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DOCUMENT

ENVISAT MISSION EXTENSION

MINI COMMISSIONING PLAN

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CHANGE LOG

Reason for change	Issue	Revision	Date

CHANGE RECORD

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1 SCOPE

The Envisat mission extension beyond 2010 implies the satellite altitude to be decreased through a series of in-plane manoeuvres. This document has been issued following the Orbit Change Operational Plan Work Package **WP.E2.1.FOS.1090** and outlines all recommended checks and activities aiming at verifying the nominal state of each instrument post orbit lowering, and/or as soon as the science data generation is resumed.

2 INTRODUCTION

In the context of the Envisat mission second extension, the satellite semi-major axis shall be reduced by 17.4 km in a series of 3 manoeuvre pairs:

- On 22nd October, two in-plane OCMs
- On 26th October, two in-plane OCMs
- On 2nd November, two SFCMs.

For the whole duration of the orbit change, the PDS does not intend to process the instrument scientific data. Consequently each instrument is expected to be kept in a safe, manoeuvre-compliant operational mode (e.g. protection of optical instruments against accidental solar illumination, instrument thermally stable, manoeuvre shock/acceleration preservation, etc.).

In supplement of the real-time telemetry down-linked during ground passes, the SSR1 shall record the satellite and payload housekeeping telemetry outside ground station coverage. Since SSR playback only occurs when at least one completely filled Word Group (256Mbit) is available, it is foreseen to keep some instruments in science data producing mode.

The following sections describe the operational considerations in that respect.

3 APPLICABLE DOCUMENTS

[RD1] email:AATSR during ENVISAT orbit lowering : 25/03/2010 teleconference minutes.

[RD2] MERIS Mission Extension, PE-TN-ASG-MER-0019, issue 2, 30.11.2007.

[RD3] MERIS Operations Report Switch on and Data Acquisition Phase, PO-RP-DOR-ME-1087, issue 1, 10.7.2002.

[RD4] ESOC mail Hugues.Dufort@esa.int, Re: AW: Contamination of the optical payload during the ENVISAT orbit descent, Fr 23.04.2010 11:36.

[RD5] MERIS Mini Commissioning Plan after Orbit Change, PE-PL-ASG-MER-0022, Issue 3, 9.6.2010.

[RD6] MIPAS Thermal Analysis Report PO-RP-FOK-MP-0125.

[RD7] MIPAS Mission Extension Analysis, ENV-TN-ASG-MP-045, 11.05.2009.

[RD8] ENVISAT mission extension beyond 2010, PLSO, ESRIN – May 2010.

[RD9] Envisat MWR in-Orbit Performance Review 16, PLSO-MOM-MWR-0014, June 2010.

[RD10] Envisat GOMOS in-Orbit Performance Review 16, PE-MN-ESA-GOM-288, June 2010.

[RD11] Envisat DORIS in-Orbit Performance Review 16, PLSO-MOM-DOR-0014, June 2010.

[RD12] Envisat SCIAMACHY IOP Review 16, PE-MN-ESA-SCI-289, June 2010.

[RD13] Dave Smith: AATSR Status, IOP ESRIN June 2010.

[RD14] Envisat ASAR in-Orbit Performance 16 MoM, PE-MN-ESA-ASR-294, June 2010.

[RD15] Orbit Change Operations Readiness Meeting MoM, 5 Oct. 20, en2010_001mom.

[RD16] AATSR Instrument Operations Request #40, Rutherford Appleton Laboratory.

[RD17] Envisat Mission Extension Spacecraft Operations Timeline, ENVI-MIS-TN-1004-OPS-OEV, ESOC, October 2010.

4 MINI COMMISSIONING

4.1 AATSR

A mini-commissioning phase plan is in preparation by IDEAS. Neither On-Board changes nor new inputs for measurement planning are expected.

4.2 ASAR

The recommended activities for resuming the instrument science mission are as follows:

- End-to-end verification: MPS + system.
- Measurements in all modes and swaths.
- Measurements in Wide Swath over the region were there is a PRF change.
- Module Stepping measurements planned once per orbit.
- Measurements in Alt Pol mode in the regions where the start of the receive window is closest to the end of the transmit pulse.
- Measurements over the transponders and rain-forest.
- Verification of ambiguities and sensitivity using images over the Netherlands and Canada (lakes).
- Verification of FBAQ correct quantization based

4.3 DORIS

No commissioning is foreseen post orbit change.

4.4 GOMOS

No commissioning is foreseen.

4.5 MERIS

No specific on board change has been identified. Nevertheless ASTRIUM recommends that after the orbit lowering some standard verification of the telemetry against the in-flight monitoring limits shall be performed. This is performed automatically at ICU level if the monitoring functions are enabled, which is the nominal case.

Still it is recommended to check the telemetry against the limits provided in the IOM for at least one orbit following a nominal mode sequence:

- First in HEATER mode, with CM in OBSERVATION position, at least two RTTF shall be acquired in this configuration,
- Then switch the instrument in STABILISATION mode for a duration of about 2 orbits, at least two RTTF shall be acquired in this configuration,
- Command the mode back to HEATER in order to keep VEU temperatures at moderate levels,
- Finally switch to DIRECT&AVERAGE mode via STABILISATION mode, for a duration of about 2 orbits, and acquire at least two RTTF, then
- Switch back to HEATER mode from where MPS should take over.

Note that RGT will have to generate a new MPL_ORS_ME file (once issued at the beginning of the mission) for each calibration.

Since the orbit period post altitude reduction shall be slightly shorter the MPS schedules should be consequently adapted.

4.6 MIPAS

After the orbit lowering, extra attention should be paid to the MIO, INT, CBB and FPA Radiator temperatures during subsequent nominal operations.

The same applies to the cooler performance via its flange and compressor head temperatures that should be compared against historical data.

The cool-down process and subsequent cooler performance shall also be evaluated during the next passive decontamination, from when the cooling point is set to 69.5 K until the instrument mode reaches Heater. The total cool-down duration shall be compared against previous decontamination processes.

4.7 MWR

No changes in the radiometer tables are expected following the orbit decrease.

4.8 RA-2

At time of writing nothing is planned at operational level.

4.9 SCIAMACHY

No specific mini commissioning other than a number of extra monthly calibrations, which are handled via nominal routine mission planning. Instead a thorough analysis of measurement data and HK telemetry shall be made.

If necessary, one or more SCIA OCRs (Operations Change Request) handled by DLR would detail special test cases and temporary Timeline CTIs.