3.2_V2.0 EMERGENCY LOAD SHED PROCEDURE

Last Revised: June 28,1999
Filename: SILSSCS

BRIEF FUNCTIONAL DESCRIPTION:
This procedure is to turn the ACIS instrument off within $\sim$ 62 s in the case of a spacecraft power emergency. The procedure is intended to work for any ACIS configuration and thus sends commands to the A and B sides without checking if they are actually on. The procedure first interrupts the current science run then turns off the DH bakeout heater (which may or may not be on), turns off the DH heater, powers off the DEA video boards, FEPs, DEA power supply and DPA power supply, while allowing enough time to get the interesting telemetry out of the instrument. At the end of the procedure, the ACIS power consumption should be 6 W (the parasitic load of the PSMC). All the commands have been doubled to be consistent with the general paranoid hysteria.

The sequence of actions will be:

1. interrupt the current science run
2. turn off and disable the Detector Housing bakeout heater
3. turn off and disable the Detector Housing heater
4. turn off and disable the Focal Plane bakeout heater
5. turn off the DEA video boards
6. turn off the FEPs
7. Turn off the DEA
8. Turn off the DPA
9. Verify that ACIS is off by checking input currents and voltages

ASSUMED INSTRUMENT STATE:
None, procedure is intended to work for any ACIS configuration.

SPECIAL INITIAL CONDITIONS:

OPERATIONAL CONSTRAINTS/CAUTIONS:
This procedure leaves ACIS completely off; therefore there is no active thermal control.
The SW TLM verifiers are only available if the spacecraft is in FMT 1 or 2.

REFERENCES:

CHANGE HISTORY:

V1.3

- added SW TLM verifiers throughout the procedure
- fixed typos in steps 3.7 and 3.8
- added step 9 to confirm that ACIS is indeed off

V2.0

- ACIS Team signed-off version
- changed version number in “Change History” to 1.3 from 1.2
- changed HW TLM verifier in step 9.3 to “1DEN1AVO”
- changed HW TLM verifier in step 9.4 to “1DEN1BVO”

Table 1: **ACIS Emergency Power-Down Procedure**

Step #	Title (Revision 3.2_V2.0)	Time Req (s)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1.0	Stop the current science run							
1.1	send one stop science	4.100	stopScience	AA00000000				
1.2	send another stop science	1.025	stopScience	AA00000000				
2.0	Turn off DH bakeout heater							
2.1	Turn off DH bakeout side A	1.025	Housing Bakeout Off A	1HBOAOF	DA BO A ON/OFF	1DABOAON	OFF	
2.2	Turn off DH bakeout side A	1.025	Housing Bakeout Off A	1HBOAOF	DA BO A ON/OFF	1DABOAON	OFF	
2.3	Disable DH bakeout side A	1.025	Housing Bakeout Dis A	1HBOADS	DA BO A ENB/DIS	1DABOAEN	DIS	
2.4	Disable DH bakeout side A	1.025	Housing Bakeout Dis A	1HBOADS	DA BO A ENB/DIS	1DABOAEN	DIS	
2.5	Turn off DH bakeout side B	1.025	Housing Bakeout Off B	1HBOBOF	DA BO B ON/OFF	1DABOBON	OFF	
2.6	Turn off DH bakeout side B	1.025	Housing Bakeout Off B	1HBOBOF	DA BO B ON/OFF	1DABOBON	OFF	
2.7	Disable DH bakeout side B	1.025	Housing Bakeout Dis B	1HBOBDS	DA BO B ENB/DIS	1DABOBEN	DIS	
2.8	Disable DH bakeout side B	1.025	Housing Bakeout Dis B	1HBOBDS	DA BO B ENB/DIS	1DABOBEN	DIS	
3.0	Turn off DH heater							
3.1	Turn off DH heater side A	1.025	Housing Htr Off A	1HHTRAOF	DA A ON/OFF	1DAHTAON	OFF	
3.2	Turn off DH heater side A	1.025	Housing Htr Off A	1HHTRAOF	DA A ON/OFF	1DAHTAON	OFF	
3.3	Disable DH heater side A	1.025	Housing Htr Dis A	1HHTRADS	DA A ENB/DIS	1DAHTAEN	DIS	
3.4	Disable DH heater side A	1.025	Housing Htr Dis A	1HHTRADS	DA A ENB/DIS	1DAHTAEN	DIS	
3.5	Turn off DH heater side B	1.025	Housing Htr Off B	1HHTRBOF	DA B ON/OFF	1DAHTBON	OFF	
3.6	Turn off DH heater side B	1.025	Housing Htr Off B	1HHTRBOF	DA B ON/OFF	1DAHTBON	OFF	
3.7	Disable DH heater side B	1.025	Housing Htr Dis B	1HHTRBDS	DA B ENB/DIS	1DAHTBEN	DIS	
3.8	Disable DH heater side B	1.025	Housing Htr Dis B	1HHTRBDS	DA B ENB/DIS	1DAHTBEN	DIS	
4.0	Turn off FP bakeout heater							
4.1	Disable FP BO heater	1.025	changeConfigSetting	WSFTNEG120				
4.2	Disable FP BO heater	1.025	changeConfigSetting	WSFTNEG120				
4.3	Dump System Config.	2.050	dumpSysConfig	RS_0000001				
4.4	Dump System Config.	1.025	dumpSysConfig	RS_0000001				
5.0	Turn off the video boards							
5.1	Turn off the video boards	1.025	changeConfigSetting	WSVIDALLDN				
5.2	Turn off the video boards	10.25	changeConfigSetting	WSVIDALLDN				
6.0	Turn off the FEPs							

Table 2: (CONT) **ACIS Emergency Power-Down Procedure**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1.0									
1.1	Check cmdResult == 1			2 stop science provide a					
1.2	commandEcho 1539			more graceful shutdown.					
2.0									
2.1									
2.2									
2.3									
2.4									
2.5									
2.6									
2.7									
2.8									
3.0									
3.1									
3.2									
3.3									
3.4									
3.5									
3.6									
3.7									
3.8									
4.0									
4.1	Check cmdResult == 1 commandEcho 105			reset FP to -120C					
4.2	Check cmdResult = 1 commandEcho 105			reset FP to -120C					
4.3	Check cmdResult = 1			commandEcho 66					
4.4	Check cmdResult = 1			commandEcho 66					
5.0									
5.1	Check cmdResult = 1			commandEcho 1541					
5.2	Check cmdResult			commandEcho 1541					
6.0									

Table 1: **ACIS Emergency Power-Down Procedure(Page 2)**

Step #	Title (Revision 3.2_V2.0)	Time Req (s)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
6.1	Turn off the FEPs	1.025	changeConfigSetting	WSFEPALLDN				
6.2	Turn off the FEPs	6.150	changeConfigSetting	WSFEPALLDN				
7.0	Power down DEAs							
7.1	turn off DEA side B	1.025	DEA PS B OFF	1DEPSBOF	DEA B ON/OFF	1DEPSB	OFF	
7.2	turn off DEA side B	1.025	DEA PS B OFF	1DEPSBOF	DEA B ON/OFF	1DEPSB	OFF	
7.3	disable DEA side B	1.025	DEA PS B OFF	1DEPSBDS	DEA B ENB/DIS	1DEPSBX	DIS	
7.4	disable DEA side B	1.025	DEA PS B OFF	1DEPSBDS	DEA B ENB/DIS	1DEPSBX	DIS	
7.5	turn off DEA side A	1.025	DEA PS A OFF	1DEPSAOF	DEA A ON/OFF	1DEPSA	OFF	
7.6	turn off DEA side A	1.025	DEA PS A OFF	1DEPSAOF	DEA A ON/OFF	1DEPSA	OFF	
7.7	disable DEA side A	1.025	DEA PS A OFF	1DEPSADS	DEA A ENB/DIS	1DEPSAX	DIS	
7.8	disable DEA side A	1.025	DEA PS A OFF	1DEPSADS	DEA A ENB/DIS	1DEPSAX	DIS	
8.0	Power down DPAs							
8.1	turn off DPA side B	1.025	DPA PS B OFF	1DPPSBOF	DPA B ON/OFF	1DPPSB	OFF	
8.2	turn off DPA side B	1.025	DPA PS B OFF	1DPPSBOF	DPA B ON/OFF	1DPPSB	OFF	
8.3	disable DPA side B	1.025	DPA PS B OFF	1DPPSBDS	DPA B ENB/DIS	1DPPSBX	DIS	
8.4	disable DPA side B	1.025	DPA PS B OFF	1DPPSBDS	DPA B ENB/DIS	1DPPSBX	DIS	
8.5	turn off DPA side A	1.025	DPA PS A OFF	1DPPSAOF	DPA A ON/OFF	1DPPSA	OFF	
8.6	turn off DPA side A	1.025	DPA PS A OFF	1DPPSAOF	DPA A ON/OFF	1DPPSA	OFF	
8.7	disable DPA side A	1.025	DPA PS A OFF	1DPPSADS	DPA A ENB/DIS	1DPPSAX	DIS	
8.8	disable DPA side A	1.025	DPA PS A OFF	1DPPSADS	DPA A ENB/DIS	1DPPSAX	DIS	
9	Verify ACIS is off when TLM is available.							
9.1	Verify DPA A is off				DPA Input V A	1DPP0AVO	0.0 ± 0.2	V
					DPA Input I A	1DPICACU	< 0.2	A
9.2	Verify DPA B is off				DPA B +5V Voltage	1DPP0BVO	0.0 ± 0.2	V
					DPA Input Current	1DPICBCU	< 0.2	A
9.3	Verify DEA A is off				DEA Input I A	1DEICACU	<0.2	A
					DEA +6 V A	1DEP0AVO	0.0 ± 0.2	V
					DEA -6 V A	1DEN0AVO	0.0 ± 0.2	V
					DEA +15 V A	1DEP1AVO	0.0 ± 0.2	V
					DEA -15 V A	1DEN1AVO	0.0 ± 0.2	V
					DEA +24 V A	1DEP2AVO	0.0 ± 0.2	V

Table 2: (CONT) **ACIS Emergency Power-Down Procedure(Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
6.1	Check cmdResult = 1			commandEcho 1542					
6.2	Check cmdResult = 1			commandEcho 1542					
7.0									
7.1									
7.2									
7.3									
7.4									
7.5									
7.6									
7.7									
7.8									
8.0									
8.1									
8.2									
8.3									
8.4									
8.5									
8.6									
8.7									
8.8									
9									
9.1									
9.2									
9.3									

Table 1: **ACIS Emergency Power-Down Procedure(Page 3)**

Step #	Title (Revision 3.2_V2.0)	Time Req (s)	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
					DEA +28 V A	1DEP3AVO	0.0 ± 0.2	V
9.4	Verify DEA B is off				DEA Input I B	1DEICBCU	<0.2	A
					DEA +6 V B	1DEP0BVO	0.0 ± 0.2	V
					DEA -6 V B	1DEN0BVO	0.0 ± 0.2	V
					DEA +15 V B	1DEP1BVO	0.0 ± 0.2	V
					DEA -15 V B	1DEN1BVO	0.0 ± 0.2	V
					DEA +24 V B	1DEP2BVO	0.0 ± 0.2	V
					DEA +28 V B	1DEP3BVO	0.0 ± 0.2	V
9.5	Verify DA Htr A is off				DA Htr +28V INPUT A	1DAHHAVO	0.0 ± 0.2	V
					DA Htr Output V A	1DAHAVO	0.0 ± 0.2	V
					DA Htr Current A	1DAHACU	<0.2	A
9.6	Verify DA Htr B is off				DA Htr +28V INPUT B	1DAHHBVO	0.0 ± 0.2	V
					DA Htr Output V B	1DAHBVO	0.0 ± 0.2	V
					DA Htr Current B	1DAHBCU	<0.2	A
	Total Time	61.5						

Table 2: (CONT) **ACIS Emergency Power-Down Procedure(Page 3)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
9.4									
9.5									
9.6									