CGMS-XXXII EUM-WP-04
Prepared by EUMETSAT
Agenda Item: C.2

STATUS OF PREPARATION OF MSG-2, MSG-3, MSG-4

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

STATUS OF PREPARATION OF MSG

1. INTRODUCTION

An overview of the mission objectives and basic capabilities of the MSG system was presented in previous paper (Reference (1): CGMS-XXV EUM-WP-04). The development status was subsequently reported in the subsequent updates of this paper. As result of completion of the MSG-1 system commissioning tests in 2003, with the System Commissioning Results Review and the Routine Operations Readiness Review completed in December 2003, the MSG-1 system was declared operational. This paper, after having recalled the entry into operation of MSG-1, addresses the status of the remaining development work part of MSG Programme, namely the status of preparation of MSG-2, MSG-3, MSG-4.

2. MSG-1/METEOSAT 8 COMMISSIONING AND ENTRY INTO OPERATIONS

The MSG-1 System Commissioning Results Review and the Routine Operations Readiness Review were both successfully completed on 18 December 2003 and, on that basis, the start of routine operations was authorised after relocation of the spacecraft. The operational service effectively started on 29 January 2004 from 3.4ºW, with image rectification at 0º, and MSG-1 was renamed Meteosat-8.

Long term Calibration and validation of meteorological products have since then continued according to plan until the Image and Product Validation Review (IPVR) closeout performed in February/March 2004. No blocking issue was identified at the Review, but the experimental nature of the Day 1 Global Instability Index product had to be confirmed, with the expectation that performance would improve with the planned implementation of a physical retrieval algorithm.

3. MSG-2 ACTIVITIES

3.1 Overall

Preparation for MSG-2 launch has started. EUMETSAT, following various iterations, at the end of February 2004 could agree with Arianespace the MSG-2 launch period February-April 2005, with a target launch date 15 February 2005. ESA, which is procuring the satellite for EUMETSAT, was notified of the satellite destorage on 1st March accordingly.

3.2 MSG-2 satellite

The MSG-2 satellite has remained in storage until mid April. Substantial progress was achieved on the open issues raised at the satellite Pre-Storage Review (PSR), which was held in June 2003.

A modified design was established for the Solid State Power Amplifiers (SSPA) as results

of investigations done after the in orbit failure of one amplifier, and extensively tested. This culminated with a successful delta Critical Design Review held in early March. Delivery of MSG-2 SSPAs is taking place mid-May 2004.
Concerning the other anomalies experienced during MSG-1 commissioning, and requiring potential retrofit for the follow-on satellites, important work was done without identifying any blocking point. In particular:

- an anomalous switch to the redundant Remote Terminal Unit (RTU) of the upper platform was experienced in January 2003 and was explained by the sensitivity of the unit to Single Event Upset (SEU). In fact, similar reconfiguration occurred on other satellites over the recent years without damaging the unit itself.
- an anomalous transition to 'fixed mode' of the CACE (Common Antenna Control Electronics) was experienced in June 2003, was also explained by the sensitivity of the CACE to SEU. The CACE was re-activated in June and has since then performed without any anomaly.
- the wobble experienced on MSG-1 in its early phases of the commissioning was explained and corrected on board: a modified thermal control low avoids the propellant migration causing of that phenomena.

An anomaly encountered on the SEVIRI Main Detector Unit (MDU) during the MSG-2 satellite optical vacuum test was assessed and found to be limited within this unit, deciding to replace the MSG-2 unit by the MSG-3 one. The S-band Transponders had to be re-tuned: work has been done and units have been re-integrated.

The MSG-2 satellite would be ready for launch in the second half of January. After its de-storage, some work on MSG-3 will be done in the available margins before the launch.

3.3 Geostationary Earth Radiation Budget (GERB) instrument for MSG-2

The GERB-1 instrument (embarked on MSG-2) was returned to RAL, via Imperial College for re-calibration, and modification in the electrical design, avoid the need of the battery on board the instrument. After modification, the instrument was re-tested, accepted and returned to the satellite Prime in early April.

3.4 Launch Service for MSG-2

Preparatory work for the MSG-2 launch has significantly progressed, such that EUMETSAT could decide on 1 March 2004 to reduce the Launch Period, which is now from 1 February to 30 April 2005. February 2005 coincides with the earliest possible date for MSG-2 launch, considering availability of Ariane-5 launch vehicles and possible co-passengers.

The availability of various versions of the Ariane-5 launcher is still uncertain at the time of preparation of this paper, due to extensive re-qualification work on going. Uncertainties are expected to narrow down progressively, such that more definitive plans can be established in July/August 2004 when the month of the MSG-2 launch - the so-called Launch Slot – will be defined.

3.5 Operations Preparations and Ground Segment for MSG-2

Following the completion of the MSG-1 (MET-8) commissioning and start of routine operations, operations preparation activities have started for MSG-2. The work in this area will be simplified with respect to the preparation for MSG-1, as many aspects, especially Ground Segment aspects, have been covered already. An important near term step for MSG-2 preparation is associated with the MSG-2 System Validation Test (SVT) in June/July

2004. The main purpose of the SVT is to validate compatibility between the satellite flight model and the ground segment. The upgrade of the MSG ground segment for the support of two in-orbit satellites configuration has been completed. The engineering verification program of the ground segment is presently ongoing and progressing according to plan; this activity will be completed by May/June 2004.

Work on the MSG Launch & Early Operation Phase (LEOP) Service for MSG-2 has also started with ESOC: its progress is nominal.

4. MSG-3 ACTIVITIES

4.1 MSG-3 Satellite

The MSG-3 satellite integration and system test phase has been completed. Some units have been removed from the satellite for implementing the necessary changes. The MSG-3 Pre-Storage Review has started, presentations took place on 28 April, and the final Board meeting is planned for early July. MSG-3 will be likely placed in an intermediate storage configuration until the end of the MSG-2 launch campaign. Only then it will be placed in its final long-term storage configuration in the dedicated container.

4.2 GERB-3 Instrument

GERB-3 instrument has been dismounted from MSG-3 and sent to RAL prior MSG-3 satellite storage. RAL will implement similar modifications as for GERB Instrument mounted on MSG-2.

4.3 Launch Service

The Option for the MSG-3 Launch was exercised in December 2003, according to the 54th EUMETSAT Council decision.

5. MSG-4 ACTIVITIES

The MSG Programme Extension to include an additional satellite (MSG-4) and extended operations until 2018 was open to vote at the 52nd EUMETSAT Council in March 2003. Preliminary activities were started in April 2004 on the satellite and GERB Instrument. To day Industrial work has progressed in line with the agreed plans. In many cases, work at equipment level is nearing completion and approaching delivery of flight units. SEVIRI and propulsion subsystem level integration will start soon. It is expected that the full Programme Extension approval will be reached this year.

6. TRANSITION OF SERVICES

The transition period with parallel operations of Meteosat-7 and Meteosat-8 will last at least until the end of 2005. By that time also MSG-2 commissioning will be completed, according to the current schedule. Plans for extension of the Meteosat Transition Programme have been in the meantime submitted for approval by EUMETSAT Council this year, these plans consider Metosat-8 (MSG-1) and Meteosat-9 (MSG-2) providing the prime geostationary service at 0° longitude.