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STATUS OF PREPARATIONS FOR MSG-3 AND MSG-4

This paper addresses the status of the remaining development work for the MSG Programme, namely the status of preparation of MSG-3 for launch and commissioning and the progress on the MSG-4 readiness before storage or launch.

In particular, for what concerns MSG-3, in the reporting period:

- Mid-June – mid-July 2012 has been agreed with Arianespace as launch slot for MSG-3 on an Ariane 5 ECA;
- The satellite destorage activities have been kicked-off and are on schedule;
- The LEOP service activities have been kicked-off and are on schedule;
- The Launch service Mission Analyses have been completed and all compatibility issues between MSG-3 satellite and the Ariane 5 launch vehicle have been sorted out;
- The upgrade of the EUMETSAT Ground Segment to be able of commissioning MSG-3 in parallel to the routine operations of Meteosat-8 (MSG-1) and Meteosat-9 (MSG-2) has been completed.

Concerning MSG-4, in the reporting period:

- A major anomaly was discovered during acceptance testing of the new SEVIRI Drive Unit, concluding that additional work is required to replace or refurbish one part inside the DU which is a long lead item;
- Consequently, the earliest readiness for launch of MSG-4 is now by end 2014/January 2015;
- EUMETSAT is currently planning the MSG-4 launch in January 2015, with an in orbit storage phase of the satellite after its commissioning, to maxime duration of the overall operations service between MSG and MTG.

Status of preparations for MSG-3 and MSG-4

1 INTRODUCTION

This paper addresses the status of the remaining development work for the MSG Programme, namely the status of preparation of MSG-3 for launch and commissioning and the progress on the MSG-4 readiness before storage or launch.

2 LAUNCH DATES FOR MSG-3 AND MSG-4

The launch slot for MSG-3 has been recently agreed with Arianespace (namely mid-June – mid-July 2012).

Concerning MSG-4, the launch date of January 2015 is used for planning purpose. This relates to the current plan of EUMETSAT to store MSG-4 in orbit instead of storing on ground, maximising the duration of the overall operations service to the users with MSG and MTG.

3 SATELLITES

3.1 MSG-3 Satellite and common MSG-3/4 activities

Following an anomaly discovered on METOP, the refurbishment of Solid State Power Amplifiers (SSPA) and S-band receivers has been carried out for MSG-3 and is on-going for MSG-4.

The MSG-3 destorage check point took place in November 2010, and it was decided:

- to start the MSG-3 destorage sequence in December 2010;
- to execute the MSG-3 destorage sequence in two parts with an interruption in between. The first part contains all schedule critical tests (e.g. verification of SEVIRI performance in vacuum) allowing more time for solving anomalies (if any). The second part is limited to mechanical activities and to the System Verification Tests (SVT) with the ground Segments of both EUMETSAT (for commissioning) and ESOC (for LEOP);
- to resume the MSG-3 sequence only at the time required to be ready for the selected MSG-3 launch slot.

The first phase of satellite destorage is close to completion, only few remaining activities of this phase are scheduled for September 2011 due to the late delivery of refurbished S-band receivers. All critical testing activities have been completed as part of this first phase of destorage.

The second phase of destorage will start in November, for allowing satellite readiness for the agreed launch slot.

Following the uncommanded in orbit changes experienced on Meteosat-8 in May 2007 and then in early February 2008, the implementation of a design change for the fixation of all MSG thermal frames has been defined and work is completed for MSG-3. The same design change will be implemented as well on MSG-4.

Refurbishment of Ground Support Equipment (GSE) necessary until the launch of MSG-4 is largely completed, and the GSE is ready to support the MSG-3 destorage and launch campaign. Other GSE items and tools have been placed in storage, until the development work on the Meteosat Third Generation (MTG) is finally secured.

3.2 MSG-4 specific activities

The integration and tests activities of the satellite at the Prime contractor's site were completed early March 2007 following which the MSG-4 Pre Storage Review (PSR) took place, concluding that a non conformance associated with missing lines observed once during a SEVIRI scan activation needed to be closed before the satellite readiness could be finally stated. The exchange of the Drive Unit (DU), which part of the Scan Mechanisms of SEVIRI, was decided.

The manufacturing of a new DU was completed in July 2010, but a non-conformance was identified on the accuracy of the displacement of the DU, concluding that the most likely root cause is within the roller screw of the DU. The manufacturing of a new roller screw was then activated: it is a long lead item and is still on-going. The go ahead to dismount SEVIRI from MSG-4 will be triggered by a successful vibration test of the new DU. Due to the constraints of the integration team and of the satellite Ground Support Equipment (GSE), the dismounting of SEVIRI from MSG-4 cannot be done in parallel to the MSG-3 launch campaign. In case of an MSG-3 launch postponed beyond August 2012, SEVIRI should be ready for re-integration on MSG-4 by (about) June 2013.

Overall the earliest readiness of MSG-4 for launch is in the period between July and November 2014, depending upon the sequence of the activities to be done. With the current status, it seems realistic to consider the earliest readiness of MSG-4 for launch by end 2014.

4 OTHER PROGRAMME ELEMENTS

4.1 Geostationary Earth Radiation Budget (GERB)

The GERB-3 Instrument is re-integrated on the MSG-3 satellite.

Since December 2009, the GERB-4 Instrument is in long term storage at RAL. The Review of the GERB-4 calibration results at instrument level took place mid September 2010 and was successful.

Concerning the Product Status of the GERB mission, the Averaged, Rectified, Geolocated (ARG) and Non-Averaged, Non-Rectified, Geolocated GERB products (NANRG) have been available for the Meteosat-8 GERB since 2006, as the Edition 1 data. The same ARG products for Meteosat-9 GERB up to end of 2010 have now been released as Edition 1 data. ARG products for 2011 are also becoming available. The NANRG product is not yet released as it is still undergoing quality checks and it was not identified as a high priority product by users.

The next expected product release will be the Binned ARG (BARG), which has the GERB point spread function removed, this will include a 'fill field' with best estimates of short wave fluxes in sun glint conditions and twilight, where fluxes are currently not present.

4.2 MSG-3 Launch service

The technical kick-off of the MSG-3 launch service took place on 9 and 10 December 2010, and baseline launch vehicle is the Ariane 5 ECA.

The Preliminary Mission Analysis Review took place from mid-March to mid-April. All remaining technical compatibility issues between the Ariane 5 launch vehicle and MSG-3 were sorted out by June 2011. In particular, a suitable light configuration of shock attenuation devices has been established ensuring compatibility with the shock environment of the launch vehicle. This was particularly complex for preparing the launches of MSG-1 & 2.

In August 2011, after several interactions, Arianespace and EUMETSAT agreed upon the timeframe from mid-June to mid-July 2012 as launch slot for MSG-3.

4.3 MSG-3 Launch and Early Orbit Phase (LEOP) service for MSG-3

The kick-off meeting of the MSG-3 LEOP service was held in November 10 and the activities of ESOC have started according to the nominal planning. ESOC is currently reviewing the Generic Mission Analysis to optimise the fuel consumption during LEOP and during the subsequent routine phase. ESOC have in the meantime received the first delivery of the monitoring and control system tailored for MSG-3.

4.4 MSG Ground Segment upgrade for MSG-3

The upgrade of the MSG Ground Segment (GS) with the addition of a 3rd imaging chain (including an additional antenna at the MSG Primary Ground Station) is completed and ready operationally. This will allow carrying out the MSG-3 Operations preparation and commissioning without interrupting the Rapid Scan Service of Meteosat-8.

5 CONCLUSIONS

CGMS Members are invited to take note.