 Position – Cl

If open
sel RPC 5

RPCM_N1RS1_A_RPC_05

cmd Close

<Cmd Inv: RPCM_N1RS1_A_RPC_5_N1_1_MDM_SDO_Card_Cl – (M1PR95SM1329K)>

√Position – Cl

'N1-1 Heaters'

Verify Opr – Ena Ops

'N1-2 Heaters'

Verify Sur – Ena BU

NOTE
The MDM Surivival Heaters default to Ena Ops in NCS R2. Ground will configure heaters as desired.

3. DISABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto_Retry_Status – INH

If Auto_Retry_Status – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2502K)>

√Auto_Retry_Status – INH

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State Transitions
'Primary MDM Transition'

√Auto Transition to Diag State – INH

If Auto Transition to Diag State – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Auto_Inh_Xtion_Diag – (M1DD95SM1055K)>

√Auto Transition to Diag State – INH

4. COMMANDING N1-2 TO DIAGNOSTIC

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

sel Processing State

Second_NCS_Processing_State_Transitions
'Secondary MDM State Transition'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Auto Transition to Diag State – Enable **Execute**

<Cmd Inv: Second_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1054K)>

√Auto Transition to Diag State – ENA

√Manual Transition to Diag State – ENA

If Manual Transition to Diag State – INH
'N1-2 MDM Transitions'

'Manual Transition to Diag State'

cmd Arm **Execute**

<Cmd Inv: N1_2_MDM_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1011K)>

√Manual Transition to Diag State – ENA

Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State_Transition
'N1-2 MDM Transition'

'Manual Transition to Diag State'

cmd Transition **Execute**

<Cmd Inv: N1_2_MDM_Xtion_Diag_State – (M1DD95SM1009K)>

Wait 1 minute for Transition to complete.

5. VERIFYING N1-2 IS IN DIAGNOSTIC

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – static

D. TRANSITIONING N1-2 TO DIAGNOSTIC/OFF FROM STANDBY WHILE N1-1 IS PRIMARY

Node 1: C&DH: MDM N1-1

Primary NCS MDM Node 1

NOTE

It is necessary to identify the EPS bus that the Node 1 MDMs are using to communicate with each other to determine the Bus ID for the Transmit Mode Code command that will be sent to verify the MDM is in Diagnostic.

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1_14_RT_Status

If 05 MDM N1-2 RT Status – ENA
Use Bus ID 2 for template command.

If 05 MDM N1-2 RT Status – INH

Primary NCS MDM Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

If 05 MDM N1-2 RT Status – ENA
Use Bus ID 3 for template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transition Mode Code commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD961M0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 5
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is YES, N1-2 MDM is in Diagnostic and is ready to accept diagnostic commands.

If transitioning N1-2 to Diagnostic >>

6. POWERING OFF N1-2 MDM

PCS1 Node 1: EPS: RPCM N1RS2C
RPCM_N1RS2_C

sel RPC 13

RPCM_N1RS2_C_RPC_13

√RPC Position – Cl

√Open Cmd – Ena

If Open Cmd – Inh
cmd Enable **Execute**

<Cmd Inv: RPCM_N1RS2_C_RPC_13_MDM_N1_2_Op_Inhib_Off – (M1PR95SM2291K)>

√Open Cmd – Ena

'RPC Position'

cmd Open **Execute**

<Cmd Inv: RPCM_N1RS2_C_13_N1_2_MDM_Op – (M1PR95SM2255K)>

√RPC Position – Op

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E. TRANSITIONING N1-1 TO SECONDARY FROM PRIMARY AND N1-2 TO PRIMARY FROM STANDBY

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NOTE

This procedure changes the Primary NCS to ЦВМ (SM Central Computer) interface from N1-2 to N1-1; therfore, **MCC-M** must be notified prior to the execution of this procedure.

On MCC GO

1. VERIFYING MDM STATES AND MDM IDs

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Primary

Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

2. COMMANDING N1-1 TO SECONDARY

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

NOTE

1. N1-2 should begin transition to Primary in 20 seconds if no BC is detected after the following command is sent.
2. Sending the following command will cause the loss of PCS1, Early Comm, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.
3. Possible '**PDI DECOM Fail**' message.

sel Processing State

Primary_NCS_Processing_State_Transition
'N1-1 MDM Transition'

cmd Transition to Secondary State **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Sec_State – (M1DD95SM2541K)>

Verify Frame Count static (loss of PCS1 telemetry)

NOTE
N1-2 should begin transition to Primary in 20 seconds if no BC is detected.

3. TELEMETRY RECOVERY ON PCS

NOTE
The following steps power up the PCS, start the CDS, and start the displays. Execute as required.

As required, EPCS SETUP, steps 4 --- 6 (SODF: ISS OPS: C&DH), then:

4. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

CRT SM 212 OIU

BUS 3 BC – ITEM 11 EXEC
BUS 4 RT – ITEM 14 EXEC
Change OIU N1 Physical Device to N1-2 – ITEM 18 +3 EXEC
Reload OIU FORMAT 2 – ITEM 1 ± 2 EXEC

SM 210 NODE

Verify PHY ID PRI MDM – N1-2
Verify STATE – PRI
Verify FAIL – blank
Verify FRM CTR – <incrementing>

5. VERIFYING MDM STATES

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verfiy MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary

****
If States are not correct or no N1-2 TLM, √**MCC-H**.
****

6. VERIFYING RS STATE

If NCS interface is ЦВМ (SM Central Computer)

Primary NCS MDM Node 1
'Software Control'

sel SMCC Contol

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB

FGB: C&DH: FGB MDM 2(1)
FGB MDM

Verify FGB Frame Count – <incrementing>

7. CLEARING MDM BST ERROR LATCH

On MCC GO

Node 1: C&DH: Primary NCS MDM
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

Node 1: C&DH: Secondary NCS MDM
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary NCS MDM Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

8. CONFIGURING MDM HEATERS

PCS1 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

If RPC 4 Position – Op
sel RPC 4

RPCM_N1RS2_C_RPC_04
'RPC Position'

cmd Close (Verify – Cl)

<Cmd Inv: RPCM_N1RS2_C_RPC_4_N1_1_MDM_SDO_1B_CL – (M1PR95SM1598K)>

'N1-1 Heaters'

Verify Sur – Ena BU

NOTE
The MDM Survival Heater default to ENA Ops in NCS R2. Ground will configure heaters as desired.

'N1-2 Heaters'

Verify Opr – Ena Ops
Verify Sur – Ena BU

NOTE
MCC-H will perform NODE 1/PMA 1 HEATER RECOVERY, all (SODF: GND: TCS).

9. RECONFIGURING N1-2 MDM EPS REMOTE TERMINALS

CRT SM 200 APCU

√APCU1 OUT VOLTS RES LOW ≥ 121

If APCU1 OUT VOLTS RES LOW ≥ 121
PCS Node 1: C&DH: MDM_N1-2
Primary NCS MDM Node 1

sel LB SYS LAB – 2

LB_SYS_LAB_2

sel RT Status

LB_SYS_LAB_2_RT_Status

cmd 18 RPCM_N13B_C_RT Status – Enable **Execute**
cmd 19 RPCM_N13B_B_RT Status – Enable **Execute**
cmd 20 RPCM_N13B_A_RT Status – Enable **Execute**

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_C – (M1DD95SM1179K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_B – (M1DD95SM1180K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_A – (M1DD95SM1181K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18 RPCM_N13B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19 RPCM_N13B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20 RPCM_N13B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_C – (M1DD95SM1342K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_B – (M1DD95SM1343K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_A – (M1DD95SM1344K)>

√RT 18, 19, 20 - RT FDIR Status – ENA

10. RECONFIGURING N1-1 MDM EPS REMOTE TERMINALS

CRT SM 200 APCU

√APCU2 OUT VOLTS RES LOW ≥ 121

If APCU2 OUT VOLTS RES LOW ≥ 121

PCS Node 1: C&DH: MDM_N1-1
Secondary NCS MDM Node 1

sel LB SYS LAB – 1

LB_SYS_LAB_1

sel RT Status

LB_SYS_LAB_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

√RT 18, 19, 20 - RT Status – ENA

11. RECONFIGURING SUBSYSTEMS
Perform C&DH RECONFIGURE THE NODE 1 MDMs, all (SODF: ISS OPS: C&DH), then:

12. RESETTING ACS MODING
If during Docked Ops, go to ACS PRE-DEPARTURE MODING, all (SODF: ISS OPS: MCS).

F. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC/STANDBY FROM PRIMARY AND N1-2 TO PRIMARY FROM STANDBY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 12 pages

NOTE
This procedure changes the Primary NCS to ЦВМ (SM Central Computer) interface from N1-2 to N1-1; therefore, **MCC-M** must be notified prior to the execution of this procedure.

On MCC GO

1. VERIFYING MDM STATES

PCS1 Node 1: C&DH: MDM N1-1
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Primary

PCS2 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Standby

2. VERIFYING MDM HEATERS STATUS

NOTE
When MDM N1-1 is in Diagnostic/Standby/Off, the N1-1 Operational Heater is not available and the N1-1 Survival Heater is required to maintain the MDM within temperature limits.

PCS1 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

'N1-1 Heaters'

Verify Sur – Ena BU

'N1-2 Heaters'

Verify Opr – Ena Ops

3. DISABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities

√Auto_Retry_Status – INH

If Auto_Retry_Status – ENA
cmd Inhibit **Execute**

<Cmd Inv: Sec_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2618K)>

√Auto Retry Status – INH

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel Processing State

Secondary_NCS_Processing_State Transitions
'Secondary MDM Transitions'

√Auto Transition to Diag State – INH

If Auto Transition to Diag State – ENA
cmd Inhibit **Execute**

<Cmd Inv: Sec_NCS_Inh_Auto_Xtion_Diag – (M1DD95SM1056K)>

√Auto Transition to Diag State – INH

4. SUBSYSTEM RECONFIGURATION

The following equipment must be shut down as required prior to executing the MDM N1-1 transition.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Cabin Fan	NODE 1 CABIN FAN DEACTIVATION, all (SODF: ISS OPS: ECLSS)	This procedure will shut down the Cabin Fan and both Node 1 Smoke Detectors.
Node 1 Smoke Detector 1	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Deactivation not performed.
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Deactivation not performed.
Node 1 Aft Port IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Port IMV Fan only.
Node 1 Aft Port IMV Valve	NODE 1 AFT PORT IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Port IMV Valve.
Node 1 Aft Stbd IMV Valve	NODE 1 AFT STBD IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Stbd IMV Valve

5. COMMANDING N1-1 TO DIAGNOSTIC

NOTE
When MDM N1-1 is commanded to Diagnostic, the following heaters are commanded to their default state, which is off.
PMA 1 Shell Heaters 1A, 3A, 4A, and 5A
Node 1 Shell Heaters 1A --- 9A
MDM N1-1 Operational Heater
MDM N1-2 Survival Heater

PCS1 Node 1: C&DH: MDM N1-1
Primary_NCS_MDM_Node 1

sel Processing State

Primary NCS Processing State Transitions
'Primary MDM Transitions'

√Auto_Transition_to_Diag_State – ENA

If Auto_Transition_to_Diag_State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1053K)

√Auto_Transition_to_Diag_State – ENA

√Manual_Transition_to_Diag_State – Arm

If Manual_Transtion_to_Diag_State – Disarm
'N1-1 MDM Transitions'
'Manual Transition to Diag State'

cmd Arm Execute

<Cmd Inv: N1_1_MDM_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1010K)>

√Manual Transition to Diag State – Arm

NOTE
1. Sending the following command will cause the loss of PCS1, Early Comm, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.

2. Possible '**PDI DECOM Fail**' message.

'N1-1 MDM Transition'
'Manual Transition to Diag State'

cmd Transition **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Diag_State – (M1DD95SM1008K)>

Wait 2 minutes.

NOTE
It takes 2 minutes for N1-1 to transition to Diagnostic. There will be a loss of telemetry on PCS1.

√Frame Count static (loss of PCS telemetry)

Wait 1 minute.

NOTE

1. It takes 1 minute for N1-2 to transition to Primary. (N1-2 begins to transition to Primary after 20 seconds of not detecting a BC.)

2. When N1-2 becomes Primary, UB EPS Buses will switch channels and N1-2 MDM will also switch from UB EPS N1-14 to UB EPS N1-23 attempting to communicate with N1-1 MDM.

6. TELEMETRY RECOVERY ON PCS2

NOTE
The following steps power up the PCS, start the CDS, and start the displays. Execute as required.

Perform EPCS SETUP, steps 4 --- 6 (SODF: ISS OPS: C&DH), then:

NOTE
C&W tone and '**MDM N1-2 Detected RT Fail MDM N1-1 PMA-1 C&W**' message will be generated as N1-2 becomes Primary and detects N1-1 fail.

7. TELEMETRY RECOVERY ON OIU

NOTE
Possible '**PDI DECOM Fail**' message.

CRT SM 212 OIU

BUS 3 BC – ITEM 11 EXEC
BUS 4 RT – ITEM 14 EXEC
Change OIU N1 Physical Device to N1-2 – ITEM 18 +3 EXEC
Reload OIU FORMAT 2 – ITEM 1 +2 EXEC

SM 210 NODE

Verify PHY ID PRI MDM – N1-2
Verify STATE – PRI
Verify FAIL – blank
Verify FRM CTR – <incrementing>

8. VERIFYING MDM STATE

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

9. VERIFYING RS STATE

If NCS interface is ЦВМ (SM Central Computer)
'Software Control'

sel SMCC Control

Primary NCS SMCC Control

Verify SMCC Frame Count – <incrementing>

If NCS interface is FGB
FGB: C&DH: FGB MDM 2(1)
FGB MDM

Verify FGB Frame Count – <incrementing>

10. VERIFYING N1-1 IS IN DIAGNOSTIC

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – static

NOTE
The following steps determine which bus and Bus ID to use in template command for Mode Code.

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1_14_RT_Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 2 in template command.

If 06 MDM N1-1 RT Status – INH
Primary_NCS_MDM_Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 3 in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Prim_NCS_Transmit_Mode_Code
'Transit Mode Code commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Mode Code – 2
Bus ID – 2 or 3 (as determined above)
RT Address – 6

cmd Transmit Primary NCS Mode Code

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is YES, N1-1 MDM is in Diagnostic and is ready to accept diagnostic commands.

11. CONFIGURING MDM HEATERS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

If RPC 4 Position – Op
sel RPC 4

RPCM_N1RS2_C_RPC_4
'RPC Position'

cmd Close

<Cmd Inv: RPCM_N1RS2_C_RPC_4_N1_2_MDM_SDO_Card_1B_Cl – (M1PR95SM1598K)>

√RPC 4 Position – Cl

Primary NCS MDM Node 1
'N1-1 Heaters'

Verify Sur – Ena BU

NOTE
1. The MDM Survival Heaters default to Ena Ops in NCS R2. Ground will configure Heaters as desired.

2. **MCC-H** will perform NODE 1/PMA 1 HEATER RECOVERY (SODF: GND: TCS).

12. RECONFIGURING N1-2 REMOTE TERMINALS

CRT SM 200 APCU Status

√APCU1 OUT VOLTS RES LOW ≥ 121

If APCU1 OUT VOLTS RES LOW ≥ 121

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel LB SYS LAB – 2

LB_SYS_LAB_2

sel RT Status

LB_SYS_LAB_2_RT_Status

cmd 18_RPCM_N13B_C RT Status – Enable **Execute**
cmd 19_RPCM_N13B_B RT Status – Enable **Execute**
cmd 20_RPCM_N13B_A RT Status – Enable **Execute**

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_C – (M1DD95SM1179K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_B – (M1DD95SM1180K)>

<Cmd Inv: N1_2_MDM_Ena_RPCM_N13B_A – (M1DD95SM1181K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18_FDIR_RPCM_N13B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_FDIR_RPCM_N13B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_FDIR_RPCM_N13B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_C – (M1DD95SM1342K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_B – (M1DD95SM1343K)>

<Cmd Inv: N1_2_MDM_Ena_FDIR_RPCM_N13B_A – (M1DD95SM1344K)>

√RT 18, 19, 20 - RT FDIR Status – ENA

13. RECONFIGURING N1-2 MDM EQUIPMENT
Reactivate the following MDM N1-2 equipment as required.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Smoke Detector 2.
Node 1 Port Fwd IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Port Fwd IMV Fan.
Node 1 Stbd Aft IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Stbd Aft IMV Fan.
Node 1 Fwd Port IMV Valve	NODE 1 FWD PORT IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Port IMV Valve.
Node 1 Fwd Stbd IMV Valve	NODE 1 FWD STBD IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Fwd Stbd IMV Valve.

14. CLEARING MDM BST ERROR LATCH
For the N1-2 MDM only, perform NCS MDM BST CLEAR LATCHED DATA, all (SODF: GND: C&DH), then:

If transitioning N1-1 to diagnostic, go to step 20.

If powering off N1-1, go to step 19.

15. REINITIALIZING MDM FROM EEPROM TO TRANSITION TO STANDBY

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities
'N1_1_MDM'

cmd Reinitialize EEPROM **Execute**

<Cmd Inv: N1_1_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2505K)>

Wait 60 seconds for MDM to reinitialize.

16. VERIFYING N1-1 IN STANDBY STATE

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Standby

****
If state is not Standby, √**MCC-H**.
****

17. ENABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto Retry Status – ENA

If Auto Retry Stbd – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_NCS_Auto_Retry – (M1DD95SM2501K)>

√Auto Retry Status – ENA

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1053K)>

√Auto Transition to Diag State – ENA

18. CLEARING MDM BST ERROR LATCH
For the N1-1 MDM only, perform NCS MDM BST CLEAR LATCHED DATA, all (SODF: GND: C&DH), then:

If transitioning N1-1 to Standby, go to step 20.

19. POWERING OFF N1-1 MDM

PCS2 Node 1: EPS: RPCM N1RS1 A
RPCM_N1RS1_A

sel RPC 11

RPCM_N1RS1_A_RPC_11

√RPC Position – Cl
√Open Cmd – Ena

If Open Cmd – Inh
cmd Enable

<Cmd Inv: RPCM_N1RS1_A_RPC_Op_Inh_off – (M1PR95SM2019K)>

√Open Cmd – Ena

'RPC Position'

cmd Open **Execute**

<Cmd Inv: RPCM_N1RS1_A_RPC_11_N1_1_MDM_Op – (M1PR95SM1983K)>

√RPC Position – Op

20. RESETTING ACS MODING
If during Docked Ops, go to ACS PRE-DEPARTURE MODING, all (SODF: ISS OPS: MCS).

G. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC/STANDBY FROM SECONDARY WHILE N1-2 IS PRIMARY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 8 pages

1. VERIFYING MDM STATES

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary

NOTE
While MDM N1-1 is in a nonoperative state, the Node 1 Cabin Fan and Node 1 Aft Port IMV Fans will be off. If this condition occurs during Node 1/FGB ingress, the ingress time must be limited, or portable fans must be set up to compensate for the loss of ventilation.

2. CONFIGURING MDM HEATERS

NOTE
When MDM N1-1 is in Diagnostic/Standby/Off, the N1-1 Operational Heater is not available and the N1-1 Survival Heater is required to maintain the MDM within temperature limits.

PCS1 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

'N1-1 Heaters'

Verify Sur – ENA OPR

NOTE
The MDM Survival Heaters default to Ena Ops in NCS R2. Ground will configure heaters as desired.

'N1-2 Heaters'

Verify Opr – Ena Ops

3. DISABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto_Retry_Status – INH

If Auto_Retry_Status – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2502K)>

√Auto_Retry_Status – INH

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – INH

If Auto Transition to Diag State – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Inh_Auto_Xtion_Diag – (M1DD95SM1055K)>

√Auto Transition to Diag State – INH

4. SUBSYSTEM RECONFIGURATION

The following equipment must be shut down as required prior to executing the MDM N1-1 transition.

√**MCC-H** for the proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Cabin Fan	NODE 1 CABIN FAN DEACTIVATION, (SODF: ISS OPS: ECLSS)	This procedure will shutdown the Cabin Fan and both Node 1 Smoke Detectors.
Node 1 Smoke Detector 1	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Deactivation not performed.
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Deactivation not performed.
Node 1 Aft Port IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Port IMV Fan only.
Node 1 Aft Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Port IMV Valve.
Node 1 Aft Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Deactivate Node 1 Aft Stbd IMV Valve.

5. TRANSITIONING N1-1 MDM TO DIAGNOSTIC

NOTE
When MDM N1-1 is commanded to Diagnostic, the following heaters are commanded to their default state, which is Off.
PMA 1 Shell Heaters 1A, 3A, 4A, and 5A
Node 1 Shell Heaters 1A --- 9A
MDM N1-1 Operational Heater
MDM N1-2 Survival Heater

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel Processing State

Secondary_NCS_Processing_State Transitions
'Secondary MDM State Transitions'

√Manual Transition to Diag State – ENA

If Manual Transition to Diag State – INH
'N1-1 MDM Transitions'
'Manual Transition to Diag State'

cmd Arm **Execute**

<Cmd Inv: N1_1_MDM_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1010K)>

'Secondary MDM State Transitions'

√Manual Transition to Diag State – Arm

√Auto_Transition to Diag State – ENA

If Auto_Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Sec_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1054K)>

√Auto_Transition to Diag State – ENA

'N1-1 MDM Transitions'
'Manual Transitions to Diag State'

cmd Transition **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Diag_State – (M1DD95SM1008K)>

Wait 2 minutes for N1-1 to transition to Diagnostics.

6. VERIFYING N1-1 IS IN DIAGNOSTIC

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – static

NOTE
The following steps determine which bus and Bus ID to use in template command for Mode code.

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1_14_RT_Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 2 in tempate command.

If 06 MDM N1-1 RT Status – INH

Primary NCS MDM Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 3 in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transmit Mode Code Command'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 6 **Execute**
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verity Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is YES, N1-1 MDM is in Diagnostic and is ready to accept diagnostic commands.

7. VERIFYING MDM AND SHELL HEATER CONFIGURATIONS

PCS2 Node 1: EPS: RPCM N1RS1 C
RPCM_N1RS1_C

√RPC 2 Position – Op

NOTE
MCC will perform NODE 1/PMA 1 HEATER RECOVERY (SODF: GND: TCS).

If transitioning N1-1 to Diagnostic >>

If powering off N1-1, go to step 12.

8. REINTIALIZING MDM FROM EEPROM TO TRANSITION TO STANDBY

PCS1 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary NCS MDM Utilities
'N1-1 MDM'

cmd Reinitialize EEPROM **Execute**

<Cmd Inv: N1_1_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2505K)>

Wait 1 minute for MDM to reinitialize.

9. VERIFYING N1-1 IN STANDBY STATE

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Standby

****
If state is not Standby, √**MCC-H**.
****

10. ENABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto Retry Status – ENA

cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_NCS_Auto_Retry – (M1DD95SM2501K)>

√Auto Retry Status – ENA

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State_Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1053)>

√Auto Transition to Diag State – ENA

11. CLEARING MDM BST ERROR LATCH
On MCC GO

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

If transitioning N1-1 to Standby >>

12. POWERING OFF N1-1 MDM
Node1: EPS: RPCM N1RS1 A
RPCM_N1RS1_A

sel RPC 11

RPCM_N1RS1_A_RPC_11

√RPC Position – Cl

√Open Cmd – ENA

If Open Cmd – Inh
cmd Enable **Execute**

<Cmd Inv: RPCM_N1RS1_A_RPC_11_N1_1_MDM_Op_Inh_Off – (M1PR95SM2019K)>

√Open Cmd – ENA

'RPC Position'

cmd Open **Execute**

<Cmd Inv: RPCM_N1RS1_A_RPC_11_N1_1_MDM_Op – (M1PR95SM1983K)>

√RPC Position – Op

I. TRANSITIONING N1-1 TO SECONDARY FROM OFF/DIAGNOSTIC/ STANDBY WHILE N1-2 IS PRIMARY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 8 pages

1. VERIFYING MDM STATES

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

If Frame Count incrementing, go to step 5.

2. APPLYING POWER TO THE N1-1 MDM IF IT IS OFF

PCS1 Node 1: EPS: N1RS1 C
RPCM_N1RS1_A

sel RPC 11

RPCM_N1RS1_A_RPC_11

√RPC Position – Op

If RPC Position – Cl
Go to step 3.

'Close Cmd'

cmd Enable **Execute**

<Cmd Inv: RPCM_N1RS1_A_RPC_11_Cl_Inh_Off – (M1PR95SM1371K)>

'RPC Position'

cmd Close **Execute**

<Cmd Inv: RPCM_N1RS1_A_RPC_11_N1_1_MDM_Cl – (M1PR95SM1335K)>

√RPC Position – Cl

Wait at least 90 seconds for MDM to start up, finish POST, and go to Standby state.

Go to step 5.

3. VERIFYING N1-1 IS IN DIAGNOSTICS
If required perform this step.

PCS Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – static

NOTE
The following steps determine which bus and Bus ID to use in template command for Mode code.

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

UB_EPS_N1-14 RT Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 2 in template command.

If 06 MDM N1-1 RT Status – INH
Primary_NCS_MDM_Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

If 06 MDM N-1 RT Status – ENA
Use Bus ID 3 in template command.

Primary NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transmit Mode Code Commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 6
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag bit is YES, N1-1 MDM is in Diagnostic and is ready to accept diagnostic commands.

4. BRINGING N1-1 TO STANDBY FROM DIAGNOSTICS MODE

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

sel Commands

NOTE
1. Reinitialize MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configurations.
2. All UAS and default Configuration Tables will be loaded from EEPROM.
3. Normal POST will also be performed.

'N1-1 MDM'

cmd Reinitialize EEPROM **Execute**

<Cmd Inv: N1_1_MDM_Re_Init_MDM_EEPROM – (M1DD95SM2505K)>

Wait 60 seconds for MDM to reinitialize.

5. VERIFYING N1-1 IS IN STANDBY STATE

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Standby

****
If state is not Standby, √**MCC-H**.
****

6. COMMANDING N1-1 TO SECONDARY

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

sel Processing State

Secondary_NCS_Processing_State_Transitions
'N1-1 MDM Transitions'

cmd Transition to Secondary State **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Second_State – (M1DD95SM2541K)>

Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Secondary

7. ENABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto Retry Status – ENA

If Auto Retry Status – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_NCS_Auto_Retry – (M1DD95SM2501K)>

√Auto Retry Status – ENA

Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State Transitions
'Primary MDM Transitions'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Prim_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1053K)>

√Auto Transition to Diag State – ENA

8. CLEARING MDM ERROR INDICATIONS
On MCC GO

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Secondary_NCS_MDM_Utilities
'Clear Latched Data in BST A'

cmd Clear **Execute**

9. CONFIGURING MDM HEATERS

PCS2 Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1
'RPCM N1RS1 A'

√RPC 5 Position – CI

If open
sel RPC 5

RPCM_N1RS1_A_RPC_05

cmd Close

<Cmd Inv: RPCM_N1RS1_A_RPC_5_N1_1_MDM_SDO_1A_Cl – (M1PR95SM1329K)>

√Position – Cl

Secondary NCS MDM Node 1

'N1-1 Heaters'

Verify Opr – Ena Ops

Secondary NCS MDM Node 1

'N1-1 Heaters'

Verify Sur – Ena BU

NOTE

1. The MDM Survival Heaters default to Ena Ops in NCS R2. Ground will configure heaters as desired.
2. **MCC-H** will perform NODE 1/PMA 1 HEATER RECOVERY, all (SODF: GND: TCS).

10. RECONFIGURING N1-1 EPS REMOTE TERMINALS

CRT SM 200 APCU Status

√APCU2 OUT VOLTS RES LOW ≥ 121

If APCU2 OUT VOLTS RES LOW ≥ 121

PCS2 Node 1: C&DH: MDM N1-1

Secondary NCS MDM Node 1

sel LB SYS LAB – 1

LB_SYS_LAB_1

sel RT Status

LB_SYS_LAB_1_RT_Status

cmd 18_RPCM_N14B_C RT Status – Enable **Execute**
cmd 19_RPCM_N14B_B RT Status – Enable **Execute**
cmd 20_RPCM_N14B_A RT Status – Enable **Execute**

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_C – (M1DD95SM1138K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_B – (M1DD95SM1139K)>

<Cmd Inv: N1_1_MDM_Ena_RPCM_N14B_A – (M1DD95SM1140K)>

√RT 18, 19, 20 - RT Status – ENA

cmd 18_RPCM_N14B_C RT FDIR Status – Enable FDIR **Execute**
cmd 19_RPCM_N14B_B RT FDIR Status – Enable FDIR **Execute**
cmd 20_RPCM_N14B_A RT FDIR Status – Enable FDIR **Execute**

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_C – (M1DD95SM1300K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_B – (M1DD95SM1301K)>

<Cmd Inv: N1_1_MDM_Ena_FDIR_RPCM_N14B_A – (M1DD95SM1302K)>

√RT 18, 19, 20 - RT FDIR Status – ENA

11. SUBSYSTEM RECONFIGURATION
Reactivate the following MDM N1-1 equipment as required.

√**MCC-H** for proper configuration

EQUIPMENT	PROCEDURE REFERENCE	COMMENTS
Node 1 Cabin Fan	NODE 1 CABIN FAN ACTIVATION, all (SODF: ISS OPS: ECLSS)	This procedure will start up the Cabin Fan and both Node 1 Smoke Detectors.
Node 1 Smoke Detector 1	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Activation not performed.
Node 1 Smoke Detector 2	NODE 1 SMOKE DETECTOR ACTIVATION/DEACTIVATION (SODF: ISS OPS: ECLSS)	Execute only if Node 1 Cabin Fan Activation not performed.
Node 1 Aft Port IMV Fan	NODE 1 IMV FAN ACTIVATION/ DEACTIVATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Port IMV Fan only.
Node 1 Aft Port IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Port IMV Valve.
Node 1 Aft Stbd IMV Valve	NODE 1 IMV VALVE RECONFIGURATION (SODF: ISS OPS: ECLSS)	Activate Node 1 Aft Stbd IMV Valve.

12. RESETTING ACS MODING
    If during Docked ops, go to ACS PRE-DEPARTURE MODING, all (SODF: ISS OPS: MCS).

J. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC FROM STANDBY WHILE N1-2 IS PRIMARY

(GND/2A.2A - 2A.2B/FIN A) Page 1 of 5 pages

1. VERIFYING MDM STATES

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-2
Verify MDM State – Primary

Node 1: C&DH: MDM N1-1
Secondary NCS MDM Node 1

Verify Frame Count – <incrementing>
Verify MDM ID – N1-1
Verify MDM State – Standby

2. CONFIGURING MDM HEATERS

NOTE
When MDM N1-1 is in Diagnostic/Standby/Off, the N1-1 Operational Heater is not available and the N1-1 Survival Heater is required to maintain the MDM within temperature limits.

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'RPCM N1RS2 C'

√RPC 4 Position – Cl

'N1-1Heaters'

Verify Sur – Ena BU

NOTE
The MDM Survival Heaters default to Ena Ops in NCS R2. Ground will configure heaters as desired.

'N1-2 Heaters'

Verify Opr – Ena Ops

3. DISABLING NCS AUTO RETRY AND AUTO TRANSITION TO DIAGNOSTICS

PCS2 Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1
'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utilities

√Auto_Retry_Status – INH

If Auto_Retry_Status – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Inh_NCS_Auto_Retry – (M1DD95SM2502K)>

√Auto_Retry_Status – INH

Node 1: C&DH: MDM N1-2
Primary NCS MDM Node 1

sel Processing State

Primary_NCS_Processing_State Transition
'Primary MDM Transitions'

√Auto Transition to Diag State – INH

If Auto Transition to Diag State – ENA
cmd Inhibit **Execute**

<Cmd Inv: Prim_NCS_Inh_Auto_Xtion_Diag – (M1DD95SM1055K)>

√Auto Transition to Diag State – INH

4. COMMANDING N1-1 TO DIAGNOSTIC

NOTE
When MDM N1-1 is commanded to Diagnostic, the following heaters are commanded to their default state, which is off.
PMA 1 Shell Heaters 1A, 3A, 4A, and 5A
Node 1 Shell Heaters 1A --- 9A
MDM N1-1 Operational Heater
MDM N1-2 Survival Heater

PCS2 Node 1: C&DH: MDM N1-1
Secondary_NCS_MDM_Node 1

sel Processing State

Secondary_NCS_Processing_State Transitions
'Secondary MDM State Transition'

√Auto Transition to Diag State – ENA

If Auto Transition to Diag State – INH
cmd Enable **Execute**

<Cmd Inv: Sec_NCS_Ena_Auto_Xtion_Diag – (M1DD95SM1054K)>

√Auto Transition to Diag State – ENA

√Manual Transition to Diag State – ENA

If Manual Transition to Diag State – INH

'N1-1 MDM Transitions'

'Manual Transition to Diag State'

cmd Arm **Execute**

<Cmd Inv: N1_1_MDM_Ena_Cmd_Xtion_Diag_State – (M1DD95SM1010K)>

'Secondary MDM State Transitions'

√Manual Transition to Diag State – Arm

'N1-1 MDM Transitions'

cmd Transition **Execute**

<Cmd Inv: N1_1_MDM_Xtion_Diag_State – (M1DD95SM1008K)>

Wait 2 minutes for N1-1 to transition to Diagnostics.

5. VERIFYING N1-1 IS IN DIAGNOSTIC

PCS2 Node 1: C&DH: MDM N1-1

Secondary NCS MDM Node 1

Verify Frame Count – static

NOTE
It is necessary to identify the EPS bus that the Node 1 MDMs are using to communicate with each other to determine the Bus ID for the Transmit Mode Code command that will be sent to verify the MDM is in Diagnostic.

Node 1: C&DH: MDM N1-2

sel UB EPS N1-14

UB_EPS_N1_14

sel RT Status

J. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC FROM STANDBY WHILE N1-2 IS PRIMARY

UB_EPS_N1_14_RT_Status

If 06 MDM N1-1 RT Status – ENA
Use Bus ID 2 in template command.

If 06 MDM N1-1 RT Status – INH

Primary_NCS_MDM_Node 1

sel UB EPS N1-23

UB_EPS_N1_23

sel RT Status

UB_EPS_N1_23_RT_Status

√06 MDM N1-1 RT Status – ENA

Use Bus ID 3 in template command.

Primary_NCS_MDM_Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code
'Transmit Mode Code Commands'

<Cmd Inv: Prim_NCS_Xmit_Mode_Code_Tmplt – (M1DD96IM0026K)>

input Bus ID – 2 or 3 (as determined above)
RT Address – 6 **Execute**
Mode Code – 2

cmd Transmit Primary NCS Mode Codes

Verify Subsystem Flag Set – YES

NOTE
If Subsystem Flag Bit is YES, N1-1 MDM is in Diagnostic and is ready to accept diagnostic commands.

6. VERIFYING MDM AND SHELL HEATER CONFIGURATIONS

PCS2 Node 1: EPS: RPCM N1RS1 C
RPCM_N1RS1_C

√RPC 2 Position – Op

NOTE
MCC-H will perform NODE 1/PMA 1 HEATER RECOVERY (SODF: GND: TCS).

If transitioning to Diagnostic >>

7. POWERING OFF N1-1 MDM

NOTE
When MDM N1-1 is unpowered, the N1-1 Survival Heater is required to maintain the MDM within temperature limits.

PCS2 Node 1: EPS: RPCM N1RS1 A
RPCM_N1RS1_A

sel RPC 11

RPCM_N1RS1_A_RPC_11

√RPC Position – Cl

√Open Cmd – Ena

If Open Cmd – Inh
cmd Enable

<Cmd Inv: RPCM_N1RS1_A_RPC_11_Op_Inh_Off – (M1PR95SM2019K)>

√Open Cmd – Ena

'RPC Position'

cmd Open

<Cmd Inv: RPCM_N1RS1_A_11_N1_1_MDM_Op – (M1PR95SM1983K)>

√RPC Position – Op

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N1-1 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS1-A RPC-5	SDO Cd 1B Pwr, RPCM N1 RS1-A RPC-6	ISS Element	Flight Activation	Flight Deactivation
N1-1	DIO 2	0	HX Lab LT-A Inl V Norm Fl Pos	Lab LTL IFHX NH3 Byp Vlv Flothru ind			Lab	5A	12A
N1-1	DIO 2	1	HX Lab LT-A Inl V Byp Fl Pos	Lab LTL IFHX NH3 Byp Vlv Byp ind			Lab	5A	12A
N1-1	DIO 2	2	HX Lab LT-A Out V Open Pos	Lab LTL IFHX NH3 Isol Vlv Op ind			Lab	5A	12A
N1-1	DIO 2	3	HX Lab LT-A Out V Cls Pos	Lab LTL IFHX NH3 Isol Vlv Cl ind			Lab	5A	12A
N1-1	DIO 2	4	Smk Det N1-1 Bit Enbl	SD 1 BIT Ena cmd			Node-1	2A	AC
N1-1	DIO 2	5	VAV Dmpr N1-N1 EnableCmd	Node 1 RAMV Enable cmd			Node-1	2A	AC
N1-1	DIO 2	6	IMV Fan N1-Aft Rtn On/Off Cmd	IMV Aft Port Fan On cmd			Node-1	2A	AC
N1-1	DIO 2	7	Cab Vent Fan N1 On/Off Cmd	Nod 1 Cab Fan On cmd			Node-1	2A	AC
N1-1	DIO 2	8	TWV N1-1 Pos A	SDS Sel Vlv Posn A			Node-1	2A	AC
N1-1	DIO 2	9	TWV N1-1 Pos B	SDS Sel Vlv Posn B			Node-1	2A	AC
N1-1	DIO 2	10	TWV N1-2 Pos A	SDS Deck Vlv Posn A			Node-1	2A	AC
N1-1	DIO 2	11	TWV N1-2 Pos B	SDS Deck Vlv Posn B			Node-1	2A	AC
N1-1	DIO 2	12	TWV N1-3 Pos A	SDS Fwd Vlv Posn A			Node-1	2A	AC
N1-1	DIO 2	13	TWV N1-3 Pos B	SDS Fwd Vlv Posn B			Node-1	2A	AC
N1-1	DIO 2	14	TWV N1-4 Pos A	SDS Stbd Vlv Posn A			Node-1	2A	AC
N1-1	DIO 2	15	TWV N1-4 Pos B	SDS Stbd Vlv Posn B			Node-1	2A	AC
N1-1	DIO 2	16	IMV V N1-Aft Rtn Cls Pos	IMV Aft Port Vlv CL			Node-1	2A	AC
N1-1	DIO 2	17	IMV V N1-Aft Rtn Enbl Cmd	IMV Aft Port Vlv Ena cmd			Node-1	2A	AC
N1-1	DIO 2	18	IMV V N1-Aft Rtn Open Pos	IMV Aft Port Vlv OP			Node-1	2A	AC
N1-1	DIO 2	19	IMV V N1-Aft Sply Open Pos	IMV Aft Stbd Vlv OP			Node-1	2A	AC
N1-1	DIO 2	20	IMV V N1-Aft Sply Cls Pos	IMV Aft Stbd Vlv CL			Node-1	2A	AC
N1-1	DIO 2	21	IMV V N1-Aft Sply Enbl Cmd	IMV Aft Stbd Vlv Ena cmd			Node-1	2A	AC
N1-1	DIO 2	22	IMV V N1-Port Sply Open Pos	IMV Port Fwd Vlv OP			Node-1	2A	AC
N1-1	DIO 2	23	IMV V N1-Port Sply Cls Pos	IMV Port Fwd Vlv CL			Node-1	2A	AC
N1-1	DIO 2	24	IMV V N1-Port Sply Enbl Cmd	IMV Port Fwd Vlv Ena cmd			Node-1	2A	AC
N1-1	DIO 2	25	IMV V N1-Stbd Rtn Enbl Cmd	IMV Stbd Aft Vlv Ena cmd			Node-1	2A	AC
N1-1	DIO 2	26	IMV V N1-Stbd Rtn Open Pos	IMV Stbd Aft Vlv OP			Node-1	2A	AC
N1-1	DIO 2	27	IMV V N1-Stbd Rtn Cls Pos	IMV Stbd Aft Vlv CL			Node-1	2A	AC
N1-1	DIO 2	28	IMV V N1-Stbd Sply Open Pos	IMV Stbd Fwd Vlv OP			Node-1	2A	AC
N1-1	DIO 2	29	IMV V N1-Stbd Sply Cls Pos	IMV Stbd Fwd Vlv CL			Node-1	2A	AC
N1-1	DIO 2	30	IMV V N1-Stbd Sply Enbl Cmd	IMV Stbd Fwd Vlv Ena cmd			Node-1	2A	AC
N1-1	DIO 2	31	SPARE	SPARE			SPARE		
N1-1	SDO 3	0	SSMDM N1-1 Htr Pwr	MDM N1-1 Op Htr Cmd	X		PMA-1	2A	AC
N1-1	SDO 3	1	HX Lab LT-A Inl V Norm Fl Cmd	Lab LTL IFHX NH3 Byp Vlv Flothru cmd	X		Lab	5A	12A

N1-1 MDM CHANNEL ASSIGNMENTS

(GND/2A.2A - 2A.2B/FIN A/MULTI)

MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS1-A RPC-5	SDO Cd 1B Pwr, RPCM N1 RS1-A RPC-6	ISS Element	Flight Activation	Flight Deactivation
N1-1	SDO 3	2	HX Lab LT-A Inl V Byp Fl Cmd	Lab LTL IFHX NH3 Byp Vlv Byp cmd	X		Lab	5A	12A
N1-1	SDO 3	3	HX Lab LT-A Out V Open Cmd	Lab LTL IFHX NH3 ISO Vlv OP cmd		X	Lab	5A	12A
N1-1	SDO 3	4	HX Lab LT-A Out V Cls Cmd	Lab LTL IFHX NH3 ISO Vlv CL cmd		X	Lab	5A	12A
N1-1	SDO 3	5	TWV N1-1 Solenoid Cmd	SDS Sel Vlv A(B) cmd	X		Node-1	2A	AC
N1-1	SDO 3	6	TWV N1-1 Latch Cmd	SDS Sel Vlv Latch Pwr	X		Node-1	2A	AC
N1-1	SDO 3	7	TWV N1-2 Solenoid Cmd	SDS Deck Vlv A(B) cmd	X		Node-1	2A	AC
N1-1	SDO 3	8	TWV N1-2 Latch Cmd	SDS Deck Vlv Latch Pwr	X		Node-1	2A	AC
N1-1	SDO 3	9	TWV N1-3 Solenoid Cmd	SDS Fwd Vlv A(B) cmd		X	Node-1	2A	AC
N1-1	SDO 3	10	TWV N1-3 Latch Cmd	SDS Fwd Vlv Latch Pwr		X	Node-1	2A	AC
N1-1	SDO 3	11	TWV N1-4 Solenoid Cmd	SDS Stbd Vlv A(B) cmd		X	Node-1	2A	AC
N1-1	SDO 3	12	TWV N1-4 Latch Cmd	SDS Stbd Vlv Latch Pwr		X	Node-1	2A	AC
N1-1	SDO 3	13-16	SPARE	SPARE			SPARE		
N1-1	DIO 4	00-15	SPARE	SPARE			SPARE		
N1-1	DIO 4	16	Psiv APAS PMA2 Cap Plngr L-1 Pos	NCSN1_1_MCS_PMA2_Capture_Long			PMA-2	2A	5A
N1-1	DIO 4	17	Psiv APAS PMA2 Cap Plngr S-1 Pos	NCSN1_1_MCS_PMA2_Capture_Short			PMA-2	2A	5A
N1-1	DIO 4	18	Psiv APAS PMA2 Dep Plngr-1 Pos	NCSN1_1_MCS_PMA2_Undocking_Complete			PMA-2	2A	5A
N1-1	DIO 4	19	Psiv APAS PMA2 Intf Sealed-1 Pos	NCSN1_1_MCS_PMA2_Interface_Sealed			PMA-2	2A	5A
N1-1	DIO 4	20	SPARE	SPARE			SPARE		
N1-1	DIO 4	21	GNC Moding Ind PMA2 Active ACS Ind Cmd-1	NCSN1_1_MCS_PMA2_LED_Unit1_Cmd1			PMA-2	2A	5A
N1-1	DIO 4	22	GNC Moding Ind PMA2 Free Drift Ind Cmd-1	NCSN1_1_MCS_PMA2_LED_Unit1_Cmd2			PMA-2	2A	5A
N1-1	DIO 4	23	Psiv APAS PMA3 Cap Plngr L-1 Pos	NCSN1_1_MCS_PMA3_Capture_Long			PMA-3	3A	16A
N1-1	DIO 4	24	Psiv APAS PMA3 Cap Plngr S-1 Pos	NCSN1_1_MCS_PMA3_Capture_Short			PMA-3	3A	16A
N1-1	DIO 4	25	Psiv APAS PMA3 Dep Plngr-1 Pos	NCSN1_1_MCS_PMA3_Undocking_Complete			PMA-3	3A	16A
N1-1	DIO 4	26	Psiv APAS PMA3 Intf Sealed-1 Pos	NCSN1_1_MCS_PMA3_Interface_Sealed			PMA-3	3A	16A
N1-1	DIO 4	27-28	SPARE	SPARE					
N1-1	DIO 4	29	GNC Moding Ind PMA3 Active ACS Ind Cmd-1	NCSN1_1_MCS_PMA3_LED_Unit2_Cmd1			PMA-3	2A	5A
N1-1	DIO 4	30	GNC Moding Ind PMA3 Free Drift Ind Cmd-1	NCSN1_1_MCS_PMA3_LED_Unit2_Cmd2			PMA-3	2A	5A
N1-1	DIO 4	31	SPARE	SPARE					

N1-1 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS1-A RPC-5	SDO Cd 1B Pwr, RPCM N1 RS1-A RPC-6	ISS Element	Flight Activation	Flight Deactivation
N1-1	LLA 5	0	VAV Cont N1-N1 Exc	RAMV Excite			Node-1	2A	AC
N1-1	LLA 5	1	VAV Cont N1-N1 Pos	RAMV Rheo Posn			Node-1	2A	AC
N1-1	LLA 5	2	Smk Det N1-1 Scatter Meas	SD 1 Sctr			Node-1	2A	AC
N1-1	LLA 5	3	Smk Det N1-1 Obscuration Meas	SD 1 Obsc			Node-1	2A	AC
N1-1	LLA 5	04-31	SPARE	SPARE			SPARE		
N1-1	AIO 6	00-01	SPARE	SPARE			SPARE		
N1-1	AIO 6	02	VAV Dmpr N1-N1 Pos Cmd	RAMV Posn cmd			Node-1	2A	AC
N1-1	AIO 6	03	Cab Vent Fan N1 Speed Cmd	Cab Fan Spd cmd			Node-1	2A	AC
N1-1	AIO 6	04	IMV V N1-Aft Rtn Speed Cmd	IMV Aft Port Vlv Spd cmd			Node-1	2A	AC
N1-1	AIO 6	05	IMV V N1-Aft Sply Speed Cmd	IMV Aft Stbd Vlv Spd cmd			Node-1	2A	AC
N1-1	AIO 6	06	IMV V N1-Port Sply Speed Cmd	IMV Port Fwd Vlv Spd cmd			Node-1	2A	AC
N1-1	AIO 6	07	IMV V N1-Stbd Rtn Speed Cmd	IMV Stbd Aft Vlv Spd cmd			Node-1	2A	AC
N1-1	AIO 6	08	IMV V N1-Stbd Sply Speed Cmd	IMV Stbd Fwd Vlv Spd cmd			Node-1	2A	AC
N1-1	AIO 6	09-16	SPARE	SPARE			SPARE		
N1-1	LLA 7	00	HX Lab LT-A Out RTD Meas	Lab LTL IFHX NH3 Out Temp			Lab	5A	12A
N1-1	LLA 7	01	Pri Struct N1 RTD Zone 1-1 Meas	Node 1 Htr1A Temp Snsr1			Node-1	2A	AC
N1-1	LLA 7	02	Pri Struct N1 RTD Zone 1-3 Meas	Node 1 Htr1A Temp Snsr2			Node-1	2A	AC
N1-1	LLA 7	03	Pri Struct N1 RTD Zone 2-1 Meas	Node 1 Htr2A Temp Snsr			Node-1	2A	AC
N1-1	LLA 7	04	Pri Struct N1 RTD Zone 3-1 Meas	Node 1 Htr3A Temp Snsr1			Node-1	2A	AC
N1-1	LLA 7	05	Pri Struct N1 RTD Zone 3-3 Meas	Node 1 Htr3A Temp Snsr2			Node-1	2A	AC
N1-1	LLA 7	06	Pri Struct N1 RTD Zone 4-1 Meas	Node 1 Htr4A Temp Snsr			Node-1	2A	AC
N1-1	LLA 7	07	Pri Struct N1 RTD Zone 5-1 Meas	Node 1 Htr5A Temp Snsr1			Node-1	2A	AC
N1-1	LLA 7	08	Pri Struct N1 RTD Zone 5-3 Meas	Node 1 Htr5A Temp Snsr2			Node-1	2A	AC
N1-1	LLA 7	09	Pri Struct N1 RTD Zone 6-1 Meas	Node 1 Htr6A Temp Snsr1			Node-1	2A	AC
N1-1	LLA 7	10	Pri Struct N1 RTD Zone 6-3 Meas	Node 1 Htr6A Temp Snsr2			Node-1	2A	AC
N1-1	LLA 7	11	Pri Struct N1 RTD Zone 7-1 Meas	Node 1 Htr7A Temp Snsr1			Node-1	2A	AC
N1-1	LLA 7	12	Pri Struct N1 RTD Zone 7-3 Meas	Node 1 Htr7A Temp Snsr2			Node-1	2A	AC
N1-1	LLA 7	13	Pri Struct N1 RTD Zone 8-1 Meas	Node 1 Htr8A Temp Snsr			Node-1	2A	AC
N1-1	LLA 7	14	Pri Struct N1 RTD Zone 9-1 Meas	Node 1 Htr9A Temp Snsr			Node-1	2A	AC
N1-1	LLA 7	15-17	SPARE	SPARE			SPARE		
N1-1	LLA 7	18	Pri Struct N2 RTD Zone 1-1 Meas				Node-2	10A	10A
N1-1	LLA 7	19	Pri Struct N2 RTD Zone 2-1 Meas				Node-2	10A	10A
N1-1	LLA 7	20	Pri Struct N2 RTD Zone 9-1 Meas				Node-2	10A	10A

N1-1 MDM CHANNEL ASSIGNMENTS

(GND/2A.2A - 2A.2B/FIN A/MULTI)

MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS1-A RPC-5	SDO Cd 1B Pwr, RPCM N1 RS1-A RPC-6	ISS Element	Flight Activation	Flight Deactivation
N1-1	LLA 7	21	Pri Struct N2 RTD Zone 3-2 Meas				Node-2	10A	10A
N1-1	LLA 7	22	Pri Struct N2 RTD Zone 5-1 Meas				Node-2	10A	10A
N1-1	LLA 7	23	Pri Struct N2 RTD Zone 6-1 Meas				Node-2	10A	10A
N1-1	LLA 7	24	Pri Struct N2 RTD Zone 7-1 Meas				Node-2	10A	10A
N1-1	LLA 7	25	Pri Struct N2 RTD Zone 1-3 Meas				Node-2	10A	10A
N1-1	LLA 7	26	Pri Struct N2 RTD Zone 2-2 Meas				Node-2	10A	10A
N1-1	LLA 7	27	Pri Struct N2 RTD Zone 9-2 Meas				Node-2	10A	10A
N1-1	LLA 7	28	Pri Struct N2 RTD Zone 3-4 Meas				Node-2	10A	10A
N1-1	LLA 7	29	Pri Struct N2 RTD Zone 5-3 Meas				Node-2	10A	10A
N1-1	LLA 7	30	Pri Struct N2 RTD Zone 6-3 Meas				Node-2	10A	10A
N1-1	LLA 7	31	Pri Struct N2 RTD Zone 7-3 Meas				Node-2	10A	10A
N1-1	HLA 8	00	VAV Dmpr N1-N1 Pos Fdbk	RAMV Vlv Posn			Node-1	2A	AC
N1-1	HLA 8	01	IMV Fan N1-Aft Rtn Speed Fdbk	IMV Aft Port Fan Spd			Node-1	2A	AC
N1-1	HLA 8	02	Cab Vent Fan N1 Speed Fdbk	Cab Fan Spd			Node-1	2A	AC
N1-1	HLA 8	03	Cab Vent Fan N1 Diff Press Xdcr Meas	Cab Fan Delta P			Node-1	2A	AC
N1-1	HLA 8	04-31	SPARE	SPARE			SPARE		
N1-1	LLA 9	00	SSMDM N1-2 RTD Meas	N1-2 MDM Surv Htr RTD			PMA-2	2A	AC
N1-1	LLA 9	01	Press Shl PMA1 RTD-1 Meas	PMA-1 Htr1A Temp Snsr			PMA-1	2A	AC
N1-1	LLA 9	02	Rdtr SSMDM N1-1 RTD	N1-1 MDM Ops Htr RTD			PMA-1	2A	AC
N1-1	LLA 9	03	Press Shl PMA1 RTD-3 Meas	PMA-1 Htr3A Temp Snsr			PMA-1	2A	AC
N1-1	LLA 9	04	Press Shl PMA1 RTD 4 Meas	PMA-1 Htr4A Temp Snsr			PMA-1	2A	AC
N1-1	LLA 9	05	Press Shl PMA1 RTD-5 Meas	PMA-1 Htr5A Temp Snsr			PMA-1	2A	AC
N1-1	LLA 9	06	Psiv APAS PMA2 Htch RTD-1 Meas	PMA2 APAS Htch Temp 1			PMA-2	2A	5A
N1-1	LLA 9	07	Psiv APAS PMA2 Htch RTD-2 Meas	PMA2 APAS Htch Temp 2			PMA-2	2A	5A
N1-1	LLA 9	08	Psiv APAS PMA2 Htch RTD-3 Meas	PMA2 APAS Htch Temp 3			PMA-2	2A	5A
N1-1	LLA 9	09	Psiv APAS PMA2 Htch RTD 4 Meas	PMA2 APAS Htch Temp 4			PMA-2	2A	5A
N1-1	LLA 9	10-21	SPARE	SPARE			SPARE		
N1-1	LLA 9	22	P6 Ammonia Loop A RTD-1 Excitation	EEATCS Loop A out temp 1 excit			ITC-Z1	4A	Post 12A
N1-1	LLA 9	23	P6 Ammonia Loop A RTD-1 Meas	EEATCS Loop A out temp 1			ITC-Z1	4A	Post 12A
N1-1	LLA 9	24	P6 Ammonia Loop A RTD-2 Excitation	EEATCS Loop A out temp 2 excit			ITC-Z1	4A	Post 12A
N1-1	LLA 9	25	P6 Ammonia Loop A RTD-2 Meas	EEATCS Loop A out temp 2			ITC-Z1	4A	Post 12A
N1-1	LLA 9	26-27	SPARE	SPARE			SPARE		
N1-1	LLA 9	28	SPDA Z1-3B Util Rail RTD-1 Meas	SPDA Z13B Htr A Temp			ITC-Z1	3A	AC

N1-1 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS1-A RPC-5	SDO Cd 1B Pwr, RPCM N1 RS1-A RPC-6	ISS Element	Flight Activation	Flight Deactivation
N1-1	LLA 9	29-30	SPARE	SPARE			SPARE		
N1-1	LLA 9	31	SPDA Z1-4B Util Rail RTD-2 Meas	SPDA Z14B Htr B Temp			ITC-Z1	3A	AC

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N1-2 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS2-C RPC-3	SDO Cd 1B Pwr, RPCM N1 RS2-C RPC-4	ISS Element	Flight Activation	Flight Deactivation
N1-2	DIO 2	00	HX Lab MT-B lN1 V Norm Fl Pos	Lab MTL IFHX NH3 Byp Vlv Flothru ind			LAB	5A	12A
N1-2	DIO 2	01	HX Lab MT-B IN1 V Byp Fl Cmd	Lab MTL IFHX NH3 Byp Vlv Byp ind			LAB	5A	12A
N1-2	DIO 2	02	HX Lab MT-B Out V Open Pos	Lab MTL IFHX NH3 Isol Vlv Op ind			LAB	5A	12A
N1-2	DIO 2	03	HX Lab MT-B Out V Cls Pos	Lab MTL IFHX NH3 Isol Vlv Cl ind			LAB	5A	12A
N1-2	DIO 2	04	Smk Det N2-1 Bit Enbl	SD 2 Bit Ena cmd			Node-1	2A	AC
N1-2	DIO 2	05	VAV Dmpr N1-CU Enbl Cmd	CUP RAMV Ena cmd			Node-1	2A	AC
N1-2	DIO 2	06	IMV Fan N1-Port Sply On/Off Cmd	IMV Port Fwd Fan On cmd			Node-1	2A	AC
N1-2	DIO 2	07	IMV Fan N1-Stbd Rtn On/Off Cmd	IMV Stfb Aft Fan On cmd			Node-1	2A	AC
N1-2	DIO 2	08-15	SPARE	SPARE			SPARE		
N1-2	DIO 2	16	IMV V N1-Fwd Rtn Open Pos	IMV Fwd Stbd Vlv CL			Node-1	2A	AC
N1-2	DIO 2	17	IMV V N1-Fwd Rtn Enbl Cmd	IMV Fwd Stbd Vlv Ena cmd			Node-1	2A	AC
N1-2	DIO 2	18	IMV V N1-Fwd Rtn Cls Pos	IMV Fwd Stbd Vlv OP			Node-1	2A	AC
N1-2	DIO 2	19	IMV V N1-Fwd Sply Open Pos	IMV Fwd Port Vlv OP			Node-1	2A	AC
N1-2	DIO 2	20	IMV V N1-Fwd Sply Cls Pos	IMV Fwd Port Vlv CL			Node-1	2A	AC
N1-2	DIO 2	21	IMV V N1-Fwd Sply Enbl Cmd	IMV Fwd Port Vlv Ena cmd			Node-1	2A	AC
N1-2	DIO 2	22	IMV V N1-Nad Rtn Open Pos	IMV Deck Fwd Vld OP			Node-1	2A	AC
N1-2	DIO 2	23	IMV V N1-Nad Rtn Cls Pos	IMV Deck Fwd Vlv CL			Node-1	2A	AC
N1-2	DIO 2	24	IMV V N1-Nad Rtn Enbl Cmd	IMV Deck Fwd Vlv Ena cmd			Node-1	2A	AC
N1-2	DIO 2	25	IMV V N1-Nad Sply Enbl Cmd	IMV Deck Aft Vlv Ena cmd			Node-1	2A	AC
N1-2	DIO 2	26	IMV V N1-Nad Sply Open Pos	IMV Deck Aft Vlv OP			Node-1	2A	AC
N1-2	DIO 2	27	IMV V N1-Nad Sply Cls Pos	IMV Deck Aft Vlv CL			Node-1	2A	AC
N1-2	DIO 2	28-31	SPARE	SPARE			SPARE		
N1-2	SDO 3	00	SSMDM N1-2 Htr Pwr	MDM N1-2 Op Htr		X	PMA-1	2A	AC
N1-2	SDO 3	01	HX Lab MT-B IN1 V Norm Fl Cmd	LAB MTL IFHX NH3 Byp Vlv Flothru cmd		X	LAB	5A	12A
N1-2	SDO 3	02	HX Lab MT-B IN1 V Byp Fl Cmd	Lab MTL IFHX NH3 Byp Vlv Byp cmd		X	LAB	5A	12A
N1-2	SDO 3	03	HX Lab MT-B Out V Open Cmd	Lab MTL IFHX NH3 Iso Vlv OP cmd	X		LAB	5A	12A
N1-2	SDO 3	04	HX Lab MT-B Out V Cls Cmd	Lab MTL IFHX NH3 Iso Vlv CL cmd	X		LAB	5A	12A
N1-2	SDO 3	05	Rnd Win Htr-1 Enbl Cmd			X	Cupola	10A	AC
N1-2	SDO 3	06	Rnd Win Htr-2 Enbl Cmd			X	Cupola	10A	AC
N1-2	SDO 3	07	Trap Win 1 Htr Enbl Cmd			X	Cupola	10A	AC
N1-2	SDO 3	08	Trap Win 2 Htr Enbl Cmd			X	Cupola	10A	AC
N1-2	SDO 3	09	Trap Win 3 Htr Enbl Cmd		X		Cupola	10A	AC
N1-2	SDO 3	10	Trap Win 4 Htr Enbl Cmd		X		Cupola	10A	AC
N1-2	SDO 3	11	Trap Win 5 RTD-1 Meas		X		Cupola	10A	AC

N1-2 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS2-C RPC-3	SDO Cd 1B Pwr, RPCM N1 RS2-C RPC-4	ISS Element	Flight Activation	Flight Deactivation
N1-2	SDO 3	12	Trap Win 6 RTD-1 Meas		X		Cupola	10A	AC
N1-2	SDO 3	13-15	SPARE	SPARE			SPARE		
N1-2	DIO 4	00-15	SPARE	SPARE			SPARE		
N1-2	DIO 4	16	Psiv APAS PMA2 Cap Plngr L-2 Pos	NCSN1_2_MCS_PMA2_Capture_Long			PMA-2	2A	5A
N1-2	DIO 4	17	Psiv APAS PMA2 Cap Plngr S-2 Pos	NCSN1_2_MCS_PMA2_Capture_Short			PMA-2	2A	5A
N1-2	DIO 4	18	Psiv APAS PMA2 Dep Plngr-2 Pos	NCSN1_2_MCS_PMA2_Undocking_Complete			PMA-2	2A	5A
N1-2	DIO 4	19	Psiv APAS PMA2 Intf Sealed-2 Pos	NCSN1_2_MCS_PMA2_Interface_Sealed			PMA-2	2A	5A
	DIO 4	20	SPARE	SPARE			SPARE		
N1-2	DIO 4	21	GNC Moding Ind PMA2 Active ACS Ind Cmd-2	NCSN1_2_MCS_PMA2_LED_Unit2_Cmd1			PMA-2	2A	5A
N1-2	DIO 4	22	GNC Moding Ind PMA2 Free Drift Ind	NCSN1_2_MCS_PMA2_LED_Unit2_Cmd2			PMA-2	2A	5A
N1-2	DIO 4	23	Psiv APAS PMA3 Cap Plngr L-2 Pos	NCSN1_2_MCS_PMA3_Capture_Long			PMA-3	3A	16A
N1-2	DIO 4	24	Psiv APAS PMA3 Cap Plngr S-2 Pos	NCSN1_2_MCS_PMA3_Capture_Short			PMA-3	3A	16A
N1-2	DIO 4	25	Psiv APAS PMA3 Dep Plngr-2 Pos	NCSN1_2_MCS_PMA3_Undocking_Complete			PMA-3	3A	16A
N1-2	DIO 4	26	Psiv APAS PMA3 Intf Sealed-2 Pos	NCSN1_2_MCS_PMA3_Interface_Sealed			PMA-3	3A	16A
N1-2	DIO 4	27-28	SPARE	SPARE			Spare		
N1-2	DIO 4	29	GNC Moding Ind PMA3 Active ACS Ind Cmd-2	NCSN1_2_MCS_PMA3_LED_Unit1_Cmd1			PMA-3	3A	16A
N1-2	DIO 4	30	GNC Moding Ind PMA3 Free Drift Ind Cmd-2	NCSN1_2_MCS_PMA3_LED_Unit1_Cmd2			PMA-3	3A	16A
N1-2	DIO 4	31	SPARE	SPARE			SPARE		
N1-2	LLA 5	00	VAV Cont CU-CU Pos	CUP RAMV Rheo Posn			Cupola	2A	AC
N1-2	LLA 5	01	VAV Cont CU-CU Exc	CUP RAMV Excite			Cupola	2A	AC
N1-2	LLA 5	02	Smk Det N2-1 Scatter Meas	SD 2 Sctr			Node-1	2A	AC
N1-2	LLA 5	03	Smk Det N2-1 Obscuration Meas	SD 2 Obsc			Node-1	2A	AC
N1-2	LLA 5	04	Rnd Win RTD-1 Meas				Cupola	10A	AC
N1-2	LLA 5	05	Rnd Win RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	06	Trap Win 1 RTD-1 Meas				Cupola	10A	AC
N1-2	LLA 5	07	Trap Win 1 RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	08	Trap Win 2 RTD-1 Meas				Cupola	10A	AC
N1-2	LLA 5	09	Trap Win 2 RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	10	Trap Win 3 RTD-1 Meas				Cupola	10A	AC
N1-2	LLA 5	11	Trap Win 3 RTD-3 Meas				Cupola	10A	AC

N1-2 MDM CHANNEL ASSIGNMENTS

(GND/2A.2A - 2A.2B/FIN A/MULTI)

MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS2-C RPC-3	SDO Cd 1B Pwr, RPCM N1 RS2-C RPC-4	ISS Element	Flight Activation	Flight Deactivation
N1-2	LLA 5	12	Trap Win 4 RTD-1 Meas				Cupola	10A	AC
N1-2	LLA 5	13	Trap Win 4 RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	14	Trap Win 5 Htr Enbl Cmd				Cupola	10A	AC
N1-2	LLA 5	15	Trap Win 5 RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	16	Trap Win 6 Htr Enbl Cmd				Cupola	10A	AC
N1-2	LLA 5	17	Trap Win 6 RTD-3 Meas				Cupola	10A	AC
N1-2	LLA 5	18	Rnd Win RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	19	Rnd Win RTD-4 Meas				Cupola	10A	AC
N1-2	LLA 5	20	Trap Win 1 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	21	Trap Win 1 RTD 4 Meas				Cupola	10A	AC
N1-2	LLA 5	22	Trap Win 2 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	23	Trap Win 2 RTD 4 Meas				Cupola	10A	AC
N1-2	LLA 5	24	Trap Win 3 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	25	Trap Win 3 RTD-4 Meas				Cupola	10A	AC
N1-2	LLA 5	26	Trap Win 4 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	27	Trap Win 4 RTD 4 Meas				Cupola	10A	AC
N1-2	LLA 5	28	Trap Win 5 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	29	Trap Win 5 RTD-4 Meas				Cupola	10A	AC
N1-2	LLA 5	30	Trap Win 6 RTD-2 Meas				Cupola	10A	AC
N1-2	LLA 5	31	Trap Win 6 RTD-4 Meas				Cupola	10A	AC
N1-2	AIO 6	00-01	SPARE	SPARE			SPARE		
N1-2	AIO 6	02	VAV Dmpr N1-CU Pos Cmd	CUP RAMV Posn cmd			LS	2A	AC
N1-2	AIO 6	03	SPARE	SPARE			SPARE		
N1-2	AIO 6	04	IMV V N1-Fwd Rtn Speed Cmd	IMV Fwd Stbd Vlv Spd cmd			Node-1	2A	AC
N1-2	AIO 6	05	IMV V N1-Fwd Sply Speed Cmd	IMV Fwd Port Vlv Spd cmd			Node-1	2A	AC
N1-2	AIO 6	06	IMV V N1-Nad Rtn Speed Cmd	IMV Deck Fwd Vlv Spd cmd			Node-1	2A	AC
N1-2	AIO 6	07	IMV V N1-Nad Sply Speed Cmd	IMV Deck Aft Vlv Spd cmd			Node-1	2A	AC
N1-2	AIO 6	08-16	SPARE	SPARE			SPARE		
N1-2	LLA 7	00	HX Lab MT-B Out Rtd Meas	Lab MTL IFHX NH3 Out Temp			LAB		
N1-2	LLA 7	01	Pn Struct N1 RTD Zone 1-2 Meas	Node 1 Htr1B Temp Snsr1			Node-1	2A	AC
N1-2	LLA 7	02	Pri Struct N1 RTD Zone 1-4 Meas	Node 1 Htr1B Temp Snsr2			Node-1	2A	AC
N1-2	LLA 7	03	Pri Struct N1 RTD Zone 2-2 Meas	Node 1 Htr2B Temp Snsr			Node-1	2A	AC
N1-2	LLA 7	04	Pri Struct N1 RTD Zone 3-2 Meas	Node 1 Htr3B Temp Snsr1			Node-1	2A	AC

N1-2 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS2-C RPC-3	SDO Cd 1B Pwr, RPCM N1 RS2-C RPC-4	ISS Element	Flight Activation	Flight Deactivation
N1-2	LLA 7	05	Pri Struct N1 RTD Zone 3-4 Meas	Node 1 Htr3B Temp Snsr2			Node-1	2A	AC
N1-2	LLA 7	06	Pri Struct N1 RTD Zone 4-2 Meas	Node 1 Htr4B Temp Snsr			Node-1	2A	AC
N1-2	LLA 7	07	Pri Struct N1 RTD Zone 5-2 Meas	Node 1 Htr5B Temp Snsr1			Node-1	2A	AC
N1-2	LLA 7	08	Pri Struct N1 RTD Zone 5-4 Meas	Node 1 Htr5B Temp Snsr2			Node-1	2A	AC
N1-2	LLA 7	09	Pri Struct N1 RTD Zone 6-2 Meas	Node 1 Htr6B Temp Snsr1			Node-1	2A	AC
N1-2	LLA 7	10	Pri Struct N1 RTD Zone 6-4 Meas	Node 1 Htr6B Temp Snsr2			Node-1	2A	AC
N1-2	LLA 7	11	Pri Struct N1 RTD Zone 7-2 Meas	Node 1 Htr7B Temp Snsr1			Node-1	2A	AC
N1-2	LLA 7	12	Pri Struct N1 RTD Zone 7-4 Meas	Node 1 Htr7B Temp Snsr2			Node-1	2A	AC
N1-2	LLA 7	13	Pri Struct N1 RTD Zone 8-2 Meas	Node 1 Htr8B Temp Snsr			Node-1	2A	AC
N1-2	LLA 7	14	Pri Struct N1 RTD Zone 9-2 Meas	Node 1 Htr9B Temp Snsr			Node-1	2A	AC
N1-2	LLA 7	15-17	SPARE	SPARE			SPARE		
N1-2	LLA 7	18	Pri Struct N2 RTD Zone 1-2 Meas				Node-2	10A	10A
N1-2	LLA 7	19	Pri Struct N2 RTD Zone 8-1 Meas				Node-2	10A	10A
N1-2	LLA 7	20	Pri Struct N2 RTD Zone 3-1 Meas				Node-2	10A	10A
N1-2	LLA 7	21	Pri Struct N2 RTD Zone 4-1 Meas				Node-2	10A	10A
N1-2	LLA 7	22	Pri Struct N2 RTD Zone 5-2 Meas				Node-2	10A	10A
N1-2	LLA 7	23	Pri Struct N2 RTD Zone 6-2 Meas				Node-2	10A	10A
N1-2	LLA 7	24	Pri Struct N2 RTD Zone 7-2 Meas				Node-2	10A	10A
N1-2	LLA 7	25	Pri Struct N2 RTD Zone 1-4 Meas				Node-2	10A	10A
N1-2	LLA 7	26	Prl Struct N2 RTD Zone 8-2 Meas				Node-2	10A	10A
N1-2	LLA 7	27	Pri Struct N2 RTD Zone 3-3 Meas				Node-2	10A	10A
N1-2	LLA 7	28	Pri Struct N2 RTD Zone 4-2 Meas				Node-2	10A	10A
N1-2	LLA 7	29	Pri Struct N2 RTD Zone 5-4 Meas				Node-2	10A	10A
N1-2	LLA 7	30	Pn Struct N2 RTD Zone 6-4 Meas				Node-2	10A	10A
N1-2	LLA 7	31	Pn Struct N2 RTD Zone 7-4 Meas				Node-2	10A	10A
N1-2	HLA 8	00	VAV Dmpr N1-CU Pos Fdbk	CUP RAMV Vlv Posn			LS	2A	AC
N1-2	HLA 8	01	IMV Fan N1-Port Sply Speed Cmd	IMV Port Fwd Fan Spd			Node-1	2A	AC
N1-2	HLA 8	02	IMV Fan N1-Stbd Rtn Speed Cmd	IMV Stbd Aft Fan Spd			Node-1	2A	AC
N1-2	HLA 8	03	Abs Press Xdcr N1 Meas	CPS Press			Node-1	2A	AC
N1-2	HLA 8	04-31	SPARE	SPARE			SPARE		
N1-2	LLA 9	00	SSMDM N1-1 RTD Meas	N1-1 MDM Surv Htr RTD			PMA-1	2A	AC
N1-2	LLA 9	01	Press Shl PMA1 RTD-6 Meas	PMA-1 Htr1B Temp Snsr			PMA-1	2A	AC
N1-2	LLA 9	02	Press Shl PMA1 RTD-7 Meas	PMA-1 Htr2B Temp Snsr			PMA-1	2A	AC

N1-2 MDM CHANNEL ASSIGNMENTS

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MDM	Card Type	Channel	Eng Name	OPS NOM	SDO Cd 1A Pwr, RPCM N1 RS2-C RPC-3	SDO Cd 1B Pwr, RPCM N1 RS2-C RPC-4	ISS Element	Flight Activation	Flight Deactivation
N1-2	LLA 9	03	Press Shl PMA1 RTD-8 Meas	PMA-1 Htr4B Temp Snsr			PMA-1	2A	AC
N1-2	LLA 9	04	Rdtr SSMDM N1-2 RTD Meas	N1-2 MDM Ops Htr RTD			PMA-1	2A	AC
N1-2	LLA 9	05	Press Shl PMA1 RTD-10 Meas	PMA-1 Htr5B Temp Snsr			PMA-1	2A	AC
N1-2	LLA 9	06	Psiv APAS PMA3 Htch RTD-1 Meas	PMA3 APAS Htch Temp 1			PMA-3	3A	16A
N1-2	LLA 9	07	Pslv APAS PMA3 Htch RTD-2 Meas	PMA3 APAS Htch Temp 2			PMA-3	3A	16A
N1-2	LLA 9	08	Psiv APAS PMA3 Htch RTD-3 Meas	PMA3 APAS Htch Temp 3			PMA-3	3A	16A
N1-2	LLA 9	09	Psiv APAS PMA3 Htch RTD-4 Meas	PMA3 APAS Htch Temp 4			PMA-3	3A	16A
N1-2	LLA 9	10	Press Shl PMA3 RTD-1 Meas	PMA-3 Htr1A Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	11	Press Shl PMA3 RTD-2 Meas	PMA-3 Htr1B Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	12	Press Shl PMA3 RTD-3 Meas	PMA-3 Htr2A Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	13	Press Shl PMA3 RTD-4 Meas	PMA-3 Htr2B Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	14	Press Shl PMA3 RTD-5 Meas	PMA-3 Htr3A Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	15	Press Shl PMA3 RTD-6 Meas	PMA-3 Htr3B Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	16	Press Shl PMA3 RTD-7 Meas	PMA-3 Htr4A Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	17	Press Shl PMA3 RTD-8 Meas	PMA-3 Htr4B Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	18	Press Shl PMA3 RTD-9 Meas	PMA-3 Htr5A Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	19	Press Shl PMA3 RTD-10 Meas	PMA-3 Htr5B Temp Snsr			PMA-3	3A	16A
N1-2	LLA 9	20-21	SPARE	SPARE			SPARE		
N1-2	LLA 9	22	P6 Ammonia Loop B RTD-1 Excitation	EEATCS Loop B out temp 1 excit			ITS-Z1	4A	Post 12A
N1 2	LLA 9	23	P6 Ammonia Loop B RTD-1 Meas	EEATCS Loop B out temp 1			ITS-Z1	4A	Post 12A
N1-2	LLA 9	24	P6 Ammonia Loop B RTD-2 Excitation	EEATCS Loop B out temp 2 excit			ITS-Z1	4A	Post 12A
N1-2	LLA 9	25	P6 Ammonia Loop B RTD-2 Meas	EEATCS Loop B out temp 2			ITS-Z1	4A	Post 12A
N1-2	LLA 9	26-27	SPARE	SPARE			SPARE		
N1-2	LLA 9	28	SPDA Z1-3B Util Rail RTD-2 Meas	SPDA Z13B Htr B Temp			ITS-Z1	3A	AC
N1-2	LLA 9	29-30	SPARE	SPARE			SPARE		
N1-2	LLA 9	31	SPDA Z1-4B Util Rail RTD-1 Meas	SPDA Z14B htr A Temp			ITS-Z1	3A	AC

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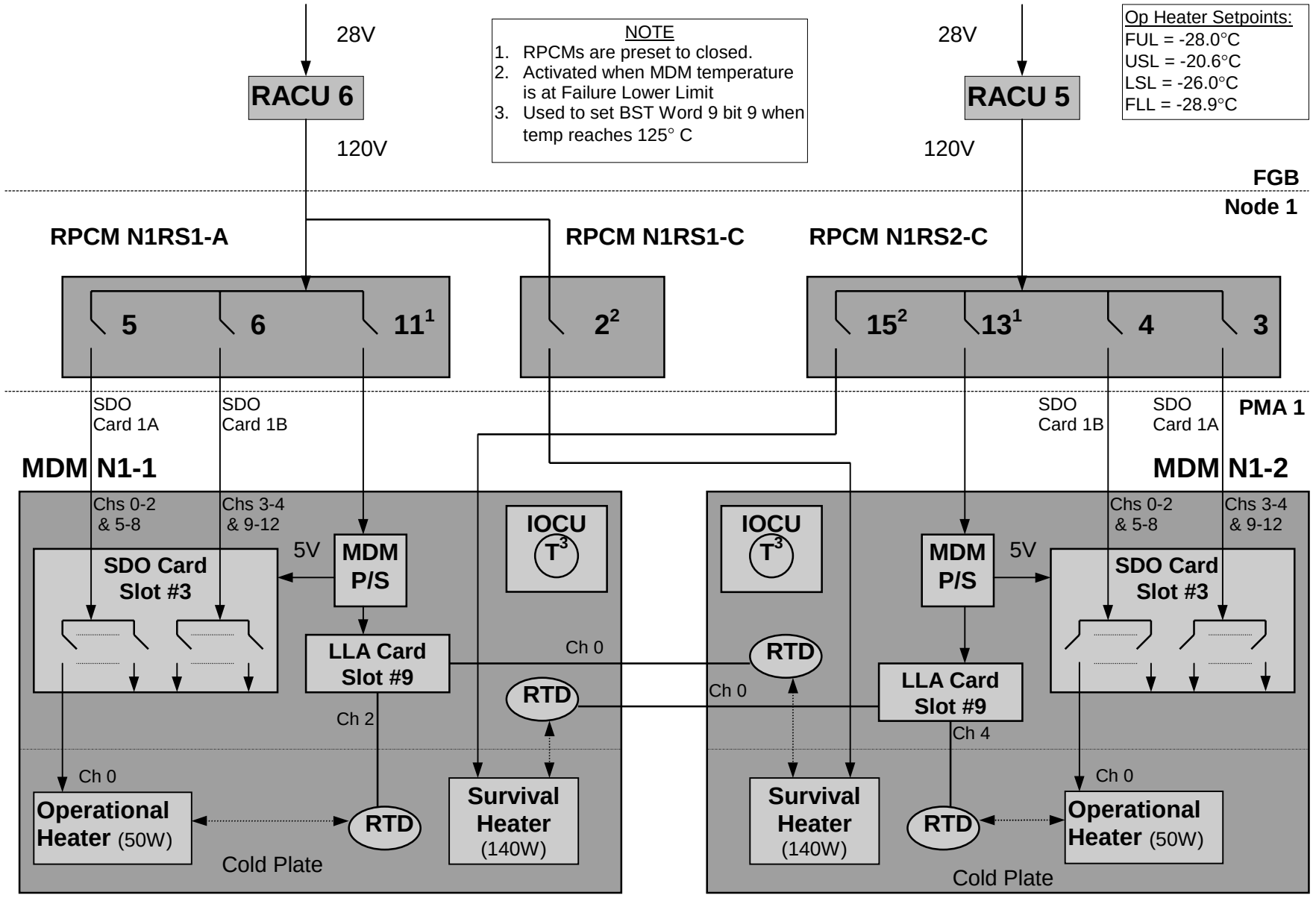
NODE 1 MDM POWER/HEATER CONFIGURATION
(GND/2A.2A - 2A.2B/FIN A/MULTI) Page 1 of 1 page



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ECLSS PROCEDURES

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Node Control Software Release 1

Atmosphere Control and Supply

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Cabin Pressure	
M1EP95SM1000K	Node_1_Cab_Press_Lim_Ena
M1EP95SM1004K	Node_1_Cab_Press_Lim_Inhib_Cfrm
M1EP95SM1001K	Node_1_Cab_Press_Lim_Inhib_Arm

Temperature and Humidity Control

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Cabin Fan	
M1EP95SM1002K	Node_1_Cab_Fan_On
M1EP95SM1003K	Node_1_Cab_Fan_Off_REL1
M1EP95SM1005K	Node_1_Cab_Fan_Lim_Inh_Cfrm
M1EP95SM1006K	Node_1_Cab_Fan_Lim_Inh_Arm
M1EP95SM1007K	Node_1_Cab_Fan_Lim_Ena
M1EP95SM1220K	Node_1_Cab_Fan_Spd_Tmplt
M1EP95SM1221K	Node_1_Cab_Fan_3400_rpm
M1EP95SM1223K	Node_1_Cab_Fan_3900_rpm
M1EP95SM1228K	Node_1_Cab_Fan_6710_rpm
M1PR95SM1881K	RPCM_N14B_B_RPC_17_Cab_Fan_Op
M1PR95SM1233K	RPCM_N14B_B_RPC_17_Cab_Fan_Cl
Node 1 IMV FDIR	
M1EP95SM1010K	MDM_Node_1_1_IMV_FDIR_Ena
M1EP95SM1014K	MDM_Node_1_1_IMV_FDIR_Inh_Cfrm
M1EP95SM1012K	MDM_Node_1_1_IMV_FDIR_Inh_Arm
M1EP95SM1011K	MDM_Node_1_2_IMV_FDIR_Ena
M1EP95SM1015K	MDM_Node_1_2_IMV_FDIR_Inhib_Cfrm
M1EP95SM1013K	MDM_Node_1_2_IMV_FDIR_Inh_Arm
Node 1 IMV Isolation	
M1EP95SM1008K	Node_1_IMV_Isol_REL1
M1EP95SM1009K	Node_1_IMV_Isol_Rls_NCS
Node 1 IMV Fans	
M1EP95SM1072K	Node_1_Aft_Port_IMV_Fan_Lim_Ena
M1EP95SM1066K	Node_1_Aft_Port_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1060K	Node_1_Aft_Port_IMV_Fan_Lim_Inh_Arm_NCS

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
M1EP95SM1054K	Node_1_Aft_Port_IMV_Fan_Off_REL1
M1EP95SM1055K	Node_1_Aft_Port_IMV_Fan_On_NCS
M1PR95SM1930K	RPCM_N14B_C_RPC_12_IMV_Aft_Port_Fan_Op
M1PR95SM1282K	RPCM_N14B_C_RPC_12_IMV_Aft_Port_Fan_Cl
M1EP95SM1077K	Node_1_Port_Fwd_IMV_Fan_Lim_Ena
M1EP95SM1071K	Node_1_Port_Fwd_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1065K	Node_1_Port_Fwd_IMV_Fan_Lim_Inh_Arm_NCS
M1EP95SM1058K	Node_1_Port_Fwd_IMV_Fan_Off_REL1
M1EP95SM1059K	Node_1_Port_Fwd_IMV_Fan_On_NCS
M1PR95SM1772K	RPCM_N13B_C_RPC_16_IMV_Port_Fwd_Fan_Op
M1PR95SM1124K	RPCM_N13B_C_RPC_16_IMV_Port_Fwd_Fan_Cl
M1EP95SM1076K	Node_1_Stbd_Aft_IMV_Fan_Lim_Ena
M1EP95SM1070K	Node_1_Stbd_Aft_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1064K	Node_1_Stbd_Aft_IMV_Fan_Lim_Inh_Arm_NCS
M1EP95SM1056K	Node_1_Stbd_Aft_IMV_Fan_Off_REL1
M1EP95SM1057K	Node_1_Stbd_Aft_IMV_Fan_On_NCS
M1PR95SM1652K	RPCM_N13B_A_RPC_04_IMV_Stbd_Aft_Fan_Op
M1PR95SM1004K	RPCM_N13B_A_RPC_04_IMV_Stbd_Aft_Fan_Cl
Node 1 IMV Valves	
M1EP95SM1045K	Node_1_Aft_Port_IMV_Vlv_Cl_REL1
M1EP95SM1208K	Node_1_Aft_Port_IMV_Vlv_Inh_NCS
M1EP95SM1209K	Node_1_Aft_Port_IMV_Vlv_Ena_NCS
M1EP95SM1044K	Node_1_Aft_Port_IMV_Vlv_Op
M1PR95SM1923K	RPCM_N14B_C_RPC_05_IMV_Aft_Port_Vlv_Op
M1PR95SM1275K	RPCM_N14B_C_RPC_05_IMV_Aft_Port_Vlv_Cl
M1EP95SM1043K	Node_1_Aft_Stbd_IMV_Vlv_Cl_REL1
M1EP95SM1206K	Node_1_Aft_Stbd_IMV_Vlv_Inh_NCS
M1EP95SM1207K	Node_1_Aft_Stbd_IMV_Vlv_Ena_NCS
M1EP95SM1042K	Node_1_Aft_Stbd_IMV_Vlv_Op
M1PR95SM1922K	RPCM_N14B_C_RPC_04_IMV_Aft_Stbd_Vlv_Op
M1PR95SM1274K	RPCM_N14B_C_RPC_04_IMV_Aft_Stbd_Vlv_Cl
M1EP95SM1051K	Node_1_Deck_Aft_IMV_Vlv_Cl_REL1
M1EP95SM1214K	Node_1_Deck_Aft_IMV_Vlv_Inh_NCS
M1EP95SM1215K	Node_1_Deck_Aft_IMV_Vlv_Ena_NCS
M1EP95SM1050K	Node_1_Deck_Aft_IMV_Vlv_Op
M1PR95SM1717K	RPCM_N13B_B_RPC_15_IMV_Deck_Aft_Vlv_Op
M1PR95SM1069K	RPCM_N13B_B_RPC_15_IMV_Deck_Aft_Vlv_Cl

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
M1EP95SM1053K	Node_1_Deck_Fwd_IMV_Vlv_Cl_REL1
M1EP95SM1216K	Node_1_Deck_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1217K	Node_1_Deck_Fwd_IMV_Vlv_Ena_NCS
M1EP95SM1052K	Node_1_Deck_Fwd_IMV_Vlv_Op
M1PR95SM1718K	RPCM_N13B_B_RPC_16_IMV_Deck_Fwd_Vlv_Op
M1PR95SM1070K	RPCM_N13B_C_RPC_16_IMV_Deck_Fwd_Vlv_Cl
M1EP95SM1047K	Node_1_Fwd_Port_IMV_Vlv_Cl_REL1
M1EP95SM1210K	Node_1_Fwd_Port_IMV_Vlv_Inh_NCS
M1EP95SM1211K	Node_1_Fwd_Port_IMV_Vlv_Ena_NCS
M1EP95SM1046K	Node_1_Fwd_Port_IMV_Vlv_Op
M1PR95SM1770K	RPCM_N13B_C_RPC_14_IMV_Fwd_Port_Vlv_Op
M1PR95SM1122K	RPCM_N13B_C_RPC_14_IMV_Fwd_Port_Vlv_Cl
M1EP95SM1049K	Node_1_Fwd_Stbd_IMV_Vlv_Cl_REL1
M1EP95SM1212K	Node_1_Fwd_Stbd_IMV_Vlv_Inh_NCS
M1EP95SM1213K	Node_1_Fwd_Stbd_IMV_Vlv_Ena_NCS
M1EP95SM1048K	Node_1_Fwd_Stbd_IMV_Vlv_Op
M1PR95SM1769K	RPCM_N13B_C_RPC_13_IMV_Fwd_Stbd_Vlv_Op
M1PR95SM1121K	RPCM_N13B_C_RPC_13_IMV_Fwd_Stbd_Vlv_Cl
M1EP95SM1041K	Node_1_Port_Fwd_IMV_Vlv_Cl_REL1
M1EP95SM1204K	Node_1_Port_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1205K	Node_1_Port_Fwd_IMV_Vlv_Ena_NCS
M1EP95SM1040K	Node_1_Port_Fwd_IMV_Vlv_Op
M1PR95SM1932K	RPCM_N14B_C_RPC_14_IMV_Port_Fwd_Vlv_Op
M1PR95SM1284K	RPCM_N14B_C_RPC_14_IMV_Port_Fwd_Vlv_Cl
M1EP95SM1039K	Node_1_Stbd_Aft__IMV_Vlv_Cl_REL1
M1EP95SM1202K	Node_1_Stbd_Aft_IMV_Vlv_Inh_NCS
M1EP95SM1203K	Node_1_Stbd_Aft_IMV_Vlv_Ena_NCS
M1EP95SM1038K	Node_1_Stbd_Aft_IMV_Vlv_Op
M1PR95SM1931K	RPCM_N14B_C_RPC_13_IMV_Stbd_Aft_Vlv_Op
M1PR95SM1283K	RPCM_N14B_C_RPC_13_IMV_Stbd_Aft_Vlv_Cl
M1EP95SM1037K	Node_1_Stbd_Fwd_IMV_Vlv_Cl_REL1
M1EP95SM1200K	Node_1_Stbd_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1201K	Node_1_Stbd_Fwd_IMV_Vlv_Ena_NCS
M1EP95SM1036K	Node_1_Stbd_Fwd_IMV_Vlv_Op_REL1
M1PR95SM1826K	RPCM_N14B_A_RPC_16_IMV_Stbd_Fwd_Vlv_Op
M1PR95SM1178K	RPCM_N14B_A_RPC_16_IMV_Stbd_Fwd_Vlv_Cl

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 RAMVs	
M1EP95SM1019K	Node_1_Cup_RAMV_Inh
M1EP95SM1017K	Node_1_Cup_RAMV_Ena
M1PR95SM1771K	NCS_RPCM_N13B_C_RPC_15_CUP_RAMV_Op
M1PR95SM1123K	NCS_RPCM_N13B_C_RPC_15_CUP_RAMV_Cl
M1EP95SM1018K	Node_1_RAMV_Inh
M1EP95SM1016K	Node_1_RAMV_Ena
M1PR95SM1880K	RPCM_N14B_B_RPC_16_RAMV_Op
M1PR95SM1232K	RPCM_N14B_B_RPC_16_RAMV_Cl

Fire Detection and Suppression

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Smoke Detectors	
M1EF95SM1006K	Node_1_SD_1_Act_BIT
M1EF95SM1012K	Node_1_SD_1_Fire_Stat_Rst
M1EF95SM1008K	Node_1_SD_1_Mon_Ena
M1EF95SM1010K	Node_1_SD_1_Mon_Inh
M1PR95SM1921K	RPCM_N14B_C_RPC_03_SD_1_Op
M1PR95SM1273K	RPCM_N14B_C_RPC_03_SD_1_Cl
M1EF95SM1007K	Node_1_SD_2_Act_BIT
M1EF95SM1013K	Node_1_SD_2_Fire_Stat_Rst
M1EF95SM1009K	Node_1_SD_2_Mon_Ena
M1EF95SM1011K	Node_1_SD_2_Mon_Inh
M1PR95SM1664K	RPCM_N13B_A_RPC_16_SD_2_Op
M1PR95SM1016K	RPCM_N13B_A_RPC_16_SD_2_Cl
Node 1 Fire Isolation	
M1EF95SM1000K	MDM_Node_1_1_Fire_Isol_Ena
M1EF95SM1002K	MDM_Node_1_1_Fire_Isol_Inh
M1EF95SM1004K	MDM_Node_1_1_Fire_Isol_Inh_Cfrm
M1EF95SM1001K	MDM_Node_1_2_Fire_Isol_Ena
M1EF95SM1003K	MDM_Node_1_2_Fire_Isol_Inh
M1EF95SM1005K	MDM_Node_1_2_Fire_Isol_Inh_Cfrm

Atmosphere Revitalization

NCS RELEASE 1 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 SDS Valves	
M1EP95SM1025K	Node_1_Deck_SDS_Vlv_Ena_FD_NCS
M1EP95SM1021K	Node_1_Deck_SDS_Vlv_Inh_FD_NCS
M1EP95SM1030K	Node_1_Deck_SDS_Vlv_A_NCS
M1EP95SM1031K	Node_1_Deck_SDS_Vlv_B_NCS
M1EP95SM1026K	Node_1_Fwd_SDS_Vlv_Ena_FD_NCS
M1EP95SM1022K	Node_1_Fwd_SDS_Vlv_Inh_FD_NCS
M1EP95SM1032K	Node_1_Fwd_SDS_Vlv_A_NCS
M1EP95SM1033K	Node_1_Fwd_SDS_Vlv_B_NCS
M1EP95SM1024K	Node_1_Sel_SDS_Vlv_Ena_FD_NCS
M1EP95SM1020K	Node_1_Sel_SDS_Vlv_Inh_FD_NCS
M1EP95SM1028K	Node_1_Sel_SDS_Vlv_A_NCS
M1EP95SM1029K	Node_1_Sel_SDS_Vlv_B_NCS
M1EP95SM1027K	Node_1_Stbd_SDS_Vlv_Ena_FD_NCS
M1EP95SM1023K	Node_1_Stbd_SDS_Vlv_Inh_FD_NCS
M1EP95SM1034K	Node_1_Stbd_SDS_Vlv_A_NCS
M1EP95SM1035K	Node_1_Stbd_SDS_Vlv_B_NCS

Node Control Software Release 2

Atmosphere Control and Supply

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Cabin Pressure	
M1EP95SM1000K	Node_1_Cab_Press_Lim_Ena
M1EP95SM1004K	Node_1_Cab_Press_Lim_Inhib_Cfrm
M1EP95SM1001K	Node_1_Cab_Press_Lim_Inhib_Arm

Temperature and Humidity Control

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Cabin Fan	
M1EP95SM1002K	Node_1_Cab_Fan_On
M1EX96IM0000K	Node_1_Cab_Fan_Off_Arm_R2
M1EX96IM0001K	Node_1_Cab_Fan_Off_Disarm_R2
M1EX96IM0002K	Node_1_Cab_Fan_Off_Cfrm_R2
M1EP95SM1005K	Node_1_Cab_Fan_Lim_Inh_Cfrm
M1EP95SM1006K	Node_1_Cab_Fan_Lim_Inh_Arm
M1EP95SM1007K	Node_1_Cab_Fan_Lim_Ena
M1EP95SM1220K	Node_1_Cab_Fan_Spd_Tmplt
M1EP95SM1221K	Node_1_Cab_Fan_3400_rpm
M1EP95SM1223K	Node_1_Cab_Fan_3900_rpm
M1EP95SM1228K	Node_1_Cab_Fan_6710_rpm
M1PR95SM1881K	RPCM_N14B_B_RPC_17_Cab_Fan_Op
M1PR95SM1233K	RPCM_N14B_B_RPC_17_Cab_Fan_Cl
Node 1 IMV FDIR	
M1EP95SM1010K	MDM_Node_1_1_IMV_FDIR_Ena
M1EP95SM1014K	MDM_Node_1_1_IMV_FDIR_Inh_Cfrm
M1EP95SM1012K	MDM_Node_1_1_IMV_FDIR_Inh_Arm
M1EP95SM1011K	MDM_Node_1_2_IMV_FDIR_Ena
M1EP95SM1015K	MDM_Node_1_2_IMV_FDIR_Inhib_Cfrm
M1EP95SM1013K	MDM_Node_1_2_IMV_FDIR_Inh_Arm
Node 1 IMV Isolation	
M1EX96IM0066K	Node_1_IMV_Isol_Arm_R2
M1EX96IM0067K	Node_1_IMV_Isol_Disarm_R2
M1EX96IM0068K	Node_1_IMV_Isol_Cfrm_R2
M1EP95SM1009K	Node_1_IMV_Isol_Rls_NCS

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 IMV Fans	
M1EP95SM1072K	Node_1_Aft_Port_IMV_Fan_Lim_Ena
M1EP95SM1066K	Node_1_Aft_Port_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1060K	Node_1_Aft_Port_IMV_Fan_Lim_Inh_Arm_NCS
M1EX96IM0003K	Node_1_Aft_Port_IMV_Fan_Off_Arm_R2
M1EX96IM0006K	Node_1_Aft_Port_IMV_Fan_Off_Disarm_R2
M1EX96IM0009K	Node_1_Aft_Port_IMV_Fan_Off_Cfrm_R2
M1EP95SM1055K	Node_1_Aft_Port_IMV_Fan_On_NCS
M1PR95SM1930K	RPCM_N14B_C_RPC_12_IMV_Aft_Port_Fan_Op
M1PR95SM1282K	RPCM_N14B_C_RPC_12_IMV_Aft_Port_Fan_Cl
M1EP95SM1077K	Node_1_Port_Fwd_IMV_Fan_Lim_Ena
M1EP95SM1071K	Node_1_Port_Fwd_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1065K	Node_1_Port_Fwd_IMV_Fan_Lim_Inh_Arm_NCS
M1EX96IM0070K	Node_1_IMV_Port_Fwd_Fan_Off_Arm_R2
M1EX96IM0072K	Node_1_IMV_Port_Fwd_Fan_Off_Disarm_R2
M1EX96IM0074K	Node_1_IMV_Port_Fwd_Fan_Off_Cfrm_R2
M1EP95SM1059K	Node_1_Port_Fwd_IMV_Fan_On_NCS
M1PR95SM1772K	RPCM_N13B_C_RPC_16_IMV_Port_Fwd_Fan_Op
M1PR95SM1124K	RPCM_N13B_C_RPC_16_IMV_Port_Fwd_Fan_Cl
M1EP95SM1076K	Node_1_Stbd_Aft_IMV_Fan_Lim_Ena
M1EP95SM1070K	Node_1_Stbd_Aft_IMV_Fan_Lim_Inh_Cfrm_NCS
M1EP95SM1064K	Node_1_Stbd_Aft_IMV_Fan_Lim_Inh_Arm_NCS
M1EX96IM0069K	Node_1_IMV_Stbd_Aft_Fan_Off_Arm_R2
M1EX96IM0071K	Node_1_IMV_Stbd_Aft_Fan_Off_Disarm_R2
M1EX96IM0073K	Node_1_IMV_Stbd_Aft_Fan_Off_Cfrm_R2
M1EP95SM1057K	Node_1_Stbd_Aft_IMV_Fan_On_NCS
M1PR95SM1652K	RPCM_N13B_A_RPC_04_IMV_Stbd_Aft_Fan_Op
M1PR95SM1004K	RPCM_N13B_A_RPC_04_IMV_Stbd_Aft_Fan_Cl
Node 1 IMV Valves	
M1EX96IM0043K	Node_1_IMV_Aft_Port_Vlv_Cl_Arm_R2
M1EX96IM0052K	Node_1_IMV_Aft_Port_Vlv_Cl_Disarm_R2
M1EX96IM0061K	Node_1_IMV_Aft_Port_Vlv_Cl_Cfrm_R2
M1EP95SM1208K	Node_1_Aft_Port_IMV_Vlv_Inh_NCS
M1EP95SM1209K	Node_1_Aft_Port_IMV_Vlv_Ena_NCS
M1EX96IM0016K	Node_1_IMV_Aft_Port_Vlv_Op_Arm_R2
M1EX96IM0025K	Node_1_IMV_Aft_Port_Vlv_Op_Disarm_R2
M1EX96IM0034K	Node_1_IMV_Aft_Port_Vlv_Op_Cfrm_R2
M1PR95SM1923K	RPCM_N14B_C_RPC_05_IMV_Aft_Port_Vlv_Op
M1PR95SM1275K	RPCM_N14B_C_RPC_05_IMV_Aft_Port_Vlv_Cl

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
M1EX96IM0042K	Node_1_IMV_Aft_Stbd_Vlv_Cl_Arm_R2
M1EX96IM0051K	Node_1_IMV_Aft_Stbd_Vlv_Cl_Disarm_R2
M1EX96IM0060K	Node_1_IMV_Aft_Stbd_Vlv_Cl_Cfrm_R2
M1EP95SM1206K	Node_1_Aft_Stbd_IMV_Vlv_Inh_NCS
M1EP95SM1207K	Node_1_Aft_Stbd_IMV_Vlv_Ena_NCS
M1EX96IM0015K	Node_1_IMV_Aft_Stbd_Vlv_Op_Arm_R2
M1EX96IM0024K	Node_1_IMV_Aft_Stbd_Vlv_Op_Disarm_R2
M1EX96IM0033K	Node_1_IMV_Aft_Stbd_Vlv_Op_Cfrm_R2
M1PR95SM1922K	RPCM_N14B_C_RPC_04_IMV_Aft_Stbd_Vlv_Op
M1PR95SM1274K	RPCM_N14B_C_RPC_04_IMV_Aft_Stbd_Vlv_Cl
M1EX96IM0046K	Node_1_IMV_Deck_Aft_Vlv_Cl_Arm_R2
M1EX96IM0055K	Node_1_IMV_Deck_Aft_Vlv_Cl_Disarm_R2
M1EX96IM0064K	Node_1_IMV_Deck_Aft_Vlv_Cl_Cfrm_R2
M1EP95SM1214K	Node_1_Deck_Aft_IMV_Vlv_Inh_NCS
M1EP95SM1215K	Node_1_Deck_Aft_IMV_Vlv_Ena_NCS
M1EX96IM0019K	Node_1_IMV_Deck_Aft_Vlv_Op_Arm_R2
M1EX96IM0028K	Node_1_IMV_Deck_Aft_Vlv_Op_Disarm_R2
M1EX96IM0037K	Node_1_IMV_Deck_Aft_Vlv_Op_Cfrm_R2
M1PR95SM1717K	RPCM_N13B_B_RPC_15_IMV_Deck_Aft_Vlv_Op
M1PR95SM1069K	RPCM_N13B_B_RPC_15_IMV_Deck_Aft_Vlv_Cl
M1EX96IM0047K	Node_1_IMV_Deck_Fwd_Vlv_Cl_Arm_R2
M1EX96IM0056K	Node_1_IMV_Deck_Fwd_Vlv_Cl_Disarm_R2
M1EX96IM0065K	Node_1_IMV_Deck_Fwd_Vlv_Cl_Cfrm_R2
M1EP95SM1216K	Node_1_Deck_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1217K	Node_1_Deck_Fwd_IMV_Vlv_Ena_NCS
M1EX96IM0020K	Node_1_IMV_Deck_Fwd_Vlv_Op_Arm_R2
M1EX96IM0029K	Node_1_IMV_Deck_Fwd_Vlv_Op_Disarm_R2
M1EX96IM0038K	Node_1_IMV_Deck_Fwd_Vlv_Op_Cfrm_R2
M1PR95SM1718K	RPCM_N13B_B_RPC_16_IMV_Deck_Fwd_Vlv_Op
M1PR95SM1070K	RPCM_N13B_C_RPC_16_IMV_Deck_Fwd_Vlv_Cl
M1EX96IM0044K	Node_1_IMV_Fwd_Port_Vlv_Cl_Arm_R2
M1EX96IM0053K	Node_1_IMV_Fwd_Port_Vlv_Cl_Disarm_R2
M1EX96IM0062K	Node_1_IMV_Fwd_Port_Vlv_Cl_Cfrm_R2
M1EP95SM1210K	Node_1_Fwd_Port_IMV_Vlv_Inh_NCS
M1EP95SM1211K	Node_1_Fwd_Port_IMV_Vlv_Ena_NCS
M1EX96IM0017K	Node_1_Fwd_Port_IMV_Vlv_Op_Arm_R2
M1EX96IM0026K	Node_1_IMV_Fwd_Port_Vlv_Op_Disarm_R2
M1EX96IM0035K	Node_1_IMV_Fwd_Port_Vlv_Op_Cfrm_R2
M1PR95SM1770K	RPCM_N13B_C_RPC_14_IMV_Fwd_Port_Vlv_Op
M1PR95SM1122K	RPCM_N13B_C_RPC_14_IMV_Fwd_Port_Vlv_Cl

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
M1EX96IM0045K	Node_1_IMV_Fwd_Stbd_Vlv_Cl_Arm_R2
M1EX96IM0054K	Node_1_IMV_Fwd_Stbd_Vlv_Cl_Disarm_R2
M1EX96IM0063K	Node_1_IMV_Fwd_Stbd_Vlv_Cl_Cfrm_R2
M1EP95SM1212K	Node_1_Fwd_Stbd_IMV_Vlv_Inh_NCS
M1EP95SM1213K	Node_1_Fwd_Stbd_IMV_Vlv_Ena_NCS
M1EX96IM0018K	Node_1_Fwd_Stbd_IMV_Vlv_Op_Arm_R2
M1EX96IM0027K	Node_1_IMV_Fwd_Stbd_Vlv_Op_Disarm_R2
M1EX96IM0036K	Node_1_IMV_Fwd_Stbd_Vlv_Op_Cfrm_R2
M1PR95SM1769K	RPCM_N13B_C_RPC_13_IMV_Fwd_Stbd_Vlv_Op
M1PR95SM1121K	RPCM_N13B_C_RPC_13_IMV_Fwd_Stbd_Vlv_Cl
M1EX96IM0041K	Node_1_IMV_Port_Fwd_Vlv_Cl_Arm_R2
M1EX96IM0050K	Node_1_IMV_Port_Fwd_Vlv_Cl_Disarm_R2
M1EX96IM0059K	Node_1_IMV_Port_Fwd_Vlv_Cl_Cfrm_R2
M1EP95SM1204K	Node_1_Port_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1205K	Node_1_Port_Fwd_IMV_Vlv_Ena_NCS
M1EX96IM0014K	Node_1_IMV_Port_Fwd_Vlv_Op_Arm_R2
M1EX96IM0023K	Node_1_IMV_Port_Fwd_Vlv_Op_Disarm_R2
M1EX96IM0032K	Node_1_IMV_Port_Fwd_Vlv_Op_Cfrm_R2
M1PR95SM1932K	RPCM_N14B_C_RPC_14_IMV_Port_Fwd_Vlv_Op
M1PR95SM1284K	RPCM_N14B_C_RPC_14_IMV_Port_Fwd_Vlv_Cl
M1EX96IM0040K	Node_1_IMV_Stbd_Aft_Vlv_Cl_Arm_R2
M1EX96IM0049K	Node_1_IMV_Stbd_Aft_Vlv_Cl_Disarm_R2
M1EX96IM0058K	Node_1_IMV_Stbd_Aft_Vlv_Cl_Cfrm_R2
M1EP95SM1202K	Node_1_Stbd_Aft_IMV_Vlv_Inh_NCS
M1EP95SM1203K	Node_1_Stbd_Aft_IMV_Vlv_Ena_NCS
M1EX96IM0013K	Node_1_IMV_Stbd_Aft_Vlv_Op_Arm_R2
M1EX96IM0022K	Node_1_IMV_Stbd_Aft_Vlv_Op_Disarm_R2
M1EX96IM0031K	Node_1_IMV_Stbd_Aft_Vlv_Op_Cfrm_R2
M1PR95SM1931K	RPCM_N14B_C_RPC_13_IMV_Stbd_Aft_Vlv_Op
M1PR95SM1283K	RPCM_N14B_C_RPC_13_IMV_Stbd_Aft_Vlv_Cl
M1EX96IM0039K	Node_1_IMV_Stbd_Fwd_Vlv_Cl_Arm_R2
M1EX96IM0048K	Node_1_IMV_Stbd_Fwd_Vlv_Cl_Disarm_R2
M1EX96IM0057K	Node_1_IMV_Stbd_Fwd_Vlv_Cl_Cfrm_R2
M1EP95SM1200K	Node_1_Stbd_Fwd_IMV_Vlv_Inh_NCS
M1EP95SM1201K	Node_1_Stbd_Fwd_IMV_Vlv_Ena_NCS
M1EX96IM0012K	Node_1_Stbd_Fwd_Vlv_Op_Arm_R2
M1EX96IM0021K	Node_1_IMV_Stbd_Fwd_Vlv_Op_Disarm_R2
M1EX96IM0030K	Node_1_IMV_Stbd_Fwd_Vlv_Op_Cfrm_R2
M1PR95SM1826K	RPCM_N14B_A_RPC_16_IMV_Stbd_Fwd_Vlv_Op
M1PR95SM1178K	RPCM_N14B_A_RPC_16_IMV_Stbd_Fwd_Vlv_Cl

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 RAMVs	
M1EP95SM1019K	Node_1_Cup_RAMV_Inh
M1EP95SM1017K	Node_1_Cup_RAMV_Ena
M1PR95SM1771K	NCS_RPCM_N13B_C_RPC_15_CUP_RAMV_Op
M1PR95SM1123K	NCS_RPCM_N13B_C_RPC_15_CUP_RAMV_Cl
M1EP95SM1018K	Node_1_RAMV_Inh
M1EP95SM1016K	Node_1_RAMV_Ena
M1PR95SM1880K	RPCM_N14B_B_RPC_16_RAMV_Op
M1PR95SM1232K	RPCM_N14B_B_RPC_16_RAMV_Cl

Fire Detection and Suppression

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 Smoke Detectors	
M1EF95SM1006K	Node_1_SD_1_Act_BIT
M1EF95SM1012K	Node_1_SD_1_Fire_Stat_Rst
M1EF95SM1008K	Node_1_SD_1_Mon_Ena
M1EF95SM1010K	Node_1_SD_1_Mon_Inh
M1PR95SM1921K	RPCM_N14B_C_RPC_03_SD_1_Op
M1PR95SM1273K	RPCM_N14B_C_RPC_03_SD_1_Cl
M1EF95SM1007K	Node_1_SD_2_Act_BIT
M1EF95SM1013K	Node_1_SD_2_Fire_Stat_Rst
M1EF95SM1009K	Node_1_SD_2_Mon_Ena
M1EF95SM1011K	Node_1_SD_2_Mon_Inh
M1PR95SM1664K	RPCM_N13B_A_RPC_16_SD_2_Op
M1PR95SM1016K	RPCM_N13B_A_RPC_16_SD_2_Cl
Node 1 Fire Isolation	
M1EF95SM1000K	MDM_Node_1_1_Fire_Isol_Ena
M1EF95SM1002K	MDM_Node_1_1_Fire_Isol_Inh
M1EF95SM1004K	MDM_Node_1_1_Fire_Isol_Inh_Cfrm
M1EF95SM1001K	MDM_Node_1_2_Fire_Isol_Ena
M1EF95SM1003K	MDM_Node_1_2_Fire_Isol_Inh
M1EF95SM1005K	MDM_Node_1_2_Fire_Isol_Inh_Cfrm

Atmosphere Revitalization

NCS RELEASE 2 CMD INSTANCE PUI	OPERATIONS NAME
Node 1 SDS Valves	
M1EP95SM1025K	Node_1_Deck_SDS_Vlv_Ena_FD_NCS
M1EP95SM1021K	Node_1_Deck_SDS_Vlv_Inh_FD_NCS
M1EP95SM1030K	Node_1_Deck_SDS_Vlv_A_NCS
M1EP95SM1031K	Node_1_Deck_SDS_Vlv_B_NCS
M1EP95SM1026K	Node_1_Fwd_SDS_Vlv_Ena_FD_NCS
M1EP95SM1022K	Node_1_Fwd_SDS_Vlv_Inh_FD_NCS
M1EP95SM1032K	Node_1_Fwd_SDS_Vlv_A_NCS
M1EP95SM1033K	Node_1_Fwd_SDS_Vlv_B_NCS
M1EP95SM1024K	Node_1_Sel_SDS_Vlv_Ena_FD_NCS
M1EP95SM1020K	Node_1_Sel_SDS_Vlv_Inh_FD_NCS
M1EP95SM1028K	Node_1_Sel_SDS_Vlv_A_NCS
M1EP95SM1029K	Node_1_Sel_SDS_Vlv_B_NCS
M1EP95SM1027K	Node_1_Stbd_SDS_Vlv_Ena_FD_NCS
M1EP95SM1023K	Node_1_Stbd_SDS_Vlv_Inh_FD_NCS
M1EP95SM1034K	Node_1_Stbd_SDS_Vlv_A_NCS
M1EP95SM1035K	Node_1_Stbd_SDS_Vlv_B_NCS

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EPS PROCEDURES

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1. COORDINATING DOWNLINK WITH ODIN
   Call ODIN on the FMT COORD DVIS loop to coordinate the upcoming downlink requests.

2. PREPARING BDT COMMAND
   If a prebuilt command is not available, consult Table 1. RPCM Address Table to determine the Start Address and BDT Words for the desired BDT dump segment.

   For each BDT Segment

   <Cmd Inv: RPCM_XXXX_X_BDT_Tmplt>

   sel Prepare Instance

   input an appropriate Ops Name
   input RPCM BDT Start Address _____ (Decimal)
   input RPCM BDT Transfer Word Count _____ (Decimal)

   sel Store in Cmd Svr

3. PREPARING DATA DUMP COMMAND (FROM MDM TO **MCC-H**)

NOTE
1. The RPCM firmware controller adds four header words to the data being transferred by the BDT. The header words are added to the MDM data dump word count but not to the BDT word count. The maximum data word count that can be transferred by a BDT is 28.
2. If the RPCM is connected to the Primary MDM, only one data dump command is required per BDT command.
3. If the RPCM is connected only to the Secondary MDM (possible for N13B and N14B), then a dump of only up to 16 words is possible. If the BDT transfer word count is greater than 12, then two data dumps are required. The downlink application might automatically do two or more dumps (of 16 words each) with just one dump command built for more than 16 words - verify application capability with ODIN.

If a prebuilt data dump command is not available:

Command Inventory: Navigation: Prepare Dump Command

Prepare Dump Command

input appropriate Ops Name

sel Tier – One for Primary Node 1 MDM
Two for Secondary Node 1 MDM

'Dump Location Type'

sel Source Device - which MDM the dump is from (do not select N1_Primary, select the physical MDM that is currently in primary MDM)

Consult Table 2. MDM Address Table for the start address of the appropriate RPCM.

input Start Address _____ (Hexadecimal)

Consult Table 1. RPCM Address Table for the number of words to transfer for the appropriate BDR Segment and transfer type.

input Word Count – 32 (Decimal)

input BIA Subaddress
BIA Subaddress = 32 for Primary MDM
BIA Subaddress = 14 for Secondary MDM

sel Dump Mode
Dump Mode = Standard for Primary MDM
SPD Card for Secondary MDM

If selected Tier Two MDM

sel Setup Dump Pipes – Setup Tier Dump display appears
sel Teir 1 Device – N1-2 or N1-1 whichever is primary MDM

Enter Bus ID – call ODIN for information
Enter Subaddress – 14
Enter BIA Subaddress – 32
Enter RT address – 6 for N1-1 MDM
– 5 for N1-2 MDM

sel Store in Cmd Svr – goes back to build dump command display
sel One-Shot Delivery

input Save Dump to File
/users/phalcon/DataDump/RPCM/**Power Bus ID/file name_date.dat**

The items in bold type need to be changed for each dump command.
Example:
/users/phalcon/DataDump/RPCM/N1RS1/N1RS1_A_Raw Buffer_1_990124.dat

NOTE
Every pass through the Data Dump portion of this procedure must write the data to a different file name to avoid loss of data.

input Remarks: "Uplink Data Dump request no sooner than 20 seconds after BDT command is issued."

sel Store In Cmd Svr

4. PROVIDING DUMP COMMANDS TO ODIN FOR UPLINK
Command Inventory: Dump Command Inventory (Unsubmitted)
Dump Command Inventory (Unsubmitted)

sel Data Dump command(s) for correct RPCM
sel Submit to FMT

5. EXECUTING BDT AND DUMP
Start real time dump viewer.

Master DNAV: Global Apps: Command Server: ISS Apps: Prime: Dump View

sel Hex View
sel File

Choose – Register for current dump

Verify GO for commanding.

cmd RPCM BDT

Wait 20 seconds.

Give ODIN GO for data dump command.
Verify with ODIN that data dump is complete.
Repeat if necessary.

NOTE
1. The data dump command must be completed prior to the next BDT command for the same RPCM. The same MDM memory location is used and any previous information will be overwritten. 2. BDT commands for different ORUs can be done in the same commanding interval prior to any dump commands.

If all required BDT segments have been downlinked, proceed to step 6.

6. PROCESSING AND INTERPRETING THE DATA
Process the data dump files through the console PC workstation spreadsheet tool RPCM BDT Reader and print the output.

Send data to MER/Phoenix.

Table 1. RPCM Address Table

BDT DUMP SEGMENT	CONTENTS	START ADDRESS DECIMAL	BDT WORD COUNT DECIMAL	DATA DUMP WORD COUNT DECIMAL
Hindsight 1	Input Current	4096	28	32
Hindsight 2	Input Current, Input Voltage	4124	28	32
Hindsight 3	Input Voltage	4152	28	32
Hindsight 4	Input Voltage	4180	20	24
Raw Buffer	Input Current, Input Voltage, RPC Output Voltage, Baseplate Temperature	7328	24	28
BITSUMM_1	BIT Results (Health Status, CRC, RAM, Interrupts, WDT, A/D, others)	8096	28	32
BITSUMM_2	BIT Results (A/D #1 Data)	8120	4	8
STAT3	Command Rejection Data, Lost Command Data	7392	9	13
FWSTAT 1	Firmware Status Indicators (Operational Status, Fault Status, Serial Port Command Status, MIL-STD-1553 Common Command Status)	8064	22	26

BDT DUMP SEGMENT	CONTENTS	START ADDRESS DECIMAL	BDT WORD COUNT DECIMAL	DATA DUMP WORD COUNT DECIMAL
FWSTAT 2	Firmware Status Indicators (Last Received Command Data	8089	7	11
STAT1	RPCM ID, Discrete Data Words, Integration Counter, Power on Reset Indicator	7200	16	20
STAT1_1	A/D Status	7228	4	8
INT1	Integrated Input Current and Input Voltage	7424	4	8
STAT2	Command Satus	7296	27	31
DATSET	Input Current, Trip Status, Close/Open Inhibits	7520	13	17

Table 2. MDM Address Table

RPCM NAME	MDM BDT START ADDRESS HEX	CONNECTED MDM	IF CONNECTED TO PRIMARY MDM USE	IF 2 DUMP CMDS REQUIRED
RPCM N13B A	25C040	N1-2	← This address	← 1st Segment, and
	25C060			← 2nd Segment
RPCM N13B B	25C240	N1-2	← This address	← 1st Segment, and
	25C260			← 2nd Segment
RPCM N13B C	25C440	N1-2	← This address	← 1st Segment, and
	25C460			← 2nd Segment
RPCM N14B A	25DE40	N1-1	← This address	← 1st Segment, and
	25DE60			← 2nd Segment
RPCM N14B B	25E040	N1-1	← This address	← 1st Segment, and
	25E060			← 2nd Segment
RPCM N14B C	25E240	N1-1	← This address	← 1st Segment, and
	25E260			← 2nd Segment
RPCM N1RS1 A	25D440	Both	← This address	
RPCM N1RS1 B	25D640	Both	← This address	
RPCM N1RS1 C	25D840	Both	← This address	
RPCM N1RS2 A	25CA40	Both	← This address	
RPCM N1RS2 B	25CC40	Both	← This address	
RPCM N1RS2 C	25CE40	Both	← This address	

MCS PROCEDURES

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1. VERIFYING ACS MODING PRE-ARRIVAL CONFIGURATION AND STATUS

PCS MCS: ACS Moding
ACS Moding
'ACS Configuration'

Verify Moding Role Primary,Secondary NCS – Full

****
If Primary(Secondary) NCS Moding Role is not set to Full, then the following commands should be sent:

sel Moding Role
Moding Role

cmd N1-2(N1-1) – Arm

Verify Arm Status Primary(Secondary) NCS – Disarm

cmd N1-2(N1-1) – Full

Verify Moding Role Primary(Secondary) NCS – Full
Verify Arm Status Primary(Secondary) NCS – blank
****

Verify RS Mode Primary,Secondary NCS – Cntl

'Arrival'

Verify PMA2(PMA3) Arrival Response SW Primary,Secondary NCS – Inh

2. ENABLING ACS MODING INDICATOR LIGHTS

NOTE
Each of the primary and secondary MDMs command one of the LED units (i.e., two units per PMA, four LEDs per unit). LED configurations: On - Active Attitude Control, Flash - Station in Free Drift, Off - LED Control Software is inhibited or an MDM loss of comm situation has occurred.

PCS MCS: ACS Moding
ACS Moding
'ACS Configuration'

sel LED Control SW

LED Control SW
'Primary NCS'

cmd Enable

√LED Control SW – Ena
Verify PMA2,PMA3 LED State – On

'Secondary NCS'

cmd Enable

√LED Control SW – Ena
Verify PMA2,PMA3 LED State – On

3. ENABLING ARRIVAL RESPONSE SOFTWARE FOR ACS MODING

ACS Moding
'Arrival'

sel PMA2(PMA3) Arrival Response SW

PMA2(PMA3) Arrival Response SW
'Primary NCS'

cmd Enable

Verify Arrival Response SW – Ena

'Secondary NCS'

cmd Enable

Verify Arrival Response SW – Ena

****
If Primary(Secondary) NCS Arrival Response SW needs to be inhibited (wave off, etc.), then the following commands should be sent:

sel PMA2(PMA3) Arrival Response SW

PMA2(PMA3) Arrival Response SW
'Primary NCS'('Secondary NCS')

cmd Arm

Verify Arm Status Primary(Secondary) NCS – Arm

cmd Inhibit

Verify Arrival Response SW Primary(Secondary) NCS – Inh
****

1. VERIFYING ACS MODING PRE-ARRIVAL CONFIGURATION AND STATUS

PCS MCS: ACS Moding
ACS Moding
'ACS Configuration'

Verify Moding Role Primary,Secondary NCS – Full
Verify RS Mode Primary,Secondary NCS – Cntl
√LED Control SW Primary,Secondary NCS – Ena
Verify PMA2,PMA3 LED State Primary,Secondary NCS – On

'Arrival'

√PMA2(PMA3) Arrival Response SW Primary,Secondary NCS – Ena

2. ATTITUDE CONTROL SYSTEM MODING AT ORBITER DOCKING

Perform STATION-ORBITER DOCKING SCRIPT, all (SODF: GND: MCS: REFERENCE DATA), then:

3. VERIFYING STATION ACS MODING POST-DOCKING CONFIGRUATION

PCS MCS: ACS Moding
ACS Moding
'Arrival'

Verify PMA2(PMA3) Capture Long Primary,Secondary NCS – X
Verify Arrival Event Primary,Secondary NCS – X

'ACS Configuration'

Verify RS Mode Primary,Secondary NCS – Drift
Verify PMA2,PMA3 LED State Primary,Secondary NCS – Flash

NOTE
The following signals nominally may take up to 13 minutes to occur before hardmate is complete.

'Departure'

Verify PMA2(PMA3) Interface Sealed Primary,Secondary NCS – X
Verify PMA2(PMA3) Separation Primary,Secondary NCS – blank

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1. VERIFYING ACS MODING SOFTWARE CONFIGURATION

PCS MCS: ACS Moding

ACS Moding

'Departure'

Verify PMA2(PMA3) Interface Sealed Primary,Secondary NCS – X
Verify PMA2(PMA3) Separation Primary,Secondary NCS – blank
Verify PMA2(PMA3) Departure Response SW Primary,Secondary NCS – Ena
Verify Back Off Time Primary,Secondary NCS: 250 (seconds)
Verify Time Since Separation Primary,Secondary NCS: 0
Verify Departure Event Primary,Secondary NCS – blank

2. MONITORING NCS SEPARATION SIGNALS, VERIFICATION OF ORBITER DEPARTURE, AND POST SEPARATION LED MODE CHANGE

****
If the Primary(Secondary) Time Since Separation is observed to be incrementing any time prior to planned departure, IMMEDIATE ACTION IS REQUIRED.

sel Moding Role

Moding Role

cmd N1-2(N1-1) – Arm

Verify Arm Status Primary(Secondary) NCS – Arm

cmd N1-2(N1-1) – Off

Verify Moding Role Primary(Secondary) NCS – Off
Verify Arm Status Primary(Secondary) NCS – Disarm
****

NOTE

1. For flights prior to onboard crew, orbiter monitoring of Station telemetry is discontinued when orbiter OIU is disconected.
2. The Time Since Separation counter is initiated when Separation is true (X) and Interface Sealed is false (blank).
3. The Departure Event is set when the time Since Separation equals the set Back Off Time. When the SM receives the Departure Event request, it will resume active attitude control.

'Departure'

Monitor the following during vehicle separation.

Verify PMA2(PMA3) Interface Sealed Primary,Secondary NCS – blank
Verify PMA2(PMA3) Separation Primary,Secondary NCS – X
Verify Time Since Separation Primary,Secondary NCS – <increasing>

When Time Since Separation equals Back Off Time:
Verify Departure Event Primary,Secondary NCS – X

3. VERIFICATION OF RUSSIAN SEGMENT ATTITUDE CONTROL AND LED STATUS

PCS MCS: ACS Moding
ACS Moding
'ACS Configuration'

Verify RS Mode Primary,Secodary NCS – Cntl
Verify PMA2,PMA3 LED State Primary,Secondary – On

SM MCS
SM MCS

Verify RS GNC Mode – Thrusters

1. INHIBITING ACS MODING INDICATOR LIGHTS

PCS MCS: ACS Moding
ACS Moding
'ACS Configuration'

sel LED Control SW

LED Control SW
'Primary NCS'

cmd Inhibit

√LED Control SW – Inh
Verify PMA2,PMA3 LED State – Off

'Secondary NCS'

cmd Inhibit

√LED Control SW – Inh
Verify PMA2,PMA3 LED State – Off

2. INHIBITING DEPARTURE RESPONSE

ACS Moding
'Departure'

sel PMA2(PMA3) Departure Response SW

PMA2(PMA3) Departure Response SW
'Primary NCS'

cmd Inhibit

Verify Departure Response SW – Inh
Verify Arm Status – disarm

'Secondary NCS'

cmd Inhibit

Verify Departure Response SW – Inh
Verify Arm Status – disarm

ACS Moding
'Departure'

Verify Departure Event Primary,Secondary NCS – blank

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S&M PROCEDURES

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OBJECTIVE:
Verify CBM full functionality after the reinstallation of CBM hardware or as a flight test.

LOCATION:
Node 1/**MCC-H**

DURATION:
1 hour 15 minutes

REFERENCED PROCEDURE(S):
None

NOTE

1. Forward CBM connectivity is as follows
   - CB GNC 1
     - A = CPA 1
     - B = CPA 4
   - CB GNC 2
     - A = CPA 2
     - B = CPA 3

2. Where CDDT HTMLs are used to command, Command Inventory command ops names and CI PUIs are listed beneath each command in parentheses and italics.

1. VERIFYING POWER CONFIGURATION

N1_Fwd_CBM_Power_Data

'RPCM N13B C'

√Integ Counter – <incrementing>

'RPCM N14B A'

√Integ Counter – <incrementing>

'APCU-1'

√Volts Hi (Res) > 122 volts

'APCU-2'

√Volts Hi (Res) > 122 volts

2. VERIFYING MDM CONFIGURATION

N1_Fwd_CBM_Power_Data

'Primary MDM'

√MDM ID – N1-2
√Frame Count – <incrementing>

'Secondary MDM'

√MDM ID – N1-1
√Frame Count – <incrementing>

√CB GNC -1 Bus Channel

Record A or B _____

√CB GNC -2 Bus Channel

Record A or B _____

3. ENABLING PRIMARY RPCS

CBM_Cmds.msk

sel Forward CBM Checkout

N1 Forward CBM Checkout

cmd RPCM N13B-C RPC [X] CPA [Y] Pri Close – Enable **Execute**

where [X] = 03 04 05 06

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N13B_C_RPC_[X]_CBM_N1_Fwd_Pri_[Y]_Cl-Enable – (M1PR95SM1147K, 1148K, 1149K, 1150K)>

N1_Fwd_CBM_Power_Data
'RPCM N13B C'

√RPC [X] Cl – Ena

Repeat

4. ENABLING SECONDARY RPCS

cmd RPCM N14B-A RPC [X] CPA [Y] Sec Close – Enable **Execute**

where [X] = 02 03 14 15

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N14B_A_RPC_[X]_CBM_N1_Fwd_Sec_[Y]_Cl-Enable – (M1PR95SM1200K, 1201K, 1212K, 1213K)>

N1_Fwd_CBM_Power_Data
'RPCM N14B A'

√RPC [X] Cl – Ena

Repeat

5. CLOSING SECONDARY RPCS

CBM_Cmds.msk

sel Forward CBM Checkout

N1 Forward CBM Checkout

cmd RPCM N14B-A RPC [X] CPA [Y] Sec Close **Execute**

where [X] = 02 03 14 15

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N14B_A_RPC_[X]_CBM_N1_Fwd_Sec_[Y]_Cl – (M1PR95SM1164K, 1165K, 1176K, 1177K)>

N1_Fwd_CBM_Power_Data
'RPCM N14B A'

√RPC [X] Posn – Cl

Repeat

6. ACTIVATING FORWARD CBM PRIMARY MASTER CONTROLLER

N1 Forward CBM Checkout

cmd Activate Primary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Fwd_Pri_Master – (M1MC95SM1160K)>

Wait 10 seconds, then:

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Primary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Channel (twenty) – B

7. INITIALIZING CONTROLLER POSITIONS ZERO

N1 Forward CBM Checkout

cmd Set All Zero Ch B **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_B – (M1MC96IM0002K)>

Node_1_CBM.msk

√Master Cmd Status – Complete

8. VERIFYING RS-485 COMM STATUS

NOTE
CBM Active BIT may have to be commanded multiple times to clear MSBDs.

Node_1_CBM.msk

√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT

If any Cmd Stat – MSBD
****

N1 Forward CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Node_1_CBM.msk

√Confirmation Request – Built-in Test

N1 Forward CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Wait 15 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Cmd Code (twenty) – BIT
√Cmd Stat (twenty) – CPLT
****

9. VERIFING CONTROLLER POSITIONS ZERO

Node_1_CBM.msk

√Position (twenty): 0 rev | deg

If any position ≠ 0 rev | deg
****

N1 Forward CBM Checkout

cmd Set All Zero Ch B **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_B –
(M1MC96IM0002K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT
√Position (twenty): 0 rev | deg
****

10. TESTING BOLT DRIVE

N1 Forward CBM Checkout

cmd DBBoltck Nominal **Execute**

<Cmd Inv: CBM_DBBoltck_Nominal – (M1MC95SM1331K)>

Node_1_CBM.msk

√Confirmation Request – DBBoltck

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Cmd – (M1MC95SM1470K)>

Wait 30 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Complete
√Bolt Cmd Code (sixteen) – DBCK
√Bolt Cmd Stat (sixteen) – CPLT
√Bolt Position (sixteen): 0.0 rev

11. DEACTIVATING FORWARD CBM MASTER CONTROLLER

N1 Forward CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Fwd – (M1MC95SM1006K)>

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

12. OPENING SECONDARY RPCS

cmd RPCM N14B-A RPC [X] CPA [Y] Sec Open **Execute**

where [X] = 02 03 14 15

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N14B_A_RPC_[X]_CBM_N1_Fwd_Sec_[Y]_Op – (M1PR95SM1812K, 1813K, 18624K, 1825K)>

N1_Fwd_CBM_Power_Data
'RPCM N14B A'

√RPC [X] Posn – Op

Repeat

13. CLOSING PRIMARY RPCS

cmd RPCM N13B-C RPC [X] CPA [Y] Pri Close **Execute**

where [X] = 03 04 05 06

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N13B_C_RPC_[X]_CBM_N1_Fwd_Pri_[Y]_Cl – (M1PR95SM1111K, 1112K, 1113K, 1114K)>

N1_Fwd_CBM_Power_Data
'RPCM N13B C'

√RPC [X] Posn – Cl

Repeat

14. ACTIVATING FORWARD CBM SECONDARY MASTER CONTROLLER

N1 Forward CBM Checkout

cmd Activate Secondary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Fwd_Sec_Master – (M1MC95SM1161K)>

Wait 20 seconds, then:

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Secondary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

15. SWITCHING RS-485 BUS TO CHANNEL A

N1 Forward CBM Checkout

cmd Set Last State to Stop Ch A **Execute**

<Cmd Inv: CBM_Set_Last_State_To_Stop_Ch_A – (M1MC95SM1491K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√485 Ch (twenty) – A

16. SETTING CONTROLLER POSITIONS ZERO

N1 Forward CBM Checkout

cmd Set All Zero Ch A **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_A – (M1MC96IM0004K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√485 Ch (twenty) – A

17. VERIFYING RS-485 COMM STATUS

NOTE
CBM active BIT may have to be commanded multiple times to clear MSBDs.

Node_1_CBM.msk

√Cmd Code (twenty) – BIT
√Cmd Stat (twenty) – CPLT

If any Cmd Stat - MSBD
****
N1 Forward CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Node_1_CBM.msk

√Confirmation Request – Built-in Test

N1 Forward CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Wait 15 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Cmd Code (twenty) – BIT
√Cmd Stat (twenty) – CPLT
****

18. VERIFYING CONTROLLER POSITIONS ZERO

Node_1_CBM.msk

√Position (twenty): 0 rev | deg

If any position 0 rev | deg
****
N1 Forward CBM Checkout

cmd Set All Zero Ch A **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_A –
(M1MC96IM0004K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT
√Position (twenty): 0 rev | deg
****

19. DEPLOYING LATCH 1 TO 210

N1 Forward CBM Checkout

cmd Deploy Latch 1 to 210 **Execute**

<Cmd Inv: CBM_Deploy_Latch_1_to_210_Degrees – (M1MC96IM0027K)>

Node_1_CBM.msk

√Confirmation Request – Deploy

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Command – (M1MC95SM1470K)>

Wait 90 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Failed
√Latch 1 Cmd Code – DPLY
√Latch 1 Cmd Stat – BIND
√Latch 1 Position: 200 --- 210 deg
√Latch 1 Capture Switch Cl – X

20. DEPLOYING LATCH 2 TO 210

N1 Forward CBM Checkout

cmd Deploy Latch 2 to 210 **Execute**

<Cmd Inv: CBM_Deploy_Latch_2_to_210_Degrees – (M1MC96IM0028K)>

Node_1_CBM.msk

√Confirmation Request – Deploy

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Command – (M1MC95SM1470K)>

Wait 90 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Failed
√Latch 2 Cmd Code – DPLY
√Latch 2 Cmd Stat – BIND
√Latch 2 Position: 200 --- 210 deg
√Latch 2 Capture Switch Cl – X

21. DEPLOYING LATCH 3 TO 210

N1 Forward CBM Checkout

cmd Deploy Latch 3 to 210 **Execute**

<Cmd Inv: CBM_Deploy_Latch_3_to_210_Degrees – (M1MC96IM0029K)>

Node_1_CBM.msk

√Confirmation Request – Deploy

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Command – (M1MC95SM1470K)>

Wait 90 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Failed
√Latch 3 Cmd Code – DPLY
√Latch 3 Cmd Stat – BIND
√Latch 3 Position: 200 --- 210 deg
√Latch 3 Capture Switch Cl – X

22. DEPLOYING LATCH 4 TO 210

N1 Forward CBM Checkout

cmd Deploy Latch 4 to 210 **Execute**

<Cmd Inv: CBM_Deploy_Latch_4_to_210_Degrees – (M1MC96IM0030K)>

Node_1_CBM.msk

√Confirmation Request – Deploy

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Command – (M1MC95SM1470K)>

Wait 90 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Failed
√Latch 4 Cmd Code – DPLY
√Latch 4 Cmd Stat – BIND
√Latch 4 Position: 200 --- 210 deg
√Latch 4 Capture Switch Cl – X

23. CLEARING LATCH BIND INDICATIONS

NOTE
Stop command may nominally need to be issued multiple times to clear binding indications.

N1 Forward CBM Checkout

cmd Stop **Execute**

<Cmd Inv: CBM_Stop_All_Controllers – (M1MC95SM1435K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Latch Cmd Code (four) – STOP
√Latch Cmd Stat (four) – CPLT

24. SETTING BOLT/LATCH START POSITIONS

N1 Forward CBM Checkout

cmd Set Deberthing Start Posns Ch A **Execute**

<Cmd Inv: CBM_Set Deberthing_Start_Posns_Ch A – (M1MC96IM0024K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT
√Bolt Position (sixteen): 51 rev
√Latch Position (four): 202 deg

25. MOVING LATCHES TO CAPTURE POSITIONS

N1 Forward CBM Checkout

cmd Capture for Deberth **Execute**

<Cmd Inv: CBM_Capture_For_Deberth – (M1MC96IM0033K)>

Node_1_CBM.msk

√Confirmation Request – Capture

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Cmd – (M1MC95SM1470K)>

Wait 108 seconds, then:

√Master Cmd Status – Complete
√Latch Cmd Code (four) – CAPT
√Latch Cmd Stat (four) – CPLT
√Latch Position (four): 11-12 deg
√Latch Capture Switch Cl (four) – X

26. CLOSING LATCHES

N1 Forward CBM Checkout

cmd Close Nominal **Execute**

<Cmd Inv: CBM_Close_Nominal – (M1MC96IM0036K)>

Node_1_CBM.msk

√Confirmation Request – Close

N1 Forward CBM Checkout

cmd Confirm Cmd **Execute**

<Cmd Inv: CBM_Confirm_Cmd – (M1MC95SM1470K)>

Wait 10 seconds, then:

Node_1_CBM.msk

√Master Cmd Status – Complete
√Latch Cmd Code (four) – CLOS
√Latch Cmd Stat (four) – CPLT
√Latch Position (four): 0 --- 1 deg

27. DEACTIVATING FORWARD CBM MASTER CONTROLLER

N1 Forward CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Fwd – (M1MC95SM1006K)>

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

28. PERFORMING CB-GNC N1-1 BUS CHANNEL SWITCH (C&DH)

NOTE
Steps 28 and 29 check out remaining CBM master controllers and 1553 channels.

√CB-GNC -1 Bus Channel

Record A or B _____

If Bus Channel recorded was A, then:
<Cmd Inv: N1_1_MDM_CB_GNC_1_Sel_Ch_B – (M1DD95SM1396K)>

√CB-GNC -1 Bus Channel – B

If Bus Channel recorded was B, then:
<Cmd Inv: N1_1_MDM_CB_GNC_1_Sel_Ch_A – (M1DD95SM1395K)>

√CB-GNC -1 Bus Channel – A

29. PERFORMING CB-GNC N1-2 BUS CHANNEL SWITCH (C&DH)

√CB-GNC -2 Bus Channel

Record A or B _____

If Bus Channel recorded was A, then:

<Cmd Inv: N1_2_MDM_CB_GNC_2_Sel_Ch_B – (M1DD95SM1402K)>

√CB-GNC -2 Bus Channel – B

If Bus Channel recorded was B, then:

<Cmd Inv: N1_2_MDM_CB_GNC_2_Sel_Ch_A – (M1DD95SM1401K)>

√CB-GNC -2 Bus Channel – A

30. CHECKING OUT CBM PRIMARY MASTER CONTROLLER, OPPOSITE CHANNEL

N1 Forward CBM Checkout

cmd Activate Primary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Fwd_Pri_Master – (M1MC95SM1160K)>

Wait 20 seconds, then:

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Primary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

31. CHECKING OUT CBM SECONDARY MASTER CONTROLLER, OPPOSITE CHANNEL

N1 Forward CBM Checkout

cmd Activate Secondary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Fwd_Sec_Master – (M1MC95SM1161K)>

Wait 20 seconds, then:

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Secondary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (sixteen bolts, four latches) – B

32. DEACTIVATING FORWARD CBM MASTER CONTROLLER

N1 Forward CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Fwd – (M1MC95SM1006K)>

N1_Fwd_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

33. OPENING PRIMARY RPCs

N1 Forward CBM Checkout

cmd RPCM N13B-C RPC [X] CPA [Y] Pri Open **Execute**

where [X] = 03 04 05 06

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N13B_C_RPC_[X]_CBM_N1_Fwd_Pri_[Y]_Op – (M1PR95SM1759K, 1760K, 1761K, 1762K)>

N1_Fwd_CBM_Power_Data
'RPCM N13B C'

√RPC [X] Posn – Op

Repeat

34. INHIBITING PRIMARY RPCs

cmd RPCM_N13B_C_RPC_[X]_CBM_N1_Fwd_Pri_[Y]_Cl_Inhib_ On **Execute**

where [X] = 03 04 05 06

[Y] = 1 2 3 4

<Cmd Inv: RPCM_N13B_C_RPC_[X]_CBM_N1_Fwd_Pri_[Y]_Cl_ Inhib_On – (M1PR95SM1129K, 1130K, 1131K, 1132K)>

N1_Fwd_CBM_Power_Data
'RPCM N13B C'

√RPC [X] Cl – Inh

Repeat

35. INHIBITING SECONDARY RPCS

cmd RPCM_N14B_A_RPC_[X]_CBM_N1_Fwd_Sec_[Y]_Cl_Inhib_ On **Execute**

where [X] = 02 | 03 | 04 | 05

[Y] = 1 | 2 | 3 | 4

<Cmd Inv: RPCM_N14B_A_RPC_[X]_CBM_N1_Fwd_Sec_[Y]_Cl_ Inhib_On – M1PR95SM1182K, 1183K, 1194K, 1195K)>

N1_Fwd_CBM_Power_Data
'RPCM N14B A'

√RPC [X] Cl – Inh

Repeat

OBJECTIVE:
Verify full CBM functionality prior to 3A flight.

LOCATION:
NOD1/**MCC-H**

DURATION:
1 hour

REFERENCED PROC(S):
None

NOTE
Where CDDT HTMLs are used to command, Command Inventory command ops names and CI PUIs are listed beneath each command in parentheses and italics.

1. VERIFYING POWER CONFIGURATION

N1_Nadir_CBM_Power_Data
'RPCM N13B B'

√Integ Counter – <incrementing>

'RPCM N14B B'

√Integ Counter – <incrementing>

'APCU-1'

√Volts Hi (Res) >122 volts

'APCU-2'

√Volts Hi (Res) >122 volts

2. VERIFYING MDM CONFIGURATION

N1_Nadir_CBM_Power_Data
'Primary MDM'

√MDM ID – N1-2
√Frame Count – <incrementing>

'Secondary MDM'

√MDM ID – N1-1
√Frame Count – <incrementing>

'UB-ORB-N1-1'

√Bus Channel
Record A or B _____

'UB-ORB-N1-2'

√Bus Channel
Record A or B _____

3. IF REQUIRED, ENABLE PRIMARY RPCs

N1 Nadir CBM Checkout

cmd RPCM N13B-B RPC [X] CPA [Y] Pri Close – Enable **Execute**

<Cmd Inv: RPCM_N13B_B_RPC_[X]_CBM_N1_Nadir_Pri_[Y]_Cl – Inhib_Off – (M1PR95SM1093K, 1094K, 1095K, 1096K)>

where [X] = 03 04 05 06

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N13B B'

√RPC [X] Cl – Ena

Repeat

4. IF REQUIRED, ENABLE SECONDARY RPCs

cmd RPCM N14B-B RPC [X] CPA [Y] Sec Close – Enable **Execute**

<Cmd Inv: RPCM_N14B_B_RPC_[X]_CBM_N1_Nadir_Sec_[Y]_Cl_ Inhib_Off – (M1PR95SM1263K, 1264K, 1265K, 1266K)>

where [X] = 11 12 13 14

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N14B B'

√RPC [X] Cl – Ena

Repeat

5. CLOSING SECONDARY RPCS

N1 Nadir CBM Checkout

cmd RPCM N14B-B RPC [X] CPA [Y] Sec Close **Execute**

<Cmd Inv: RPCM_N14B_B_RPC_[X]_CBM_N1_Nadir_Sec_[Y]_Cl – (M1PR95SM1227K, 1228K, 1229K, 1230K)>

where [X] = 11 12 13 14

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N14B B'

√RPC [X] Posn – Cl

Repeat

6. ACTIVATING NADIR CBM PRIMARY MASTER CONTROLLER

N1 Nadir CBM Checkout

cmd Activate Primary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Nadir_Pri_Master – (M1MC95SM1151K)>

Wait 10 seconds.

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Primary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

7. INITIALIZING CONTROLLER POSITIONS ZERO

N1 Nadir CBM Checkout

cmd Set All Zero Ch B **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_B – (M1MC96IM0002K)>

Node_1_CBM.msk

√Master Cmd Status – Complete

8. VERIFYING RS-485 COMM STATUS

NOTE
CBM active BIT may have to be commanded multiple times to clear MSBDs.

Node_1_CBM.msk

√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT

If any Cmd Stat - MSBD
****

N1 Nadir CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Node_1_CBM.msk

√Confirmation Request – Built-in Test
√Master Override Request – X

N1 Nadir CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Wait 15 seconds.

Node_1_CBM.msk

√Master Cmd Status – Complete
√Master Override Request – blank
√Active BIT Error – blank
√Cmd Code (twenty) – BIT
√Cmd Stat (twenty) – CPLT

****

9. VERIFYING CONTROLLER POSITIONS ZERO

Node_1_CBM.msk

√Position (twenty): 0 rev | deg

If any Position ≠ 0 rev | deg

****

N1 Nadir CBM Checkout

cmd Set All Zero Ch B **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_B – (M1MC96IM0002K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT
√Position (twenty): 0 rev | deg

****

10. TESTING BOLT DRIVE

CAUTION
Nominal bolting operation extends each bolt 2 revs and retracts 3 revs. If bolt extends past 2 revs during actuation, **MCC** should immediately issue the Stop command to stop actuation.

N1 Nadir CBM Checkout

cmd BBoltck Nominal **Execute**

<Cmd Inv: CBM_BBoltck_Nominal – (M1MC96IM0026K)>

Node_1_CBM.msk

√Confirmation Request – BBoltck

N1 Nadir CBM Checkout

cmd BBoltck Nominal **Execute**

<Cmd Inv: CBM_BBoltck_Nominal – (M1MC96IM0026K)>

Wait 90 seconds.

Node_1_CBM.msk

√Master Cmd Status – Complete
√Bolt Cmd Code (sixteen) – BBCK
√Bolt Cmd Stat (sixteen) – CPLT
√Bolt Position (sixteen): 50.0---50.4 rev

11. DEACTIVATING NADIR CBM MASTER CONTROLLER

N1 Nadir CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Nadir – (M1MC95SM1003K)>

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

12. OPENING SECONDARY RPCs

N1 Nadir CBM Checkout

cmd RPCM N14B-B RPC [X] CPA [Y] Sec Open **Execute**

<Cmd Inv: RPCM_N14B_B_RPC_[X]_CBM_N1_Nadir_Sec_[Y]_ Op – (M1PR95SM1875K, 1876K, 1877K, 1878K)>

where [X] = 11 12 13 14

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N14B B'

√RPC [X] Posn – Op

Repeat

13. CLOSING PRIMARY RPCS

N1 Nadir CBM Checkout

cmd RPCM N13B-B RPC [X] CPA [Y] Pri Close **Execute**

<Cmd Inv: RPCM_N13B_B_RPC_[X]_CBM_N1_Nadir_Pri_[Y]_Cl –
(M1PR95SM1057K, 1058K, 1059K, 1060K)>

where [X] = 03 04 05 06

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N13B B'

√RPC [X] Posn – Cl

Repeat

14. ACTIVATING NADIR CBM SECONDARY MASTER CONTROLLER

N1 Nadir CBM Checkout

cmd Activate Secondary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Nadir_Sec_Master –
(M1MC95SM1152K)>

Wait 20 seconds.

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Secondary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

15. SWITCHING RS-485 BUS TO CHANNEL A

N1 Nadir CBM Checkout

cmd Set Last State to Stop Ch A **Execute**

<Cmd Inv: CBM_Set_Last_State_To_Stop_Ch_A – (M1MC95SM1491K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√485 Ch (twenty) – A

16. SETTING CONTROLLER POSITIONS ZERO

N1 Nadir CBM Checkout

cmd Set All Zero Ch A **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_A – (M1MC96IM0004K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√485 Ch (twenty) – A

17. VERIFYING RS-485 COMM STATUS

NOTE
CBM active BIT may have to be commanded multiple times to clear MSBDs.

Node_1_CBM.msk

√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT

If any Cmd Stat - MSBD
****

N1 Nadir CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Node_1_CBM.msk

√Confirmation Request – Built-in Test
√Master Override Request – X

N1 Nadir CBM Checkout

cmd CBM Active BIT **Execute**

<Cmd Inv: CBM_Act_Built_In_Test – (M1MC95SM1027K)>

Wait 15 seconds.

Node_1_CBM.msk

√Master Cmd Status – Complete
√Master Override Request – blank
√Active BIT Error – blank
√Cmd Code (twenty) – BIT
√Cmd Stat (twenty) – CPLT
****

18. VERIFYING CONTROLLER POSITIONS ZERO

Node_1_CBM.msk

√Position (twenty): 0 rev | deg

If any position ≠ 0 rev | deg
****

N1 Nadir CBM Checkout

cmd Set All Zero Ch A **Execute**

<Cmd Inv: CBM_Set_All_Posns_To_Zero_Ch_A – (M1MC96IM0004K)>

Node_1_CBM.msk

√Master Cmd Status – Complete
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√Cmd Code (twenty) – RELD
√Cmd Stat (twenty) – CPLT
√Position (twenty): 0 rev | deg
****

19. DEACTIVATING NADIR CBM MASTER CONTROLLER

N1 Nadir CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Nadir – (M1MC95SM1003K)>

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

20. PERFORMING UB-ORB N1-1 BUS CHANNEL SWITCH (C&DH)

NOTE
Steps 19 and 20 switch 1553 bus channels to allow checkout of remaining CBM master controllers and 1553 channels.

N1_Nadir_CBM_Power_Data
'UB-ORB-N1-1'

√Bus Channel
Record A or B _____

If Bus Channel recorded was A, then
<Cmd Inv: N1_1_MDM_UB_ORB_N1_1_Sel_Ch_B – (M1DD95SM1394K)>

√UB ORB N1-1 Bus Channel – B

If Bus Channel recorded was B, then
<Cmd Inv: N1_1_MDM_UB_ORB_N1_1_Sel_Ch_A – (M1DD95SM1393K)>

√UB ORB N1-1 Bus Channel – A

21. PERFORMING UB-ORB N1-2 BUS CHANNEL SWITCH (C&DH)

N1_Nadir_CBM_Power_Data
'UB-ORB-N1-2'

√Bus Channel
Record A or B _____

If Bus Channel recorded was A, then
<Cmd Inv: N1_2_MDM_UB_ORB_N1_2_Sel_Ch_B – (M1DD95SM1400K)>

√UB ORB N1-2 Bus Channel – B

If Bus Channel recorded was B, then
<Cmd Inv: N1_2_MDM_UB_ORB_N1_2_Sel_Ch_A – (M1DD95SM1399K)>

√UB ORB N1-2 Bus Channel – A

22. CBM PRIMARY MASTER CONTROLLER CHECK OUT, OPPOSITE CHANNEL

N1 Nadir CBM Checkout

cmd Activate Primary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Nadir_Pri_Master - (M1MC95SM1151K)>

Wait 20 seconds.

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Primary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

23. CBM SECONDARY MASTER CONTROLLER CHECK OUT, OPPOSITE CHANNEL

N1 Nadir CBM Checkout

cmd Activate Secondary Master **Execute**

<Cmd Inv: CBM_Activate_N1_Nadir_Sec_Master – (M1MC95SM1152K)>

Wait 20 seconds.

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Activated
√Master – Secondary
√CPA – Record # _____
√Comm Error – blank

Node_1_CBM.msk

√Master Cmd Status – Complete
√Active BIT Error – blank
√Background BIT Error – blank
√Master Cmd Error – blank
√Slave Cmd Error – blank
√485 Timeout – blank
√Command Rejected – blank
√485 Ch (twenty) – B

24. DEACTIVATING NADIR CBM MASTER CONTROLLER

N1 Nadir CBM Checkout

cmd Deactivate CBM **Execute**

<Cmd Inv: CBM_Deactivate_N1_Nadir – (M1MC95SM1003K)>

N1_Nadir_CBM_Power_Data
'CBM Status'

√Mode – Deactivated

25. OPENING PRIMARY RPCS

N1 Nadir CBM Checkout

cmd RPCM N13B-B RPC [X] CPA [Y] Pri Open **Execute**

<Cmd Inv: RPCM_N13B_B_RPC_[X]_CBM_N1_Nadir_Pri_[Y]_Op – (M1PR95SM1705K, 1706K, 1707K, 1708K)>

where [X] = 03 04 05 06

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N13B B'

√RPC [X] Posn – Op

Repeat

26. INHIBITING PRIMARY RPCS

N1 Nadir CBM Checkout

cmd RPCM_N13B_B_RPC_[X]_CBM_N1_Nadir_Pri_[Y]_Cl_Inhib_On **Execute**

<Cmd Inv: RPCM_N13B_B_RPC_[X]_CBM_N1_Nadir_Pri_[Y]_Cl_Inhib_On – (M1PR95SM1075K, 1076K, 1077K, 1078K)>

where [X] = 03 04 05 06

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N13B B'

√RPC [X] Cl – Inh

Repeat

27. INHIBITING SECONDARY RPCS

N1 Nadir CBM Checkout

cmd RPCM_N14B_B_RPC_[X]_CBM_N1_Nadir_Sec_[Y]_Cl_Inhib_On
Execute

<Cmd Inv: RPCM_N14B_B_RPC_[X]_CBM_N1_Nadir_Sec_[Y]_Cl_ Inhib_On – (M1PR95SM1245K, 1246K, 1247K, 1248K)>

where [X] = 11 12 13 14

[Y] = 1 2 3 4

N1_Nadir_CBM_Power_Data
'RPCM N14B B'

√RPC [X] Cl – Inh

Repeat

TCS PROCEDURES

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1. RECORDING AVAILABILITY, CURRENT TEMPERATURE, AND CURRENT SETPOINTS OF HEATER TO BE CHECKED OUT

   Availability = _____

   Temperature (deg C) = _____

   Failure Upper Limit, deg C = _____
   Upper Setpoint, deg C = _____
   Lower Setpoint, deg C = _____
   Failure Lower Limit, deg C = _____
   Cyclic Load Delta, deg C =_____

2. INHIBITING HEATER TO BE CHECKED OUT

   Inhibit heater to be checked out per the following example for PMA1 Htr1A

CDDT

Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

cmd Htr1A Availability – Inhibit

√Htr1A Availability – Inh

3. UPDATING HEATER SETPOINTS

   Update Heater setpoints for heater to be checked out per the following example for PMA 1 Htr1A

CDDT

Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

sel PMA1 HtrA setpoints

PMA1 HtrA Setpoints

sel Htr1A - Chng Setpoint

PMA1 Htr1A Setpoint

input Failure Upper Limit, deg C = 40
Upper Setpoint, deg C = Current Temp + 4 deg C
Lower Setpoint, deg C = Current Temp + 1 deg C
Failure Lower Limit, deg C = -17
Cyclic Load Delta, deg C = 5

cmd Execute Change

PMA1 HtrA Setpoints

√Htr1A Failure Upper Limit, deg C = 40
√Upper Setpoint, deg C = Current Temp + 4 deg C
√Lower Setpoint, deg C = Current Temp + 1 deg C
√Failure Lower Limit, deg C = -17
√Cyclic Load Delta, deg C = 5

NOTE
Node 1 heaters in zones 1, 3, 5, 6, and 7 have two temperature sensors. Repeat step 3 for second sensor if heater being checked is in one of these zones.

4. ENABLING HEATER TO BE CHECKED OUT

Enable heater to be checked out per the following example for PMA 1 Htr1A

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 HtrAvailability

cmd Htr1A Availability – Ena Operate

√Htr1A Availability – Ena Opr

5. VERIFYING HEATER TURNED ON

Verify telemetry for heater being checked out per the following example for PMA 1 Htr1A

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr1A

PMA1 Htr1
'Htr1A'

√Htr1A Cmd Status – On
√Htr1A RPC Posn – Cl

Wait until Htr1A Temp - Temperature Value in step 1 + 1 deg C

NOTE
Temperature and RPCM current changes should be plotted to verify successful heater operation.

6. INHIBITING HEATER

Inhibit heater to be checked out per the following example for PMA 1 Htr1A

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

cmd Htr1A Availability – Inhibit

√Htr1A Availability – Inh

7. RETURNING HEATER SETPOINTS TO ORIGINAL VALUES

Return heater setpoints to their original values per the following example for PMA 1 Htr1A

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

sel PMA1 HtrA Setpoints

PMA1 HtrA Setpoints

sel Htr1A Chng Setpoint

PMA1 Htr1A Setpoint

input Failure Upper Limit, deg C = Value in step 1
Upper Setpoint, deg C = Value in step 1
Lower Setpoint, deg C = Value in step 1
Failure Lower Limit, deg C = Value in step 1
Cyclic Load Delta, deg C = Value in step 1

cmd Execute Change

PMA1 HtrA Setpoints

√Htr1A Failure Upper Limit, deg C = Value in step 1
√Upper Setpoint, deg C = Value in step 1
√Lower Setpoint, deg C = Value in step 1
√Failure Lower Limit, deg C = Value in step 1
√Cyclic Load Delta, deg C = Value in step 1

NOTE
Node 1 heaters in zones 1, 3, 5, 6, and 7 have two temperature sensors. Repeat step 7 for second sensor if heater being checked is in one of these zones.

8. RETURNING HEATER AVAILABILITY TO ORIGINAL VALUE
Return heater availability to original value per the following example for PMA 1 Htr1A

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

cmd Htr1A Availability – Value in step 1

√Htr1A Availability – Value in step 1

SHELL HEATER - UPDATE TEMPERATURE SENSOR SETPOINTS

Identification Section:

Procedure Name:	Shell Heater - Update Temperature Sensor Setpoints
Applicability:	2A-Life of Station
Frequency:	Rare
Objective:	Adjust the heater control algorithm setpoints for any Shell Heater.
Description:	
Crew Required:	Ground only
Power:	
Data:	Cyclic Telemetry
Duration:	5 minutes
Location:	**MCC-H**
Parts:	None
Materials:	None
Tools:	None
Constraints:	None
Reference Material:	NCS SRS (18 April 1998)
Assumptions:	Nominal MDM operation.

Definitions:

1. NOTE CURRENT HEATER AVAILABILITY
   Current Heater Avail = _____

2. INHIBITING HEATER

   NOTE
   For Node 1 Heaters with two temperature sensors, the heater must be inhibited prior to changing setpoints and failure limits. If the heater is not inhibited, the heater FDIR may consider the heater failed after setpoints and failure limits for one of the two temperature sensors has been changed.

   Inhibit heater per the following example for Node 1 Htr1A:

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability
PMA1 Htr Availability

cmd Htr1A Availability – Inhibit

√Htr1A Availability – Inh

3. UPLINKING NEW SETPOINTS
   Update heater setpoints for heater per the following example for PMA 1 Htr1A.

   NOTE
   No setpoints are listed in the following commands. Desired setpoints should be flight noted into the command and verification steps prior to performing this procedure.

CDDT Node 1: TCS
NODE1:TCS
'PMA1'

sel Htr Availability

PMA1 Htr Availability

sel PMA1 HtrA setpoints

PMA1 HtrA Setpoints

sel Htr1A - Change Setpoint

PMA1 Htr1A Setpoint

input Failure Upper Limit, degC = _____
Upper Setpoint, degC = _____
Lower Setpoint, degC = _____
Failure Lower Limit, degC = _____
Cyclic Load Delta, degC = _____

cmd Execute Change

PMA1 HtrA Setpoints

√Htr1A Failure Upper Limit, degC = _____
√Upper Setpoint, degC = _____
√Lower Setpoint, degC = _____
√Failure Lower Limit, degC = _____
√Cyclic Load Delta, degC = _____

If new setpoints required for heater in Node 1 Zone 1, 3, 5, 6, or 7, repeat step 3 for the second temp sensor.

4. RETURNING AVAILABILITY TO ORIGINAL VALUE

NOTE
Heater will turn on if new lower setpoint is > current temperature.

Command heater availability per the following example for PMA 1 Htr1A.

CDDT Node 1: TCS
NODE1: TCS
'PMA1'

sel Htr Availability

NODE 1 Htr16 Availability

cmd Htr1A Availability – Value in step 1.

√Htr1A Availability – Value in step 1.

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