NODE 1 POWERDOWN AND RECOVERY

1. Obtain the powerdown target value from **MCC** and continue working the powerdown in order until the target value is reached.

2. Use the POWERUP column in reverse order to back out of the powerdown.

3. The POWERUP column will also be used to recover from an automatic Loadshed.

4. The loads for the major power users are presented below.

> NOTE
> During Node 1 Pre-Ingress Warm-up, Ingress, and Post Egress Dryout, the Node 1 and PMA1 Shell Heater power allocation and configuration will vary.

Equipment	dc Watts
PMA 3 Shell Heaters	0 W predicted
Node 1 Shell Heaters	0 W predicted Total for String B 1284 W
PMA 1 Shell Heaters	40 W predicted Total for String B 272 W
SPDA Rail Heaters	120 Watts
Z1 EEATCS Heaters	TBD Watts
Z1 DDCU Heaters	200 Watts
PCUs and Heaters	124 Watts
CMG Heaters	400 Watts
KU-Band and S-Band Heaters	290 Watts
Early Comm	340 W
MDM N1-1	70 --- 90 W
MDM N1-2	70 --- 90 W

	POWERDOWN	POWERUP
	NOTE Depending on the heater configuration, power usage may not decrease after every step.	
	1. POWER DOWN TARGET VALUE Obtain power down target value, XX, from **MCC-M** _____ kw Continue performing steps until RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX.	
PCS	2. INHIBIT PMA 3 A AND B SHELL HTRS Node 1: 3A USOS Powerdown Powerup - Display 1	**cmd** Ena Bu
	sel PMA 3 Htr [X] = 1 2 3 4 5 'Htr [X]A' **cmd** Inhibit √Htr[X]A Availability - Inh Repeat	**cmd** Ena Opr
	sel PMA 3 Htr [X] = 1 2 3 4 5 'Htr [X]B' **cmd** Inhibit √Htr[X]B Availability - Inh Repeat	
	Node 1: 3A USOS Powerdown Powerup - Display 1	
	√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	

POWERDOWN	POWERUP
3. <u>INHIBIT NODE 1 A HTRS (1 --- 6)</u> sel Node 1 Htrs 1 --- 6 [X] = 1 2 3 4 5 6 'Htr [X]A' **cmd** Inhibit √Htr[X]A Availability - Inh Repeat Node 1: 3A USOS Powerdown Powerup - Display 1 √RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	**cmd** Ena Bu
4. <u>INHIBIT NODE 1 B HTRS (1 --- 6)</u> sel Node 1 Htrs 1 --- 6 [X] = 1 2 3 4 5 6 'Htr [X]B' **cmd** Inhibit √Htr[X]B Availability - Inh Repeat Node 1: 3A USOS Powerdown Powerup - Display 1 √RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	**cmd** Ena Opr
5. <u>INHIBIT NODE 1 A HTRS (7 --- 9)</u> sel Node 1 Htrs 7 --- 9 [X] = 7 8 9 'Htr [X]A' **cmd** Inhibit √Htr[X]A Availability - Inh Repeat Node 1: 3A USOS Powerdown Powerup - Display 1 √RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	**cmd** Ena Bu

POWERDOWN	POWERUP
6. <u>INHIBIT NODE 1 B HTRS (7 --- 9)</u> sel Node 1 Htrs 7 --- 9 [X] = 5 6 7 8 9 'Htr [X]B' **cmd** Inh √Htr[X]B Availability - Inh Repeat Node 1: 3A USOS Powerdown Powerup - Display 1 √RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	**cmd** Ena Opr
7. <u>INHIBIT PMA1 A AND B SHELL HTRS</u> sel PMA1 Htr [X] = 1 3 4 5 'Htr [X]A' **cmd** Inhibit √Htr[X]A Availability - Inh Repeat	**cmd** Ena Bu
sel PMA 1 Htr [X] = 1 2 3 5 'Htr [X]B' **cmd** Inhibit √Htr[X]B Availability - Inh Repeat Node 1: 3A USOS Powerdown Powerup - Display 1 √RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	**cmd** Ena Opr

POWERDOWN	POWERUP
8. <u>DISABLE Z1 SPDA RAIL HEATERS</u>	
'SPDA Rail Htrs'	
sel Z1 [X] Htr A [X] = 3B 4B	
cmd Z1[X] Htr A Inh	**cmd** Htr A Ena BU
√Status - Inh	**cmd** Htr A Ena BU
Repeat	
'Z14B SPDA Rail Htrs'	
sel Z1 [X] Htr B [X] = 3B 4B	
cmd Z1[X] Htr B Inh	**cmd** Htr B Ena Opr
√Status - Inh	**cmd** Htr B Ena Opr
Repeat	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	
9. <u>DISABLE Z1 EEATCS HEATERS</u>	
'EEATCS Htr RPCM Z13B B'	
cmd RPC 7 - Op	**cmd** Close
√Position - Op	
'EEATCS Htr RPCM Z14B B'	
cmd RPC 7 - Op	**cmd** Close
√Position - Op	

POWERDOWN	POWERUP
10. <u>DISABLE Z1 DDCU HEATERS</u> 'DDCU Htr RPCM Z13B B'	
sel RPC [X] [X] = 6 11 **cmd** RPC [X] - Op √Position - Op Repeat	**cmd** Close
'DDCU Htr RPCM Z14B B'	
sel RPC [X] [X] = 11 16 **cmd** RPC [X] - Op √Position - Op Repeat	**cmd** Close
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	
11. <u>DISABLE PCUs AND HEATERS</u> 'PCU 1 and PCU 2 Htr'	
sel RPC [X] [X] = 15 16 **cmd** RPC [X] - Op √Position - Op Repeat	**cmd** RPC 16 Close
'PCU 2 and PCU 1 Htr'	
sel RPC [X] [X] = 15 14 **cmd** RPC [X] - Op √Position - Op Repeat	**cmd** RPC 14 Close
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	

POWERDOWN	POWERUP
12. <u>DISABLE CMG HEATERS</u> 'CMG Htrs RPCM Z13B B'	
sel RPC [X] [X] = 10 12	
cmd RPC [X] - Op √Position - Op	**cmd** Close
Repeat	
'CMG Htrs RPCM Z14B B'	
sel RPC [X] [X] = 10 12	
cmd RPC [X] - Op √Position - Op	**cmd** Close
Repeat	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	
13. <u>DISABLE KU-BAND AND S-BAND HEATERS</u> 'KU - Band Htr RPCM Z14B B'	
sel RPC [X] [X] = 5 6	
cmd RPC [X] - Op √Position - Op	**cmd** Close
Repeat	
'S - Band Htr RPCM Z14B B'	
sel RPC [X] [X] = 1 4	
cmd RPC [X] - Op √Position - Op	**cmd** Close
Repeat	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	

POWERDOWN	POWERUP
14. DISABLE INTERNAL EARLY COMM EQUIPMENT	
NOTE The Early Comm equipment is powered by the stbd CBM RPCs.	
sel Display 2 - Early Comm and MDMs	
'Early Comm RPCM N1RS2 A'	
sel RPC [X] [X] = 5 6 10 11	
cmd RPC [X] - Op **Execute** √Position - Op	**cmd** Close **Execute**
Repeat	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	
15. TURN OFF EARLY COMM ANTENNAS AND ANTENNA HEATERS	
CAUTION The Early Comm Antennas may experience hardware damage after TBD hours without heater power.	
'Early Comm RPCM N1RS1 C'	
sel RPC [X] [X] = 5 6 12 13	
cmd RPC [X] - Op **Execute** √Position - Op	**cmd** Close **Execute**
Repeat	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	

POWERDOWN	POWERUP
16. <u>POWERDOWN OF N1-1 MDM</u> √**MCC-H** before powerdown of N1-1 MDM	
<u>Inhibit NCS Autoretry</u> 'N1 - 1 MDM RPCM N1RS1 A'	**cmd** Prime_NCS_Ena_NCS_Retry **Execute**
cmd Prim_NCS_Inh_NCS_Retry **Execute** √Auto Retry Inhibit - X	√Auto Retry Inhibit - <blank>
<u>Command N1-1 To Diagnostics</u> <u>NOTE</u> Expect PCS FDA 'CDH MDM N1-2 Detected RT Fail MDM N1-1 - PMA1'.	
'N1 - 1 MDM RPCM N1RS1 A'	**cmd** N1_1_MDM_Xsitn_Second_state_Arm **Execute**
cmd N1_1_MDM_Xsitn_Dgnstc_State_ARM **Execute** **cmd** N1_1_MDM_Xsitn_Dgnstc_State **Execute**	**cmd** N1_1_MDM_Xsitn_Second_state **Execute** √State - Secondary
<u>Remove Power From N1-1 MDM and SDO Card</u> sel RPC [X] [X] = 5 11	
cmd RPC[X] - Op **Execute** √Position - Op	**cmd** Close **Execute**
Repeat	
<u>Verify N1_2 MDM Survival Heater Off</u> 'MDM N1_2 Srv Htr RPCM N1RS1 C'	
√RPC 2 Position - Op	
√RACU 5 Output Pwr, kW + RACU 6 Output Pwr, kW ≤ XX kw >>	

POWERDOWN	POWERUP
17. <u>POWERDOWN OF N1-2 MDM</u> √**MCC-H** before powerdown of N1-2 MDM	√**MCC-H**
‘N1_2 MDM RPCM N1RS2 C	
sel RPC [X] [X] = 15 3 13	
cmd RPC[X] - Op **Execute** √Position - Op	
Repeat	