Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	PRU and BCRs Unexpected switching	State	Pending	ID	INT_SC-154

Originator	Richard Southworth	**Criticality**	High		
Created	2006-07-10 12:38	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-07-09 12:00	**Classification**	Space Segment | Spacecraft | EPS		

Description

Description

On DoY 190, the following sequence of OOLs was observed:

At 190.15.41.15
P5102 PRU A AUX STAT = SECV PRSENT (CO)
P3004 BCR1 ON/OFF STAT = OFF (FX)
P3005 BCR2 ON/OFF STAT = OFF (FX)
P1112 LCL STA IMU1 = CLOSE (CO)
P1151 LCL STA IMU3 = CLOSE (CO)
P1101 LCL STA LV A = CLOSE (CO)
P1174 LCL STANOM CBH B = CLOSE (CO)
P1051 LCL CUR IMU3 = 0.94A (HH) remained OOL for about 3m.
P3012 BUS PRU A STAT = ON (FX)

At 190.15.41.31
P1012 LCL CUR IMU1 = 0.95A (HH) remained OOL for about 3m.

At 190.15.41.31
P1105 LCL STA FCV A = CLOSE (CO)

At 190.15.51.39
P5031 ATHN STAT 1A = CLOSE (CO)
P3104 BAT1 DICHA CUR M = 0.71A
P3105 BAT1 DICHA CUR R = 0.71A
These 3 remained OOL for about 1m.

At 190.15.52.51
P5030 ATHN STAT 2A = CLOSE (CO)
P3104 BAT1 DICHA CUR M = 0.71A
P3105 BAT1 DICHA CUR R = 0.71A
These 3 remained OOL for about 1m.

The above pattern of 3 OOL was repeated with the same relative timing for parameters P5029, P5028, P5027, P5026, P5025, P5024
Following this no new OOLs occurred.

As the SPACON and on-call support were unsure of the AOCS configuration (some AOCS HW ststuses had changed) AOCS timeline operations were suspended. Similarly the PLM instruments were placed in a safe mode. SOM / SOE and Flight Dynamics support were also requested.

	Investigation suggested that a SEU or similar had caused both BCRs to switch-off and the PRU to switch-on (the PRU is the unit which configures the satellite autonomously following separation from the launcher). Following switch on of the PRU the separation sequence would immediately start to execute again, this would explain all subsequent OOLs, the relative timing of OOLs was also in agreement. Following a check that the sequence had executed correctly and that apart from this the Satellite status was as expected, the following steps were taken to return to a nominal configuration: - Switch on BCR1 (FCP_EPS_1231) - Switch on BCR2 (FCP_EPS_1232) - Switch off PRU-A (FCP_EPS_1630) - Switch-off IMU-1 (FCP_AOC_1601) - Switch-off IMU-3 (FCP_AOC_1604) - Switch-off Nominal Cat Bed Heater B (FCP_AOC_1537) - Switch-off FCV-A (FCP_AOC_0004 step 5) - Switch-off LV-A (FCP_AOC_1512) Following this a reaction wheel biasing was executed as part of the attitude recovery operations, this was also a confirmation that the reconfiguration of the RCS components (LV, FCV, Cat. Bed Heater) had executed correctly. In parallel with the attitude recovery the payload instruments were brought back into use. The recovery was completed at 19.20z.
Item Configuration	
Environment	Routine Operations
Impacted Service	Loss of 3h 40m Science time.
Recommendation	
Affected Requirement	
External Reference	

Processing	
Root Cause	
Preventive Action	No
Resolution	
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-163	2006-10-30	BCR1 and 2 switch-off	Pending
Foreign Copy	CNES_OUT-154	2006-07-20	INT_SC-154 - PRU and BCRs Unexpected switching	Pending

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	BCR1 and 2 switch-off	State	Pending	ID	INT_SC-163

Originator	Richard Southworth	**Criticality**	High		
Created	2006-10-30 13:52	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-10-29 12:00	**Classification**	Space Segment | Spacecraft | EPS		

Description

Description

On DoY 302 at 09.24z, the following parameters changed status from ON (1) to OFF (0):

- P3004 BCR1 ON/OFF STATUS

- P3005 BCR2 ON/OFF STATUS

At the same time the battery charge current fell from its nominal value of 0.1A to 0.0A. As Integral is currently in eclipse season and the next eclipse was scheduled for the same day priority was given to restoring the correct BCR functionality (there was also a SPI problem at the same time: INT-SC-162). After checking the EPS status with the on-call SOE the SPACON switched the BCRs back on. BCR1 at 10.11z and BCR2 at 10.13z. Following this the battery trickle charge current returned to its nominal value of 0.1A for each battery.

It was noted that switching the BCRs back on also cleared the SPI problem, the reason for this is not known, however the behaviour of the SPII OOL at the time of each switch on makes it difficult to believe that it was just coincidence. For further details see INT-SC-162.

Item Configuration

Environment Routine Operations

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

ID	Title	Assigned	Due Date	State	Related Files
82	Relationship between SPI SAS HV ST L81 and BCR1 and 2 status	MM	2006-11-30	In Progress	

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-162	2006-10-30	SPI FEE HV status #81 Out of Specification	Pending
Local	INT_SC-68	2003-11-03	BCR2 Spurious Switch-off	Closed
Local	INT_SC-135	2005-12-14	BCR2 Spurious Switch-off #3	Closed
Local	INT_SC-154	2006-07-10	PRU and BCRs Unexpected switching	Pending
Local	INT_SC-99	2004-11-11	BCR2 Spurious Switch-off #2.	Closed
Local	INT_SC-89	2004-07-30	DoY 211_04 EPS Autonomously Changing Items ON/OFF Status	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	SPI Wrong On Request Report Generation by IASW 4.20 & 4.30	State	Pending	ID	INT_SC-70

Originator	Federico Cordero	**Criticality**	Low		
Created	2003-11-20 14:35	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2003-11-20 12:00	**Classification**	Space Segment | Payload | SPI		

Description

Description

On 20th Nov at around 07:10z, the SPI instrument was being deactivated for the uplink of a new version of the DPE software (IASW 4.30). After the SPI transition to Stand-by2 mode, during the execution of the S/As switch off procedure FCP_SPI1_0061, the command TC E0525 was sent to report the S/A on/off configuration on-request packet (TM packet 64041). Unexpectedly, the command did not generate this TM packet but triggered the downlink of another packet, the packet 64646, here after reported:

Header:

SC: 177 STID: 65535 SCID: 121 TPSD: -1

Filing Time: 2003-11-20T06:51:47.360847 Create Time: 2003-11-20T07:09:51.179277

APID: 1029 PSSC: 10866 SPTYPE: 5 SPSUBTYPE: 4 SPID: 64646

Dump:

0000:8C05EA72 01B15407 4F8D0216 08028016 302F2D34 31322B30 3930342F 25343230
0020:323532BC 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0040:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0060:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0080:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00A0:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00C0:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00E0:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0100:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0120:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0140:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0160:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0180:00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
01A0:00000000 00000000 00000000 00000000 00000000 0000F312

The command was sent four more times, always reporting the above unexpected packet. The TM packet 64041 was never seen.

We understood the problem as being related to the IASW and continued with the deactivation of the instrument and uplink of the new IASW 4.30. After the uplink, the new version of the software was also tested against the command E0525 while in stand-by2 mode: this time the TM packet 64041 was correctly downlinked.

Item Configuration

DPE software IASW 4.2.0

Environment

Impacted Service

Recommendation

Try to reproduce the problem on ground using the SPI simulator at CESR, Toulouse and understand if also the IASW 4.30 could be affected during the deactivation procedure.

Affected Requirement

External Reference	[Not Specified]

Processing

Root Cause	
Preventive Action	No
Resolution	ARB (16-1-04): confirmed PENDING. F. Cordero (5-7-04): confirmed pending and still present in IASW 4.30. ARB (26-7-04): confirmed PENDING. Integral Coordination Meeting (3-11-04): TBC. F. Cordero to contact SPI to check whether the AR can be closed. ARB (20/12/2004): reopened, also present in v. 4.3.1, a fix of the problem is possible and will be provided next year by SPI team as part of a future S/W update. - RS ARB #17 (10-10-05) Low priority Fix To be kept Open
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

ID	Title	Assigned	Due Date	State	Related Files
76	To further investigate	FC	2005-09-30	Completed	
70	Report on fixing of SPI On Request Report Generation by IASW 4.2.0. Additional investigations, performed with the help of CNES people, showed that the anomaly actually occurred a few days before, during the commanding of on-request telemetry. The problem occurred when more telemetry packets were requested for downlink than the allocated PST bandwidth. The IASW is unable to handle this situation for on-request TM. Discussions with CNES experts highlighted that the anomaly could occur again, with the current IASW version 4.3.0, as nothing has changed on this part of the code.	FC		Completed	

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	SPI Task Overrun Problems with IASW 4.3.0	State	Pending	ID	INT_SC-71

Originator	Federico Cordero	**Criticality**	High		
Created	2003-12-02 16:13	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2003-12-02 12:00	**Classification**	Space Segment | Payload | SPI		

Description

Description

On 25th November, during the in-flight validation tests of the IASW 4.3.0, a few anomaly and exception on-event-messages were generated by SPI. They were generated during the following tests:

§ during science acquisition - started at 13:26z - with single events filtering enabled, five spectra lines selected and multiple events reduction enabled:

--> OEM id.10 SPI1 PERIODIC TASK OVERRUN

--> OEM id.229 SPI1 PARTIAL FLAG OVERFLOW

--> OEM id.7 SPI1 CONSTRAINT DPE CULPR

§ during science acquisition - started at 14:11z - with multiple events reduction enabled only

--> OEM id.229 SPI1 PARTIAL FLAG OVERFLOW

§ during science acquisition - started at 14:52z - with single events filtering enabled only and five spectra lines selected

--> OEM id.10 SPI1 PERIODIC TASK OVERRUN

--> OEM id.7 SPI1 CONSTRAINT DPE CULPR

--> OEM id.224 SPI1 SW ERROR

--> OEM id.242 SPI1 FAILURE IN ANALYSING HSL DATA

The anomaly was never detected during the on-ground validation tests and is present only when the new features of IASW 4.3.0 are enabled. It is believed that this is due to the increased DPE processor load, occurring at certain data acquisition conditions in-flight.

CNES was present during the anomaly and will try to reproduce these conditions using the SPI simulator at Toulouse.

Item Configuration

IASW 4.3.0

Environment

in flight, nominal SPI configuration at 85K

Impacted Service

Recommendation

Try to reproduce the anomaly on-ground and find out a possible solution. The new features of SPI IASW 4.3.0 cannot be enabled with this anomaly.

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action

No

Resolution

ARB (16-1-04): confirmed PENDING.

F. Cordero (5-7-04): confirmed pending.

ARB (26-7-04): confirmed PENDING.

Integral Coordination Meeting (3-11-04): TBC. F. Cordero to contact SPI to check whether the AR can be closed.

ARB (20/12/2004), cannot be closed, investigation must be carried out and fix provided - FC

ARB #17 10-10-05 _ Investigation not yet performed but still requested to keep it open

F.Cordero 06-05-2006: Following OCR#211 in-flight tests, the part of the anomaly related to ME reduction can be deleted as the reported mulfunction was related to a DFEE - DPE link problem that seldomly occurs. The anomaly is still applicable for the SE filtering function and must stay open until resolution in a future IASW issue.

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

ID	Title	Assigned	Due Date	State	Related Files
69	Report on fixing of SPI Task Overrun Problems with IASW 4.3.0. The problem will be fixed in a next release of the instrument on-baord software. A plan is being discussed with the PI. The fix is not urgent but has to be solved within 2006. Otherwise it might have serious impact on science ops when the functions - cause of the anomaly - will be enabled due to the increasing radiation background.	FC	2005-09-30	Responded	

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS VETO toggling of the PMT 28 V set by IASW	State	Pending	ID	INT_SC-101

Originator	Federico Di Marco	**Criticality**	High		
Created	2004-11-18 11:04	**Urgency**	Low	**Reproducibility**	Yes
Occurrence Date	2004-11-18 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

Reported during the last weeks (Sept/October 2004) many occurences of the Veto 28 V PMT set by IASW (parameter G8015) in warning high (>29.4 V) for few TM cycles. This value is set by the IASW and not hrough the payloads PPDU or VETO power interface. The parameter toggled out/in limits reaching the limit value 29.4 V triggering the warning condition. During the event the VETO PMTs were OFF as it is nominally inside Radiation Belts and no further action was taken, accordingly to Payloads FDIR document (action V-VLT-1).

The event has been observed also during the last solar flare. On DoY 315 at 04:58Z, the VETO 28V PMT set by IASW (G8015) was continually toggling between nominal and warning high. The same behaviour was observed at 06:00Z. It is the first time this event is observed outside Radiation Belts and is likely connected to high radiations (requested PIs investigation). Also during this occurences the VETO s/s was in Stand-By with HVs OFF.

Item Configuration

Environment Routine

Impacted Service

Recommendation Requested clarification from the IBIS PIs.

Affected Requirement

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

Resolution

ARB (20/12/2004): Investigation on-going. - FdiM

Coordination Meeting #9 (21/6/05)

TM G8015 does not toggle any further but stays OOL.

Investigations ongoing by PI, AR open.

Investigation stopped however kept for open for logging

ARB #17 10-10-2005

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS: VETO VDM 09 High Voltage break down to ~550V	State	Pending	ID	INT_SC-129

Originator	Orlane Bergogne	**Criticality**	High		
Created	2005-10-11 12:08	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2005-10-11 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On DoY 2005.276 (03/10/2005) the following anomaly was reported:

1) at 09:11:19Z TM parameter G6043 (VDM 09 HV) was reported out of limits ALARM low, the value was 549.42V (instead of 992.68V usually). This did not trigger an OEM since the voltage was not close to 0. This is the first break down of module number 09; VDM15, 11, 4, 12 and 8 already reported break-down in the past.

At the time of the break-down, the VDM 09 temperatures were in limits and consistent with the others VDMs. The S/C was exiting the radiation belts at 45733.6km. The VETO lateral and bottom count rates dropped from ~30000 cts/s to 10000 cts/s. The VETO current remained nearly constant (from 1.63A to 1.64A). Similarly the VDM/CDM current changed from 0.99A to 0.98A and the VEB current from 1.47A to 1.48A.

The value of HV for VDM09 came back by itself to nominal at 09:12:39Z. However VETO counters remained low.

2) at 10:31Z, following the OOL & OEM reaction (V-HV-1) in the Payloads Recovery Document, VETO was set in Stand-By mode switching off all HVs with:

- FCP_IBIS1_0313 IBIS Transition to Stand-By (TC G0125)

- FCP_IBIS1_0203 VETO Transition to Stand-By (TC G0601);

3) at 10:36Z, still following V-HV-1, VETO was set in Maintenance mode and was monitored for 25 minutes. The value of VETO counters went back to nominal and remained there during the whole monitoring period. The anomaly did not occur again;

4) at 11:00Z, VETO was set back in Nominal and IBIS in Scientific Standard mode. The unit reported the following nominal values:

VDM 09 HV = 992.68V (nominal)

VETO counters both ~30000 cts/sec.

Item Configuration	
Environment	routine
Impacted Service	[Not Specified]
Recommendation	
Affected Requirement	
External Reference	[Not Specified]

Processing

Root Cause	
Preventive Action	No
Resolution	ARB #18 2 Nov 2005 Reduced urgency
Link Report	[Not Specified]

Related Files

Id	Filename	File Size	Status
1695	VDM09HVbreakdown.xls	137 kB	Available

Actions
No actions assigned to this report.

Related Reports
No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS: VETO TC rejected during the execution of VETO patch 3.2	State	Pending	ID	INT_SC-130

Originator	Orlane Bergogne	**Criticality**	High		
Created	2005-11-11 12:27	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2005-11-11 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On DoY 2005.315 (11/11/2005) at 04:24:40Z (1st solar eclipse of the winter season) during the uplink of the VETO patch 3.2 after eclipse the following events were reported:

at 04:24:40Z TC GU0613TC (TC-V-DUMP-31) failed acceptance,

at 04:24:41Z OEM ID 129 class 2 \"IASW TIME-OUT LSL DATA\",

at 04:24:41Z OEM ID 134 class 3 \"IASW EXTERNAL TC REJECTED COULD NOT BE EXECUTED\",

at 04:24:45Z OEM ID 129 class 2 \"IASW TIME-OUT LSL DATA\",

at 04:25:12Z TC GU0614PA (TC-V-PATCH-31) failed release.

This already happened during last winter eclipse season (on DoY 2004.334) as reported in INT_SC-102.

The OEMs flagged an on-board problem during the execution of the patch TC from the Event Designator ED GEVESP01. It actually reported an interruption of the Low Speed Line (TC/HK) communication between DPE and peripherals.

The failed TCs from the GEVESP01 were reuplinked by the operator and the rest of the patch was automatically uplinked following the timeline.

However a check in telemetry showed that both CDM01 and CDM02 were switched ON after the TC rejection. This led to the conlusion that VETO had performed a reset when this communication problem on LSL line occurred and was then running with the wrong configuration.

Under the guidance of the SOE, the following recovery was performed:

- at 04:50:13Z, TC G0102 (restore VETO CTX table from DPE)

- at 04:53:20Z, uplink GEVESP01.

As the recovery was completed well in advance before the exit of the belts, VETO was normally switched to Nominal mode with ED GEBEXT01 at 06:24:04Z.

The reason of the cut in communication (LSL error) is unknown.

Obviously, the solution implemented previously to increase the time range between ED GECLEX02 and ED GEVESP01 at eclipse reconfiguration does not seem to have fixed the problem.

Item Configuration

Environment

Impacted Service

Recommendation

Investigation of the IBIS/VETO teams on this problem as well as on similar ones (INT_SC-102 and INT_SC-86) is required.

For the coming eclipses, the operator and on-call SOE will be told about the recovery procedure to be executed in case of new anomaly occurrence.

Affected

Requirement	
External Reference	

Processing	
Root Cause	Unknown
Preventive Action	No
Resolution	2006-07-07 ARB (MS, RS, OB, FA, AP): Leave open until winter eclipse season has passed. _____ ARB (13.12.05) : to remain open
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: jump in the MSW of the block counter	State	Pending	ID	INT_SC-141

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-02-13 13:15	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-02-13 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

On DoY 2006.044 (13/02/2006) at 03:18Z, a jump in the MSW block counter (U9901 from 13 to 3468) was observed. This apparent internal timing problem triggered a very high proton count-rate (U9919 = 48256) as well as several Out Of Limits and corrupted telemetry parameters.

The anomaly affected the instruments since the proton count-rate crossed both OMC and IBIS thresholds (JEMX and SPI IREM automatism being disabled on PIs request). Both instruments entered their respective safe configuration at 03:18Z. OMC was recovered at 03:43Z and IBIS at 04:14Z.

At the time of the anomaly, the radiation background was quiet according to the Monitoring Tool (SEIS).

From a first investigation, this anomaly is similar to the one that occurred on 19/05/2004 (INT_SC_80) but this time the unit did not cure the problem itself. The MSW of the block counter did not come back to its initial value after the jump and corrupted data kept being reported.

The status of the unit pre-anomaly (03:18:37Z) was:

- LCL current = 0.073 A
- radiation counters: proton = 3, dose = 0 and electron = 24
- LSW of the IREM block counter = 52618
- MSW of the IREM block counter = 13.

At the time of the anomaly (03:18:45Z) it was:

- LCL current = 0.073 A
- radiation counters: proton = 48256, dose = 1 and electron = 0
- LSW of the IREM block counter = 52619
- MSW of the IREM block counter = 3468
- and the IREM status word was 16397 [dec]= 400D [hex]:

0 Integral Ground Link Off
1 BIT/TDB failed
0 Accumulation off
0 Integral Counting off
0 Operation Mode = Standard
0 Command validity = invalid
0 5.0 Voltage Out of range = no
0 6.0 Voltage Out of range = no
0 High Voltage = off
0 Checksum failure = no
0 Watchdog Elapsed = no

	0 Electron Alarm Underactivity = no 1 Electron Alarm Hyperactivity = yes 1 Proton Alarm Underactivity = yes 0 Proton Alarm Hyperactivity = no 1 IREM state = busy. However this value is probably irrelevant during the anomaly. The first cycle after the anomaly (03:18:53Z) reported: - LCL current = 0.088 A (inside the determination of the lsb) - radiation counters: proton = 48256, dose = 1 and electron = 0 - LSW of the IREM block counter = 65535 (FFFF hex) - MSW of the IREM block counter = 3469. The second cycle after the anomaly (03:19:01Z) reported: - LCL current = 0.073 A - radiation counters: proton = 48256, dose = 2 and electron = 0 - LSW of the IREM block counter = 0 - MSW of the IREM block counter = 3470. To recover IREM the following activities were performed: - at 04:52Z, send TC U4904 (parameter U4903=0) to check the status word of IREM: 137A [hex] = 0001001101111010 [bin] (different from usual SEU ones) - at 10:17Z, start complete dump of the memory - at 13:30Z, do a power reset of the unit: TC P3130 (power off) and TC P3131 (power on) - at 13:32Z, resume \"usual\" recovery (CRP_SYS_2570) and apply patch (FCP_RM_0080).
Item Configuration	
Environment	Routine
Impacted Service	
Recommendation	Investigations to find correlation between this anomaly and the previous ones.
Affected Requirement	
External Reference	

Processing	
Root Cause	Unknown
Preventive Action	No
Resolution	2006-07-07 ARB (MS, RS, OB, FA, AP): Leave open in order to keep track _____
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-139	2006-02-01	IREM Anomaly: jump in the Dose count-rate (U9920)	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	SPI: Autonomous Change in PSD Low Threshold for detector 4	State	Open	ID	INT_SC-155

Originator	Salma Fahmy	**Criticality**	Low		
Created	2006-07-26 09:59	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-07-21 12:00	**Classification**	Space Segment | Payload | SPI		

Description

Description

On 2006-07-21 at approximately 15:30Z, ISDC informed MOC that at 11:48Z TM parameter E3674 R PD LOW-TH L4 (Low Threshold for detector 4) had changed its value autonomously from 80 to 208. This is the lower energy threshold for the processing of events by the PSD from detector 4. The ED EEORTM01 was uplinked to refresh SPI configuration and HK TM and verify that there were no other anomalies. It was concluded that the change in this threshold was probably due to an SEU on the PSD. As it was not critical, and in order not to interrupt the ongoing science observations, it was decided to set the value back to nominal shortly before radiation belt entry of the ongoing revolution (460), on 2006-07-22.

Therefore the following was performed on 2006-07-22:

â€¢ 20:12Z FCP_SPI1_0160 SPI BACK TO CONFIGURATION MODE.

â€¢ 20:14Z TPF ES1741_PD_LWTHR_FMCONFIG_0003.TPF uplinked to set the nominal PSD low energy thresholds.

â€¢ 20:15Z FCP_SPI1_0130 SPI TRANSITION TO PHOTON MODE.

SPI operations continued nominally.

Item Configuration	
Environment	Routine Operations
Impacted Service	
Recommendation	
Affected Requirement	
External Reference	

Processing

Root Cause	Unknown
Preventive Action	No
Resolution	
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS: VETO VDM 10 High Voltage break down	State	Pending	ID	INT_SC-144

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-03-23 10:15	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-03-23 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On DoY 2006.081 (22/03/2006) at 22:35Z, the following OEM (class 2, ID 186) was reported:

<<IBIS1 VETO PMTXX IS ON AND CORRESPONDING HV MONITORING IS ABOUT ZERO>>;

at the same time, TM parameter G6044 (V1S-VDM10HV) was reported Out Of Limit Low-Low with a value of ~0 (-34V).

Before the anomaly the main VETO parameters reported nominal values:

G6012 (VETO current)= 1.62 A
G6013 (VETO VDM/CDM current)= 0.98 A
G6062 (VETO BOT counter)= 36256 /s
G6063 (VETO LAT counter)= 36256 /s
G6050 (VETO VDM10 HV)= 1034.0 V

During the anomaly,the currents dropped down due to the HV break-down of VDM #10, as well as the count-rates (due to missing contribution of module #10):

G6012 (VETO current)= 1.58 A
G6013 (VETO VDM/CDM current)= 0.94 A
G6062 (VETO BOT counter)= 34704 /s
G6063 (VETO LAT counter)= 34696 /s
G6050 (VETO VDM10 HV)= -34.0 V

No special radiation was reported at the time of the anomaly, according to the SEIS tool.

The anomaly was recovered by the operator following the recovery action V-HV-1:

1- Set IBIS-IASW in Stand-By
2- Set IBIS-VETO in Stand-By
3- Set IBIS-VETO in Maintenance and monitor for ~45mins
4- Set IBIS-VETO in Stand-By
5- Set IBIS-VETO in Nominal
6- Set IBIS-IASW in Science Standard.

At 23:50Z IBIS was back in Science Standard and VETO in Nominal.
The main VETO parameters were nominal:

G6012 (VETO current)= 1.61 A
G6013 (VETO VDM/CDM current)= 0.98 A

	G6062 (VETO BOT counter)= 36176 /s G6063 (VETO LAT counter)= 36168 /s G6050 (VETO VDM10 HV)= 1028.0 V.
Item Configuration	
Environment	
Impacted Service	
Recommendation	
Affected Requirement	
External Reference	

Processing

Root Cause	System/Equipment_Failure
Preventive Action	No
Resolution	2006-07-07 ARB (MS, RS, OB, FA, AP): Equipment malfunction -> Reoccurs -> kept open for tracking _____
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-138	2006-01-30	IBIS: VETO VDM 16 High Voltage break down	Closed
Local	INT_SC-126	2005-09-14	IBIS: VETO VDM 08 High Voltage break down	Closed
Local	INT_SC-136	2006-01-03	IBIS: VETO VDM 03 High Voltage break down	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: Reset of IREM_CSCI S/W #31, 10/06/2006	State	Pending	ID	INT_SC-152

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-06-12 09:08	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-06-12 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

The 31st reset of IREM S/W occurred on 10/06/2006(DoY 2006.161) at 12:18Z. This was during science observations of revolution 446, which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The sequence of events was as follows:

12:18Z IREM S/W crash; IBIS and OMC to Safe mode

12:19Z IBIS and OMC disabled from Timeline

12:45Z Start recovery with procedure CRP_SYS_2570

12:51Z DRMC flag set to DISREGARD

12:53Z OMC exit from Safe, enabled in timeline

13:06Z IBIS into Scientific Standard mode, enabled in Timeline

15:03Z IREM patch procedure completed (FCP_RM_0081)

15:05Z DRMC flag set to REGARD; IREM enabled in Timeline.

Item Configuration

Environment

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-157	2006-08-17	IREM Anomaly: Reset of IREM_CSCI S/W #32, 16/08/2006	Pending
Local	INT_SC-132	2005-11-25	IREM Anomaly: Reset of IREM_CSCI S/W #28, 21/11/2005	Closed
Local	INT_SC-146	2006-04-10	IREM Anomaly: Reset of IREM_CSCI S/W #29, 09/04/2006	Closed
Local	INT_SC-149	2006-05-02	IREM Anomaly: Reset of IREM_CSCI S/W #30, 30/04/2006	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS: VETO CDM1 High Voltage break down	State	Pending	ID	INT_SC-148

Originator	Orlane Bergogne	**Criticality**	Low		
Created	2006-04-24 15:53	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-04-24 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On DoY 2006.114 (24/04/2006) at 14:51Z, the following OEM (class 2, ID 186) was reported:

<<IBIS1 VETO PMTXX IS ON AND CORRESPONDING HV MONITORING IS ABOUT ZERO>>;

at the same time, TM parameter G6051 (V1S-CDM01HV) was reported Out Of Limit Low-Low with a value of ~0 (-31.5V), G6011 (V1S-CDM1TEMP) was OOL High-High with 104.4degC (=raw 0) and G6061 (V1S-CAL-COUNT) was OOL Low-Low with 0/s.

Before the anomaly the main VETO parameters reported nominal values:

G6012 (VETO current)= 1.63 A

G6013 (VETO VDM/CDM current)= 0.98 A

G6061 (VETO CAL counter)= 1860 /s

G6051 (VETO CDM01 HV)= 1052.26 V

G6011 (VETO CDM01 TEMP)= -25.88 degC

During the anomaly,the currents dropped down due to the HV break-down of CDM #1, as well as the Calibration count-rate (due to missing contribution from the only Calibration module):

G6012 (VETO current)= 1.60 A

G6013 (VETO VDM/CDM current)= 0.94 A

G6061 (VETO CAL counter)= 0 /s

G6051 (VETO CDM01 HV)= -31.5 V

G6011 (VETO CDM01 TEMP)= 104.4 degC

Note:

the temperature telemetry (G6011 in HK1 and G6227 in HK4) coming from the Calibration Unit, both seemed corrupted during the anomaly, giving a raw value of 0.

No special radiation was reported at the time of the anomaly, according to the SEIS tool.

The anomaly was recovered by the operator following the recovery action V-HV-1:

1- Set IBIS-IASW in Stand-By

2- Set IBIS-VETO in Stand-By

3- Set IBIS-VETO in Maintenance and monitor for ~45mins

4- Set IBIS-VETO in Stand-By

5- Set IBIS-VETO in Nominal

6- Set IBIS-IASW in Science Standard.

At 15:47Z IBIS was back in Science Standard and VETO in Nominal.

	The main VETO parameters were nominal: G6012 (VETO current)= 1.62 A G6013 (VETO VDM/CDM current)= 0.98 A G6061 (VETO CAL counter)= 1828 /s G6051 (VETO CDM01 HV)= 1052.26 V G6011 (VETO CDM01 TEMP)= -25.55 degC.
Item Configuration	
Environment	
Impacted Service	
Recommendation	
Affected Requirement	
External Reference	

Processing	
Root Cause	System/Equipment_Failure
Preventive Action	No
Resolution	2006-07-07 ARB (MS, RS, OB, FA, AP): Equipment malfunction -> Reoccurs -> kept open for tracking _____
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-145	2006-03-27	IBIS: VETO CDM1 High Voltage break down	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: Reset of IREM_CSCI S/W #33, #34, #35	State	Pending	ID	INT_SC-158

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-09-19 09:08	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-09-18 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

The 33rd reset of IREM S/W occurred on 08/09/2006 (DoY 2006.251) during the perigee passage between revolutions 476 and 477. No science observations was hence interrupted.

The sequence of events was as follows:

DOY 251 19:59Z IREM S/W crash

DOY 251 20:05Z LOS

DOY 251 23:34Z AOS

DOY 252 02:24Z DRMC flag set to DISREGARD

DOY 252 03:57Z SEU recovery procedure (CRP_SYS_2570)

DOY 252 04:45Z IREM patch procedure (FCP_RM_0081)

DOY 252 07:20Z IREM patch procedure completed (FCP_RM_0081)

DOY 252 09:30Z DRMC flag set to REGARD; IREM enabled in Timeline.

The 34th reset of IREM S/W occurred on 10/09/2006 (DoY 2006.253) at 15:41Z. This was during science observations of revolution 477, which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The sequence of events was as follows:

15:41Z IREM S/W crash; IBIS and OMC to Safe mode

15:42Z IBIS and OMC disabled from Timeline

15:48Z Start recovery with procedure CRP_SYS_2570

16:12Z DRMC flag set to DISREGARD

16:40Z IBIS into Scientific Standard mode, enabled in Timeline

16:44Z OMC exit from Safe, enabled in timeline

17:09Z IREM patch procedure started (FCP_RM_0081)

18:29Z IREM patch procedure completed (FCP_RM_0081)

22:26Z DRMC flag set to REGARD; IREM enabled in Timeline.

The 35th reset of IREM S/W occurred on 18/09/2006 (DoY 2006.261) at 16:23Z. This was during science observations of revolution 480, which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The sequence of events was as follows:

16:23Z IREM S/W crash; IBIS and OMC to Safe mode

16:27Z IBIS and OMC disabled from Timeline

16:43Z Start recovery with procedure CRP_SYS_2570

16:44Z DRMC flag set to DISREGARD

17:09Z OMC exit from Safe, enabled in timeline

17:27Z IBIS into Scientific Standard mode, enabled in Timeline

18:44Z IREM patch procedure started (FCP_RM_0081)

20:59Z IREM patch procedure completed (FCP_RM_0081)

22:40Z DRMC flag set to REGARD; IREM enabled in Timeline.

It is the first time there have been 3 IREM SEUs in less than 10 days.

The first conclusion is that the \"manual power reset\" activity that has been performed since April 2006, has got no effect. Therefore this can be stopped. And, the idea of a charging/discharging phenomenom can be discarded.

The sensitivity of the IREM micro-chip to cosmic particles seems to remain the most reasonnable explanation. Actually, the sun has been particularly quiet these days. The solar wind protection against cosmic particles is hence very low. This could increase the risk of SEU.

Item Configuration

Environment

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-157	2006-08-17	IREM Anomaly: Reset of IREM_CSCI S/W #32, 16/08/2006	Pending
Local	INT_SC-159	2006-09-29	IREM Anomaly: Reset of IREM_CSCI S/W #36, 29/09/2006	Pending

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	SPI Automatic Reconfiguration Anomaly at Radiation Belt Exit	State	Pending	ID	INT_SC-160

Originator	Salma Fahmy	**Criticality**	High		
Created	2006-10-11 09:00	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-09-30 12:00	**Classification**	Space Segment | Payload | SPI		

Description

Description

On 2006-09-30T00:23:56Z, at radiation belt exit of revolution 484, the following OEMs were received from SPI:

APID 1024 ID 176 ANOMALY SPI1 CONFIGURATION STATUS ACQ ERROR

E9765 S/A AUTOTEST ERR PSD

E9079 MESS CLASS 2

E9080 MESS ID 176

E9766 HIGH BYTE 33

E9767 MEDIUM BYTE 0

E9768 LOW BYTE 0

FIX8 161

>>indicating an error in the acquisition of the configuration status of the PSD.

APID 1024 ID 177 ANOMALY SPI1 AUTOMATIC RECONFIGURATION ERROR

E9769 AUTOMATIC STEP CONF STATUS

E9079 MESS CLASS 2

E9080 MESS ID 177

FIX16 0

FIX16 0

>>indicating an error in the CONF STATUS step of the automatic reconfiguration. This is the penultimate step of the automatic reconfiguration, when the IASW asks each S/A which is ON for its configuration status.

APID 1024 ID 130 EVENT SPI1 STATE CHANGE

FIX6 0

E9079 MESS CLASS 0

E9080 MESS ID 130

E9755 OLD STATE AUTOMATIC

E9756 NEW STATE COMMANDED

>>This indicates that the nominal change of state following automatic reconfiguration at belt exit was executed.

APID 1024 ID 192 TC REJECT SPI1 TC NOT EXECUTED

E9771 TC REJECT REASON TC BAD EXEC

E9079 MESS CLASS 3

E9080 MESS ID 192

FIX5 0

E9781 APID REJECT TC 1025

FIX2 0

E9770 SSC NOT EXEC TC 8195

>>indicating that the TC from the DPE to the subassemblies to go to PHOTON mode was not executed.

The mode of the IASW and all subassemblies remained in CONF following the automatic

	reconfiguration after radiation belt exit, rather than transitioning to PHOTON/OPER. SPI was recovered by manually re-starting the automatic reconfiguration and commanding the transition into PHOTON mode as follows: â€¢ 2006-09-30T01:21:20Z FCP_SPI1_0175 SPI RESTORE ALL CONFIGURATION SETTINGS â€¢ 2006-09-30T01:32:55Z FCP_SPI1_0130 SPI TRANSITION TO PHOTON MODE SPI operations continued nominally.
Item Configuration	SPI IASW 4.3.2
Environment	Routine operations at radiation belt exit
Impacted Service	Science data
Recommendation	
Affected Requirement	
External Reference	

Processing	
Root Cause	Unknown
Preventive Action	No
Resolution	
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: Reset of IREM_CSCI S/W #36, 29/09/2006	State	Pending	ID	INT_SC-159

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-09-29 11:44	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-09-29 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

The 36th reset of IREM S/W occurred on 29/09/2006 (DoY 2006.272) at 05:46Z. This was during science observations of revolution 483 (CRAB Calibration for IBIS and SPI), which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The sequence of events was as follows:

05:46Z IREM S/W crash; IBIS and OMC to Safe mode

06:09Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD

06:41Z IBIS into Scientific Standard mode, enabled in Timeline

06:47Z OMC exit from Safe, enabled in timeline

07:16Z IREM patch procedure started (FCP_RM_0081)

08:25Z IREM patch procedure completed (FCP_RM_0081)

10:46Z DRMC flag set to REGARD; IREM enabled in Timeline.

Item Configuration

Environment

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-158	2006-09-19	IREM Anomaly: Reset of IREM_CSCI S/W #33, #34, #35	Pending
Local	INT_SC-164	2006-11-01	IREM Anomaly: Reset of IREM_CSCI S/W #37, 31/10/2006	Open

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS-VETO Calibration, Bottom and Lateral Counters reported reduced count-rates	State	Pending	ID	INT_SC-153

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-06-20 12:36	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-06-19 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On 2006-06-19 (DoY 170) at 02:02Z, parameters G6061 (V1S-CAL-COUNT), G6062 (V1S-BOT-COUNT) and G6063 (V1S-LAT-COUNT) reported a drop. This triggers the OOL \"warning low\" for G6061(new limits definition for this parameter since 2006-05-24).

In coincidence with this event, an increase of VETO total current (G6012) has been reported.

Before anomaly (02:02:10Z):

G6061 (V1S-CAL-COUNT) = 1876 cnt/s

G6062 (V1S-BOT-COUNT) = 37216 cnt/s

G6063 (V1S-LAT-COUNT) = 37200 cnt/s

G6012 (V1S-VETOCURR) = 1.62 A

After anomaly (02:02:26Z):

G6061 (V1S-CAL-COUNT) = 1364 cnt/s

G6062 (V1S-BOT-COUNT) = 16744 cnt/s

G6063 (V1S-LAT-COUNT) = 16728 cnt/s

G6012 (V1S-VETOCURR) = 1.63 A

About 15min after the anomaly, P2002 (LCL CUR VEB A) also increased slightly from 1.48A to 1.50A.

The radiation background was quiet according to the SEIS-tool and to IREM counters.

After consultation of the on-call SOE, a mode cycle Nominal/Stand-By/Nominal of VETO was preformed. This fixed the problem as VETO counters came back to nominal values.

note: 2 pages of plots showing VETO Counters and Currents are enclosed to this report.

Item Configuration

Environment

Routine

Impacted Service

Recommendation

This problem already occured on 2006-05-20 (INT_SC-150), 2004-07-30 and 2004-08-08 (INT_SC-92).

Investigations on PI side.

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action	No
Resolution	
Link Report	[Not Specified]

Related Files

Id	Filename	File Size	Status
3220	IBIS_VETO_COUNTS_DOY170.doc	46.5 kB	Available
3221	IBIS_VETO_CURRENTS_DOY170.doc	101 kB	Available

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-150	2006-05-22	IBIS-VETO Calibration, Bottom and Lateral Counters reported reduced count-rates	Closed
Local	INT_SC-92	2004-09-08	IBIS- VETO calibration, bottom and lateral counters reported reduced count-rates	Closed

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IBIS: PICsIT PDM6 Latch-up Mode	State	Open	ID	INT_SC-156

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-08-07 09:54	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-08-06 12:00	**Classification**	Space Segment | Payload | IBIS		

Description

Description

On 2006-08-06 at 05:04:21Z,the following OEM was reported:

<< APID 1280, class 1, id 170, IBIS1 PICSIT LATCHED UP MODULE NOTIFICATION>>.

It concerned PDM #6 that reported at the same time TM parameter G5042 (P0E-PDM6STB) OFF. All others PDM were working nominally, and PICsIT was in Nominal mode.

The reason for this change of status remains unknown at the time being.

No radiation were reported by the Payload counters nor IREM, at the time of the anomaly.

Following the action in FDIR, the recovery consisted in switching OFF PDMs, then switching them ON and enabling them.

1/ At 06:11Z IBIS was set in Stand-By mode with TC G0125.

2/ From 06:55Z to 07:21Z, all PDMs were switched OFF with FCP_IBIS1_0315 to FCP_IBIS1_0329.

3/ From 07:40Z to 07:48Z, all PDMs were switched ON with FCP_IBIS1_0103 to FCP_IBIS1_0110 steps 3.3.

Note that the requirements of these procedures were not met since PICsIT was still in Nominal and the thermal configuration was also the Nominal one (in particular HTR CSI B CLOSE and HTR CSI A OPEN). In fact the recovery concerned only the PDMs not the PFDM or PEB; and, since the detectors had not been OFF for a long time, it was not needed to change the Heaters status (therefore only steps 3.3 were relevant).

4/ From 07:50Z to 08:09Z, all PDMs were enabled with FCP_IBIS1_0213 to FCP_IBIS1_0227 using the dynamic TC GU0512 as advised in steps 3.

PDM #6, like all the others, showed nominal TM (temperatures, voltages and counters).

5/ As the recovery was successful, IBIS was set back in Scientific Standard mode at 08:14Z.

The impact on the science was: Pointing #48 was interrupted, Pointings #49 to #51 were missed, and Pointing #52 started with a slight delay.

Item Configuration

Environment

no radiation

Impacted Service

Recommendation

If thermal equilibrium OK, then switch off/on and enable only the concerned PDM.

Affected Requirement

External Reference

Processing	
Root Cause	
Preventive Action	No
Resolution	
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: Reset of IREM_CSCI S/W #32, 16/08/2006	State	Pending	ID	INT_SC-157

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-08-17 13:00	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-08-16 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

The 32nd reset of IREM S/W occurred on 16/08/2006(DoY 2006.228) at 18:07Z. This was during science observations of revolution 469, which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The sequence of events was as follows:

18:07Z IREM S/W crash; IBIS and OMC to Safe mode

18:09Z IBIS and OMC disabled from Timeline

18:13Z Start recovery with procedure CRP_SYS_2570

18:36Z DRMC flag set to DISREGARD

19:10Z IBIS into Scientific Standard mode, enabled in Timeline

19:16Z OMC exit from Safe, enabled in timeline

22:00Z IREM patch procedure completed (FCP_RM_0081)

22:20Z DRMC flag set to REGARD; IREM enabled in Timeline.

It should be noted that 2 hours before the SEU, a C3 solar flare was emitted from sunspot 904 (precisely at 16:17Z). No impact had been noticed on the P/L counters however.

Item Configuration

Environment

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-158	2006-09-19	IREM Anomaly: Reset of IREM_CSCI S/W #33, #34, #35	Pending
Local	INT_SC-152	2006-06-12	IREM Anomaly: Reset of IREM_CSCI S/W #31, 10/06/2006	Pending

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	JEM-X1 DFEE CRC Anomaly following eclipse on 2006-10-26	State	Pending	ID	INT_SC-161

Originator	Salma Fahmy	**Criticality**	High		
Created	2006-10-27 15:36	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-10-26 12:00	**Classification**	Space Segment | Payload | JEM-X		

Description

Description

On 2006-10-26, during the post-eclipse reconfiguration of JEM-X1 following the 1st eclipse of this season, another DFEE anomaly occurred like those observed on 2004-06-20, 2004-06-23, 2004-12-08; 2005-05-18 and 2005-11-14 (ref: Anomaly Reports INT_SC-84; INT_SC-104; INT_SC-119 and INT_SC-131).

The symptoms were as follows:

1) The following OEMs were received after the JEM-X1 DFEE was switched on by the ED KECLEX01 in the Timeline (uplinked at 2006-10-26T20:21:52Z):

2006.299.20.22.39.200 2006.299.20.22.45.501 1536 RealTime 191 EVENT JEM-X1 PROB DFEE 11

>> Indicating that the operation â€œLoad DFEE contextâ€• was unsuccessful due to CRC failure 2006.299.20.22.39.200 2006.299.20.22.45.534 1536 RealTime 234 EVENT JEM-X1 AUTO EVENT 4

>>> Indicating failure of the automatic recovery from shutdown level ECLIPSE to shutdown level RAD. BELTS

2) Following the KECLEX01 ED, the JEM-X1 DFEE state (TM parameter K5022) remained MEMORY, instead of SAFE, and the Active Shutdown Level (TM parameter K5381) remained ECLIPSE instead of RAD. BELTS.

3) The DFEE CPU speed, TM parameter K5583 CPU MODE, remained at a value of 8 MHz WAIT (as at startup) rather than the nominal value of 16MHz.

In order to recover JEM-X1, a power cycle was performed according to CRP_JEM1_5010 JEMX1 DFEE POWER CYCLE, consisting of:

â€¢ 21:04:39Z FCP_JEM1_9010 JEMX1 DFEE SWITCH OFF

â€¢ 21:23:28 Z FCP_JEM1_0021 JEMX1 DFEE ACTIVATION

The above recovery proceeded nominally and JEM-X1 operations then continued from the Timeline with the ED KEACAL01 (Anode Calibration at radiation belt exit).

Item Configuration

Environment Routine operations

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution

Link Report	[Not Specified]

Related Files
No files are attached to this report.

Actions
No actions assigned to this report.

Related Reports
No other reports related to this report.

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	SPI FEE HV status #81 Out of Specification	State	Pending	ID	INT_SC-162

Originator	Richard Southworth	**Criticality**	Low		
Created	2006-10-30 13:27	**Urgency**	Low	**Reproducibility**	Unknown
Occurrence Date	2006-10-29 12:00	**Classification**	Space Segment | Payload | SPI		

Description

Description

On DoY 302 (29/10/2006) at 03.04z the following parameter went ot of limits indicating a status consistency failure.

- E3277 SAS HV-ST L81 (FEE HV status #81)

Its value changed from 2 (\"CORRECT VALUE\") to 3 (\"PARAM < SPEC\") indicating a problem with one of the SPI FEE HV values.

Following the failure the SPACON checked the applicable action in the SPI Users manual, which referred to SPI CRP ECP7 (ACRS Reset) in the Users manual.

After contcting the on-call support the SPACON then started execution of this procedure. The CRP executed correctly and the OOL was cleared, however the following parameter was OOL HH

- P2017 LCL CUR AF2 DT A

Further investigation showed that in fact the value of this parameter had not changed, however the applicable set of limits had changed from 0 to 1.77-2.22A to 0.0-0.4A, also a number of other SPI TM parameters were invalid. Investigation showed that the OOL set selection criteria for this parameter is based on the statuses of parameters E170, E1080 and E1090 which indicated OFF and had previously been ON.

The SPACON and on-call engineer then decide to re-execute the ACS reset together, this was done with the smae result.

After consultation with the SPI engineer CRP_SPI1_3070 was executed, this cleared all OOL and SPI was restored to normal status.

The table of SPI OOL must be updated to remove reference to any non applicable procedures such as ECP7, any such procedures in the SPACON documentation must be clearly marked as such and a link to the applicable procedure must be made.

On DoY 302 (29/10/2006) at 09.28z, E3277 again went OOL just 4m., after both BCRs swithed off spuriously (see INT-AR-163).

As the BCR switch-off was judged to be more critical than the SPI problem (upcoming eclipse), priority was given to the BCRs. At 10.11z BCR1 was swithed back on, parameter E3277 then went back in limits for abouit 30s. at 10.13z when BCR2 was switched on E3277 went back in limits and stayed in limits.

At 11.04z E3277 again went OOL CO, no action was taken as we were close to the belts entry which would anyway switch-off SPI, possibly the subsequent deactivation and rea-ctivation for the eclipse passage would cler the problem permanently.

attachments:

- Anomaly Analysis
- Radiation Analysis

Item Configuration

Environment Routine Operations

Impacted Service

Recommendation	_____ Email by: \"Dr. Andreas von Kienlin\" <azk@mpe.mpg.de> 09/11/2006 15:45 _____ Dear Federico, Thank you for your detailed report. I forwarded it to Mr. Lichtenauer, Jena-Optronik, asking for an interpretation of the observed problem and for recommendations for further tests. In the meantime we should proceed as you proposed in your conclusions: - to switch of the FEE. Thanks to the redundancy concept ACS will not have a\" hole\" in its shield. - to try a reanimation after the next annealing Best regards Andreas > > > Andreas, > > here is a first quick-look analysis of the anomaly done with the available > information. If you wish, you can add your considerations and then > circulate > the note. Feel free to change/correct it. > (See attached file: Fee81AnomalyAnalysis.doc) > Regards, > > Federico Cordero > >
Affected Requirement	
External Reference	

Processing	
Root Cause	
Preventive Action	No
Resolution	The SPI ACS FEE 81 was switched off on 2006-11-09 starting at 16:24Z, with SPI back in Photon mode at 16:31Z. Operations following the switch-off were nominal.
Link Report	[Not Specified]

Related Files

Id	Filename	File Size	Status
3906	Fee81AnomalyAnalysis.doc	215.5 kB	Available
3915	Radiation_Analysis_FEE81_HV_status_OOL.pdf	311.93 kB	Available

Actions					
ID	**Title**	**Assigned**	**Due Date**	**State**	**Related Files**
81	Revise SPI OOL-CRP tables	SF	2006-11-30	In Progress	

Related Reports				
Relation	**ID**	**Created**	**Description**	**State**
Local	INT_SC-163	2006-10-30	BCR1 and 2 switch-off	Pending

Anomaly Report Tracking System

Project	Integral Spacecraft Anomalies	Project ID	INT_SC	Report Type	SC
Observation	IREM Anomaly: Reset of IREM_CSCI S/W #37, 31/10/2006	State	Open	ID	INT_SC-164

Originator	Orlane Bergogne	**Criticality**	High		
Created	2006-11-01 09:37	**Urgency**	High	**Reproducibility**	Unknown
Occurrence Date	2006-11-01 12:00	**Classification**	Space Segment | Payload | IREM		

Description

Description

The 37th reset of IREM S/W occurred on 31/10/2006 (DoY 2006.304) at 02:18Z. This was during science observations of revolution 494, which were interrupted as a result for IBIS and OMC. JEM-X and SPI automatism have been disabled as requested by PIs.

The investigation on IREM revealed that the reset was not due to a Checksum Failure as it was for the 36 previous cases but to a Watchdog Elapsed.

Actually the dump of the IREM status at the time of the reset reported HEX BCA0 instead of the usual HEX BCC0. The difference is in 2 bits: Checksum Failure = NO, Watchdog Elapsed = YES.

According to the user manual, \"when the watchdog elapses, the HW causes a local reset. After a restart with a program copy from PROM to RAM, the software increments the watchdog failure counter (also verified in TM during the IREM anomaly investigation) and sets the Watchdog Elapsed flag in IREM_STATUS\".

The recovery for this reset is the same as the one for a Checksum Failure. The sequence of events was as follows:

02:18Z IREM S/W crash; IBIS and OMC to Safe mode

02:41Z Start recovery with procedure CRP_SYS_2570

02:54Z DRMC flag set to DISREGARD

03:49Z IBIS into Scientific Standard mode, enabled in Timeline

03:52Z OMC exit from Safe, enabled in timeline

04:55Z IREM patch procedure started (FCP_RM_0081)

06:10Z IREM patch procedure completed (FCP_RM_0081)

06:18Z DRMC flag set to REGARD; IREM enabled in Timeline.

Note: the radiation background seems to be particularly active lately as other anomalies have occured on the S/C (see INT_SC-162 for SPI & 163 for BCR).

Item Configuration

Environment Eclipse season

Impacted Service

Recommendation

Affected Requirement

External Reference

Processing

Root Cause

Preventive Action No

Resolution	
Link Report	[Not Specified]

Related Files

No files are attached to this report.

Actions

No actions assigned to this report.

Related Reports

Relation	ID	Created	Description	State
Local	INT_SC-159	2006-09-29	IREM Anomaly: Reset of IREM_CSCI S/W #36, 29/09/2006	Pending