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PLEIADES

A unique response to civil

DESIGNED TO GENERATE HIGHLY DETAILED 3D IMAGERY, THE TWO PLEIADES SATELLITES WILL AFFORD THE ABILITY TO IMAGE ANY POINT ON THE GLOBE EVERY DAY, PROMISING NEW LEVELS OF TECHNOLOGICAL AND OPERATIONAL PERFORMANCE TO FULFIL CIVIL AND MILITARY REQUIREMENTS AS NEVER BEFORE.

The first of the two Pleiades satellites will be launched early in 2010 into an orbit less than 700 kilometres above Earth's surface. Its identical twin will join it 18 months later, taking the Pleiades programme to full operational capacity in readiness to serve Europe's civil and military needs.

It all began back in 2001, when France and Italy initiated the ORFEO programme (Optical and Radar Federated Earth Observation) to build a dual-use optical/radar Earth-imaging system. France committed to supply the Pleaides optical component and Italy the COSMO-Skymed radar component comprising four satellites, three of which have since been orbited. ORFEO thus combines the advantages of optical and synthetic aperture radar (SAR) imaging.

More than one million sq.km a day

EADS Astrium is supplying the high-performance Pleiades duo. The constellation will carry very-high-precision optical instruments each able to cover 1.5 million sq.km. a day. This constitutes a considerable leap forward from the 2.5-metre resolution offered by SPOT 5, although the latter has a wider field of view (60 kilometres compared to 20 kilometres for Pleiades). Above all, Pleiades' capabilities are geared toward a very ambitious programme, as they will be the first-ever very-high-resolution satellites to cater for both civil and military applications. Pleiades imagery will be used by the defence community in France, Italy and Spain, but also for large-area mapping, land planning, mineral and oil exploration, civil engineering and telecoms. More than 90% of satellite capacity will be kept available for European civil public service and commercial applications. *"The Pleiades system is intended to serve a broad market,"* confirms Christophe Hutin, Pleiades Business Development Manager. *"Its agility and flexibility will enable it to fulfil simultaneous requests."*

Pleiades simulation, near Cannes, France

and military requirements

OPERATIONALLY RESPONSIVE STATIONS

The three Pleiades receiving stations have been chosen to meet customers' requirements as efficiently as possible. They will be located in:

• the Kerguelen Islands for morning passes, the best time to upload tasking commands for Europe, Africa and the Middle East

• in Sweden for midday orbits and coverage of North and South America

• in Toulouse for evening passes over Asia and Oceania

A key feature of the Pleiades satellites is their ability to acquire imagery daily anywhere in the world while systematically combining panchromatic and multispectral viewing modes to generate 50-centimetre colour merge products. The satellites will be able to acquire more than one million sq.km every day, in black and white and colour. Two or three images of an area of interest will be obtainable from different angles in a single pass, for production of 3D data products. This stereo and tri-stereo viewing capability is made possible by the satellites' ultra-sophisticated gyros, allowing them to tilt quickly up to 60 degrees forward/aft and across track, and to stabilize in just 25 seconds.

Highly responsive tasking

"The satellites' ability to respond quickly increases users' chances of obtaining the imagery they need," adds Christophe Hutin. What's more, the satellites' work plan will be adjustable three times a day, a significant improvement over SPOT, which today only supports uploading of one work plan a day. For certain receiving stations, it will be possible to task the satellites up to about 40 minutes before each pass, enabling customers to refine their requests at the last moment. The three tasking periods will reduce the latency between users' programming requests and image acquisition via the three receiving stations (see box). Pleiades is shaping up as an excellent complement for SPOT 5, whose successor is now known. Combining SPOT 5's acquisition capacity with the agility of Pleiades, the SPOT 6 satellite to be launched in 2011 will pave the way for new commercial applications. ■