

Payload Powerdown

STS-125

**Mission Operations Directorate
Operations Division**

**Final, Rev A
April 17, 2009**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
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MISSION OPERATIONS DIRECTORATE

**PAYLOAD POWERDOWN
STS-125**

FINAL, REVISION A
April 17, 2009

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NOTES

1. Section 1 of this book is inserted at the back of the Ascent Pocket Checklist.
2. Sections 2 and 3 of this book are inserted at the back of the Orbit Pocket Checklist.
3. Section 4 of this book is inserted at the back of the Entry Pocket Checklist.

PAYLOAD POWERDOWN
STS-125

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REV A 04/17/09

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PL PWRDN – ASCENT

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**PL PWRDN
ASC**

PL PWRDN MATRIX

**PL PWRDN
ASC**

PROCEDURE	ACTION
PWRDN FOR LOSS OF:	
2 CAB FANS	N/A
CAB PRESS	
(MINOR PWRDN; from step 4)	N/A
(MAJOR PWRDN; from step 5)	N/A
2 H2O LOOPS	
[PLT PWRDN, SYS AOA,	
<u>2 H2O LOOPS (AOA);</u>	
(CDR/PLT PWRDNS)]	N/A
(POST OMS-2)	N/A
1 FREON LOOP	N/A
HI LOAD EVAP	N/A
2 FREON LOOPS	
[PLT PWRDN, SYS AOA,	
<u>2 FREON LOOPS (AOA);</u>	
(CDR/PLT PWRDNS)]	N/A
(POST OMS-2)	N/A
FES/1 FC	N/A
2nd FC	N/A
MN BUS UNDERVOLTS/FC VOLTS	
(from step 6; permanent loss of PL PRI)	N/A
(from step 14; temporary loss of PL PRI)	N/A
AV BAY COOLING (from MAL GPC FRP-7)	N/A
AV BAY FIRE	N/A

ACTION

A	PWRDN	PWRUP
N/A		N/A

PL PWRDN – ORBIT

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ACTION.....	PL 2-3
PRIORITY PWRDN PP3A.....	PL 2-3
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**PL PWRDN
ORB**

PL PWRDN MATRIX

**PL PWRDN
ORB**

PROCEDURE	ACTION
PWRDN FOR LOSS OF:	
HI LOAD EVAP	N/A
1 FREON LOOP	PP3A*, PP3B** (on MCC call) as required
1 FC	PP3A*, PP3B** (on MCC call) as required until ORB kW < 17
FES (ON ORBIT)	N/A
(DEORBIT PREP)	N/A
MN BUS UNDERVOLTS/FC VOLTS	
(from step 6; permanent loss of PL PRI)	A
(from step 17; temporary loss of PL PRI)	A
PRIORITY PWRDN GROUP 3	PP3A*, PP3B** (on MCC call) as required
AV BAY COOLING (from MAL GPC FRP-7)	N/A

*PRIORITY PWRDN 3A (PP3A) contains recoverable Payload Operations Powerdown steps

**PRIORITY PWRDN 3B (PP3B) is a total Payload Powerdown that may cause Payload Operations to be nonrecoverable

ACTION

PP3A	PRIORITY PWRDN (Recoverable) (On MCC call only)	PWRUP
<u>BSA</u>	1. Perform CONFIGURE PRIME COMM STRING FOR PSP-BYPASS (TURN-AROUND PLUG) (PL OPS, <u>CONTINGENCY OPERATIONS</u>)	√MCC
<u>ICBC3D</u> PGSC	If during filming ops: 2. Click on 'Stop' button 3. To edit Shot log (filename Shot.log): Select Log from menu bar Edit Log Close Log window 4. Under Systems Control, select: 'Close Window' button 'Disarm Camera' button 5. Exit ICBC3D – Control Interface screen 6. Shut down PGSC	
L12L	7. √ICBC3D EMER RUN – OFF (tb-bp) PWR – OFF (tb-bp)	
<u>PGSCs</u>	8. Power off non-essential PGSCs and associated DC util outlets	
<u>SSV</u>	9. Perform SSV DEACTIVATION (P/TV, <u>SSV</u>)	
<u>SSE</u>		
L11U	10. HTR/ILLUM PWR – OFF 11. KEEL CAM ENABLE – OFF 12. cb KEEL CAM PWR – op 13. RNS PWR – DIS (tb-bp)	
L12U	14. CCTV HTR PWR – OFF (tb-bp)	
L11U	15. MULE COPE HTR A(B) PWR – OFF (tb-bp)	
L12L	16. BPA STBD HTR B(A) PWR – OFF (tb-bp)	
	17. PORT HTR A(B) PWR – OFF (tb-bp)	
	18. WSIPE HTR A(B) PWR – OFF (tb-bp)	
L12U	19. ORUC PWR CONTR A,B (two) – OFF (tb-bp)	
	20. FSS HTR PWR – OFF (tb-bp)	
L11U	21. MULE FMDM A(B) PWR – OFF (tb-bp)	
	22. SURV HTR B(A) PWR – OFF (tb-bp)	
L12L	23. SLIC EPDSU HTR PWR – OFF (tb-bp)	

PP3A (Cont)	PRIORITY PWRDN (Recoverable) (On MCC call only)	PWRUP
<p>HST</p> <p>L12U</p> <p>CRT</p>	<p>24. FHST SHUTTER – OP (tb-bp)</p> <p style="text-align: center;"><u>NOTE</u> Battery charge attitude and SA slews required to maintain HST power margin</p> <p style="text-align: center;"><u>NOTE</u> Prior to removing HST external power, STOCC may command off HST initial, secondary and tertiary loads</p> <p>On MCC GO (if AOS):</p> <p>25. ESS/MN SW ENA – ON (tb-gray)</p> <p>26. ESS BUS INT PWR – ON (tb-UP)</p> <p>27. EXT PWR – OFF (tb-bp)</p> <p>28. MAIN BUS EXT PWR – OFF (tb-bp)</p> <p>29. ESS/MN SW ENA – OFF (tb-bp)</p> <p><u>SM 211 SSE OVERVIEW</u></p> <p>30. PCU OFF – ITEM 2 EXEC (*)</p> <p>If additional powerdown required:</p> <p>31. Perform PRIORITY PWRDN 3B (PP3B)</p>	

PP3B	PRIORITY PWRDN (Non-Recoverable) (On MCC call only)	PWRUP
	<p>OBSS</p> <ol style="list-style-type: none"> 1. LCC DEACT (Cue Card, <u>LCS</u>) LCH DEACT (Cue Card, <u>LCS</u>) LDRI/ITVC DEACT (Cue Card, <u>LDRI/ITVC</u>) <p>HST</p> <p>If HST berthed:</p> <ol style="list-style-type: none"> 2. Rotate FSS to berthing (-V3) position (if required): Perform ROTATE HST (PL OPS, <u>IN-BAY OPERATIONS</u>) 3. Pivot FSS to 90 deg position (if required): Perform PIVOT HST (PL OPS, <u>IN-BAY OPERATIONS</u>) 4. Perform HST GRAPPLE (HST DPY, <u>GRAPPLE</u>) 5. Perform HST UMB DISCONNECT, steps 4 and 5 (HST DPY, <u>UNBERTH</u>) 6. Perform HST UNBERTH, steps 1 thru 11, omit pause in step 9 (HST DPY, <u>UNBERTH</u>) 7. If BAPS post installed: Perform FSS STOW WITH BSP INSTALLED (PL OPS, <u>IN-BAY OPERATIONS</u>) If BAPS post <u>not</u> installed: Perform FSS STOW WITHOUT BSP (PL OPS, <u>CONTINGENCY OPERATIONS</u>) <p>L12U</p> <ol style="list-style-type: none"> 8. FSS FMDM A(B) PWR – OFF (tb-bp) <p>R1</p> <ol style="list-style-type: none"> 9. PL PRI MNC – OFF (tb-OFF) 10. Perform HST RELEASE PREP (HST DPY, <u>RELEASE OPS</u>) 11. Perform RELEASE (RMS & HST SYSTEMS) (HST DPY, <u>RELEASE OPS</u>) 12. Perform RELEASE AND SEP BURNS (ORBITER) (HST DPY, <u>RELEASE OPS</u>) <p>If HST not berthed (no BAPS post):</p> <ol style="list-style-type: none"> 13. Pivot FSS to stow position and engage downlock: Perform FSS STOW WITHOUT BSP (PL OPS, <u>CONTINGENCY OPERATIONS</u>) <p>L12U</p> <ol style="list-style-type: none"> 14. FSS FMDM A(B) PWR – OFF (tb-bp) <p>R1</p> <ol style="list-style-type: none"> 15. PL PRI MNC – OFF (tb-OFF) 	N/A

PP3B (Cont)	PRIORITY PWRDN (Non-Recoverable) (On MCC call only)	PWRUP
<p>If HST not berthed (BAPS post installed):</p> <p>16. Rotate/Pivot FSS to stow position, berthing latch forward: Perform FSS STOW WITH BSP INSTALLED (PL OPS, <u>IN-BAY OPERATIONS</u>)</p> <p>L12U</p> <p>17. FSS FMDM A(B) PWR – OFF (tb-bp)</p> <p>R1 18. PL PRI MNC – OFF (tb-OFF)</p> <p>19. PL AUX – OFF AFT MNB – OFF MNC – OFF</p>		

A	PWRDN (PL PRI permanently or temporarily lost)
<p><u>HST</u></p> <p>If HST comm lost (TLM COUNT not incr on SM 210):</p> <ol style="list-style-type: none"> 1. Perform COMM SSR-1 PI RF REACQ (PL SYS, <u>PL COMM</u>) <p>If HST berthed:</p> <p>L12U</p> <ol style="list-style-type: none"> 2. ESS/MN SW ENA – ON (tb-gray) 3. √ESS BUS INT PWR tb – UP <p style="text-align: center;"><u>NOTE</u> Talkbacks not shown for remaining switches invalid while PL PRI lost</p> <ol style="list-style-type: none"> 4. ESS BUS EXT PWR – OFF 5. FHST SHUTTER – OP 6. RSU SURV HTR PWR – OFF 7. ESS/MN SW ENA – OFF (tb-bp) 8. SSM WK LTS – OFF (ctr) 9. √FSS PCU PWR CONTR A(B) – OFF <p style="text-align: center;"><u>NOTE</u> IPCU Motor transfer switches remain closed</p> <ol style="list-style-type: none"> 10. CCTV HTR PWR – OFF 11. FSS FMDM A(B) PWR – OFF 12. HTR PWR – OFF 13. ORUC PWR CONTR A,B (two) – OFF <p>L12L</p> <ol style="list-style-type: none"> 14. WSIPE HTR A(B) PWR – OFF 15. BPA PORT HTR A(B) PWR – OFF 16. STBD HTR B(A) PWR – OFF 17. SLIC EPDSU HTR PWR – OFF <p>L11U</p> <ol style="list-style-type: none"> 18. MULE FMDM A(B) PWR – OFF 19. SURV HTR A(B) PWR – OFF 20. MULE COPE HTR A(B) PWR – OFF 21. RNS PWR – DIS 	
<p>----- (Cont next page)</p>	

A	PWRUP (PL PRI recovered)
<u>HST</u>	
L12U	1. FSS HTR PWR – PRI (REDUN) (tb-gray)
	2. FMDM A(B) PWR – ON (tb-gray)
L11U	3. SURV HTR A(B) PWR – ON (tb-gray)
	4. MULE FMDM A(B) PWR – ON (tb-gray)
CRT	5. SM I/O RESET EXEC
	6. SM 211 SSE OVERVIEW
	POWER
	√FSS HTR P1(R1)/P2(R2) AMPS: < 14/<11
	√MULE HTR AMPS: ≤ 13
	THERMAL
	√FSS EPDSU TEMP (two): -20 to 50 degC
	√FMDM TEMP (two): -3 to 55 degC
	√PCU TEMP (two): -20 to 50 degC
	√IPCU TEMP: -30 to 50 degC
	7. If HST berthed:
	Configure FGE inrush:
STOCC	Power down and initialize FGEs prior to external
	power activation
CRT	On MCC GO:
	PCU ON – ITEM 1 EXEC (*)
	√DPC 1-12 (twelve) – *
	√VOLTS (twelve): 33.7 to 35.3
	√AMPS (twelve): 2 to 7
L12U	√MAIN BUS EXT PWR tb-gray
	ESS/MN SW ENA – ON (tb-gray)
	ESS BUS EXT PWR – ON (tb-UP)
	On MCC GO:
	ESS BUS INT PWR – OFF (tb-bp)
	ESS/MN SW ENA – OFF (tb-bp)
	8. ORUC PWR CONTR A,B (two) – ON (tb-gray)
CRT	9. √POWER ORUC AMPS (two): ≤ 30
L12U	10. CCTV HTR PWR – ON (tb-gray)
CRT	11. √POWER FSS CCTV HTR AMPS: ≤ 0.9
L12L	12. WSIPE HTR A(B) PWR – ON (tb-UP)
	13. SLIC EPDSU HTR PWR – B ON (A ON) (tb-gray)
	14. BPA PORT HTR A(B) PWR – ON (tb-gray)
	15. STBD HTR B(A) PWR – ON (tb-gray)
CRT	16. √POWER SLIC EPDSU AMPS: ≤ 16

A (Cont)	PWRUP (PL PRI recovered)
L11U	17. MULE COPE HTR A(B) PWR – ON (tb-gray)
CRT	18. √POWER MULE COPE 1A/2A (two): < 3.5 √1B&2B: ≤ 0.4 √3A/3B (two): < 3.5
L11U	19. RNS PWR – ENA (tb-gray)
CRT	<div style="border: 1px solid black; padding: 2px; display: inline-block;">SM 212 SSE MECH/BPA/RNS</div> RNS TM ON – ITEM 25 EXEC √RNS AMPS: ≤ 1.3 √FRM CNT: INCR

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PL 2-10

PL PWR/125/O/FIN A

PL SAFING – ORBIT

PL SAFING MATRIX..... PL 3-2
ACTION..... PL 3-2
 PL SAFING..... PL 3-2

PL SAFING
ORB

PL SAFING MATRIX

PROCEDURE	ACTION
PWRDN FOR LOSS OF:	
2 CAB FANS	PL SAFING (omit APCU steps)
2 H2O LOOPS	PL SAFING (omit APCU steps)
CAB PRESS	PL SAFING
2nd FC (TIG < 4 hr) (from step 5)	PL SAFING
2nd FC (TIG > 4 hr) (from step 15)	PL SAFING
2 FREON LOOPS	PL SAFING

ACTION

<u>PL SAFING</u>	
If HST EVA in progress:	
1.	Perform HST JETTISON DURING (current) EVA (PL SYS, <u>RAPID SAFING</u>)
If HST berthed:	
2.	Perform HST JETTISON FOR RAPID SAFE (PL OPS, <u>CONTINGENCY OPERATIONS</u>)
If HST not berthed:	
3.	Perform <u>RAPID SAFING WITHOUT HST</u> (PL OPS, <u>CONTINGENCY OPERATIONS</u>)
<u>ICBC3D</u>	
L12L	4. √ICBC3D EMER RUN – OFF
	5. PWR – OFF
<u>APCU</u>	
L12L	6. APCU 1,2 CONV (two) – OFF
	7. OUTPUT RLY (two) – op
	8. When PL SAFING completed, return to calling procedure, if required

PL SAFING
ORB

PL PWRDN – ENTRY

PL PWRDN MATRIX..... PL 4-2
ACTION..... PL 4-2
PWRDN A PL 4-2

PL PWRDN
ENT

PL PWRDN MATRIX

PROCEDURE	ACTION
POWERDOWN FOR LOSS OF:	
2 CAB FANS	N/A
2 H2O LOOPS (ENTRY)	N/A
CAB PRESS	N/A
1 FREON LOOP	N/A
HI LOAD EVAP (ENTRY)	N/A
FES	N/A
2 FREON LOOPS (ENTRY)	N/A
1 FC	N/A
2nd FC (ENTRY)	N/A
MN BUS UNDERVOLTS/FC VOLTS	
(from step 6; permanent loss of PL PRI)	N/A
(from step 14; temporary loss of PL PRI)	N/A
AV BAY COOLING (from MAL GPC FRP-7)	N/A
AV BAY FIRE	N/A

ACTION

A	PWRDN	PWRUP
N/A		N/A

**PL PWRDN
ENT**

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Space Shuttle Program
FLIGHT DATA FILE

JSC-48097-125
FINAL, REV A



**PAYLOAD
POWERDOWN**

**STS
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Flight Cover (trim bottom to expose tabs)