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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 LAUNCH DATES FOR MSG-3 AND MSG-4**

The proposal for postponing the launch dates of MSG-3 and MSG-4 by one year was agreed at the 67<sup>th</sup> EUMETSAT Council meeting end of June 2009. The new launch dates which are used for planning purpose are :

January 2012 for MSG-3  
January 2014 for MSG-4

### **3 SATELLITES**

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

The satellite is in long term storage at the Prime contractor's premises and the related work is limited to monitoring the storage conditions, periodic activation of SEVIRI, anomaly investigations and corrective actions.

The implementation of the measures to solve the anomaly associated to an inconsistent Telemetry read-out in the redundant chain of the SEVIRI Preamplifier Unit (PU) and Functional Control Unit, reported at CGMS-36, was successfully achieved by November 2008.

The increase of occurrence of error words experienced in orbit on the SEVIRI Main Detection Unit (MDU) of Meteosat-8 has been further investigated to understand possible degradation effects over time and the remedy actions to be implemented on the MSG-3 and MSG-4 satellites on ground. A dedicated study done by Industry until July 2009 could not conclude with the identification of a clear root cause, but a proposed design change has been confirmed to be suitable for avoiding the occurrence of this anomaly. Decision on the implementation of this change will be taken in the next months, observing the trend of the anomaly occurrence, considering also that the anomaly has never been observed when the redundant MDU side was in use, and in view of the related cost. The in orbit performance always remained well compliant with the applicable imaging requirements.

The design concept of the Gauging Sensor Unit (GSU) which are used for fuel monitoring on Meteosat-8/9 and currently mounted on MSG-3/4 was changed following the failures observed on ground and in orbit. The so called Ultrasonic Gauging Sensor (UGS) has been developed and the related activities have progressed well since the last report. The Critical Design Review (CDR) has been successfully closed. All qualification tests have been successfully completed on the protoflight UGS model, and the associated Test Review Board has taken place on September 2009. The specified fuel measurement accuracy is met by the new design, allowing an accurate determination of the time to re-orbit MSG-3/4 at their end of life. The manufacturing of the UGS flight units for MSG-3 and MSG-4 are on-going. The delivery of UGS Flight Models will likely take place in the second quarter 2010, well compatible with the destorage activities of MSG-3.

Investigations associated with the un-commanded in orbit changes experienced on Metosat-8 in May 2007 and then in early February 2008 have come to an end, concluding that design changes need to be implemented on the MSG-3 & 4 thermal hardware attachments. These changes are not of a significant nature and can be implemented either before or during the de-storage activities of the satellites. Go-ahead for the detailed design of the change and verification of the attachments of the thermal frame has been given, the changes on the flight hardware will be implemented following the Incident Review Board conclusion, including results of some testing activity currently in preparation at component level.

### **3.2 MSG-4 specific activities**

The MSG-4 satellite is stored in the clean room at the Prime contractor's premises. 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 and it has been technically and contractually agreed with Industry to replace this unit.

The manufacturing of a new drive unit has started in January 2009, also re-using, as far as possible, available Engineering Model parts. Currently, there is a delay to the agreed schedule of tasks due to a ball bearing out of specification, and the need to re-manufacture a new one. The current schedule forecasts the delivery of the SEVIRI Flight Model with the new Drive Unit by mid 2011, which remains not critical with respect to the launch plans agreed, although it may interfere with the preparation work of MSG-3. Assuming a launch of MSG-3 by beginning 2012, the re-integration of SEVIRI on MSG-4 and completion of associated re-acceptance testing would then take place after the launch of MSG-3, so that MSG-4 should be ready for long term storage in late 2012 (about 9 months after MSG-3 launch).

## **4 OTHER PROGRAMME ELEMENTS**

### **4.1 Geostationary Earth Radiation Budget (GERB)**

The GERB-3 Instrument is in long term storage at Rutherford Appleton Laboratory (RAL) premises in UK after its re-calibration was completed in August 2008.

The GERB-4 calibration at instrument level was completed in March 2009. Following a failure in the power supply experienced at the time of the preparation for the calibration, the electrical unit has also been refurbished. During the re-acceptance testing after this change, an incident occurred during a thermal vacuum test, resulting in a possible contamination of GERB-4. Measurements showed that there is a slight contamination of the scan mirror; however this contamination is not a result of the above incident, but due to an accumulation of contaminants during the whole GERB-4 integration phase. A Material Review Board in September 2009 concluded with the decision to clean the scan mirror according to agreed cleaning procedures.

Acceptance testing of the spare Focal Plane Assembly (FPA) is completed. A Material Review Board in September 2009 concluded with the decision to re-calibrate the spare FPA.

## **5 LAUNCH Service and LEOP**

Following the re-planning of the MSG-3 and MSG-4 launch dates, EUMETSAT has started interactions with Arianespace to define the launch period for MSG-3. Realistic opportunities for a suitable co passenger are currently arising for a launch around mid 2012 rather than for the

beginning of the year. No opportunity exists before early 2013 for launching MSG-3 with Soyuz instead of Ariane 5.

Concerning the LEOP service for MSG-3 and MSG-4, no real work started yet with the service provider (ESOC) since the last report. In fact, for an MSG-3 launch in January 2012, the preparation work for the LEOP service will be kicked-off in early 2010

## **6 CONCLUSIONS**

CGMS Members are invited to take note.