

PLANS FOR METEOSAT THIRD GENERATION (MTG)

In response to CGMS action/recommendation A35.27

The EUMETSAT Meteosat Third Generation (MTG) Programme is under definition and Phase A is planned to be completed by end of 2008, with the system level Preliminary Requirements Review.

Phase A included competitive Space Segment and Ground Segment studies to address the feasibility of the system concepts. A twin-satellite concept has been adopted, with an Imaging Satellite embarking a Flexible Combined Imager and a Lightning Imaging Instrument, and a sounding Satellite embarking the Infrared Sounder and providing for accommodation of the GMES provided Sentinel 4 instruments supporting atmospheric chemistry applications.

The Phase B activities will start in early 2009 and will run until mid 2010.

Action/Recommendation proposed:

CGMS is invited to take note of the progress of preparation of the MTG Programme at EUMETSAT.

Plans for Meteosat Third Generation (MTG)

1 INTRODUCTION

This paper summarises the status of the MTG Programme definition activities at EUMETSAT, which are currently at the end of Phase A. This Phase aims at assessing the feasibility of key components of the mission and the overall architecture of the MTG System. The objectives, organization and plan for Phase A work have been presented to and endorsed by the EUMETSAT Council in July 2006. The Council also approved in July 2007 a twin-satellite in-orbit configuration, with a MTG-I Satellite dedicated to imaging missions and a MTG-S satellite dedicated to the sounding mission.

Parallel work is ongoing at ESA for the definition of the Space Segment, in coordination with EUMETSAT.

2 STATUS OF ACTIVITIES

The EUMETSAT MTG Team, with the support of ESA and Industry, focused on the following system and ground segment level activities:

- Functional analysis for a notional MTG system fulfilling missions (imagery, IR sounding, lightning, Data Collection and Search and Rescue) and considering services continuity, incremental development, integration, and testing, verification and validation constraints;
- Assessment of operations needs and high level operability requirements, participating in the update of standards (e.g. ECCS) drafts open for public review;
- Analysis of requirements and capabilities for: navigation and registration of images and soundings; accurate attitude determination and adequate satellite ranging and tracking methods for orbit determination; data compression methods both lossless and lossy of hyperspectral imagery data; and wide area network communication services, lines and protocols;
- Analysis of external interface requirements and constraints for DCPs, Search and Rescue and dissemination, considering regulatory issues, allocation and management of frequencies, coordination or orbital station positions, and telecommunication driven constraints;
- High level System configuration trade-offs, addressing space segment configuration, instrument concepts, cross-mission needs and operability;
- Architectural Studies for the MTG Ground Segment;
- System and Mission Operations concepts;
- Documentation of high level System Requirements, driving requirements and open issues deferred for consideration at later stages or forthcoming phases;
- Drafting of the MTG End-User requirements Document (EURD).

Space Segment architectures traded-off in Phase A accommodate 4 instruments:

- The flexible Combined Imager (FCI), for continuation of MSG image related missions;
- The Infra-red Sounder (IRS), sensor based on a Fourier Transform Spectrometer;

The Lightning Imager (LI), for detection of total lightning flashes;
The GMES Sentinel 4, as UVN (Ultraviolet Nadir) Instruments provided by ESA.

The MTG Preparatory Programme, approved by the EUMETSAT Council in July 2007, entered into force. It covers the closeout of the Phase A and the full Phase B activities.

Phase B focuses on consolidation of the requirements for the MTG system, and their justification via detailed analyses and trade-off, to derive necessary design elements and associated specifications for development. These activities will allow the system to be subsequently developed, produced, integrated, tested and operated and maintained.

The requirements activities are formally closed by a Preliminary Design Review (PDR), which leads to the Development Configuration Baseline of the MTG system. The definition and justification activities start after the System Requirements Review (SRR) at which the system specification is baselined. Justification Files are generated by analyses, trade-offs, and Design Reports and will constitute an important element of the documented project progress. An essential part of the work will be the analysis of risks on technical, costing and scheduling aspects.

At EUMETSAT level, the Phase B activities will encompass the overall MTG System, including the Ground Segment, system interfaces, and specification of products. A further important element of the Phase B activities will consist in following-up and supporting the Space Segment activities performed by ESA, keeping a coordinated baseline of requirements across the Programme elements.

A close interaction with users over the course of EUMETSAT Phase B activities through direct involvement of the MTG Mission Team and MTG User consultation Workshops as required will ensure the elaboration of a consolidated EURD (End User Requirements Document). Inputs to this process are captured within the MTG Science Plan document, which is currently consolidated until the end of EUMETSAT Phase A activities.

It is highlighted that the ESA MTG Space Segment Development Programme proposal is submitted to the ESA Council at Ministerial Level, ESA-CMIN-08, in November 2008 for approval and subscription by ESA Members States.

3 CGMS Action 35.27

For distribution of data/products, MTG will rely on EUMETCast, as enhanced to cope with the higher volume of data with respect to MSG (tens of megabits per second), to be disseminated to a large community of end-users, over a large coverage area, the data being received through a simple and cheap reception station.

Due to the high data volume, additional mechanisms are considered for possible dissemination to a restricted set of priority users of a larger quantity of data (hundreds of megabits per second), with coverage restricted to Europe. This could be done via communications satellites. and/or terrestrial dissemination means, which are not totally excluded at this stage.

The GTS/RMDCN will continue to be supported with an increase of the volume of data to be disseminated and thus a need for improved performance is identified.

The retrieval via the EUMETSAT Earth Observation portal and internet will also be enhanced to the state-of-the-art.

4 PLANNING

The following main planning elements are assumed for the preparation of the MTG Programme:

Phase 0:	2001-2005, completed
Phase A:	2006-2008, on-going
Phase B:	2008-2010, planned as part of the MTG Preparatory Programme
Phase C/D:	2010-2014, planned
Need date:	2015, for the first in-orbit elements
Phase E:	Operations and Utilisation: min 15 years for the Imaging Missions after commissioning of the first in-orbit elements.

5 CONCLUSIONS

CGMS is invited to take note of the progress of preparation of the MTG Programme at EUMETSAT.