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STATUS OF PREPARATION FOR MSG-3 AND MSG-4

This paper reports on the current MSG programme development status following the entry into service of MSG-1 and MSG-2 respectively in January 2004 and July 2006. CGMS members are invited to take note.

Status of Preparation for MSG-3 and MSG-4

1 INTRODUCTION

This paper addresses the status of the remaining development work part of MSG Programme, namely the status of preparation of MSG-3 and MSG-4.

2 SATELLITES

2.1 MSG-3 Satellite and common MSG-3/3 activities

The satellite remained in storage in the clean room at Prime contractor's premises, the related work focussed on anomaly investigations, either raised as result of the tests of MSG-3 done before entry into long term storage, or because of anomalies experienced on other MSG satellite models. More detail is provided in the following text.

An anomaly associated to inconsistent telemetry read-out in a redundant chain of SEVIRI has been localised in the Preamplifier Unit (PU). The unit has been removed and shipped to the manufacturer. The investigations done until now led to identify a likely cause in a free metallic particle found inside the unit, which could create an anomalous connection between pins of an integrated circuit. Analyses are on going before concluding that other possible causes can be excluded and the unit can be used as is for flight.

An increase of occurrence of error words experienced in orbit on the SEVIRI Main Detection Unit (MDU) of Meteosat-8 is being investigated to understand possible degradation effects over long time and the remedy actions on the satellites on ground, both for MSG-3 and MSG-4. This anomaly affects one detector in each of the three 9.7 μ m, 12.0 μ m and 13.4 μ m Infrared channels and the image performance specification is not violated because of it. Tests done confirm that a video board which handles the above affected detector chains is sensitive to noise and that an increased noise above the nominal level could cause the observed anomaly.

Concerning the Gauging Sensor Unit (GSU) which is used for determining with high accuracy the residual levels of fuel and oxidiser towards the end of the operational life, a new concept using ultrasonic technique has been studied and feasibility tests have been successful. The new unit is called Ultrasonic Gauging Sensor (UGS). The overall development and manufacturing is planned to last less than 1 year and a half, and therefore is largely in line with the anticipated MSG-3 need date. A Kick Off meeting for developing and remanufacturing the new UGS both for MSG-3 and MSG-4 takes place in October.

In preparation of the long term storage of both MSG-3 and MSG-4 satellites, it has been decided to refurbish and/or maintain all the Ground Support Equipment (GSE) at satellite and SEVIRI level, and to store other GSE until the development work on the Meteosat Third Generation (MTG) has started.

Lifetime time testing for SEVIRI in a Rapid Scan mode has been completed for the most critical element, the Mirror Support Bearings. The results available to date indicate that SEVIRI can be used to support the Rapid Scanning Service as proposed (no more than 28 days in rapid scanning mode in any 30 day period; at least one month every year in full Earth disc scanning mode) for at least 10 years in orbit.

2.2 MSG-4 specific activities

The integration and tests activities of the satellite at the Prime contractor's site have been completed early March this year and the MSG-4 Pre Storage Review (PSR) took place in the period from March to May.

There are a few anomalies still under investigation, among which a complex one concerns missing lines observed once during SEVIRI scan activation. This anomaly has never been reproduced despite extensive testing both in ambient and in vacuum. The work done until now leads to attribute the potential cause of the anomaly either to a mechanical cause inside the Drive Unit (DU) of SEVIRI or to electrical cause inside the Functional Control Unit (FCU) of SEVIRI. Should the anomaly investigations require intervention inside the DU, the related work would become particularly complex requiring a dismounting of SEVIRI from the satellite and opening of the instrument.

2.3 Continuation of activities beyond the Pre Storage Reviews of MSG-3 and MSG-4

The technical and contractual framework for the continuation of the satellite activities after PSR has been established. After EUMETSAT Council agreed the recommendation to continue with ESA in their role of procurement Agency until successful commissioning of MSG-3 and MSG-4, the related Agreement Change Notices for both MSG-3 and MSG-4 have been co- signed between EUMETSAT and ESA.

3 OTHER PROGRAMME ELEMENTS

3.1 Geostationary Earth Radiation Budget (GERB)

The GERB-4 Instrument assembly, integration and testing (AIT) activities suffered delays in the reported period. Critical tasks relate now the calibration of a replacement Focal Plane Assembly (FPA) after the one to be mounted on the flight instrument did not return a signal when reconnected to the measurement equipment. Subsequent investigation indicated that two of the four Application Specific Integrated Circuits (ASIC) built into the FPA are unresponsive. Investigation into the cause of this anomaly and the remedial activities is on-going. The completion of GERB-4 Assembly Integration and Testing is foreseen by the end of 2007/beginning of 2008.

On GERB-3 implementation of the timing board improvements for the Instrument Electronic Unit (IEU) as requested by EUMETSAT is under way. The GERB-3 Quartz Filter Mechanism is being refurbished to achieve a better alignment and to apply the same design modification as applied for GERB-4 QFM. The current plan is to deliver GERB-3 to Imperial College (IC) for re-calibration by end 2007.

After the GERB edition 1 climate products along with appropriate documentation and quality summaries were made available in spring 2006 to the Users via the GERB Ground Segment Processing System (GGSPS) at Rutherford Appleton Laboratory (RAL), RMIB have completed the level 2 reprocessing. Incremental release of Edition 1 level 2 ARG (Averaged, Rectified, Geolocated) products is now complete. At RAL, incremental release of level 1.5 NANRG (Not Averaged, Not Rectified, Geolocated) products is ongoing, with final batch (Feb - Aug 2005) to be released in by end of September 2007.

3.2 MSG-4 Launch service and the service for the Launch and Early Orbit Phase (LEOP) for MSG-3 and MSG-4

In the first half of this year, EUMETSAT has released to Arianespace a Request for Quotation (RFQ) for the MSG-4 Launch Service and Arianespace has prepared their Offer. Also MSG-3 has been addressed, for possibly introducing Soyuz from Kourou as back up to Ariane 5 in the form of an Amendment to the existing Launch Service Agreement of MSG-1/2/3. Negotiations are on going.

Concerning the LEOP Service, after a competitive tender process, final negotiations took place with ESOC for the MSG-3/4 LEOP Service and the related contract has been agreed.

4 LAUNCH DATES FOR MSG-3 AND MSG-4

Taking into account the outcome of the analyses done at the time, the following plan was agreed at the 59th EUMETSAT Council in June 2006:

- to launch MSG-3 in January 2011;
- to plan the launch of MSG-4 in the time frame from mid 2012 to mid 2013, with the understanding that the MSG-4 launch date will be revisited at the time of the MSG-3 de-storage

An update of availability analyses for the MSG system on the basis of the in orbit status has been done in summer this year concluding that the current planning of launches of MSG-3 (January 2011) and MSG-4 (January 2013) remains valid as result of the evolution of the in orbit status experienced over the time until now. This also implies that the first MTG satellite has to be launched in 2015.

5 CONCLUSIONS

CGMS Members are invited to take note.