image

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EUMETSAT

Europe's Weather Satellite Organisation

MSG launch signals start of new era for weather imagery services

The first Meteosat Second Generation (MSG) spacecraft is in Kourou, French Guiana, undergoing final preparations for launch on an Ariane-5. Lift-off is planned for 27 August 2002, just over three months after MSG-1 arrived at Europe's launch site in South America aboard a giant Antonov transport aircraft.

MSG-1 was originally scheduled for launch on an Ariane-4, but since a suitable co-passenger could not be found it was switched to the newer and larger capacity Ariane-5, where it will fly with the Atlantic Bird-1 telecommunications satellite.

As a result of the change, EUMETSAT, Arianespace, ESA and the satellite prime contractor had to devise a solution to the shock problem that had initially prevented an Ariane-5 launch, implementing suitable shock attenuation devices between the satellite and the launcher adapter.

Reception of the first image taken by MSG-1 is planned for October 2002 with the wider dissemination of images foreseen from the end of 2002. The start of routine operations is planned by September 2003, pending the timely delivery of the image processing element of the Ground Segment.

Although still in a critical phase, the development of the image processing element is now under control. Temporary recovery actions were implemented to mitigate delays, allowing an early start of satellite in-orbit verification and of system commissioning in parallel with the final integration and verification of the image processing element within the Ground Segment.

To assure continuity of EUMETSAT satellite services from geostationary orbit, the EUMETSAT Council agreed to parallel operations between the current Meteosat and the MSG system until the end of 2005. Meteosat-7, which currently provides the operational service from 0° Longitude, has sufficient on-board fuel for this.

Further details are given on page three, and the EUMETSAT website will provide regular updates on progress towards and beyond the launch of MSG-1.

MSG-1 in its sealed container (below) is about to be unloaded from its transport aircraft after arriving in French Guiana on 15 May. The satellite was removed from its container the next day and mounted on a dolly (left) for transport into the cleanroom

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Nairobi PUMA office opens for business

The Republic of Kenya's Minister of Transport and Communication, the Honourable Musalia Mudavadi, inaugurated the PUMA Project Management Unit offices in the premises of the Kenya Meteorological Department (KMD) in Nairobi on 19 March 2002. The PUMA project management unit has been based in Nairobi since October 2001.

Presiding over the inauguration, the Minister said that the new equipment provided by the PUMA project will facilitate speedy meteorological data processing and the Meteosat Second Generation (MSG) satellites will transform the meteorological services by ensuring a strong database.

He added that the project will ensure meteorological services in all the 53 countries covered by PUMA have the necessary ground-receiving equipment to enable them to access the products of the EUMETSAT satellites.

Data from the new satellites will form a critical input for accurate and timely weather forecasts, most African economies being highly dependent on weather.

Accurate and timely forecasts of adverse weather events will allow nations to take prompt mitigation actions in relation to agricultural production, hydro-electric power generation and development and management of the public water supply.

The Honourable Musalia Mudavadi inaugurates the PUMA Project Management Unit offices at the Kenya Meteorological Department Headquarters in Nairobi in the presence of Colonel N'Dala, Chairman of the PUMA Project Steering Committee, Mr Mukolwe, Chairman of the PUMA Task Team and Mr Buse, EC Delegation in Nairobi

PUMA gathers momentum

The Preparation for Use of MSG in Africa (PUMA) project has shifted into a higher gear as the countdown to the launch of the MSG-1 satellite this Summer has begun.

A contract for the provision of MSG receiving stations and the related technical training is about to be placed following an Invitation to Tender (ITT) issued by the European Commission at the end of November 2001. It was supported by an information day at the EUMETSAT headquarters prior to the tendering period closing on 28 February 2002.

Two major reference documents, establishing the general framework of the training and outlook activities of the project, were an important output from a workshop organised by EUMETSAT in December 2001 to coordinate the actions undertaken by different partners involved in training in Africa with the training component of the PUMA project.

The second meeting of the PUMA Project Steering Committee held in Nairobi in March this year provided an opportunity for all project stakeholders to endorse the work plan for 2002. During the meeting the participants were also informed of the latest developments on the Trust Fund set up by the World Meteorological Organization to enable North African countries and South Africa to participate in the project.

In October 2002, the 5th EUMETSAT User Forum in Africa, to be held in Dakar, Senegal, will concentrate on the implementation of the PUMA project. Industry will be invited to make presentations on the selected receiving system to all participants. Parallel working groups will also discuss in detail the training and outlook activities of the PUMA project.

Strengthening mutual interest

The long history of fruitful cooperation between EUMETSAT and the National Oceanic and Atmospheric Administration (NOAA) in the provision of meteorological satellite observations from space continued when the organisations met in Darmstadt, Germany, on 7 June for top level discussions.

Vice Admiral Conrad C. Lautenbacher Jr, the Under Secretary of Commerce for Oceans and Atmosphere and Administrator of NOAA, met with Dr.Tillmann Mohr, Director-General of EUMETSAT.

In addition to working together on the future Initial Joint Polar System (IJPS) of meteorological satellites, both organisations have cooperated in the past to provide back-up solutions to gaps in geostationary satellite coverage.

EUMETSAT also maintains close liaison with NOAA on a bilateral basis with high level representation of both organisations attending each other's executive meetings. At the working level the cooperation is further strengthened by both organisations having a staff member working in each other's headquarters.

While at EUMETSAT, Vice Admiral Lautenbacher was able to gain more insight into matters of mutual interest connected with geostationary and polar-orbiting meteorological satellites and provided an interesting perspective of US plans.
He was updated on the latest developments regarding the forthcoming launch of MSG and the progress with the EUMETSAT Polar System.

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MSG Ground Segment testing

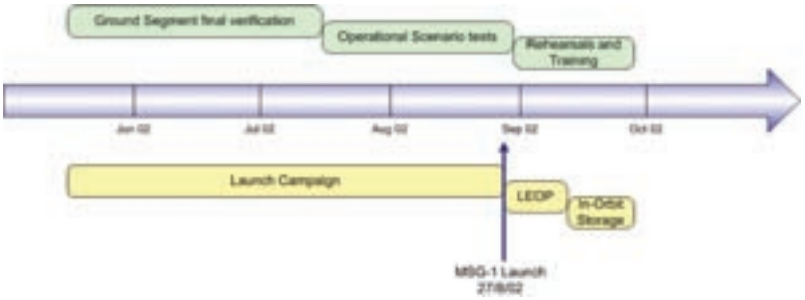
With the launch date for MSG-1 rapidly approaching, the MSG Ground Segment is being put through its paces in preparation for the start of in-orbit commissioning. Having started in mid-May, the final sequence of Ground Segment verification tests will be run to ensure that all the facilities work together in normal configurations and can survive simulated failure cases.

Starting in mid-July and lasting for six weeks (following the Ground Segment tests) the operational scenario tests will take place to validate that all the Ground Segment facilities and the external elements function together in test configurations representative of both routine and in-orbit commissioning operations. Both normal and contingency configurations will be tested.

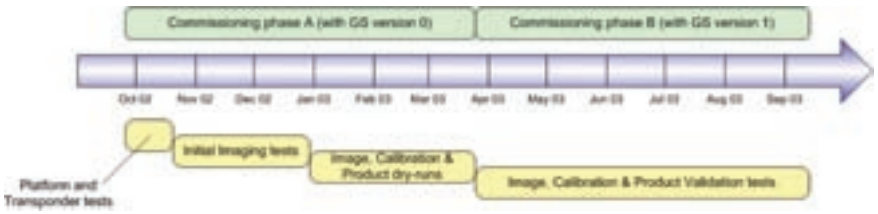
Preparations for the start of commissioning will be finally completed by a month of training and rehearsals. This is to ensure that all components of the Ground Segment and the operations teams are ready to assume control of the spacecraft and start the in-orbit tests. This incremental build-up aims at readiness to start commissioning being achieved by the end of September. The schematic shows the progression of the various activities.

Due to delays in the delivery of parts of the Ground Segment, the version that will be used to start the in-orbit commissioning is not quite the same as the one required to finish it. This means that the in-orbit commissioning will be split into two parts – commissioning using the initial Ground Segment configuration (version 0), and commissioning using the successive configuration (version 1).

The outline of the commissioning activities is shown below, with the first activation of the Spinning Enhanced Visible and Infrared Imager (SEVIRI) instrument taking place around the end of October followed by the initial phase of imaging tests. The first dissemination of SEVIRI data to users is planned towards the end of the initial imaging tests, with non-SEVIRI data being available to High Rate and Low Rate User Station (HRUS and LRUS) users prior to that time.



MSG-1 operations preparation schedule



MSG-1 commissioning schedule

Coordination of the actual transmission of data to HRUS and LRUS users will be via the EUMETSAT User Service. During in-orbit commissioning, the MSG-1 spacecraft will be located at 10.5°W. Antenna pointing angles for this location will be published on the EUMETSAT Web pages.

Following the successful completion of MSG-1 in-orbit commissioning, the spacecraft at 10.5°W will be swapped with Meteosat-7 at 0° Longitude, and parallel operations will start with MSG-1 at 0°, and Meteosat-7 at 10.5°W, currently planned for Autumn 2003.

Director-General's Desk

With a launch date for the first Meteosat Second Generation (MSG) satellite planned for 27 August, the anxious waiting time is almost over and the race is on. Everyone is focused on this important event and what is to follow it.

The years of development are now behind us – the first thoughts were expressed in 1984 and the programme went into full swing from 1994. Despite uncertainty since 2000 about the launcher and the readiness of parts of the ground system, the way forward is now much clearer and we have solutions to the problems.

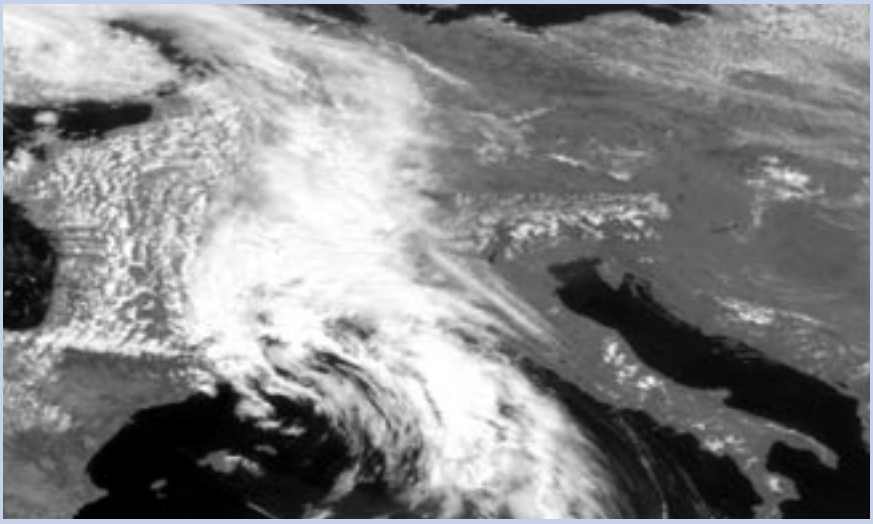
Although the production of the operational version of the Ground Segment still has a long way to go, our experts have ingeniously developed an interim solution to the image processing. This is by modifying the system originally intended for use in testing and evaluating the performance of the MSG radiometer which will allow commissioning of the satellite starting in late September.

All being well we also plan to commence dissemination of imagery to users by the end of the year. Because the modified interim system was designed for another purpose, it does not have a back-up function and thus the dissemination provided cannot be guaranteed to be as non-stop as the full operational service but it is a major step in the right direction.

The prospects for a launch on an Ariane-4 became even more precarious this year because there are only a few of these launchers left and a suitable co-passenger could not be found. More ingenuity was called for and a solution emerged whereby the fitting of a package of shock attenuation devices to the Ariane-5 launcher made it safe to carry MSG without shock damage occurring.

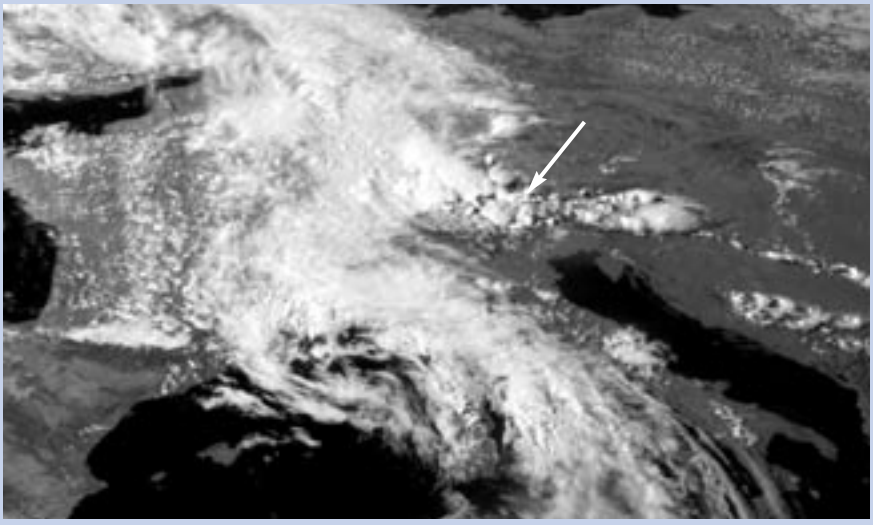
The satellite is now in Kourou and being prepared for launch in August. The clock is ticking, the adrenaline is high and we eagerly look forward to having our long-awaited spacecraft in orbit by the end of August and first visible results by the end of October.

From the archive



Meteosat-6 Rapid Scan visible image, 12:00 UTC, 15 May 2002

Deep convective development over the Alpine region 4 hours 20 minutes later



By Jochen Kerkmann, EUMETSAT Meteorological Scientist

Torrential rain occurred in Southern Germany on 18 May 2002 when a short-wave trough approached Germany from the west.

The associated cold front extended from the UK to Switzerland, and at the same time a cut-off process took place over the Gulf of Lion leading to a separate surface low in the area west of Corsica.

This led to an intensification of warm air advection to the central and eastern parts of the Alps.

In the afternoon, the warm air tongue over the Alps and Southern Germany was the area where severe convection took place. The first pre-frontal convective cells developed in the area of Lake Constance, merging quickly to form a Mesoscale Convective System (MCS).

Later in the afternoon, this MCS, being fed by inflowing warm air from the east, moved along the northern slope of the Alps towards Munich where it arrived around 22:00h in the evening.

The system led to severe thunderstorms over Bavaria with hail and torrential rain resulting in flooding and a landslide. Lightning was particularly spectacular and several fires were reported.

The Meteosat-6 images taken from a rapid scan sequence show the development of the convective cells during the afternoon of 18 May 2002.

Member S

Positive steps have been taken to ensure the continuation of precise sun-synchronous orbit altimetry data in response to the need clearly expressed by the ocean user community. As part of an Oceanographic Surface Topography Mission (OSTM), CNES (France), NASA and NOAA (USA) and EUMETSAT have agreed to work towards the joint implementation of the Jason-2 satellite.

Since the last edition of IMAGE, a Programme Declaration and an attached Programme Definition for the Jason-2 mission were agreed by the 17 EUMETSAT Member States at the EUMETSAT Council meeting in December 2001.

A schedule was established aimed at committing to funding of the programme based upon a Gross National Income (GNI) scale of contributions by November 2003. At the time of writing Switzerland became the first country to confirm its financial contribution.

With a planned launch date at the end of 2005 and a nominal five-year life, the primary objective of Jason-2 will be to ensure that the global user community continues to receive accurate and continuous

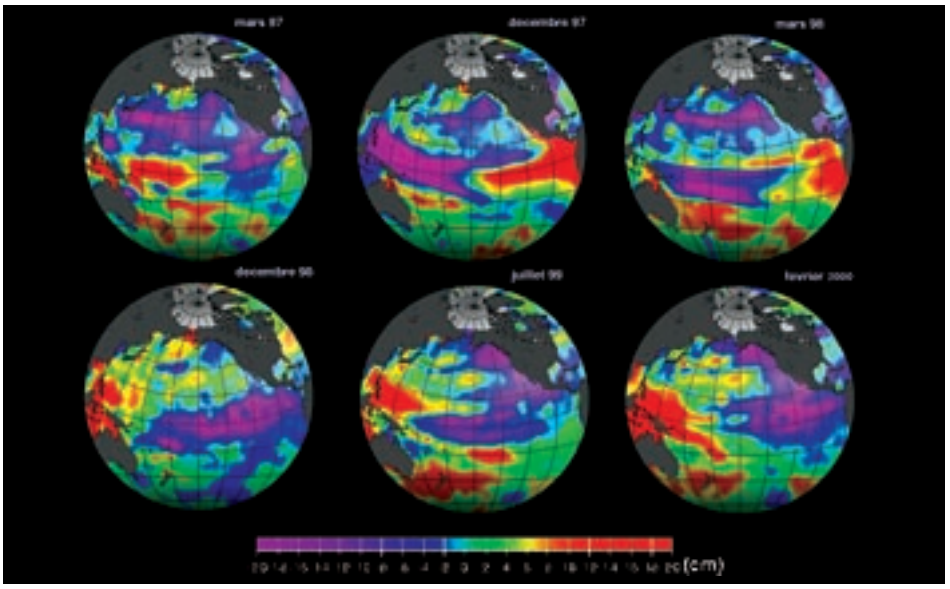
Survey re

Preliminary results of a user survey

A survey of the EUMETSAT user community revealed a high degree of satisfaction with the services provided. Carried out at the end of 2001, the survey results showed that for the prime image dissemination services, 80% of those who responded were more than satisfied, 17% satisfied and 3% less than satisfied with the quality and reliability of the services. Taken over all of the operational data, products and services these figures are 66%, 30% and 4% respectively. The most commonly expressed concern was the uncertainty of users due to the replacement of WEFAX (the universal geostationary analogue image dissemination system) by MSG Low Rate Information Transmission (LRIT) reception systems and the potential cost of conversion.

The survey was not carried out just to hear how good we are but with the major aim of looking for areas that need improvement. This follows the philosophy of the ISO 9001 standard which aims at continuous monitoring and improvement of services. For each of the EUMETSAT operational services (image

tates look forward to Jason-2



El Niño/la Niña as shown by TOPEX Poseidon satellite observations. Jason will provide complementary data for ocean monitoring

altimetry data on an operational basis.

The data will support operational activities in marine meteorology, seasonal forecasting and oceanographic services. It will also support the monitoring of the climate through its contribution to the description and understanding of the ocean circulation and variability on all scales.

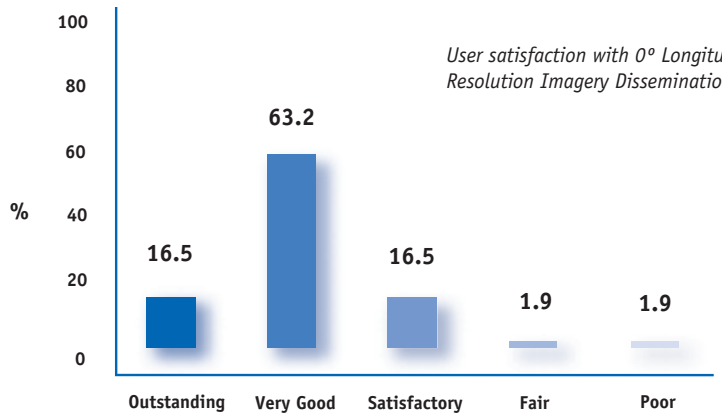
The Jason-2 satellite will circle the Earth in a non-sun-synchronous 66° orbit and will be equipped with a radar altimeter and other instruments to directly measure sea surface elevation along a fixed grid of ground tracks directly below the path of the satellite.

Data from the satellite will include real-time wind and wave observations with an accuracy of better than 2 m/s, an orbit accuracy of better than 50 cm and a range accuracy of better than 4.5 cm. In addition, higher precision products will be available on a three and a 30-day basis, and all data will be archived and available to the science community.

The OSTM mission is also an important element in the context of the overall altimetry data needs. In addition to the precise non-sun-synchronous altimetry data from Jason-2, the ERS and Envisat satellites are providing high-inclination sun-synchronous data. Merging the data from these two systems provides maximum synergy for applications such as ocean mesoscale circulation.

sults highlight EUMETSAT user views

dissemination, data collection and retransmission, meteorological data distribution, archiving and retrieval, operational information dissemination and the user service helpdesk) users were asked to give their opinion on quality and reliability. In addition, comments and suggestions for improvement for any aspect of EUMETSAT operational services, including those planned for the MSG operational era, were invited by the survey.



User satisfaction with 0° Longitude High Resolution Imagery Dissemination

Many varied comments and suggestions were received including some common themes:

- Concern from many amateur users over the forthcoming loss of the WEFAX service and the cost implications for HRIT/LRIT reception
- Continuation of the Indian Ocean Data Coverage Service and the Foreign Satellite Data Relay
- Requests for direct download of archived products
- Easier access to larger quantities of archived products
- Availability of software products for archive product format conversion
- Improvements in the website content and services
- Increased technical content of publications for expert users but less for inexpert users
- Production of publications and information in foreign languages
- Avoidance of excessive use of abbreviations

Analysis of the survey returns is ongoing and details will be published on the EUMETSAT website. An action plan is being drawn up to address the concerns and suggestions.

This was not a one-off activity and we plan further surveys in the future to check up on the effectiveness of EUMETSAT operational services. We thank all those users who responded to this survey.

Strategic issues in focus

EUMETSAT Director-General, Dr. Tillmann Mohr, was appointed Chairman of the Strategic Implementation Team (SIT) working group of the Committee on Earth Observation Satellites (CEOS) in January 2002.

The SIT group focuses on the coordination of satellite activities, while CEOS is a forum in which all primary space agencies of the world meet to discuss issues of mutual interest and improve the synergy of satellite observations within the overall structure of the Integrated Global Observing Strategy (IGOS).

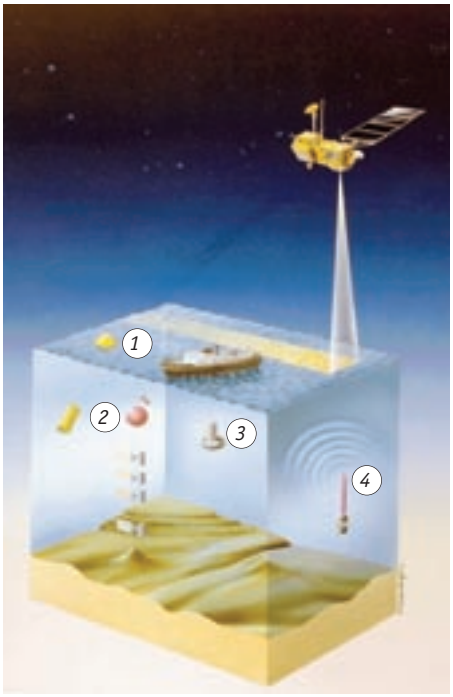
As Chairman of SIT, one of Dr. Mohr's specific aims is to focus the meetings on the discussion of strategic issues. Senior representatives of space agencies, willing and able to commit to the provision of specific observations, will be encouraged to provide a balance between requirements and available resources.

The first meeting of the SIT was attended by Director-General level representatives of Earth science agencies from the USA and Japan in addition to senior staff of European organisations and the European Commission.

The main points of discussion were the space agencies' detailed response to the recommendations of the ocean community for data observations as well as the preliminary International Global Observing Strategy (IGOS) plans in defining the needs of the carbon cycle, atmospheric chemistry, the global water cycle and coastal waters. The SIT provides a mechanism for considering how to best use the necessarily limited resources in order to achieve an optimum result.

The IGOS partners have held discussions on how to emphasise the importance of space- and surface-based observations within the scientific and decision-making bodies, especially in view of the World Summit on Sustainable Development to be held in September 2002. The link between political needs and decisions and Earth observation is essential to ensure long-term support and enable an assessment of the data value.

An 'IGOS Open Session' in November 2001 was a significant initiative organised in the Japanese city of Kyoto to promote IGOS-P activities to policy makers, media and the public. The event was very successful, with distinguished speakers from Earth science and climate change bodies, the World Meteorological Organization and as many as 170 participants from around the world.



An example of integrated operational ocean monitoring with satellite and different types of observing platforms:
1. Surface free floating
2. Sub-surface tethered floating
3. Ship tethered
4. Variable depth free floating

The European Science Foundation (ESF) hosted a similar meeting in January 2002, where social science, environment and space communities met to discuss how the major socio-economic drivers for the understanding of climate can be defined and what observations are needed. It was recognised that competition for research budgets exists and climate research cannot expect continually increasing support.

New resources for long-term environment observations are partly dependent upon the efforts in meeting broader needs of society including the understanding of changing patterns in environmental risks such as floods, droughts, water resources and agricultural capability.

EUMETSAT's training looks East

EUMETSAT has expanded its education and training programmes in recent months, concentrating on central and eastern European states in addition to its ongoing work in two African centres in Kenya and Niger.

Each of the EUMETSAT Cooperating States has now hosted an initial training event with courses taking place in Budapest, Krakow and Bratislava. A course was also held in Zagreb just a few weeks before Croatia became the fourth EUMETSAT Cooperating State.

In the Baltic region, the latest course in the NOMEK (Nordisk Meteorolog Efteruddannelses Kursus) series was conducted in Vilnius, Lithuania, and a similar event focussing on subjects of particular regional interest is planned for Estonia later in 2002.

A training workshop in Prague in the Czech Republic will immediately precede the European Severe Storm Conference at the end of August 2002 and an in principle agreement has been reached to organise a regional event in Bulgaria, probably also later this year.

One theme that is proving extremely popular in almost all of these events is the inclusion of presentations based around the conceptual model approach to satellite image interpretation.

These techniques have been incorporated both into an operational image analysis procedure (SATREP) and into the increasingly popular training material (SATMANU) by a consortium of the National Meteorological Services of Austria (ZAMG), the Netherlands (KNMI) and Finland (FMI).

Participants of the EUMETSAT training seminar held in Zagreb, Croatia

image profile

Mikael Rattenborg

Director of Operations

Mikael Rattenborg, Director of Operations

Responding to the needs of the operational meteorological community and providing efficient and reliable high quality operational services are just two of the goals for Mikael Rattenborg, who was appointed by the EUMETSAT Council as the Director of Operations in July 2001.

As the capabilities of operational meteorological systems, in particular Numerical Weather Prediction Models, are rapidly advancing, Mikael faces the challenge of continuing to provide a state-of-the-art response to the changing operational requirements.

Mikael's expertise in the meteorological field began with an M.Sc. in Numerical Weather Prediction from the University of Copenhagen, which led to his first professional post in the Danish Meteorological Institute (DMI).

It was here that he developed the first Danish Limited Area Numerical Weather Prediction Model, the precursor for the High Resolution Limited Area Model (HIRLAM) system used for Numerical Weather Prediction in a number of European countries.

His career then moved gradually towards the computer systems side, and he became responsible for the operational implementation of the very first supercomputer system at DMI, including the adaptation of the Limited Area Model to this system.

In 1987, Mikael decided to focus his career entirely on large-scale computer systems. He was recruited by the computer company UNISYS, which seconded him to Germany as a systems expert where in 1990 he became responsible for systems software development for Lufthansa, Amadeus and other major German customers in the area of high volume transaction processing systems.

After having gained technical and management experience in the industry, Mikael's true fascinations beckoned and he decided to go back to his roots by applying his experience to meteorology.

On 1 January 1995 he joined EUMETSAT as Manager of the Meteorological Products Extraction Facility (MPEF) for the Meteosat Transition Programme, and was responsible for the successful operational introduction of MPEF products in late 1995. In January 2001 he became Head of the Meteorological Operations Division.

Mikael Rattenborg is married with four children and when time permits he enjoys running and skiing. He is vice-president of the EUMETSAT badminton club and also has a keen interest in science, languages and history.

Polar System preparation moves on

A promising future is in store for the EUMETSAT Polar System (EPS) and many aspects of its development are progressing well. During the Preliminary Design Review for the complete system, started in January 2002, the programme plans were revised and the launch date of the first Metop satellite was confirmed for July 2005.

Work continues in the finalisation of the specification of meteorological products, in the preparation of prototype processing software and in the generation of test data to validate the system on ground.

The Core Ground Segment completed its Preliminary Design Review and the detailed design phase has commenced. The polar site infrastructure service commenced in April 2002 and the contractor has finalised the preparatory work for installation of antennas. This will be performed during the coming Summer at the time when weather permits outdoor work in Svalbard within the Arctic Circle.

The Metop structural model undergoing tests

The Critical Design Review of the Metop spacecraft was successfully completed as well as the testing campaigns on the engineering and structural models. Compatibility of the Metop design with the Soyuz launcher environment was also confirmed but with some changes to the Advanced Very High Resolution Radiometer. The necessary work has been initiated in the USA.

Work on the Metop-1 flight model is well advanced, with all avionics integrated and instrument integration under way. The integration of the Metop service module is also progressing well.

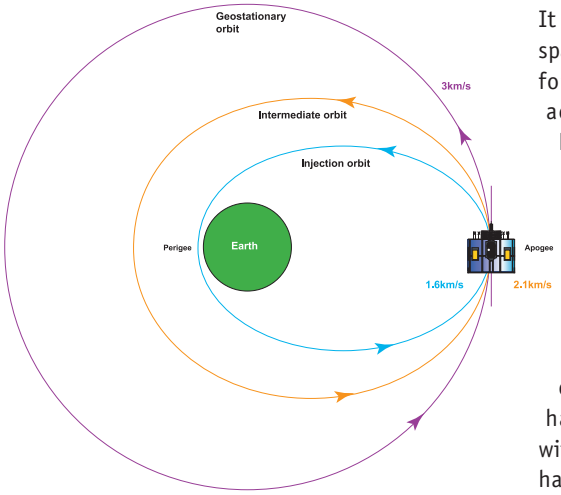
The Infrared Atmospheric Sounding Interferometer (IASI) engineering model was delivered to Metop industry where its integration is under way and initial results are very good. The Critical Design Review was completed in May 2002 with delivery of the first IASI flight model planned for August 2003.

Marc Cohen, EUMETSAT's EPS Programme Manager, says it is very encouraging that the programme is now moving well on so many fronts and this increases confidence that the first satellite will be launched in 2005. In a few years from now users will be reaping the benefits of the data produced by the new system.

Helping hands guide MSG to orbit

Flight dynamics expertise, simulation, communications networks and training are just some of the vital skills required to ensure MSG reaches the correct geostationary orbit and is accurately aligned to the Earth's axis when it is launched this Summer. This crucial task is in the capable hands of ESA's European Space Operations Centre in Darmstadt - recognised for its considerable experience in these areas - who will carry out the Launch and Early Orbit Phase (LEOP) activities on behalf of EUMETSAT.

The Ariane-5 launcher will deliver the spacecraft into an elliptical orbit known as a Geostationary Transfer Orbit (GTO). At the lowest part of the orbit the perigee is approximately 580 kilometres above the Earth, and at the highest part the perigee is 36,000 kilometres. Unlike its predecessors, MSG has liquid fuelled apogee motors rather than a one-shot solid booster.



MSG-1 from Injection to Geostationary Orbit

The satellite will be allowed to pass around the Earth for three revolutions in GTO before the first motor burn at the apogee on orbit number four.

It is vital to know the precise location of the spacecraft and that its orientation is correct for the burn as a number of important activities have to take place before this happens. This is achieved through the assistance of ground stations in Villafranca in Spain, Perth in Australia and one in Kourou, French Guiana.

At apogees six and eight, successive motor burns will occur to transfer the satellite into a completely circular orbit at 36,000 km above the Earth with a velocity of three kilometres per second. MSG then has to be stabilised and its axis aligned with that of the Earth, the radiometer hatch has to be removed by pyrotechnics and the satellite's spin rate adjusted to 100 revolutions per minute.

Satellite operations will be handed over to EUMETSAT for commissioning to start by the end of September.

Global Satellite Update

Europe: Meteosat-7 supports the primary service at 0° Longitude. Meteosat-6 performs the operational Rapid Scanning Service (and is the primary service back-up at 9°W). Meteosat-5 continues the Indian Ocean Data Coverage Service at 63°E. MSG-1 target launch date is 27 August, 2002. Metop-1 is planned for launch in mid-2005.

USA: NOAA-M, now NOAA-17, was launched on 24 June 2002 and will be the last NOAA satellite in the morning orbit. Aqua was launched on 4 May 2002 into a sun-synchronous afternoon orbit. GOES-8 (East) is functioning at 75°W. GOES-9 is expected to act as back-up for the Japanese GMS-5 from Spring 2003. GOES-10 (West) is functioning at 135°W. GOES-11 acts as back-up at 105°W. GOES-12 is in in-orbit storage. NOAA-15 is the primary polar orbit morning satellite, with NOAA-12 as back up. NOAA-16 is the primary polar satellite in the afternoon orbit.

Russia: Meteor-3M-N1 was successfully launched on a Zenit-2 on 10 December 2001 into a polar sun-synchronous morning orbit, inclined at 99.7°. Meteor-3M-N2 is planned to be launched in December 2004. GOMS-Electro-N2, which will be positioned at 76°E, is planned for launch in 2005. Two satellites of the Meteor-2 and Meteor-3 series continue to operate beyond their designed lifetimes with reduced capabilities in circular orbits inclined at approximately 82°.

China: On 15 May China launched on a Long March-4 rocket the Fengyun-1D (FY-1D) satellite, a polar-orbiting meteorological satellite to replace FY-1C, and the Haiyang-1 satellite, China's first marine satellite for surveying ocean resources. FY-2B is stationed at 105°E. FY-2A continues to act as back-up satellite at 86°E. FY-3A is planned for launch in 2004. FY-2C is planned for launch in 2004.

Japan: GMS-5, Japan's current operational geostationary meteorological satellite, continues to operate at 140°E. The US satellite GOES-9 is expected to act as back-up for GMS-5 at 155°E from Spring 2003 until MTSAT-1R becomes operational towards the end of 2003. MTSAT-1R is planned for launch on H-IIA from Tanegashima Space Center early in 2003. MTSAT-2 is planned for launch in mid 2004, then for stand-by operation for three years and start of service in 2008.

India: INSAT-3C was successfully launched on board Ariane-5 on 24 January 2002. INSAT-3B was launched aboard Ariane-5 in March 2000 as the first of the INSAT series. It could not be followed up with INSAT-3A as had been originally planned, due to difficulties associated with the meteorological payload. This resulted in an advancement of the launch of INSAT-3C. INSAT-3A is scheduled for launch in August 2002. INSAT-3E is planned to be launched early in 2003 and INSAT-3D at the end of 2003 or in the first quarter of 2004. INSAT-1D operates at 74°E. INSAT-2E operates at 83°E. INSAT-2B acts as back-up satellite from an inclined orbit. METSAT is scheduled for launch in September 2002.

Satellite experts to meet in Dublin

Innovative use of satellite navigation signals to monitor temperature and humidity in the upper atmosphere will be a featured theme of the annual EUMETSAT satellite conference this year. Held in the historic Dublin Castle, scientists from around the world will gather in Ireland's capital city from 2-6 September for presentations and discussions about the multitude of meteorological satellite data applications.

Scientists from as far afield as the USA, China, Russia, Japan and Africa with many more from Europe will hold over 70 oral presentations and 50 poster and software demonstrations, covering: current and future satellite programmes and systems, meteorological applications, ocean observation applications, training applications and climate monitoring applications.

The special presentations on the use of navigation signals will concentrate on applications in meteorology, climate monitoring and ocean observations. A keynote presentation on the assimilation of Global Positioning System radio occultation data into Numerical Weather Prediction models will be of special interest.

There will be increased attention this year on ocean monitoring and a completely new outlook on training applications. To register as a participant visit our website.