



Anomaly Report Tracking System

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|------------------------|--------------------------------------|-----------------------|--------------------------------|------------------------|-------------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IBIS VETO Crash | State | Pending | ID | INT_SC-222 |
| Originator | Salma Fahmy | Criticality | High | | |
| Created | 2008-04-04 13:21 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2008-03-31 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

IBIS Veto Crash

Symptoms

On 2008-03-31 at 02:11:25Z the following OOLs were received on the VETO currents:

â€¢ G6012 V1S-VETOCURR Alarm Low , Value = 0A

â€¢ G6013 V1S-VDMCDMCURR Alarm Low, Vale = 0A

followed at 02:11:41Z by an OOL on the Veto Electronic Box LCL current:

â€¢ P2002 LCL CUR VEB A Alarm Low, Value = 0.30A

At the same time, the following OEM began to be generated every 8 seconds:

2008.091.02.11.22.466 2008.091.02.11.27.406 1280 RealTime 129 ANOMALY IBIS1 IASW TIME-OUT TRANSMITTING LSL DATA

This indicated a problem in transmitting housekeeping data to the DPE.

Prior to the anomaly all VETO, as well as other IBIS, TM parameters were nominal and the behaviour of the instrument was nominal.

Following the anomaly, in addition to the above OOLs and OEMs, the following parameters were showing non-nominal values (all equal to 0 RAW):

â€¢ VETO mode: TM G6008 V1S-NOMBIT = STAND/BY (This would indicate VETO had transitioned to Standby mode autonomously.)

â€¢ VDM statuses: TM G6014-G6029 = OFF

â€¢ CDM01 status: TM G6031 = OFF (CDM02 also OFF as nominal)

â€¢ VDM and CDM High Voltages: TM G6035-G6052 = 0 Raw and invalid (due to VDMs and CDM being OFF)

â€¢ VETO bottom, lateral and calibration counters: TM G6061-G6063 = 0

â€¢ TM G6011 V1S-CDM1TEMP = 104.4degC [0 RAW]

â€¢ TM G6002 V1S-SWNR = 0 (This would indicate standard VETO SW, instead of nominal value of 2.)

â€¢ TM G6004 V1S-WATCHSTAT = 0 (instead of 0.64 sec)

â€¢ EPROMBIT and RAMBIT: TM G6005-G6006 = NOT OK

â€¢ Current Essential HK Number: TM G6009 V1S-ESSHKNR = 0

â€¢ Internal VECU counter: TM G6010 V1S-VECUCOUNT = 0

â€¢ Internal counter of executed TCs: TM G6053 V1S-COMEXNR = 0

However, as these values are all simply zero, they do not necessarily reflect the real condition. In fact all the parameters in the VETO block of the SPID 79102 (i.e. from byte B2 hex to D7 hex) were zero following the anomaly:

2008-03-31T02:11:17.302360

SPID: (65535:79102) Time: 2008.091.02.11.17.302360 Seq: 130015 Size: 504

Header:

0: 0 0 0 0 47F04845 0 49D18 47F0484F 0 4 6DD 0 0 0 1 079 0 A 0 0 1F8
20: 1138FFFF 0 1FBDF 0 134FE 0 0 0 0

Body:

0: 8D 0F487 1B118 0 32FE2760 07E6BE3 FFFF 512 275C 07C 6AE2FFFF 4B42759
20: 07C6CE3 FFFF 4E8 2755 081 71E3FFFF 4D32752 07A6AE3 FFFF 496 274B 07F
40: 69E3FFFF 4D62748 07D68E2 FFFF 4E4 2745 07D 6AE2FFFF 4FD7491 74A2 EEB
60: E3E 813 745C7499 11 5 EC8 8147478 7485 FE7 F73 814 745474A5 11AB E38
80: 8147497 74C7 F13 D F 814 747B7487 1046 FC1 8137476 74591067 11C6 813
A0: 74807494 FC4 F F 813FFE6 01A29B8 D E 0 0 0 0 0 0 0 0 0 0 0 0
C0: 0 3944B0 0 136C87 0
E0: 37E3224 F3 0 04C 0 04C5B 15 07A80 0 0 0 0 FFC0F8 0 E2 0D2 0 0 0 041
100: E0F8707F E07FE0FE 3DE28C21 0 0 0 0 FFFF0 0 0 0 0 0 AA9A 11C 1039 9 0
120: 0 0 0 D A82A5E45 EB 058 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
140: 22 0 0 0 0604233 6FFFFFFE0 C8C2C8CA CA7B 0 F A1E0F155 1018 0 1 1DAE4233
160: 32A9281 80 62EEB FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
180: FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF FFFFFFFF
1A0: FFFFFFFF FFFFFFFF FFFFFFFF FFFF 0CA B7 2 3 1 20 3BAFB 0 0 060 1DAE4233
1C0: 0 0 0 0 80 62EEB

Recovery

In line with the OOL reaction specified for TM parameters G6012 and G6013, the following were performed:

â€¢ 02:23:57Z FCP_IBIS1_0313 IBIS Standby Mode

â€¢ 02:28:34Z FCP_IBIS1_0203 VETO Stand-By Mode

â€¢ 03:05:38Z CRP_IBIS1_0061 IBIS Unconditioned Switch-Off, only the part relating to VETO switch OFF, i.e. TC P4008 LCL IBIS VEBA OF.

(N.B. At this time the status of the VETO Nominal Substitution Heater (TM T8007) was OPEN, instead of CLOSE as is the nominal configuration in sunlight. This was due to the fact that this was an eclipse revolution and the anomaly occurred after the end of the post-eclipse activation but before the ED TENPE_00 to enable nominal substitution heaters, scheduled in the Timeline at 2008-03-31T04:13:04Z.)

At this point, OEM APID 1280 ID 129 ANOMALY IBIS1 IASW TIME-OUT TRANSMITTING LSL DATA were still being received, as the VETO ECR was still ON (hence IASW considered VETO to be ON). Therefore the VETO ECR was then switched off as follows:

â€¢ 03:13:41Z FCP_IBIS1_0084 IBIS ECR(s) Setting by Dynamic Default, with TC parameter G8740 = OFF to set the VETO ECR OFF

Following this the OEM APID 1280 ID 129 ANOMALY IBIS1 IASW TIME-OUT TRANSMITTING LSL DATA stopped.

(N.B. The above actions were cross-checked against the nominal VEB-A deactivation procedure FCP_IBIS1_0332 to verify that they were equivalent.)

In order to recover the unit the following procedures were then performed:

â€¢ 03:28:43Z FCP_IBIS1_0111 VETO VEB ACTIVATION (In this procedure the TCs to disable the VEB Heater A for the duration of the procedure were omitted as the VEB Heater A was already disabled following post-eclipse reconfiguration and was due to be enabled by the Timeline at later stage.)

â€¢ 03:39:57Z FCP_IBIS1_0199 IBIS: VETO Restore CTX

â€¢ 03:42:02Z ED GEVESP01 (IBIS VETO SW Patch) uplinked

â€¢ 03:54:47Z FCP_IBIS1_0201 VETO Nominal Mode. Following this a delay of 15 minutes was

introduced, as indicated in the procedure, as the first HK4 packets have old (and meaningless values). During this period several parameters therefore went OOL as expected but later returned within limits. FCP_IBIS1_0201_A0 to FCP_IBIS1_0201_A18 were then performed to check the VETO telemetry. All parameters were found to be nominal.

â€¢ 04:55:00Z ED GESTAN02 uplinked with the planned observation parameters

IBIS was back in Science Standard mode at 04:56:10Z and commanding from the Timeline re-enabled. Following the recovery all parameters are nominal and IBIS is operating nominally.

Item Configuration

Environment Routine operations (eclipse season but outside eclipse)

Impacted Services Science data

Recommendation

Affected Requirement

Date of last MRB

External Reference

Processing

Root Cause

Preventive Action No

Resolution (M)

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

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|------------------------|--------------------------------------|-----------------------|--------------------------------|------------------------|-------------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IBIS VETO: CDM#1 HV Breakdown | State | Pending | ID | INT_SC-221 |
| Originator | Salma Fahmy | Criticality | High | | |
| Created | 2008-04-04 13:17 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2008-03-20 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On 2008-03-20 at 15:57:11Z OEM APID 1280 ID 186 ANOMALY IBIS1 VETO PMTXX IS ON AND CORRESPONDING HV MONIT IS AB OUT ZERO began to be received (8 occurrences every TM cycle).

At the same time, the following TM parameters went OOL with value = 0 RAW:

â€¢ G6051 V1S-CDM01HV

â€¢ G6011 V1S-CDM1TEMP

â€¢ G6061 V1S-CAL-COUNT

In addition, the currents dropped down slightly due to the HV break-down of CDM #0:

G6012 (VETO current)= 1.59 A

G6013 (VETO VDM/CDM current)= 0.94 A

Before the anomaly the main VETO parameters reported nominal values and no particularly high radiation was reported at the time of the anomaly.

The anomaly was recovered as follows:

â€¢ 16:08:19Z FCP_IBIS1_0313 IBIS Transition to Standby

â€¢ 16:11:39Z FCP_IBIS1_0203 VETO to Standby

â€¢ 16:14:32Z FCP_IBIS1_0205 VETO to Maintenance

â€¢ During this time, an OOL on G6227 was observed and VETO was commanded back to Standby at 16:32:36Z. When it was understood that this OOL was nominal considering the "bad" telemetry which could be received from VETO during this time, it was commanded back to maintenance at 16:48:28Z.

â€¢ 17:36:08Z FCP_IBIS1_0203 VETO to Standby

â€¢ 17:39:03Z FCP_IBIS1_0201 VETO to Nominal

â€¢ 17:40:05Z IASW to Science Standard (TC G0129)

Item Configuration

Environment

Routine operations (outside radiation belt and eclipse)

Impacted Services

Recommendation

Affected Requirement

Date of last MRB

External Reference

Processing

Root Cause

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| Preventive Action Resolution (M) | No |
| Link Report | [Not Specified] |

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| Related Files |
| No files are attached to this report. |

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| Actions |
| No actions assigned to this report. |

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| Related Reports |
| No other reports related to this report. |



Anomaly Report Tracking System

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|------------------------|--|-----------------------|--------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IREM Anomaly: Reset of IREM_CSCI S/W #61, 31/01/2008 | State | Pending | ID | INT_SC-219 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2008-02-07 15:34 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2008-01-31 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description

The 61st reset of IREM S/W occurred on 31/01/2008 (DoY 2008.031) at 15.05.07Z. This was during science observations of revolution 647, 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:

15.05.07Z, observed IREM S/W crash;

15:08Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

16:05Z Start IREM patch procedure (FCP_RM_0081);

18:00Z IREM patch procedure completed;

18:01Z IREM re-enabled.

Item Configuration

Environment

Impacted Services

Recommendation

Affected Requirement

Date of last MRB

External Reference

Processing

Root Cause

Preventive Action

No

Resolution (M)

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

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|------------------------|--|-----------------------|-------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | SPI IASW 4.3.4: TM parameter E0229 incorrect | State | Pending | ID | INT_SC-218 |
| Originator | Salma Fahmy | Criticality | Low | | |
| Created | 2008-02-04 14:34 | Urgency | Low | Reproducibility | Yes |
| Occurrence Date | 2008-01-28 12:00 | Classification | Space Segment Payload SPI | | |

Description

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| Description | <p>On 2008-01-28, following the installation of SPI IASW 4.3.4 onboard (ref. OCR-231), it was observed that the value of TM parameter E0229 P IASW PH/PH was incorrect. This parameter reports the occupation of the photon/photon buffer and a nominal value is (as prior to the installation of IASW 4.3.4) of the order of 500 when SPI is in PHOTON mode outside the radiation belts. Since the installation of IASW 4.3.4 the value of this parameter has been of the order 107 \hat{a}€“ 109.</p> <p>The problem is believed to be caused by a bug in IASW 4.3.4 as this parameter should not have been affected by the patch, e.g. there was no change in the IODB definition of this parameter for IASW 4.3.4.</p> |
| Item Configuration | SPI IASW 4.3.4 |
| Environment | Routine operations |
| Impacted Services | As this parameter is used for offline analysis and no monitoring checks or procedures are associated to it, there is no safety or performance impact on SPI due to this anomaly. |
| Recommendation | The SPI team concluded that IASW 4.3.4 should be used as is, with this known problem. Until the problem is fixed, TM parameter E0229 should be disregarded. |
| Affected Requirement | |
| Date of last MRB | |
| External Reference | |

Processing

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| Root Cause | |
| Preventive Action | No |
| Resolution (M) | |
| 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

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|------------------------|--|-----------------------|--------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IREM Anomaly: Reset of IREM_CSCI S/W #60, 09/01/2008 | State | Pending | ID | INT_SC-217 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2008-01-17 09:22 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2008-01-09 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description The 60th reset of IREM S/W occurred on 09/01/2008 (DoY 2008.009) at 21.43.51Z. This was during science observations of revolution 640, 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:

21.43.51Z, observed IREM S/W crash;

13:50Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

21:58Z Start IREM patch procedure (FCP_RM_0081);

00:02Z IREM patch procedure completed;

02:43Z IREM re-enabled.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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

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|------------------------|--|-----------------------|--------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IREM Anomaly: Reset of IREM_CSCI S/W #59, 03/01/2008 | State | Pending | ID | INT_SC-216 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2008-01-10 15:57 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2008-01-03 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description The 59th reset of IREM S/W occurred on 03/01/2008 (DoY 2008.003) before 13.43.51Z. This was during the perigee passage between revs 637 & 638. This did not affect science operations, as the instruments were in Safe mode anyway.

The sequence of events was as follows:

13:43:51Z AOS Redu, observed IREM S/W crash;

13:50Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

15:00Z Start IREM patch procedure (FCP_RM_0081);

16:05Z IREM patch procedure completed;

16:05Z IREM re-enabled.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 #58, 11/12/2007 | State | Pending | ID | INT_SC-215 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-12-20 09:50 | Urgency | Low | | |
| Occurrence Date | 2007-12-11 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description The 58th reset of IREM S/W occurred on 11/12/2007 (DoY 2007.345) at 20.20.08Z. This was during science observations of revolution 630, 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:

20:20:08Z IREM S/W crash;

20:24Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

20:40Z OMC in stand-by & enabled in timeline;

21:00Z IBIS in science-standard & enabled in timeline;

21:05Z Start IREM patch procedure (FCP_RM_0081);

22:40Z IREM patch procedure completed;

22:43Z DRMC flag set to REGARD.

22:47Z IREM re-enabled.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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

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|------------------------|--|-----------------------|--------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IREM Anomaly: Reset of IREM_CSCI S/W #57, 23/11/2007 | State | Pending | ID | INT_SC-213 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-11-29 10:10 | Urgency | Low | | |
| Occurrence Date | 2007-11-23 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description

The 57th reset of IREM S/W occurred on 23/11/2007 (DoY 2007.327) at 04.58.15Z. This was during science observations of revolution 624, 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:

04:58:15Z IREM S/W crash;

05:09Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

07:30Z OMC in stand-by & enabled in timeline;

07:38Z IBIS in science-standard & enabled in timeline;

07:40Z Start IREM patch procedure (FCP_RM_0081);

09:13Z IREM patch procedure completed;

12:10Z DRMC flag set to REGARD.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 IASW 433: Problem in acquiring parameters in TM packet 60060 at belt exit | State | Pending | ID | INT_SC-212 |
| Originator | Salma Fahmy | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-11-27 12:32 | Urgency | Low | | |
| Occurrence Date | 2007-11-16 12:00 | Classification | Space Segment Payload SPI | | |

Description

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| Description | <p>On 2007-11-16 at 20:13:43Z, during the reconfiguration of SPI at radiation belt exit of revolution 622, TM parameters E3825; E3826 and E3828- E3831 all went OOL with value 0. These are the PSD +/-5V analogue and some PSD board temperatures and are in SPID 60060. They returned within limits when the next packet was received at 20:14:47Z.</p> <p>This has occurred several times in the past, e.g. in the previous week:</p> <p>On 2007-11-07 at 20:51:02Z, during the reconfiguration of SPI at radiation belt exit of revolution 605, TM parameters E3825; E3826 and E3828- E3831 all went OOL with value 0. They returned within limits when the next packet was received at 20:52:06Z.</p> |
| Item Configuration | IASW 433 patch #1 |
| Environment | Routine operations at radiation belt exit |
| Impacted Services | [Not Specified] |
| Recommendation | |
| Affected Requirement | |
| Date of last MRB | |
| External Reference | [Not Specified] |

Processing

| | |
|--------------------------|-----------------|
| Root Cause | |
| Preventive Action | No |
| Resolution (M) | |
| 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 IASW 433: Problem in acquiring ACS parameters in TM packet 60601 at belt transition | State | Pending | ID | INT_SC-211 |
| Originator | Salma Fahmy | Criticality | Low | | |
| Created | 2007-11-27 12:22 | Urgency | Low | Reproducibility | Yes |
| Occurrence Date | 2007-11-13 12:00 | Classification | Space Segment Payload SPI | | |

Description

Description

On 2007-11-13 at 20:24:28Z, during the reconfiguration of SPI at radiation belt exit of revolution 621, TM parameters E2101- E2116 and E2121-E2123 all went OOL with value 0. These are blocks 10 (ACS power supply voltage and current) and 11 (ACS veto shield temperatures) of TM packet 60601. This was a periodic TM packet and the building of this packet started 45 secs before the reconfiguration of the ACS at belt exit (at 20:25:13Z) and so the ACS parameters being zero was likely due to the acquisition of these blocks being exactly at the time the ACS switch-on was occurring. These parameters returned within limits when the next (mode change) packet was received at 20:27:00Z.

This has also occurred in the past, e.g.:

On 2007-08-13 at 03:15:51Z (packet time) the ACS parameters E2101-E2116; E2150-E2179; E2250-E2279; E2350-E2379 and E3164-E3193 all went OOL value 0 raw. They are all in the periodic housekeeping packet SPID 60601. The building of this packet started 53secs before the reconfiguration of the ACS at belt exit (at 03:16:44Z) and so the ACS parameters being zero was likely due to the acquisition of these blocks being exactly at the time the ACS switch-on was occurring. They returned within limits when the next packet was received at 03:18:31Z.

Update 20/12/07: This has now also been observed at radiation belt entry, e.g. on 2007-12-13 at 08:08:29Z.

Update 14/02/08: This has also been observed with other blocks of SPID 60601 (and with IASW 4.3.4):

On 2008-02-02 at 14:41:04Z, during the reconfiguration of SPI at radiation belt exit of revolution 648, TM parameters E2195-E2241; E2295-E2341; E2395-E2399; E3121-E3162; E3209- E3254 and E3289 went OOL (value = PARAM > SPEC). These are the ACS FEE digital status 5 V from FEE#45 onwards; ACS FEE analogue status 5 V from FEE#45 onwards; ACS FEE analogue status -5 V from FEE#45 onwards; ACS FEE temperature status from FEE#45 onwards and the PSAC Auxiliary Analogue Supply. They are in blocks 15, 16 and 17 of TM SPID 60601. The building of this packet started 74 seconds before the reconfiguration of the ACS at radiation belt exit and so the ACS parameters being zero was likely due to the acquisition of these blocks being exactly at the time the ACS switch-on was occurring. As they all returned within limits at 14:43:56Z no action was taken.

Item Configuration

IASW 433 patch #1, IASW 434

Environment

Routine operations at radiation belt exit/entry

Impacted Services

Recommendation

Affected Requirement

Date of last MRB

External Reference

Processing

| | |
|--------------------------|-----------------|
| Root Cause | |
| Preventive Action | No |
| Resolution (M) | |
| Link Report | [Not Specified] |

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| Related Files |
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| No files are attached to this report. |
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| Actions |
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| No actions assigned to this report. |
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| Related Reports |
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| No other reports related to this report. |
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Anomaly Report Tracking System

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|------------------------|--|-----------------------|--------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | IREM Anomaly: Reset of IREM_CSCI S/W #56, 04/11/2007 | State | Pending | ID | INT_SC-210 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-11-16 10:20 | Urgency | Low | | |
| Occurrence Date | 2007-11-04 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description The 56th reset of IREM S/W occurred on 04/11/2007 (DoY 2007.308) at 22.34.00Z. This was during science observations of revolution 618, 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:

22.34.00Z IREM S/W crash;

22:48Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

22:56Z OMC in stand-by & enabled in timeline;

23:15Z IBIS in science-standard & enabled in timeline;

23:51Z Start IREM patch procedure (FCP_RM_0081);

01:13Z IREM patch procedure completed;

03:52Z DRMC flag set to REGARD.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 | JEM-X1 DFEE CRC Anomaly following eclipse on 2007-11-01 | State | Pending | ID | INT_SC-209 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-11-08 16:41 | Urgency | Low | | |
| Occurrence Date | 2007-11-01 12:00 | Classification | Space Segment Payload JEM-X | | |

Description

Description

On 2007-11-01 (revolution 617), during the post-eclipse reconfiguration of JEM-X1 following the 8th eclipse of this season, another DFEE anomaly occurred like those observed on 2004-06-20, 2004-06-23, 2004-12-08; 2005-05-18; 2005-11-14 and 2006-10-26 2007-04-30 (ref: Anomaly Reports INT_SC-84; INT_SC-104; INT_SC-119; INT_SC-131; INT_SC-161 and INT_SC-187).

The symptoms were as follows:

1) The following OEMs were received after the JEM-X1 DFEE was switched on by the ED KECLX01 in the Timeline (uplinked at 2007-11-01T19:19:30Z):

```
2007.305.19.20.10.715 2007.305.19.20.16.682 1536 RealTime 191 EVENT JEM-X1
PROB DFEE 11 0 0 65535 PR N E E
```

```
FIX6 11
```

```
K9079 MESS CLASS 0
```

```
K9080 MESS ID 191
```

```
FIX16 8
```

```
FIX16 0
```

Indicating that the operation "Load DFEE context" was unsuccessful due to CRC failure of the area B000 (hex) to CFFF (hex).

```
2007.305.19.20.10.715 2007.305.19.20.16.718 1536 RealTime 234 EVENT JEM-
X1 AUTO EVENT 4 0 0 65535 PR N E E
```

```
FIX6 4
```

```
K9079 MESS CLASS 0
```

```
K9080 MESS ID 234
```

```
K5419 ACTUAL LEVEL ECLIPSE
```

```
K5420 TARGET LEVEL RAD.
```

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 start-up) rather than the nominal value of 16MHz.

In response to this, the following operations were performed:

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

- 19:57Z FCP_JEM1_0120 JEMX1 SET BCP OVERRIDES
- 19:59Z FCP_JEM1_9010 JEMX1 DFEE SWITCH OFF
- 20:05Z FCP_JEM1_0021 JEMX1 DFEE ACTIVATION

2) At 20:27Z FCP_JEM1_0120 JEMX1 SET BCP OVERRIDES was executed to e-enable the JEM-X1 reactions to the Broadcast Packet radiation belt times.

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

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action No

Resolution (M)

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 #55, 06/10/2007 | State | Pending | ID | INT_SC-208 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-10-17 16:08 | Urgency | Low | | |
| Occurrence Date | 2007-10-06 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description

The 55th reset of IREM S/W occurred on 06/10/2007 (DoY 2007.279) at 23:58:22Z. This was during science observations of revolution 608, 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:

23:58:22Z IREM S/W crash;

00:05Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

00:19Z OMC in stand-by & enabled in timeline;

00:40Z IBIS in science-standard & enabled in timeline;

00:45Z Start IREM patch procedure (FCP_RM_0081);

02:45Z IREM patch procedure completed;

03:52Z DRMC flag set to REGARD.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 VDM09 and VDM13 High Voltage Breakdown | State | Pending | ID | INT_SC-207 |
| Originator | Salma Fahmy | Criticality | High | | |
| Created | 2007-10-12 12:45 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2007-10-11 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On 11/10/2007 at 04:42:44Z, the VETO VDM09 and VDM13 HV went OOL Alarm Low:
 G6043 (V1S-VDM09HV) = 489.52V,
 G6047 (V1S-VDM13HV) = 520.28V
 and the VETO Calibration counter went OOL Warning Low:
 G6061 (VETO CAL counter) = 956/s
 The other VETO count rates had also dropped to much lower values than nominal however the VETO currents remained at the nominal values:
 G6012 (VETO current) = 1.65A
 G6013 (VETO VDM/CDM current) = 0.98A
 G6062 (VETO BOT counter) = 10816/s
 G6063 (VETO LAT counter) = 11296/s

Note that before the anomaly (04:42:20Z) these VETO parameters were all nominal:

G6012 (VETO current)= 1.63A
 G6013 (VETO VDM/CDM current)= 0.97A
 G6061 (VETO CAL counter)= 1228/s
 G6062 (VETO BOT counter)= 42448/s
 G6063 (VETO LAT counter)= 42432/s
 G6043 (V1S-VDM09HV) with value = 992.68V,
 G6047 (V1S-VDM13HV) with value = 992.96V,

At 04:42:52Z, due to the reduced count rates from VETO, the PICsIT PDM counters, TM families G5002 and G5003 all went OOL High with values around 2300/s.

At 04:44:48Z the following OEM was received:

APID 1280 ID 167 ANOMALY IBIS1 PICSIT NOISY SEMIMODULE SIGNALLING: ORIGIN SM COO.

This was at the start of slew 06090057:

```
2007-10-11T04:44:45Z MOUTP      SLEW_START      /*
2007-10-11T04:46:41Z MOUTP      SLEW_END        /*
```

After the end of the slew another occurrence of the OEM was received:

2007.284.04.47.12.299 1280 RealTime 167 ANOMALY IBIS1 PICSIT NOISY SEMIMODULE SIGNALLING: ORIGIN SM COO

At 04:47:48Z the VDM09 and VDM13 HV recovered to nominal values however the VETO count rates remained at the reduced values:

G6061 (VETO CAL counter) = 984/s
 G6062 (VETO BOT counter) = 10808/s
 G6063 (VETO LAT counter) = 11432/s
 G6043 (V1S-VDM09HV) = 992.68V

G6047 (V1S-VDM13HV) = 992.96V

The PICsIT counters also remained OOL High, due to the reduced count rates from VETO.

The situation remained as such until the anomaly was recovered by the operator as follows:

- 1- At 05:07:45Z, set IBIS-IASW in Stand-By (TC G0125)
- 2- At 05:17:51Z, set IBIS-VETO in Stand-By (TC G0601)
- 3- At 05:20:42Z, set IBIS-VETO in Nominal (TC G0600)
- 4- At 05:23:28Z, set IBIS-IASW in Science Standard (TC G0129).

Following the recovery VETO was in Nominal and the main VETO parameters were nominal:

At 05:24:04Z:

G6012 (VETO current) = 1.63A

G6013 (VETO VDM/CDM current) = 0.98A

G6061 (VETO CAL counter) = 1264/s

G6062 (VETO BOT counter) = 42328/s

G6063 (VETO LAT counter) = 42320/s

G6043 (V1S-VDM09HV) = 992.68V

G6047 (V1S-VDM13HV) = 992.96V

The PICsIT counters also returned stably within limits, with nominal values.

Note that this is only the second time that more than one VDM experienced a High Voltage breakdown at the same time (the first instance, in which 3 VDM HVs broke down simultaneously was on 2007-08-11 and is reported in Anomaly Report INT_SC-198).

Item Configuration

| | |
|--------------------------|---|
| Environment | Routine operations (outside radiation belt and eclipse) |
| Impacted Services | Science data |
| Recommendation | |

Affected Requirement

| | |
|---------------------------|-----------------|
| Date of last MRB | |
| External Reference | [Not Specified] |

Processing

| | |
|--------------------------|-----------------|
| Root Cause | |
| Preventive Action | No |
| Resolution (M) | |
| 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 #54, 14/09/2007 | State | Pending | ID | INT_SC-206 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2007-10-10 07:46 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-09-14 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description

The sequence of events was as follows:

22:47:13Z IREM S/W crash;
22:50Z Start recovery with procedure CRP_SYS_2570;
23:00Z Start IREM patch procedure (FCP_RM_0081);
00:33Z IREM patch procedure completed;
01:03Z DRMC flag set to REGARD. (sent from the Timeline)

(The SEU occurred during the belt exit for Revolution 601, hence the instruments were already in SAFE mode, and were not affected.)

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Unknown

Preventive Action

No

Resolution (M)

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 | JEM-X CSSW Anomalies observed | State | Pending | ID | INT_SC-204 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2007-09-12 14:45 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-09-12 12:00 | Classification | Space Segment Payload JEM-X | | |

Description

Description On 9th September 2007, and 12th September 2007, the following pairs of anomalous OEMs were received from JEMX-1

```
2007.252.19.22.25.620 2007.252.19.22.30.922 1536 RealTime 5 EXCEPTION JEM-X1
EXC IACS INTERF EXID 0 0 65535 PR N E E
```

```
FIX6 0
```

```
K9079 MESS CLASS 1
```

```
K9080 MESS ID 5
```

```
K9065 CSSW OPERAT ID START
```

```
K9066 TASK ID 8 IASW
```

```
K9067 LOGICAL ADDRESS 4989
```

```
2007.252.19.22.25.620 2007.252.19.22.31.023 1536 RealTime 6 EXCEPTION JEM-
X1 EXC IACS INTERF CULP 0 0 65535 PR N E E
```

```
FIX6 0
```

```
K9079 MESS CLASS 1
```

```
K9080 MESS ID 6
```

```
K9065 CSSW OPERAT ID START
```

```
K9066 TASK ID 8 IASW
```

```
K9067 LOGICAL ADDRESS 19726
```

and on the 12th September the following was received:

```
2007.255.08.16.41.755 2007.255.08.16.48.386 1536 RealTime 5 EXCEPTION JEM-X1
EXC IACS INTERF EXID 0 0 65535 PR N E E
```

```
FIX6 0
```

K9079 MESS CLASS 1
 K9080 MESS ID 5
 K9065 CSSW OPERAT ID START
 K9066 TASK ID 8 IASW
 K9067 LOGICAL ADDRESS 4989

2007.255.08.16.41.755 2007.255.08.16.48.449 1536 RealTime 6 EXCEPTION JEM-
 X1 EXC IACS INTERF CULP 0 0 65535 PR N E E

FIX6 0
 K9079 MESS CLASS 1
 K9080 MESS ID 6
 K9065 CSSW OPERAT ID START
 K9066 TASK ID 8 IASW
 K9067 LOGICAL ADDRESS 19726

On each occasion no action was taken, and no further OEMs were received.

Item Configuration Environment Impacted Services Recommendation

[Not Specified]
 email from SÃ,ren Brandt, 11/09/2007:

Mike,

Thanks for the info. So again a couple of messages from CSSW. We don't quite know what to make of it, but as long as everything else is running well we don't want to do anything about it.

SÃ,ren

Affected Requirement Date of last MRB External Reference

[Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 | JEM-X CSSW Anomalies observed | State | Pending | ID | INT_SC-203 |
| Originator | Mike Walker | Criticality | Low | | |
| Created | 2007-09-05 08:15 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-09-03 12:00 | Classification | Space Segment Payload JEM-X | | |

Description

Description

On 3rd September 2007, the following two groups of anomalies were observed:

2007.246.12.04.11.308 2007.246.12.04.14.426 1536 RealTime 5 ANOMALY JEM-X1
 CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.461 1536 RealTime 5 ANOMALY JEM-X1
 CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.463 1536 RealTime 5 ANOMALY JEM-X1
 CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.485 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.488 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.490 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.12.04.11.308 2007.246.12.04.14.492 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 5336

This was followed some time later, by another group of anomalies:

2007.246.14.31.07.313 2007.246.14.31.09.500 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.550 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.553 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2

K9080 MESS ID 5

K9074 TASK ID 16 12

K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.555 1536 RealTime 5 ANOMALY JEM-X1
CSSW INT ER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2
K9080 MESS ID 5
K9074 TASK ID 16 12
K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.560 1536 RealTime 5 ANOMALY JEM-X1
CSSW INTER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2
K9080 MESS ID 5
K9074 TASK ID 16 12
K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.562 1536 RealTime 5 ANOMALY JEM-X1
CSSW INTER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2
K9080 MESS ID 5
K9074 TASK ID 16 12
K9067 LOGICAL ADDRESS 4989

2007.246.14.31.07.313 2007.246.14.31.09.564 1536 RealTime 5 ANOMALY JEM-X1
CSSW INTER EXCEPTIO 0 0 65535 PR N E E

FIX6 0

K9079 MESS CLASS 2
K9080 MESS ID 5
K9074 TASK ID 16 12
K9067 LOGICAL ADDRESS 5336

No other out-of-limits or anomalies were observed, no action was taken, and no further

occurrences were seen.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation email from SÄ,ren Brandt 03/09/2007 17:12 local

I have just looked at JEM-X science data from our Instrument Stations at ISDC up to 17 local time.
All seems normal, aside from these CSSW OEMs.
I suggest we continue.

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action No

Resolution (M)

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 #53, 23/08/2007 | State | Pending | ID | INT_SC-202 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-08-29 11:21 | Urgency | Low | | |
| Occurrence Date | 2007-08-23 12:00 | Classification | Space Segment Payload IREM | | |

Description

Description The 53rd reset of IREM S/W occurred on 23/08/2007 (DoY 2007.235) at 16:08:12Z. This was during science observations of revolution 593, 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:

16:08:12Z IREM S/W crash;

16:20Z Start recovery with procedure CRP_SYS_2570; DRMC flag set to DISREGARD;

16:23Z OMC enabled in timeline;

16:49Z IBIS enabled in timeline;

17:21Z Start IREM patch procedure (FCP_RM_0081);

18:25Z IREM patch procedure completed;

20:28Z DRMC flag set to REGARD.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 | JEMX DPE crash | State | Pending | ID | INT_SC-201 |
| Originator | Mike Walker | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-08-24 16:00 | Urgency | Low | | |
| Occurrence Date | 2007-08-11 12:00 | Classification | Space Segment Payload JEM-X | | |

Description

Description

On 2007-08-11 at 07:52:21Z, an anomaly occurred on the JEM-X1 DPE. Prior to the DPE anomaly, the status of JEM-X1 had been nominal, with all HK parameters within limits and no unusual OEMs being issued.

The symptoms of the anomaly were as follows:

1) The following OEMs were received:

```
2007.223.07.52.14.754 2007.223.07.52.21.259 129 RealTime 82 EXCEPTION EX
OBIH TM ST11 WRONG RBI STATUS
```

```

FIX6                                0
D0006    MESS CLASS                NON-FATAL
D0008    MESS ID                    82EX
FIX8                                0
D0009    PT ADDRESS                 JEMX1BUSADDR
D0077    RESET STATE                RESET
D0078    WAIT STATE                 NOT
D0079    DMA BUSY                   DMA
D0080    RUNNING STATE              NOT
D0081    PARITY ERROR               NO
D0082    INV LITTON CODE            VALID
FIX1                                0
D0083    WRONG INTER                NO
D0084    TM TRANS                   NO
D0085    ANOMALY IND                NO

```

| | | |
|-------|------------|--------------|
| D0086 | TC RECEIPT | NOT |
| D0087 | SW INDIC | TBDBYACC/ICU |

2007.223.07.52.18.363 2007.223.07.52.29.237 129 RealTime 91 EXCEPTION EX
 OBIH TC ST9 WRONG RBI STATUS 2

| | | |
|-------|---------------|-----------|
| D0079 | DMA BUSY | DMA |
| D0080 | RUNNING STATE | NOT |
| D0083 | WRONG INTER | NO |
| D0085 | ANOMALY IND | NO |
| D0086 | TC RECEIPT | NOT |
| D0006 | MESS CLASS | NON-FATAL |
| D0008 | MESS ID | 91EX |
| FIX5 | 0 | |
| D0089 | PT APID | 1537 |
| FIX2 | 0 | |
| D0096 | TCP SSC OEM | 8195 |

Indicating that the RBI (Remote Bus Interface) protocol communication with the JEM-X1 DPE is correct but the DPE delivers an RBI status which is not correct with respect to the checks performed by the RBI S/W, in this case that the JEM-X1 DPE has reset and is in NOT RUNNING state.

2007.223.07.52.29.324 65535 OBEVhandler imca INFORMATION
 LOG2007.211.16.43.44.085 R 1536 0 0 \"JEM-X1 CAUSE OF CPU RESET\" K9072=0 K9079=0
 K9080=0 FIX16=0 FIX16=65535.

Indicating that the JDPE1 CPU has reset

2007.223.07.53.41.325 65535 OBEVhandler imca ERROR
 LOG2007.211.16.44.54.210 R 1536 2 4 \"JEM-X1 CSSW INT ER BUF OVER\" FIX6=0 K9079=0

K9080=14 K9074=1 K9077=0

Indicating a JDPE1 CSSW internal error - buffer overflow

2007.223.07.53.41.328 65535 OBEVhandler imca ERROR
LOG2007.211.16.44.54.210 R 1536 3 3 \"JEM-X1 TC REP TC SBFULL\" FIX6=0 K9079=0
K9080=1 FIX8=32 K9068=3 FIX2=3 K9069=16383

Indicating a rejected/failed TC report due to the JDPE1 TC sub-buffer being full

These last two OEMs (\"JEM-X1 CSSW INT ER BUF OVER\" and \"JEM-X1 TC REP TC SBFULL\") then continued to be received every TM cycle (8 seconds).

2) All the HK TM parameters from the JEM-X1 DPE were invalid. However, the JEM-X1 DFEE LCL A (TM parameter P2106) was closed, and the LCL current parameter P2004 was reporting a nominal value of ~1.1A. This indicated that probably no data was being received from the JEM-X1 DPE (i.e. empty packets).

The DPE Local On-board Time was reset to zero and this had the effect that the correlated packet time was the time of the last LOBT wraparound (2007.211.16.43Z). This is reflected in the reported creation time of the OEMs from the DPE reported in point 1) above.

The above 2 sets of symptoms are consistent with a reset of the JEM-X1 DPE, in which the CSSW is initialised but the IASW is not initialised. Thus all TM parameters values supplied by the IASW are zero, and the DPE buffer overflows due to the received broadcast packet TCs which are not executed due to the IASW not being started (hence the OEMs \"JEM-X1 CSSW INT ER BUF OVER\" and \"JEM-X1 TC REP TC SBFULL\" being generated every TM cycle).

Recovery actions:

Following the recovery actions suggested for repeated occurrences of the OEM \"CSSW INT ER BUF OVER\" in the Integral User Manual (Section 5.8.8.2.2.3.1.1), a full power cycle of the DPE and DFEE, including the reloading of all the DPE and DFEE patches, was then performed according to CRP_JEM1_5020. As in the previous case of a JEM-X1 DPE reset, FCP_JEM_9010 JEM-X1 DFEE SWITCH OFF was replaced by CRP_JEM1_9010 JEMX1 UNCONDITIONED DFEE SWITCH OFF in Step 2 of this procedure. The operations were performed as follows:

09:05Z CRP_JEM1_9010 JEMX1 UNCONDITIONED DFEE SWITCH OFF executed successfully.

09:12Z FCP_JEM1_9001 JEMX1 DISABLE BCP DISTRIBUTION. The Broadcast Packet Distribution to JEM-X1 was stopped at 09:13:49Z, after which the OEMs (\"JEM-X1 CSSW INT ER BUF OVER\" and \"JEM-X1 TC REP TC SBFULL\") stopped.

09:16Z FCP_JEM1_9000 JEMX1 DPE SWITCH OFF started and JDPE1 switched off. OEM Real Time Exception 81 EXCE OBIH TM 1 9 INVALID OR NOT RECEIVED RBI RESPONSE received from the CDMU as expected.

09:24Z FCP_JEM1_0010 JEMX1 DPE AND CSSW ACTIVATION started.

At 09.26 Z the JPDE1 was switched on and the following OEM was received as expected:

2007.223.09.26.44.616 2007.223.09.26.44.623 129 RealTime 82 EXCEPTION EX
OBIH TM ST11 WRONG RBI STATUS

| | | | |
|-------|-----------------|---|--------------|
| FIX6 | | 0 | |
| D0006 | MESS CLASS | | NON-FATAL |
| D0008 | MESS ID | | 82EX |
| FIX8 | | 0 | |
| D0009 | PT ADDRESS | | JEMX1BUSADDR |
| D0077 | RESET STATE | | RESET |
| D0078 | WAIT STATE | | NOT |
| D0079 | DMA BUSY | | DMA |
| D0080 | RUNNING STATE | | NOT |
| D0081 | PARITY ERROR | | NO |
| D0082 | INV LITTON CODE | | VALID |
| FIX1 | | 0 | |
| D0083 | WRONG INTER | | NO |
| D0084 | TM TRANS | | NO |
| D0085 | ANOMALY IND | | WD |
| D0086 | TC RECEIPT | | NOT |
| D0087 | SW INDIC | | TBDBYACC/ICU |

2007.223.09.27.09.359 2007.223.09.27.09.365 1536 RealTime 0 EVENT JEM-X1
CAUSE OF CPU RESET

| | | | |
|-------|-----------------|--|-------|
| K9072 | CAUSE CPU RESET | | POWER |
| K9079 | MESS CLASS | | 0 |
| K9080 | MESS ID | | 0 |

FIX16 0

FIX16 0

As part of this procedure, the following was then performed:

09:48Z FCP_JEM1_9810 JEMX1 LOAD NEW SW VERSION, to load the DPE image IIMG_P_JM1_0129_00006_F_X_000_000_2.INT. The following OEMs were generated as expected during this procedure:

2007.223.09.50.14.758 2007.223.09.50.20.677 129 RealTime 82 EXCEPTION EX
OBIH TM ST11 WRONG RBI STATUS

FIX6 0

D0006 MESS CLASS NON-FATAL

D0008 MESS ID 82EX

FIX8 0

D0009 PT ADDRESS JEMX1BUSADDR

D0077 RESET STATE NOT

D0078 WAIT STATE WAIT

D0079 DMA BUSY DMA

D0080 RUNNING STATE NOT

D0081 PARITY ERROR NO

D0082 INV LITTON CODE VALID

FIX1 0

D0083 WRONG INTER NO

D0084 TM TRANS NO

D0085 ANOMALY IND NO

D0086 TC RECEIPT READY

D0087 SW INDIC TBDBYACC/ICU

received when the JDPE1 was commanded to WAIT state by TC D7503.

2007.223.11.58.03.848 2007.223.11.58.12.619 129 RealTime 81 EXCEPTION EXCE
OBIH TM 1 9 INVALID OR NOT RECEIVED RBI RESPONSE

| | | |
|-------|-------------|--------------|
| FIX6 | | 0 |
| D0006 | MESS CLASS | NON-FATAL |
| D0008 | MESS ID | 81EXCE |
| FIX8 | | 0 |
| D0009 | PT ADDRESS | JEMX1BUSADDR |
| D0011 | OBDH BUS SR | 10913 |

received when the JDPE1 RELAY0 was commanded OFF to restart the DPE CSSW after the patch as per step 11.

At 2007.223.11.58.37Z OEM APID 1536 ID 0 \"JEM-X1 CAUSE OF CPU RESET\" K9072=0 K9079=0 K9080=0 FIX16=0 FIX16=65535 was received when the JDPE1 RELAY0 was commanded back ON.

N.B. 34 occurrences of the OEM APID 129 Real Time Rejection 31 ME LOADPT EXEC STILL IN PROGRESS were received during the patch process, due to patch TCs failing as the previous patch TC was still being executed. In all cases, the failed TC was then re-uplinked later.

12:06Z FCP_JEM1_0011 JEMX1 IASW DPE PATCH FOR BCP PID INTERPRETATION

12:12Z FCP_JEM1_0015 JEMX1 IASW ACTIVATION. Once the IASW was started. At 2007.223.12.12.29Z OEM APID 1536 ID 231 \"JEM-X1 AUTO EVENT 1\" FIX6=0 K9079=0 K9080=0 K5419=80 K5420=65535 was received. This was correct and indicated that upon activation the IASW registered that the shutdown level should be LV OFF (as the DFEE was off) instead of its initial value of NORMAL [0 RAW].

12:25Z FCP_JEM1_0016 JEMX1 ENABLE BCP DISTRIBUTION

12:33Z FCP_JEM1_0017 JEMX1 IASW EXTENDED TM CHECK

12:38Z FCP_JEM1_0020 JEMX1 DFEE 1st ACTIVATION AFTER DPE SWITCH-ON

At 2007.223.12.38.53Z OEM APID 1536 ID 233 \"JEM-X1 AUTO EVENT 3\" FIX6=0 K9079=0 K9080=80 K5419=0 K5420=65535 was correctly received, when the DFEE was switched on and JEM-X1 autonomously transitioned to Safe mode. (As the DFEE has been switched off unconditionally via CRP_JEM1_9010, the Autorecovery Level, TM parameter K5458 AUTO RECOV INFO, was still DFEE CONTEXT, rather than being set to NO RECOVERY as during the nominal DFEE switch off procedure FCP_JEM1_9010.)

As part of this procedure, the following procedures were executed:

â€¢ 12:43Z FCP_JEM1_0025 JEMX1 DFEE SW PATCH SEQUENCE (ver 4.0 to 5.3)

â€¢ 13:07Z FCP_JEM1_0060 JEMX1 UPDATE ENERGY LINEARISATION TABLE

13:43Z FCP_JEM1_1010 JEMX1 CONFIGURATION SETTING FOR SCIENCE OPS. JEM-X1 was activated with the current nominal microstrip gas gain voltage (dV) of 73 RAW.

14:15Z FCP_JEM1_0044 JEMX1 DATA TAKING

JEM-X1 commanding from the automatic Timeline was then re-enabled at 14:16Z.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action

No

Resolution (M)

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 VDM05, VDM06 and VDM07 High Voltage break down | State | Pending | ID | INT_SC-198 |
| Originator | Orlane Bergogne | Criticality | High | | |
| Created | 2007-08-17 09:12 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2007-08-11 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On DoY 2007.223 (11/08/2007) at 19:19:14Z, 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, the following TM parameters were reported Out Of Limit Low-Low:

- G6039 (V1S-VDM05HV) with value = 329.54V,
- G6040 (V1S-VDM06HV) with value = 314.92V,
- G6041 (V1S-VDM07HV) with value = 325.61V.

3 TM cycles later (24s), VDM05 and VDM07 recovered themselves. Their HV were back to nominal values, 991.74 and 1083.25 respectively.

VDM06 HV however broke down to a value -0V (-60.8V).

Before the anomaly (19:19:06Z) the main VETO parameters reported nominal values:

- G6012 (VETO current)= 1.62 A
- G6013 (VETO VDM/CDM current)= 0.98 A
- G6061 (VETO CAL counter)= 1396 /s
- G6062 (VETO BOT counter)= 41144 /s
- G6063 (VETO LAT counter)= 41136 /s
- G6039 (VETO VDM05 HV)= 991.74 V
- G6040 (VETO VDM06 HV)= 1005.76 V
- G6041 (VETO VDM07 HV)= 1089.36 V

During the anomaly (19:19:14Z), the currents dropped down due to the HV break-down of VDM #05, #06 and #07, as well as the count-rates (due to missing contribution of these modules):

- G6012 (VETO current)= 1.59 A
- G6013 (VETO VDM/CDM current)= 0.93 A
- G6061 (VETO CAL counter)= 1360 /s
- G6062 (VETO BOT counter)= 35232 /s
- G6063 (VETO LAT counter)= 35568 /s
- G6039 (VETO VDM05 HV)= 329.54 V
- G6040 (VETO VDM06 HV)= 314.92 V
- G6041 (VETO VDM07 HV)= 331.72 V

At the next TM cycle (19:19:22z), the count-rates became stable at much lower values:

- G6061 (VETO CAL counter)= 1040 /s
- G6062 (VETO BOT counter)= 9408 /s
- G6063 (VETO LAT counter)= 10992 /s

3 TM cycles after the anomaly, at 19:19:38Z, both VDM05 and VDM07 recovered themselves, and VDM06 HV dropped down to ~0V:

G6012 (VETO current)= 1.59 A
G6013 (VETO VDM/CDM current)= 0.92 A
G6061 (VETO CAL counter)= 1000 /s
G6062 (VETO BOT counter)= 9432 /s
G6063 (VETO LAT counter)= 11048 /s
G6039 (VETO VDM05 HV)= 991.74 V
G6040 (VETO VDM06 HV)= -60.8 V
G6041 (VETO VDM07 HV)= 1083.25 V

No special radiation was reported at the time of the anomaly, according to the SEIS tool. However it can be noted that JEM-X DFEE crashed on the same day at 07:52Z.

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

- 1- At 19:29:12Z, set IBIS-IASW in Stand-By (TC G0125)
- 2- At 19:29:45Z, set IBIS-VETO in Stand-By (TC G0601)
- 3- At 19:47:50Z, set IBIS-VETO in Nominal (TC G0600)
- 4- At 19:48:54Z, set IBIS-IASW in Science Standard (TC G0129).

At 19:47:54Z VETO was in Nominal and the main VETO parameters were nominal:

G6012 (VETO current)= 1.61 A
G6013 (VETO VDM/CDM current)= 0.97 A
G6039 (VETO VDM05 HV)= 985.72 V
G6040 (VETO VDM06 HV)= 1005.76 V
G6041 (VETO VDM07 HV)= 1083.25 V

At the next TM cycle, the count-rates became stable at nominal values:

G6061 (VETO CAL counter)= 1364 /s
G6062 (VETO BOT counter)= 40904 /s
G6063 (VETO LAT counter)= 40896 /s.

It must be noticed that this is the first time 3 VDMs report a HV break-down at the same time. The impact of VDM HV break-down on the Calibration Counter is unclear at the moment...

Note: data file enclosed to this Anomaly Report.

Item Configuration

Environment

Impacted Services

[Not Specified]

Recommendation

Affected Requirement

| | |
|---------------------------|-----------------|
| Date of last MRB | |
| External Reference | [Not Specified] |

| Processing | |
|--------------------------|-----------------|
| Root Cause | |
| Preventive Action | No |
| Resolution (M) | |
| Link Report | [Not Specified] |

| Related Files | | | | | |
|---------------|-----------------------|----------|---------|-----------|-----------|
| Id | Filename | Revision | Comment | File Size | Status |
| 5139 | VETO_HV_breckdown.xls | | | 248 kB | Available |

| Actions |
|-------------------------------------|
| No actions assigned to this report. |

| Related Reports | | | | |
|-----------------|------------|------------|---|---------|
| Relation | ID | Created | Description | State |
| Local | INT_SC-183 | 2007-04-04 | IBIS: VETO CDM1 High Voltage break down | Pending |



Anomaly Report Tracking System

| | | | | | |
|------------------------|-----------------------------------|-----------------------|-------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | SPI PSD channel rates malfunction | State | Pending | ID | INT_SC-194 |
| Originator | Salma Fahmy | Criticality | Low | Reproducibility | Unknown |
| Created | 2007-07-30 08:59 | Urgency | Low | | |
| Occurrence Date | 2007-07-19 12:00 | Classification | Space Segment Payload SPI | | |

| Description | |
|-----------------------------|---|
| Description | <p>On 2007-07-19 at 07:57:12Z TM parameters E3840 P PD CHL-RTE L0 to E3858 P PD CHL-RTE L18 (except for E3842 and E3857) all went OOL Alarm Low, with value 0. These are the PSD channel rates for all detectors except the failed GeD#2 and GeD#17 (which have no OOL defined as they are permanently zero). They remained at zero until 08:12:08Z, when they returned to a nominal value of their own accord.</p> <p>All other SPI TM around the time of this anomaly were nominal.</p> <p>This is a re-occurrence of a previously observed anomaly recorded in INT_SC-90, INT_SC-142 and INT_SC-179.</p> |
| Item Configuration | IASW 433 patch #1 |
| Environment | Routine operations (outside radiation belt and eclipse) |
| Impacted Services | [Not Specified] |
| Recommendation | |
| Affected Requirement | |
| Date of last MRB | |
| External Reference | [Not Specified] |

| Processing | |
|--------------------------|-----------------|
| Root Cause | Unknown |
| Preventive Action | No |
| Resolution (M) | |
| 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-142 | 2006-03-06 | SPI PSD Channel Rates Malfunction | Closed |
| Local | INT_SC-179 | 2007-03-08 | SPI PSD channel rates malfunction | Closed |
| Local | INT_SC-90 | 2004-08-10 | SPI PSD (Pulse Shape Discriminator) channel rates malfunction | Closed |



Anomaly Report Tracking System

| | | | | | |
|------------------------|---|-----------------------|---------------------------------|------------------------|------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | JEM-X1 DFEE CRC Anomaly following eclipse on 2007-04-30 | State | Pending | ID | INT_SC-187 |
| Originator | Salma Fahmy | Criticality | High | | |
| Created | 2007-04-30 14:13 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2007-04-30 12:00 | Classification | Space Segment Payload JEM-X | | |

Description

Description

On 2007-04-30 (revolution 555), during the post-eclipse reconfiguration of JEM-X1 following the 5th eclipse of this season, another DFEE anomaly occurred like those observed on 2004-06-20, 2004-06-23, 2004-12-08; 2005-05-18; 2005-11-14 and 2006-10-26 (ref: Anomaly Reports INT_SC-84; INT_SC-104; INT_SC-119; INT_SC-131 and INT_SC-161).

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 2007-04-30T07:53:32Z):

```
2007.120.07.54.16.862 2007.120.07.54.21.769 1536 RealTime 191 EVENT JEM-X1
PROB DFEE 11
```

```
FIX6 11
```

```
K9079 MESS CLASS 0
```

```
K9080 MESS ID 191
```

```
FIX16 8
```

```
FIX16 0
```

Indicating that the operation "Load DFEE context" was unsuccessful due to CRC failure of the area B000 (hex) to CFFF (hex).

```
2007.120.07.54.16.862 2007.120.07.54.21.793 1536 RealTime 234 EVENT JEM-
X1 AUTO EVENT 4
```

```
FIX6 4
```

```
K9079 MESS CLASS 0
```

```
K9080 MESS ID 234
```

```
K5419 ACTUAL LEVEL ECLIPSE
```

```
K5420 TARGET LEVEL RAD.
```

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 start-up) rather than the nominal value of 16MHz.

In response to this, the following operations were performed:

1) For the purpose of later analysis, a dump of the relevant area of the DFEE memory was executed:

- 08:08:50Z FCP_JEM1_0040 JEMX1 TRANSITION TO SAFE
- 08:14:46Z FCP_JEM1_0120 JEMX1 SET BCP OVERRIDES to disable the JEM- - X1 reactions to the Broadcast Packet radiation belt times
- 08:15:29Z FCP_JEM1_0045 JEMX1 TRANSITION TO MEMORY MAINTENANCE
- 08:19:27Z FCP_JEM1_0051 JEMX1 DFEE MEMORY DUMP, with the following values for the parameters of TC K0018:

K0017 START ADDR = B000 (hex)

K0018 LENGTH OF MEM = 1FFF (hex)

No differences with respect to the reference image on-ground were observed.

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

- 08:27:43Z FCP_JEM1_9010 JEMX1 DFEE SWITCH OFF
- 08:32:08Z FCP_JEM1_0021 JEMX1 DFEE ACTIVATION

3) At 08:39:12Z FCP_JEM1_0120 JEMX1 SET BCP OVERRIDES was executed to e-enable the JEM-X1 reactions to the Broadcast Packet radiation belt times.

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

Item Configuration

Environment Routine operations for eclipse

Impacted Services None

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Preventive Action No

Resolution (M)

| | |
|--------------------|-----------------|
| Link Report | [Not Specified] |
|--------------------|-----------------|

| |
|----------------------|
| Related Files |
|----------------------|

| |
|---------------------------------------|
| No files are attached to this report. |
|---------------------------------------|

| |
|----------------|
| Actions |
|----------------|

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---|----------|------------|-------------|--------|---------------|
| 90 | JEM-X1 DFEE CRC Anomaly following eclipse on 2007-04-30 | MW | 2007-12-31 | In Progress | 0 | |

| |
|------------------------|
| Related Reports |
|------------------------|

| Relation | ID | Created | Description | State |
|----------|------------|------------|---|--------|
| Local | INT_SC-161 | 2006-10-27 | JEM-X1 DFEE CRC Anomaly following eclipse on 2006-10-26 | Closed |



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-185 |
| Originator | Orlane Bergogne | Criticality | High | | |
| Created | 2007-04-11 08:59 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-04-05 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On 2007-04-05 (DoY 095) at 17:39Z, TM parameters G6061 (V1S-CAL-COUNT), G6062 (V1S-BOT-COUNT) and G6063 (V1S-LAT-COUNT) reported a drop. This triggered the OOL "warning low" for TM G6061.

Before anomaly (17:39:38Z):

G6061 (V1S-CAL-COUNT) = 1448 cnt/s
 G6062 (V1S-BOT-COUNT) = 39848 cnt/s
 G6063 (V1S-LAT-COUNT) = 39848 cnt/s
 G6012 (V1S-VETOCURR) = 1.63 A
 G6013 (V1S-VDMCDMCURR) = 0.98 A

At anomaly (17:40:02Z):

G6061 (V1S-CAL-COUNT) = 1100 cnt/s
 G6062 (V1S-BOT-COUNT) = 24296 cnt/s
 G6063 (V1S-LAT-COUNT) = 24320 cnt/s
 G6012 (V1S-VETOCURR) = 1.64 A
 G6013 (V1S-VDMCDMCURR) = 0.98 A

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

The VETO counters remained in these low ranges of values until Radiation Belts entry on 06/04/2007 at 01:56Z, impacting the science observation for:

- Pointings 05460067 to 05460069: OMC Flat Field Calibration (=> IBIS TM allocation to 90 TMPS/cycle)
- Pointings 05460070 to 05460076 (IBIS TM allocation 128 TMPS/cycle).

In the future, the indicated reaction in FDIR (to perform a VETO mode cycle) shall be executed by the operator after confirmation by s/s SOE or on-call SOE.

Item Configuration

Environment

Impacted Services

[Not Specified]

Recommendation

This problem already occurred on 2006-12-19 (INT_SC-170), 2006-06-19 (INT_SC-153), 2006-05-20 (INT_SC-150), 2004-07-30 and 2004-08-08 (INT_SC-92).

Investigations on PI side.

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause
Preventive Action No
Resolution (M) 20070711 ARB (RS, OB, SF, FA)
Kept open for tracking purpose

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---|----------|------------|-------------|--------|---------------|
| 89 | IBIS-VETO Calibration, Bottom and Lateral Counters reported reduced count-rates | SF | 2007-12-31 | In Progress | 0 | |

Related Reports

| Relation | ID | Created | Description | State |
|----------|------------|------------|---|--------|
| Local | INT_SC-170 | 2006-12-19 | 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 PDM8 Latch-up Mode | State | Pending | ID | INT_SC-184 |
| Originator | Orlane Bergogne | Criticality | High | | |
| Created | 2007-04-04 08:39 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-04-04 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On 03/04/2007 at 22:52Z, TM parameter G5040 (P0E-PDM8STB) was reported OOL with the value OFF. All other PDMs were working nominally, and PICsIT was in Nominal mode. At the same time, the OEM <> was reported.

These 2 events reported a Latch-Up notification of PDM#8. The reason for this change of status remains unknown at the time being.

The radiation background was low according to the SEIS tool. However several anomalies occurred at this time (BCR SEU & IBIS VETO HV break-down).

Following the action in FDIR, under s/s SOE guidance, the recovery was performed as follows:

1/ At 23:47Z IBIS was set in Stand-By mode with TC G0125(FCP_IBIS1_0313).

2/ At 23:30Z, PDM #8 was switched OFF with FCP_IBIS1_0329.

3/ At 23:30Z, PDM #8 was switched ON with FCP_IBIS1_0110.

4/ At 23:42Z, PDM #8 was enabled with FCP_IBIS1_0083 using the dynamic TC GU0512. PDM #8, 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 23:44Z.

The impact on the science was: Pointing #05460015 and Pointing #05460016 were partially performed without PDM#8.

Item Configuration

Environment

Impacted Services

[Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference

[Not Specified]

Processing

Root Cause

Unknown

Preventive Action

No

Resolution (M)

20070711 ARB (RS, OB, SF, FA)

kept open for tracking purpose

Link Report

[Not Specified]

Related Files

No files are attached to this report.

Actions

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---------------------------------|----------|------------|-------------|--------|---------------|
| 88 | IBIS: PICsIT PDM8 Latch-up Mode | SF | 2007-12-31 | In Progress | 0 | |

Related Reports

| Relation | ID | Created | Description | State |
|----------|------------|------------|---------------------------------|--------|
| Local | INT_SC-175 | 2007-02-09 | IBIS: PICsIT PDM6 Latch-up Mode | 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-183 |
| Originator | Orlane Bergogne | Criticality | High | | |
| Created | 2007-04-04 08:28 | Urgency | Low | Reproducibility | Unknown |
| Occurrence Date | 2007-04-03 12:00 | Classification | Space Segment Payload IBIS | | |

Description

Description

On DoY 2007.093 (03/04/2007) at 17:20Z, the following OEM (class 2, ID 186) was reported:
<>;

at the same time, TM parameter G6051 (V1S-CDM01HV) was reported Out Of Limit Low-Low with a value of ~0 (-31.5V).

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)= 1440 /s
G6062 (VETO BOT counter)= 39384 /s
G6063 (VETO LAT counter)= 39384 /s
G6051 (VETO CDM01 HV)= 1052.26 V

During the anomaly, the currents dropped down due to the HV break-down of CDM #01, as well as the count-rates (due to missing contribution of Calibration Module #01):

G6012 (VETO current)= 1.59 A
G6013 (VETO VDM/CDM current)= 0.94 A
G6061 (VETO CAL counter)= 0 /s
G6062 (VETO BOT counter)= 37544 /s
G6063 (VETO LAT counter)= 37528 /s
G6051 (VETO CDM01 HV)= -31.5 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 ~10mins
- 4- Set IBIS-VETO in Stand-By
- 5- Set IBIS-VETO in Nominal
- 6- Set IBIS-IASW in Science Standard.

At 17:43Z IBIS was back in Science Standard and VETO in Nominal.

The main VETO parameters were nominal:

G6012 (VETO current)= 1.63 A

G6013 (VETO VDM/CDM current)= 0.98 A
 G6061 (VETO CAL counter)= 1560 /s
 G6062 (VETO BOT counter)= 39304 /s
 G6063 (VETO LAT counter)= 39296 /s
 G6051 (VETO CDM01 HV)= 1052.26 V.

Item Configuration

Environment

Impacted Services [Not Specified]

Recommendation

Affected Requirement

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause System/Equipment_Failure
Preventive Action No
Resolution (M) 20070711 ARB (RS, OB, SF, FA)
 kept for tracking purposes

Link Report [Not Specified]

Related Files

No files are attached to this report.

Actions

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---|----------|------------|-------------|--------|---------------|
| 87 | IBIS: VETO CDM1 High Voltage break down | SF | 2007-12-31 | In Progress | 0 | |

Related Reports

| Relation | ID | Created | Description | State |
|----------|------------|------------|---|---------|
| Local | INT_SC-198 | 2007-08-17 | IBIS: VETO VDM05, VDM06 and VDM07 High Voltage break down | Pending |
| Local | INT_SC-166 | 2006-12-04 | IBIS: VETO VDM 15 High Voltage break down | Closed |



Anomaly Report Tracking System

| | | | | | |
|------------------------|--------------------------------------|-----------------------|-------------------------------|------------------------|-------------------|
| Project | Integral Spacecraft Anomalies | Project ID | INT_SC | Report Type | SC |
| Observation | SPI GeD # 12 Degradation | State | Pending | ID | INT_SC-176 |
| Originator | Salma Fahmy | Criticality | High | | |
| Created | 2007-02-09 16:30 | Urgency | High | Reproducibility | Unknown |
| Occurrence Date | 2006-12-21 12:00 | Classification | Space Segment Payload SPI | | |

Description

Description

On 2006-12-21, during the SPI camera switch-on following the 9th SPI annealing, the Ge detector #12 was observed by the SPI PI to have a degraded energy resolution compared to the other detectors. This had also been the case after the previous annealing (#8).

Therefore, during and after the switch-on, ending on 21/12/2006 at 09:50Z, the HV of GeD#12 was left at 2.5kV (instead of increasing to the nominal 4kV). On 21/12/2006 at 15:25Z the HV for GeD#12 was increased to 3kV. The evolution of the energy resolution, with the decreasing cold plate temperature, was monitored over the next few days. The evolution was as follows:

| Cold Plate Temp | GeD#12 Energy res (198keV line, HV at 3kV) |
|-----------------|--|
| 83 K | 2.33 keV |
| 81.5K | 2.2 keV |
| 79.3K | 2.11 keV |

It was then decided to perform a few tests in order to re-evaluate the performance of GeD#12, following the stabilisation of the cold plate temperature in the range 80K+/-1K, to find the best HV for GeD#12 (and to evaluate whether it was possible to return to 4kV). The test was performed on 2006-12-29 with the detector HVs set to different values as follows:

- 2006-12-29T08:20:05Z SPI to CONF, all GeD HVs set to 2.5kV (TPF ES1713_AF-HVSET_2500volt_0001.TPF) and back to PHOTON
- 2006-12-29T09:00:04Z SPI to CONF, all GeD HVs set to 3kV (TPF ES1713_AF-HVSET_3000volt_0001.TPF) and back to PHOTON
- 2006-12-29T09:45:35Z SPI to CONF, all GeD HVs set to 3.5kV (TPF ES1713_AF-HVSET_3500volt_0001.TPF) and back to PHOTON
- 2006-12-29T10:30:20Z SPI to CONF all GeD HVs set to 4kV except GeD#2 and GeD#17 (TPF ES1713_AF-HVSET_fmconfig_0005.TPF) and back to PHOTON

The results of the tests were as follows:

- GeD12 198 keV 2.5 KV 2.03keV
- GeD12 198 keV 3.0 KV 2.11keV
- GeD12 198 keV 3.5 KV 2.15keV
- GeD12 198 keV 3.0 KV 2.42keV

A significant degradation of the GeD#12 energy resolution was observed at 4kV and therefore the PI decided to continue operation of the GeD#12 at 3.5 kV. At 2006-12-29T11:15:15Z SPI was commanded back to CONF, the GeD#12 HV was set to 3.5kV and SPI was commanded back to PHOTON. The GeD#12 HV has since remained at 3.5kV.

Item Configuration

Environment

Impacted Services

Science data

Recommendation

Affected Requirement**Date of last MRB****External Reference** [Not Specified]**Processing****Root Cause****Preventive Action**

No

Resolution (M)

20070711 ARB (RS, SF, FA)

Still open and is being observed after Annealing #10

Link Report

[Not Specified]

Related Files

No files are attached to this report.

Actions

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|--------------------------|----------|------------|-------------|--------|---------------|
| 85 | SPI GeD # 12 Degradation | SF | 2007-11-30 | In Progress | 0 | |

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 conclusion 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 Services

[Not Specified]

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

Date of last MRB

External Reference [Not Specified]

Processing

Root Cause

Unknown

Preventive Action

No

Resolution (M)

20070711 ARB (RS, OB, SF, FA)

kept open for tracking purpose

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

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---|----------|------------|-------------|--------|---------------|
| 84 | IBIS: VETO TC rejected during the execution of VETO patch 3.2 | SF | 2007-12-31 | In Progress | 0 | |

Related Reports

| Relation | ID | Created | Description | State |
|----------|------------|------------|--|--------|
| Local | INT_SC-188 | 2007-05-02 | IBIS: VEB-A SW reported problem during reconfiguration after eclipse | 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 Services

[Not Specified]

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**Date of last MRB****External Reference** [Not Specified]**Processing****Root Cause****Preventive Action** No**Resolution (M)** 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

20070711 ARB (RS, SF, FA)

Version 4.3.3 is implemented at present.

needs to be verified if it has re-occured.

Link Report [Not Specified]**Related Files**

No files are attached to this report.

Actions

| ID | Title | Assigned | Due Date | State | Effort | Related Files |
|----|---|----------|------------|-----------|--------|---------------|
| 76 | To further investigate | FC | 2005-09-30 | Completed | 0 | |
| 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 | 0 | |

Related Reports

No other reports related to this report.