Operations Notes

FOS Team @ ESAC

Reported by:

J. Fauste/J.M. Castro Cerón

Topic:

Date:

Issue:

FOS Report for week 21, year 2020

from 18 MAY 2020 to 25 MAY 2020

1.0

1 General Comments

Activities scheduled for this week are those planned for the 21st calendar week of 2020:

```
18 MAY 2020 to 25 MAY 2020 (DOYs 139 to 146).
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The following routine activities were planned this week (see Gantt chart on next page and CRF 884).

- One PMS Offset on 21 MAY 2020 (DOY 142), including three Short Calibrations at 06:25:00.0z, 06:25:34.8z, and 06:26:09.6z (orbit 55444).
- Local Oscillator Calibrations every 10 minutes.
- *X* band Passes over ESAC and Svalbard.

2 Mission Planning Deviations

Due to the MIRAS CCU reset that happened on the 23th of May the following X-Band passes were not received on ground.

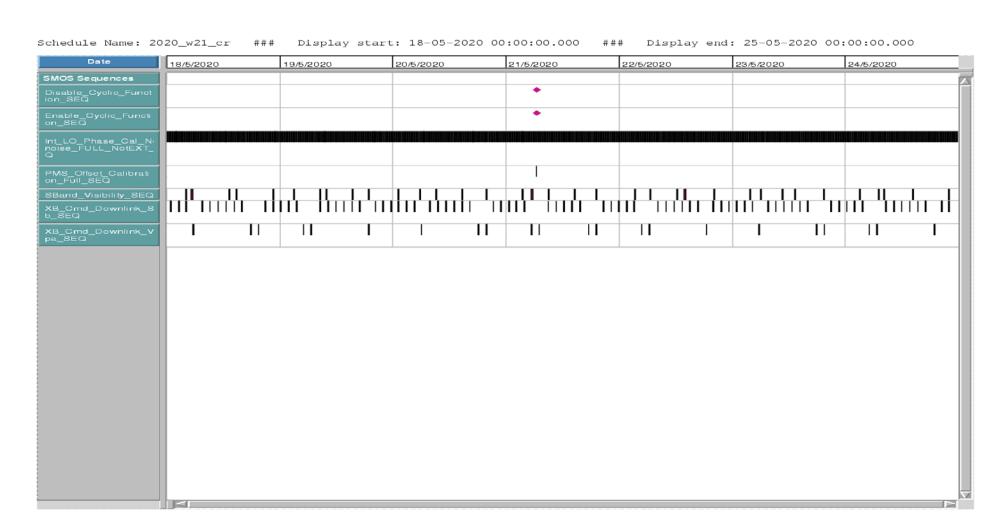| Station	AOS	LOS	Duration
ESAC	2020-05-23T17:51:27	2020-05-23T17:57:28	361
ESAC	2020-05-23T19:29:21	2020-05-23T19:36:27	426
SVAL	2020-05-23T20:56:31	2020-05-23T21:06:54	622
SVAL	2020-05-23T22:35:19	2020-05-23T22:45:35	615
SVAL	2020-05-24T00:13:58	2020-05-24T00:24:18	619
SVAL	2020-05-24T01:52:47	2020-05-24T02:03:14	626
SVAL	2020-05-24T03:32:08	2020-05-24T03:42:26	618
ESAC	2020-05-24T05:03:47	2020-05-24T05:11:11	443
ESAC	2020-05-24T06:43:12	2020-05-24T06:49:37	384
SVAL	2020-05-24T08:35:44	2020-05-24T08:41:25	340
SVAL	2020-05-24T10:18:13	2020-05-24T10:21:56	222
SVAL	2020-05-24T11:59:43	2020-05-24T12:03:44	240
SVAL	2020-05-24T13:40:03	2020-05-24T13:46:15	372

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3 TC Failures

None.

4 On Board Anomalies

- A new MIRAS CCU reset happened on 2020-05-23T16:02:54z. The reset took place at the end of X-Band Svalbard pass with AOS at 15:58:40z. The anomaly was initially suspected from the DPGS operator since the two X-Band passes following the one from Svalbard were not received on ground. The reception of the S-Band pass with AOS at 19:18:01z finally confirmed the on board CCU reset followed by a telephone call from the CNES on call engineer at 22:26z

  Recovery took place according to CRF-885 issued at the time of the nominal planning of calendar week 22 and uploaded by CNES to the spacecraft on the 24 of May during SBand pass IVK-17 at 06:57z According to this CRF, resume of XBand activities took place on the 24 of May at 15:20:28z.

  Incidentally, this reset recovered the latch-up from 21 MAY 2020, thus CRF 886 (i.e. the CRF dedicated to recover the latch-up), scheduled to be mailed out in the morning of 25 MAY 2020, was never sent to CNES nor executed. As reported in the instrument Boot report packet, the reason for the reset was the usual *"Task Overrun error"*.

  The CCU reset created a TM gap from 2020-05-23T15:59:39 to 2020-05-23T16:03:32 (233 seconds). Also and because the time from the reset to the instrument recovery was longer than 11 hours, the faulty chip 6 of MM partition P3 was overwritten creating 1364 seconds of data lost from 2019-05-24T03:23:43z to 2019-05-24T03:46:27z

  At the time of the anomaly, the position of the MM write and read pointers was as follows:

  > *Write Pointer= 833446, Partition P1*
  > *Read Pointer= 571217, Partition P1*

- The MIRAS CMN, unit B2, unlocked 2020-05-24T01:15:17.340z (DOY 145). This anomaly was geolocated over the coast of Antarctica, just as the spacecraft was about to enter the Indian Ocean:
  > *Latitude   = -70.07°*
  > *Longitude = 95.55°*

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Both parameters, output power SPM18162 and locking status SPM18167, went out of limits in the FOS PLPC system. The anomaly recovered by itself in about few seconds.

- MIRAS instrument MM, partition P3, latched up 2020-05-21T21:10:14.526z (DOY 142). The following parameters went out of limits in the PLPC system:
  2020.142.21.10.14,526z   DMASME09   LU Switch P3
  2020.142.21.10.14,526z   DMASME37   SDD LU Detected

This anomaly was geolocated over the Estado do Paraná (Brazil):
   Latitude   = -26.45°
   Longitude = 308.56°

There were no science data losses associated with this anomaly because it affected partition P3, while the Read and Write pointers were both on partition P5. Because of MIRAS CCU reset on the 23rd of May, CRF 886, scheduled to be mailed out in the morning of 25 MAY 2020, was never sent to CNES nor executed.

At the time of the anomaly the position of the MM pointers were as follows:
   READ   = 2201551   (partition P5)
   WRITE = 2289605   (partition P5)

5 On Board Events Telemetry

The following Alarm and Error packets were received immediately before the CCU reset:

Event Description	Packet ID	Severity	Event Time
MM_Partition_Configuration_Acquistion_Failur	687	ALARM	2020-05-23T16:02:53
MM_Error_Counters_Acquisition_Failure	689	ALARM	2020-05-23T16:02:53
MM_Scrub_Frequency_Acquisition_Failure	690	ALARM	2020-05-23T16:02:53
MM_Address_Acquistion_Failure	684	ALARM	2020-05-23T16:02:53
MM_Science_Write_Failure	692	ALARM	2020-05-23T16:02:54
Triggered_Task_Overrun	612	ERROR	2020-05-23T16:02:53

The following RAM Single Bit errors befell this week:

Event Description	Packet ID	Severity	Event Time	Parameters

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RAM single Bit Error	730	WARN	2020-05-18T21:43:26	2050940

6 FOS Systems Status

- New version of *FlexPlan* version 4.5.4 was installed on 19 of May 2020 on SPGF-3 machine. This new version was successfully tested on the 13 of May on SPGF-1 and then installed on SPGF-4 on the 13 of May.

7 Data Reception from CNES

All *S* band passes were correctly received from CNES and successfully processed by the FOS PLPC system.

8 *X* Band Data Reception in PXMF

None, all *S* band passes successfully received and processed.

9 Exceptional Activities

None.

10 AOB

None.

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APPENDIX A: OOLs

During the execution of the CCU recovery procedure, the following TM parameter went nominally out of limit indicating that the on-board ITL was temporary made disabled.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2020-05-24T08:33:35	2020-05-24T06:59:30	NTLHK022	ITL Ena State	Disabled	Enabled

The CMN unlock of unit B2 on the 24th of May, generated the following two temporary out of limits on the FOS PLPC system.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2020-05-24T03:37:31	2020-05-24T01:15:17	SPM18162	B2 LO_Out_Power	NOT-OK	OK
2020-05-24T03:37:31	2020-05-24T01:15:23	SPM18167	B2 LO_Locking	UNLOCK	LOCK

At the time of the CCU reset event, the following list of TM parameters went temporary out of limits on the FOS PLPC system.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM22167	C3 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM21167	C2 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM20167	C1 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM19167	B3 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM18167	B2 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM17167	B1 LO_Locking	UNLOCK	LOCK

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2020-05-23T19:53:16	2020-05-23T16:03:27	SPM16167	A3 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM15167	A2 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM14167	A1 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM13167	H3 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM12172	H2 LO_locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPM11167	H1 LO_Locking	UNLOCK	LOCK
2020-05-23T19:53:16	2020-05-23T16:03:27	SPC02106	Instrument_Mode	Inst Init	Any
2020-05-23T19:53:16	2020-05-23T16:03:27	XNIRABST	NIR AB VALID ST	NOT-OK	OK
2020-05-23T19:53:16	2020-05-23T16:03:27	XNIRBCST	NIR BC VALID ST	NOT-OK	OK
2020-05-23T19:53:16	2020-05-23T16:03:27	XNIRCAST	NIR CA VALID ST	NOT-OK	OK

The following two out of limits were received on FOS PLPC system at the time of the Mass Memory Latch-up on the 21st of May.

GS_TIME	OB_TIME	PARAMETER	DESCRIPTION	OOL Value	Check Value
2020-05-22T03:47:39	2020-05-21T21:10:14	DMASME37	SDD LU Detected	FALSE	TRUE
2020-05-22T03:47:39	2020-05-21T21:10:14	DMASME09	LU Switch P3	OFF	ON