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Telespazio: ready to handle operations to launch and test the first Meteosat Third-Generation satellite

Telespazio, a joint venture between Leonardo (67%) and Thales (33%), will be managing the Launch and Early Orbit Phase (LEOP) from the Fucino space Centre in Abruzzo (Italy) of the first Meteosat Third-Generation geostationary satellite (MTG-I), to be launched on 13 December from the European spaceport of Kourou, in French Guiana. The operations involve managing the early orbit activities and final orbit transfer.

The MTG programme – springing from a collaboration between the European Space Agency (ESA) and Eumetsat (Europe's meteorological satellite agency) and following in the wake of the success of the previous generations, still operational today – will ensure continuity of data for weather forecasts in the next two decades. The satellite has been developed by Thales Alenia Space, a joint venture between Thales (67%) and Leonardo (33%), in collaboration with OHB. Also on board is the first European “lightning hunter”, developed by Leonardo.

The role of Telespazio

Telespazio has been involved in the development of the MTG programme, in particular in the development and management of the ground segment, right from the outset, handling both data acquisition and satellite command and control operations. In particular, Telespazio provides Eumetsat with launch and in-orbit services for two satellites (with an option for a third) of the new MTG constellation.

It has taken 5 years to prepare for the orbit and orbit transfer operations of the first MTG-I, with the involvement of some 40 people from Telespazio in developing the ground segment and in preparing and testing LEOP operations. Launching the MTG will involve monitoring tens of thousands of telemetry parameters to verify the state of the satellite and send remote commands to configure the on-board equipment and complete the transfer into geostationary orbit. The orbit transfer will be carried out by means of engine “thrusts”, which will have to be calculated with absolute precision in order to optimise the use of propellant and maximise the satellite’s operational life for the provision of weather forecasts.

A few seconds after the launch of the satellite, the teams involved in the operations, divided into two groups, will be engaged 24/7 for eleven days, until the transfer into geostationary orbit has been completed and the on-board equipment has been configured.

To be able to communicate with the MTG programme, Telespazio has developed and implemented a new groundsegment component (Mission Data Acquisition Facility – MDAF) at its Space Centre in Lario (Como), at the Swiss Station in Leuk (belonging to its partner Signalhorn) and at Eumetsat's headquarters in Darmstadt, Germany.

The MTG geostationary satellites will send to Earth data collected from on-board sensors via high-speed Ka-band radio links. The ground infrastructure will acquire data simultaneously from the Lario and Leuk

Telespazio, a Leonardo and Thales 67/33 joint venture, is one of the world's leading operators in satellite services. Its activities range from the design and development of space systems to the management of launch services, from in-orbit satellite control to Earth observation, from integrated communications, satellite navigation and localisation services to scientific programmes. Telespazio plays a leading role in the reference markets harnessing technological experience acquired over the years. Since its establishment, the company has participated in major European space programmes such as Galileo, EGNOS, Copernicus and COSMO-SkyMed. In 2021, Telespazio generated sales of EUR 605 million while employing more than 3,000 people in 15 different countries.

sites and analyse it in real time, eliminating the negative effects of the rain. It will then send the data to Darmstadt, where the final meteorological services to be distributed to users will be produced.

In addition, Telespazio has implemented and operates the telemetry, tracking and command system of the MTG satellites, both at the Fucino Space Centre and at the Cheia station (Romania) of its subsidiary, Rartel.

The MTG programme

The MTG (Meteosat Third Generation) programme will have an operational life of approximately 20 years and will comprise six satellites: 4 Imaging (MTG-I) and 2 sounding (MTG-S).

The MTG-I satellites will have a Flexible Combined Imager (FCI) on board, but the big news is the Lightning Imager (LI), Leonardo's "lightning meter" capable of "seeing" rapid flashes of lightning in the atmosphere from a distance of more than 36,000 km. The first instrument of its kind ever made in Europe and the only one in the world to offer such a high level of performance, Leonardo's "lightning hunter" can capture even just a single lightning bolt in the sky, in any light condition, both by day and by night. The MTG-S satellites, instead, will host the Infrared Sounder (IRS) and Copernicus Sentinel-4.

Leonardo is also participating in the MTG programme by supplying its A-STR star tracker sensors and photovoltaic arrays (PVA) for all six new generation satellites.

The MTG satellites will bring about a significant improvement in the ability to observe meteorological phenomena, ensuring higher-level forecasting capabilities, particularly for the difficult task of "nowcasting": the very short-term monitoring and forecasting of rapidly evolving and potentially harmful meteorological phenomena. Early detection of such phenomena will decrease the response times needed to issue warnings of bad weather to the population and therefore to implement precautionary measures with a view to avoiding potentially catastrophic events.

Thales Alenia Space has been prime contractor for the Meteosat satellites on behalf of ESA for more than 30 years. The company delivered into orbit seven first-generation Meteosat satellites (the first model was launched in November 1977) and four second-generation Meteosat satellites (MSG), two of which are still in service today. It is currently building the six Meteosat Third-Generation satellites, in partnership with OHB. Thales Alenia Space is also contributing to the development of the ground segment for EUMETSAT, by designing and building the component for first-level image data processing (IDPF).