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STATUS OF PREPARATIONS 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 PREPARATIONS FOR MSG-3 AND MSG-4

1 INTRODUCTION

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

2 SATELLITES

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

The satellite is kept in storage in the clean room at Prime contractor's premises. Work focussed on anomaly investigations and corrective actions.

The anomaly associated to an inconsistent Telemetry read-out in the redundant chain of the SEVIRI Preamplifier Unit (PU) and Functional Control Unit, already reported at CGMS-35, was localised in the Preamplifier Unit (PU). This led to a decision to repair the PU: the related manufacturing work has been done, re-testing is on going and largely completed in September.

The increase of occurrence of error words experienced in orbit on the SEVIRI Main Detection Unit (MDU) of Meteosat-8, also already reported to CGMS-35, was investigated to understand possible degradation effects over long time and the remedy actions on the MSG-3 and MSG-4 satellites on ground, even if the performance always remained compliant with the applicable imaging requirements. The anomaly drastically reduced its frequency of occurrence, following a swap to MDU redundant side and then a return to the nominal side. In parallel, a slight design change has been identified by Industry to avoid the occurrence of this anomaly, but, given the present frequency of occurrence of this anomaly, the Secretariat has not decided yet to modify the MDUs for MSG-3 & 4.

The design concept of the Gauging Sensor Unit (GSU) flying on Meteosat-8/9 and mounted on MSG-3/4 was changed following the failures observed on ground and in orbit. The so called Ultrasonic Gauging Sensor (UGS) was proposed and the preliminary design was agreed in a Design Review end of 2007. The development model has now been built and fully tested. Further design changes have been introduced after the Design Review to improve the measurement accuracy. A delta Qualification and Critical Design Review to review all the testing done on the development model and to give the go-ahead for UGS flight models production will take place before end of 2008. Delivering of all flight units for MSG-3 and MSG-4 after successful qualification and acceptance testing is planned for summer 2009.

Investigations associated with the uncommanded in orbit changes experienced on Metosat-8 in May 2007 and then in early February 2008 have also progressed. Today, only one possible root-cause is left as result of the investigations done, associated with

internal mechanical failure of thermal control hardware (attachments of the thermal frame to the solar array panels are suspected). Design weaknesses have been identified, but the possible cause has not yet been finally proven. The design changes for MSG-3 & 4 today envisaged are not of significant nature and can be implemented either during the storage period or during the preparation for launch.

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 also for the less critical items, providing the confirmation that SEVIRI can support the Rapid Scanning Service for at least 10 years in orbit with the rapid scan service as agreed with EUMETSAT Delegations (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).

2.2 MSG-4 specific activities

The integration and tests activities of the satellite at the Prime contractor's site were completed early March 2007 and then MSG-4 Pre Storage Review (PSR) took place concluding that a non conformance associated with missing lines observed once during a SEVIRI scan activation needs to be closed before the satellite readiness can be finally stated. This anomaly has never been reproduced despite extensive testing both in ambient and in vacuum. The analyses done have demonstrated unambiguously that the root cause is inside the Drive Unit (DU), part of the Scan Mechanisms of SEVIRI; they currently lead to conclude with the need of exchanging the unit. A replacement of the DU inside SEVIRI at a time the satellite is fully integrated and tested implies work extending for a total duration of about 3 years, which is not impacting the satellite readiness for its planned launch, but may interfere with the preparation work of MSG-3: the implementation of this work is presently under negotiation with Industry.

3 OTHER PROGRAMME ELEMENTS

3.1 Geostationary Earth Radiation Budget (GERB)

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 and the release of Edition 1 level 2 ARG (Averaged, Rectified, Geolocated) products. At RAL, the release of level 1.5 NANRG (Not Averaged, Not Rectified, Geolocated) products has also been completed in 2007.

The GERB-3 Instrument has been re-calibrated, and is now in long term storage configuration at RAL premises. Work is instead still continuing for the GERB-4 Instrument. Its Focal Plane Assembly (FPA) has been calibrated and integrated in the instrument, which has also successfully passed the functional testing and is undergoing the environmental testing campaign at RAL. After that, GERB-4 will be calibrated at

Imperial College. The total calibration campaign at instrument level should last about 5 months; by spring 2009 the instrument should then be in long term storage at RAL premises.

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

The results of the negotiations with Arianespace was agreed by EUMETSAT Council this summer, addressing both the procurement of the MSG-4 Launch Service and the changes to the MSG-3 Launch Service Agreement (LSA) to introduce Soyuz as a back-up to Ariane 5 for MSG-3. During the summer, the EUMETSAT D-G and Arianespace CEO have signed both the MSG-4 LSA and the Amendment to the MSG-3 LSA.

Concerning the LEOP service for MSG-3 and MSG-4 the related contract was agreed with ESOC and signed in late 2007, following a competitive tender. ESOC already had performed this service for MSG-1 and MSG-2. For an MSG-3 launch in Jan 2011, the work will be resumed in 2009.

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 2007 concluding that the above 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. The analysis has been done also this year on the basis of the status of the satellites in orbit, concluding that a decision to possibly postpone the above launch dates should be taken once the remaining work for the satellites on ground (MSG-4) will be consolidated.

5 CONCLUSIONS

CGMS Members are invited to take note.