XMM-Newton and INTEGRAL weekly Mission Operations Report

XMM-INT-WOPS-24_19-20

Issue 1

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1. Weekly report

	XMM	Integral
Main activities	▪ Nominal Operations ▪ Automation of Replenishment ▪ CDMU patch testing ▪ Automation System 3.4.1 release	▪ Routine science operations ▪ SPI annealing on-going (May 10th - 28th)
Status and performance of S/C	▪ X-Class solar flares, instruments to safe	▪ Manual transponder swaps following RF switch anomaly ▪ No stars found in star tracker field of view
Status and performance of Ground segment	▪ NIS issues → Swap to NIS-B ▪ MOIS performance issues are under review	▪ Cumulative issues with ISDC
S/C Anomalies	▪ None	▪ INT_SC-748 JEMX2 Post Lunar Eclipse Anomaly ▪ INT_SC-749 Solar Flare (X1) Affects Payload Operations ▪ INT_SC-750 Star Tracker(STR A) cannot find any stars after slew end ▪ INT_SC-751 Science lost due to high radiation(solar flare)
G/S Anomalies	▪ XMM-1569 XNISA frozen or showing incorrect TM status	▪ Cumulative issues with ISDC – analysis/discussions ongoing (AR INT-3937)
Future activities planned	▪ NSM via MOIS and CDMU patch ▪ Cebreros migration ▪ Webserver and NRT Analysis/Monitoring migration	▪ FOP Release 5.0 ▪ Automation of Transponder swap operations ▪ Automation of ground station operations (EVFM) ▪ Automation of IREM recovery

2. Detailed weekly operational events

note: all times are Zulu (in brackets DOY)

2.1. XMM

- 06/05/2024 (127) 08:35:03 Battery 2 reconditioning starting
  - 19:29:52 Frames out of sequence, followed by TM drop (both VCs), duration ~6s at 19:30:06. PN commanding interrupted & PN s/s disabled in T/L. Cause is suspected RFI.
  - 19:45:21 PN was recovered with MOIS procedure and re-enable in the A/S
- 08/05/2024 (129) 01:57:35: No on-board lock during the G/S handover from KRU to TOH. This caused OM commands missed, OM s/
- 09/05/2024 (130) 07:59:06: Call on-call due to MOIS crash close to the deactive window. Enable MOS1+2 in autostack to allow them to go to idle closed from TL at 08.05.
  - 08:05:16: On-call restart MOIS. Manually delete OM TTAG. Once MOIS was back it appear that it deleted some safety TTAG but not all. Manually delete RG1 TTAG.
  - 09:51:52: Put MCOOL1 from 4 back to 0 and re-enable PN, RGS1+2 (which are already in correct perigee mode).
- 10/05/2024 (131) 06:24:40: NIS HCI Connectivity links in left panel show red: Nis Manager Conn, S2K Admin link, S2k TC link, S2K Mode. Restart the HCI. Left panel Connectivity links then showed green correctly.
  - 12:40:38: Report current ACC on board tables performed by the AOCS SOE
- 11/05/2024 (132) 20:51:26: procedure to for rejoining PN X_CRP_EPN_1500 after radiation failed with error due to a TC failing completion (F0180 "EACMADDOFFS")
  - 21:02:06: PN: IDLE MODE , FW THICK. SCP_SYS_5000 Scientific Instrument to SAFE MODE. Step 4.3 executed. Now PN: IDLE MODE, FW CLOSED
  - 21:34:05: After consultation with On Call SOE with respect to the command failure on PN at 20.51, Re-started MOIS PN re-join Procedure X_CRP_EPN_1500. Command F0180 failed completion as the TC not executed successfully on-board even though instrument was in correct mode. X-ref requests rerun of procedure. Cause of the failure was two instances of the same procedure ran at the same time.
- 16/05/2024 (137) 09:45:00: Swap of MOIS machines from IXAUTO-H to IXAUTO-D to activate Automation System 3.4.1
  - 17:12:16: End of battery 2 discharge
  - 17:38:18: Battery 2 Reconditioning relays OFF
  - 18:46:23: Start of Battery 2 recharge (trickle)
  - 18:58:00: Battery 2 to full charge
- 17/05/2024 (138) 22:15:21: MOIS scheduler error report pop-up on IXAUTOD: EVM_X_CRP_SYS_5201 (Start recovery of MOS1 instrument after radiation), failed execution, status = ERROR (clicking detail button just shows a value of zero). Same for procedure 5202. The termination is normal because the radiation procedure X_CRP_EPN_5101 that is aborting all running PN, MOS2 and MOS1 procedures.
- 18/05/2024 (139) 06:53:13 XMM_XMC_0002 (swap NIS), LELA was restarted.
  - 07:03:56: SCP_SYS_5004 (G2,4) Top Level instrument contingency procedure, step 7 case D, SCP_SYS_2000. Recovery after a G/S outage.
  - 07:25:38: NIS-A was restarted.
  - 07:54:06: Event logger, GMMS, Fatal Error, Lela not updated, but Lela is updating radiation displays ok. CRP_SYS_5004, step 44. Link MOC-SOC monitor incrementing ok

  - 08:41:43: NIS-A server and HCI restarted using right click options. HCI showing correct information now. Stay on NIS-B as per on-call instruction (anomaly created XMM-1569)
- 19/05/2024 (140) 12:29:11: MOIS crashed. "Error during screen refresh'. MOIS restarted.
- 20/05/2024 (141) 08:43:06: XMCSA:TCOserver: "TEDV_SET_OVERFLOW" multiple instances. Re-started TCOserver on XMCSA

2.2. INTEGRAL

- 08/05/2024 (129) 02:34:20 ECLIPSE START OOL P3115 SA wing 1 CUR 2, LOW/LOW.
  - 02:45:24 ECLIPSE END (All SA wing currents nominal)
  - 02:50:00 OI2497 PDU Sun/ECL sequence did NOT trigger (as described in step 1). Step 2. therefore applies. 2.1 Disabled IBIS in T/L
  - 03:16:25 OOL LD5380D remains since 02:51:09 Checked OOL & OEM x-refs. Contacted on-call SOE to confirm course of action. ***See AR INT_SC-748 JEMX2 Post Lunar Eclipse Anomaly***
  - 03:31:28 On advice from on-call SOE, executed FCP_JEM2_0040 (sent TC L0008), JEMX2 transition to safe.
  - 13:00:40 G/S: MSP: TM Drop for few seconds, reason possible RFI, Impact slew #11 failure
  - 13:00:42 CSL #27750011 missed from timeline (Slew cmd's failed due to a TM drop)
  - 13:37:56 FDS: TPF 2775_0502_A.OSL applied on A/S to update slew 27750012
  - 15:05:00 AOCS end of eclipse season activities as per OI-2480: Execute the steps 2, 7 and 8 of FCP_AOC_0522.

- 10/05/2024 (131) 10:15:27 Start of SPI annealing #42 (Ops Instr #2499): warm up phase
  - 10:15:27 execute step 1, 10, 11 of EENTRY03 to disable events & spectra acquisition
  - 10:18:29 FCP_SPI1_0090 step 3: FCP_SPI1_1700 - Disable cold plate monitoring
  - 10:19:51 FCP_SPI1_0090 step 4: FCP_SPI1_0160 - SPI to CONF mode
  - 10:21:07 FCP_SPI1_0090 step 5: FCP_SPI1_1713 - Set AFEE HV to zero
  - 10:26:38 FCP_SPI1_0090 step 6: FCP_SPI1_1710 - AFEE HV OFF & LVPS of det #2, #8 & #11 OFF
  - 10:30:17 FCP_SPI1_0090 step 7: FCP_SPI1_1738 - ACS HV to minimum
  - 10:34:13 FCP_SPI1_0090 step 8: FCP_SPI1_0180 - Load safety TT TC for end of SPI annealing
  - 10:37:14 FCP_SPI1_0090 step 9: FCP_SPI1_0240 - Stop SPI active cooling
  - 20:30:49 OI#2500 SPI Annealing #42: warm up phase FCP_SPI1_0130 :SPI transition to Photon mode, executed successfully.

- 11/05/2024 (132) 01:47:37 OI#2500 SPI Annealing #42: warm up phase FCP_SPI1_0100 Step 7 executed under the guidance of SPI SOE
  - 02:11:37 TM:M5024 'CCD OFF' STATUS-OOL (value= 1) TM:MD0033D OMC_SAFEOUTBELT STATUS-OOL (value=1) OMC went to SAFE due to high radiation. NOAA website shows increased activity. Waiting for counts to be below threshold for 2 hours as per CRP_OMC_5120, before OMC re-join. ***See AR INT_SC-749 Solar Flare (X1) Affects Payload Operations***
  - 02:12:36 S/S:OMC Disabled in timeline
  - 02:29:40 OOL KD5020D EQ DFEE STATE False OOL LD5020D EQ DFEE STATE False OOL KD0033D JEM1_SAFEOUTBELT 1 OOL LD0033D JEM2_SAFEOUTBELT 1 FCP_JEM1&2_0040 JEMX1/2 Transition to Safe High radiation environment
  - 05:53:28 1280, 167, Red, Anomaly, IBIS1 PICSIT NOISY Cross ref : OEM class 0 ID 175 "Killed Pixel Notification" not seen in obeh. No action listed. Note: space radiation is still rising but is below the Ibis safe automation trigger level

- 09:02:31 IBIS in standby. Veto Off
- 09:11:20 FCP_IBIS1_0801 : IBIS TRANSITION TO SAFE. - follow checks - MCE's standby, voltages off Notify oncall
- 20:38:17 IBIS is observing now. S/S: IBIS re-enabled in timeline

- 12/05/2024 (133) 10:43:47 PD3522D Pwr Budget Saa40, low, 2.7A (limit 3.0) Back in limit 3mins later. Could not find parameter in cross ref
  - 13:08:17 CRP_JEM1_5060 JEMX1 RECOVERY FROM HIGH RADIATION Step 7.2 go to FCP_JEM1_1010
  - 13:10:36 FCP_JEM1_1010 JEMX1 CONFIGURATION SETTING FOR SCIENCE send KS1010 (check with oncall if this is still up to date) steps 3-end
  - 13:45:06 CRP_JEM1_5060 JEMX1 RECOVERY FROM HIGH RADIATION back to Step 7.2 send KEDATA02 (saved from timeline) command KU0014 X on completion this changes to V when you send the next command K0021
  - 14:20:35 CRP_JEM2_5060 JEMX2 RECOVERY FROM HIGH RADIATION Step 7.2 go to FCP_JEM2_1010
  - 14:36:15 FCP_JEM2_1010 JEMX2 CONFIGURATION SETTING FOR SCIENCE send LS1010 steps 3-end (typo step 4.5) Mention to oncall that steps 4.1 - 4.8 repeat what is written in steps 3.1 to 3.7 and could be abbreviated by saying send seqeunce LS1010
  - 14:59:33 CRP_JEM2_5060 JEMX2 RECOVERY FROM HIGH RADIATION back to Step 7.2 send LEDATA02 (saved from timeline)
  - 15:31:16 FCP_OMC_0041 : : OMC EXIT FROM SAFE send TC M1511

- 13/05/2024 (134) 14:03:58 M4024 CCD Off. OMC gone to safe due to High Space Weather radiation (NOAA SW proton count increasing again). Oncall notified ***See AR INT_SC-751 Science lost due to high radiation(solar flare)***
  - 17:18:51 L, K5317, Jemx1,2 Rad Mon3 toggling. Check with oncall - ok to wait until automation triggers
  - 18:43:18 L5317 and K5317 still OOL and radiation trend up FCP_JEM1_0040 JEMX1 TRANSITION TO SAFE FCP_JEM2_0040 JEMX2 TRANSITION TO SAFE JEMX1,2 disabled in autostack

- 16/05/2024 (137) 14:53:00 CRP_OMC_5120 OMC RECOVERY FROM HIGH RADIATION
  - 14:54:00 FCP_OMC_0041Â OMC EXIT FROM SAFE MODE
  - 15:05:30 CRP_JEM1_5060 JEMX1 RECOVERY FROM HIGH RADIATION
  - 15:52:20 CRP_JEM2_5060 JEMX2 RECOVERY FROM HIGH RADIATION

- 19/05/2024 (140) 07:51:49 TPF update failed - only 2 stars matching SEQ: AESAM_00 uplinked & recovery tool started
  - 07:55:29 Recover Tool fails twice: difference of expected time. Call FD -FD later explain this error is actually connected with shortage of stars
  - 08:01:43 Try recover tool with FD on phone. Fails again same error. Wheel speeds close to prediction. Ok to allow next slew to go from TL while FD investigate error. AOCS re-enabled
  - 08:45:09 auto slew update for slew 27790015 09.38 worked ok
  - 14:56:41 FDS: TPF update failed for SlewID #27790021. updateslew failed to determine input for IPF generation. Slew meets criteria of OI #2443 so slew can go without update. ***See AR INT_SC-750 Star Tracker(STR A) cannot find any stars after slew end***

- 15:51:51 A3087 Auth Sun Steering Ini Failed release, but AOCS subsystem did not automatically interlock. Spacon manually disabled AOCS in Autostack
- 16:04:00 While trying to recover the slew, I cannot send the sequence for a mapping from the manual stack, because Static PTV shows NO GO! Called on-call (LT)
- 17:16:34 FCP_AOC_1104 Disable STR Use
- 17:24:27 STR Mapping (release all stars) no Stars found
- 17:48:45 FCP_AOC_1050 Update word B to remove STR then FCP_AOC_1411 STR-A POWER OFF
- 17:49:17 Entry 34 Triggered Command A3009 Disable STR in use. This triggered ACC incorrect CRC rejection Recoverable Errors increase by 1 A5008. Suspect A3009 command is encoded incorrectly? Also triggered OOL A5754 REJECT REASON = INCORR CRC
- 18:01:18 FCP_AOC_1410 STR-A ON then FCP_AOC_1050 Update word B to enable STR
- 18:08:07 FCP_AOC_1406 STR Mapping (release all stars) â€“ no Stars found (or at least all reduced accuracy)
- 18:35:15 FCP_AOC_1106 SLEW AROUND THE SUNLINE USING THE IMU DRIFT 18:37:16-18:42:38 Yaw Slew FCP_AOC_1106 for 5 min
- 18:43:29 FCP_AOC_1406 STR Mapping (release all stars) Guide Star found. 2 stars only in ESW not possible to perform FD attitude determination decision was taken to perform
- 18:51:16 FCP_AOC_1106 SLEW AROUND THE SUNLINE USING THE IMU DRIFT 18:51:16-18:56:20 Slew Yaw Slew FCP_AOC_1106 for 5 min
- 18:58:47 FCP_AOC_1406 STR Mapping (release all stars) â€“ Guide Star found. 8 stars in ESW FD attitude determination OK
- 19:04:16 FCP_AOC_1105 Enable STR Use
- 19:08:00 SEQ: AESAM_00 uplinked
- 19:26:33 Manual slew 2779_0500_M.OSL to PID #27790024
- 19:40:24 SYS: S/S AOCS enabled in TL
- 23:17:02 G/S: Lost connection to KIR (all links showing unbound) closed and re-opened links, TM was reestablished. Interruption of 55s, no impact on commanding Asked ECC to investigate.
- 23:18:40 G/S: Lost connection to KIR (all links showing unbound) as before. ECC reported problems with comms lines to KIR. TM re-established at 23:21:07
- 23:18:48 OSL #27790029 failed
- 23:37:00 Manual slew 2779_0502_M.OSL from PID #27790028 to #27790029
- 23:59:33 G/S: Lost connection to KIR (all links showing unbound) as before, but this time also TC link affected. Also lost bit-lock

- 20/05/2024 (141) 00:10:51 FDS: TPF 2779_0503_A.OSL applied on A/S to update slew 27790030
  - 02:20:00 SPI Annealing #42 (part 2): Passive Cooling
  - 02:20:00Z - FCP_SPI1_180 :: Stop SPI Annealing
  - 02:25:00Z - FCP_SPI1_0182_A :: Toggle Heat Pipe Heaters
  - 02:41:09Z - FCP_SPI1_0160 - SPI to CONF mode
  - 02:44:51Z - FCP_SPI1_1738 :: Set ACS to Nominal HV
  - 02:54:38Z - FCP_SPI1_0250 :: ACS Calibration – Start
  - 11:11:06Z OI 2504 annealing FCP_SPI1_0130 SPI to photon E2134-2141 lower limit changed from 0 to 50