5.9_V2.2 SWITCH FROM DEA A TO DEA B

Last Revised: May 19, 2015
Filename: switch_deaa_b

BRIEF FUNCTIONAL DESCRIPTION:

This is a contingency procedure to switch from powering the DEA from the A-side of the PSMC to powering it from the B-side. After switching DEA input power and reestablishing control of the focal plane heaters, the magnetic relays that control pairs of video boards are thrown one at a time, and those two video boards are powered up separately, while verifying that the PSMC doesn't report a current overflow.

The sequence of actions will be:

- Power down the video boards (skip if not powered)
- Turn off and disable the DEA side A power supply (skip if not enabled and on)
- Verify that all DEA side B heaters are off and disabled
- Enable and turn on the DEA side B power supply
- Perform a soft BEP reboot
- Start DEA interface housekeeping
- Enable DEA-B to assume control of the focal plane temperature by commanding it to -122^0C and then to -120^0C
- Switch the video board relays one at a time, wait for PSMC telemetry verifiers to refresh, and verify that DEA-B hasn't powered down due to an overcurrent or overvoltage condition
- After switching each pair of video boards, power up each of the two boards, waiting for PSMC telemetry verifiers to refresh, and verifying that DEA-B hasn't powered down due to an overcurrent or overvoltage condition
- Power down all video boards
- Dump the system configuration table

ASSUMED INSTRUMENT STATE:

- Assumes that DPA A and/or DPA B is on and that the flight SW is running.

SPECIAL INITIAL CONDITIONS:

- Assumes that telemetry is in Format 1 or 2.
- Assumes that neither the bakeout heater nor the detector housing heater is being powered by DEA-B. If they are, switch them off and, if the procedure ends with the DEA powered from DEA-B, consider enabling and turning them on again on DEA-A.

CHANGE HISTORY:

Version 1.2

- added a new step 1 to start a DEA HKP run if necessary
- changed HW TLM verifiers to check state of DEA A and DEA B in steps 2.1 and 3.2
- added a new step 5 to warmboot the active BEP
- added a command in step 6 to set the focal plane temperature to -120^0C
- added operational constraint/caution that the B side does not produce the telltales to verify the state of the relays

Version 2.0

- ACIS Team signed-off version
- changed expected value of "1STAT7ST" in step 5.6

Version 2.1

- changed comment in step 1.2 to read "check FP temp"
- changed telemetry verified in step 5.5 to read "version=??" and changed comment to read "version # depends on loaded patches, if any"
- changed expected value of "1STAT7ST" in step 5.6
- changed command in step 6.2 to WSFTNEG121
- added to "Assumed Instrument State", "Assumes DEA A is on"

Version 2.2

- added explicit step to verify that 28V heaters are off before powering DEA-B
- replaced warm boot with FP temperature changes
- replaced command to switch all 5 relays simultaneously with 5 sets of 3 commands: a command to switch one of the relays, followed by a pair of commands to power up each of the two boards controlled by that relay
- added command to power up 6 FEPs
- added bias-only run to acquire housekeeping from ACIS-I boards
- added bias-only run to acquire housekeeping from ACIS-S boards
- added command to power down all video boards

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Table 1: **SWITCH FROM DEA A TO DEA B(Page 1)**

Step #	Title (Revision 5.9_V2.2)	Time (mins)	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
1	**Power Down Video Boards**							
1.1	Power off video boards	1	changeConfigSetting	WSVIDALLDN				
2	**Turn off DEA-A input power**							
2.1	DEA Power A Off	1	DEA-A Power Off	1DEPSAOF				1DEPSA
							DEA +24 V A	1DEP2AVO
							DEA Input V A	1DE28AVO
							DEA +6 V A	1DEP0AVO
							DEA -6 V A	1DEN0AVO
							DEA +15 V A	1DEP1AVO
							DEA -15 V A	1DEN1AVO
							DEA +28 V A	1DEP3AVO
2.2	Disable DEA PS A	1	DEA-A Power Disable	1DEPSADS			DEA A Dis	1DEPSAX
3	**Verify that DEA-B heaters are off**							
3.1	Verify heaters off	1					DEA B DH Htr Off	1DAHTBON
							DEA B DH Htr Dis	1DAHTBEN
							DEA B Bakeout Off	1DABOBON
							DEA B Bakeout Dis	1DABOBEN
4	**Turn on DEA-B input power**							
4.1	Enable DEA PS B	1	DEA-B Power Enable	1DEPSBEN			DEA B En	1DEPSBX
4.2	DEA Power B On	1	DEA-B Power On	1DEPSBON				1DEPSB
							DEA +24 V B	1DEP2BVO
							DEA Input V B	1DE28BVO
							DEA Input I B	1DEICBCU
							DEA +6 V B	1DEP0BVO
							DEA -6 V B	1DEN0BVO
							DEA +15 V B	1DEP1BVO
							DEA -15 V B	1DEN1BVO
							DEA +28 V B	1DEP3BVO
5	**Reboot active BEP**							
5.1	DPA Boot Modifier	1	DPA Boot Modifier	1BMMODIBM(0)				

Table 1: **SWITCH FROM DEA A TO DEA B(Page 1)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1	**Power Down Video Boards**					Skip if video boards off					
1.1			Check cmdResult==OK commandEcho==1541		A			Y	1,2	60k	
2	**Turn off DEA-A input power**					Skip if DEA-A unpowered					
2.1	OFF					Ignore if DPA unpowered	SF 4.4.2	Y	1,2,4,6	60k	
	0.0 ± 0.5	V			1	Powers off DEA and board 11					
	25.0–34.0	V			2	Expect DEA-A power 0.0 W					
	0.0 ± 0.5	V			2						
	0.0 ± 0.5	V			2						
	0.0 ± 0.5	V			2						
	0.0 ± 0.5	V			2						
	0.0 ± 0.5	V			2						
2.2	DIS					Ignore if DPA unpowered	SF 4.4.1	Y	1,2,4,6	60k	
3	**Verify that DEA-B heaters are off**										
3.1	OFF				1	Verify housing heater is off			1,2,4,6	60k	
	DIS				2	Verify housing heater disabled					
	OFF				1	Verify bakeout heater is off					
	DIS				2	Verify bakeout heater disabled					
4	**Turn on DEA-B input power**										
4.1	ENB					Ignore if DPA unpowered		Y	1,2,4,6	60k	
4.2	ON					Ignore if DPA unpowered		Y	1,2,4,6	60k	
	24.0–26.0	V			1	Powers on DEA board 12					
	25.0–34.0	V			2						
	0.62–0.75	A			2	Expect DEA-B power 21±3 W					
	5.6–6.7	V			2						
	-7– -5.7	V			2						
	15.0–17.0	V			2						
	-17.0– -15.0	V			2						
	> 26.0	V			2						
5	**Reboot active BEP**										
5.1			Disable uplink boot					Y	1,2	60k	

Table 1: **SWITCH FROM DEA A TO DEA B(Page 2)**

Step #	Title (Revision 5.9_V2.2)	Time (mins)	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
5.2	Set warm boot flag on	1	DPA Warm Boot	1WRMBTSB(1)				
5.3	Halt BEP	1	DPA Command Reset	1RSETIRT(1)				
5.4	Restart BEP	1		1RSETIRT(0)				
5.5	Check BEP boot	2					bepStartupMessage swHousekeeping	
5.6	Check HW LEDs	2					BEP select BEP FIFO not full BEP FIFO not empty	1STAT4ST 1STAT6ST 1STAT7ST
5.7	Check SW LEDs	2					BEP initialization Watchdog boot Science run status	1STAT3ST 1STAT2ST 1STAT1ST 1STAT0ST
6	**Start DEA Interface Housekeeping**							
6.1	Load Board 11 DEA Hkp	1	loadDeaBlock	WD00001024				
6.2	Start DEA Hkp run	1	startDea	XDZ0000005				
7	**Start FP temperature control**							
7.1	set FP temp to -121^0C	1	changeConfigSetting	WSFTNEG123				
7.2	set FP temp to -120^0C	2	changeConfigSetting	WSFTNEG121				
8	**Power video boards from DEA-B**							
8.1a	Set I0,S0 relays to DEA-B	1	changeConfigSetting	WS_RELAY_0				
8.1b	Power up I0	1	changeConfigSetting	WSPOW00100				

Table 1: **SWITCH FROM DEA A TO DEA B(Page 2)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
5.2			Warm boot active BEP					Y	1,2	60k	
5.3			Hold active BEP reset line					Y	1,2	60k	
5.4			Release BEP reset line					Y	1,2	60k	
5.5			version> 11 warmbootFlag=1 version> 11								
5.6	0 1 0				2 2 2	0 indicates BEP-A is selected 1meansFIFOnotfull 1meansFIFOnotempty		Y Y Y	1,2 1,2 1,2	60k 60k 60k	
5.7	0 1 1 0 or 1				1 2 2 2	0 means BEP sw is running 1 means no watchdog reboot 1 means science idle this bit toggles to indicate BEP running		Y Y Y Y	1,2 1,2 1,2 1,2	60k 60k 60k 60k	
6	**Start DEA Interface Housekeeping**										
6.1			Check cmdResult==OK commandEcho==225		B	Monitor FP temp and DEA voltages		Y	1,2	60k	
6.2			Check cmdResult==OK commandEcho==18		B	If Hkp running, cmdResult==CLOBBERED		Y	1,2	60k	
7	**Start FP temperature control**										
7.1			Check cmdResult==OK commandEcho==6369		A			Y	1,2	60k	
7.2			Check cmdResult==OK commandEcho==1220		A			Y	1,2	60k	
8	**Power video boards from DEA-B**					Abort if DEA-B heaters on or 1DEPSB==OFF					
8.1a			Check cmdResult==OK commandEcho==14429	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.1b			Check cmdResult==OK commandEcho==14439	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	

Table 1: **SWITCH FROM DEA A TO DEA B(Page 3)**

Step #	Title (Revision 5.9_V2.2)	Time (mins)	Command Description	Command Mnemonic	Cmd EGSE	Seq Key	Telemetry Description	Telemetry Mnemonic
8.1c	Power up S0	1	changeConfigSetting	WSPOW01100				
8.2a	Set I1,S1 relays to DEA-B	1	changeConfigSetting	WS_RELAY_1				
8.2b	Power up I1	1	changeConfigSetting	WSPOW01300				
8.2c	Power up S1	1	changeConfigSetting	WSPOW03300				
8.3a	Set I2,S3 relays to DEA-B	1	changeConfigSetting	WS_RELAY_2				
8.3b	Power up I2	1	changeConfigSetting	WSPOW03700				
8.3c	Power up S3	1	changeConfigSetting	WSPOW0B700				
8.4a	Set I3,S2 relays to DEA-B	1	changeConfigSetting	WS_RELAY_3				
8.4b	Power up I3	1	changeConfigSetting	WSPOW0BF00				
8.4c	Power up S2	1	changeConfigSetting	WSPOW0FF00				
8.5a	Set S4,S5 relays to DEA-B	1	changeConfigSetting	WS_RELAY_4				
8.5b	Power up S4	1	changeConfigSetting	WSPOW1FF00				
8.5c	Power up S5	1	changeConfigSetting	WSPOW3FF00				
9	**Power down video boards**							
9.1	Power off video boards	1	changeConfigSetting	WSVIDALLDN				
9.2	Dump System Config.	1	dumpSysConfig	RS_0000001				
	Total Time	38						

Table 1: **SWITCH FROM DEA A TO DEA B(Page 3)**

Step #	Expected Value	Units	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
8.1c			Check cmdResult==OK commandEcho==14440	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.2a			Check cmdResult==OK commandEcho==14430	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.2b			Check cmdResult==OK commandEcho==14443	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.2c			Check cmdResult==OK commandEcho==14445	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.3a			Check cmdResult==OK commandEcho==14433	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.3b			Check cmdResult==OK commandEcho==14446	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.3c			Check cmdResult==OK commandEcho==14448	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.4a			Check cmdResult==OK commandEcho==14434	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.4b			Check cmdResult==OK commandEcho==14451	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.4c			Check cmdResult==OK commandEcho==14453	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.5a			Check cmdResult==OK commandEcho==14436	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.5b			Check cmdResult==OK commandEcho==14454	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
8.5c			Check cmdResult==OK commandEcho==14457	1DEPSB	A	Wait 60 secs, then check that 1DEPSB=ON		Y	1,2	60k	
9	**Power down video boards**										
9.1			Check cmdResult==OK commandEcho==1541		A			Y	1,2	60k	
9.2			Check cmdResult==OK commandEcho==66		B			Y	1,2	60k	

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