



# Commitment to long-term future for geostationary satellite services

The Meteosat Second Generation (MSG) programme looks set to secure the continuation of the geostationary satellite services until at least the year 2018.

The MSG Programme Extension Proposal, tabled at EUMETSAT's special Council meeting on 4 March 2003, will include the development of an MSG-4 satellite, extended operations, procurement of a GERB-4 instrument, associated launch and LEOP services and the necessary maintenance and upgrades of the Ground Segment.

All 18 Member States unanimously agreed on the content of the proposed extension, enabling the Resolution to be opened for voting. It is expected that full commitment will be received by the end of 2003. In the meantime, the mechanism to start industrial activities has commenced.

The operational service of the MSG programme is based on a configuration of two satellites in orbit, one of which constitutes a hot spare. When MSG-2's

service ends, MSG-3 would then remain alone in orbit, with significant risk of non-availability of the service in case of any problem.

To maintain the MSG system and services at the high level required for an operational mission and at the standard already adopted by other operators of meteorological satellites, the EUMETSAT Council, already in 1999, agreed the concept that an MSG-4 satellite was required.

Even through the intense period of the MSG-1 launch campaign, preparations on MSG-4 continued with the finalisation of the industrial offer. Negotiations were concluded in January 2003.

Meanwhile, at its June 2002 meeting, the EUMETSAT Council agreed that for planning purposes, indicative launch dates for MSG-3 and MSG-4 are January 2008 and October 2010; the MSG-2 target launch date remains January 2005.

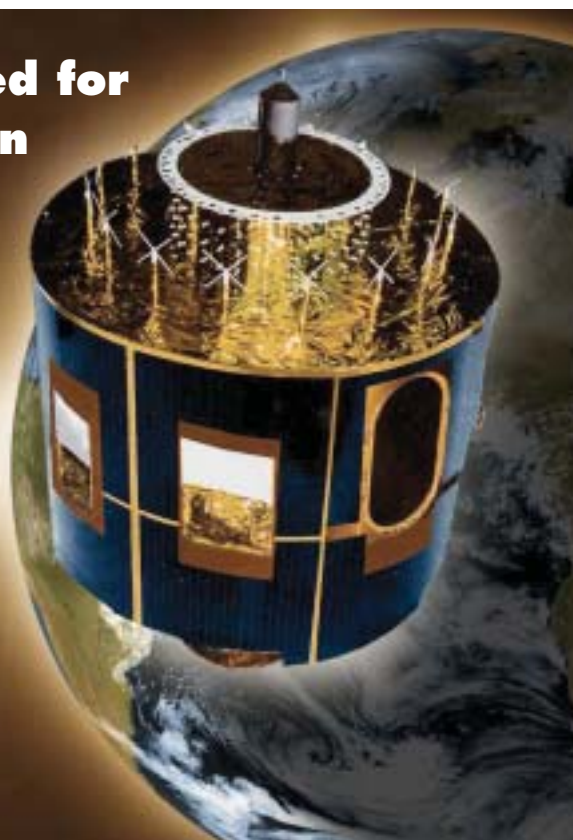
## EUMETCast to be used for MSG-1 dissemination

An alternative dissemination scheme is rapidly being put in place following the problems experienced with the MSG-1 on-board dissemination system. This alternative scheme is based on EUMETCast, the dissemination component of EARS (EUMETSAT ATOVS Retransmission Service), which is now in the process of being upgraded for MSG.

The initial phase of EUMETCast upgrades has been split in two:

- data rate upgrade to handle MSG data
- coverage upgrade to embrace outside Europe.

The data rate upgrade is well under way, with testing in progress at trial user sites - thereby providing early availability of MSG data to European users. Expanding the coverage to take in Africa is currently in the specification and procurement phase and is planned to be available in the September/October time-frame.



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## Arab nations workshop

An information workshop on MSG brought together representatives from 10 arabic speaking countries and the WMO (World Meteorological Organization) at a meeting in Cairo on 17-18 February.

EUMETSAT's aim in organising the workshop was to strengthen links with this important user community, particularly purposeful in view of the recent launch of MSG-1 and Meteosat-5's continued operation over the Indian Ocean.

In fact, participants from Egypt, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen re-emphasised the importance of extending the coverage of the Indian Ocean after 2005.

The workshop also raised the issue of providing access to MSG data under the Alternative Dissemination Method (ADM) within the global field of view of the satellite.

The representatives from the 10 nations reviewed the possibility of coordinating their efforts for procuring MSG receiving data capabilities and also addressed the issue of training of regional National Meteorological Service experts.

It was recommended that similar workshops be hosted on a more regular basis with the possibility of a second organised for 2005.

## Parliamentarians' visit



German and French parliamentarians pose for an official photo in the Atrium of EUMETSAT HQ together with EUMETSAT's Director-General and senior members of staff

EUMETSAT received the first visit from a joint delegation of German and French parliamentarians, led by Kurt Rossmanith from the 'Parlamentsgruppe Luft- und Raumfahrt des Deutschen Bundestages', and

Christian Cabal from the French 'Groupe Parlementaire de l'Espace', on 5 March 2003. The aim of the visit was to learn of EUMETSAT's activities and future plans, including its contribution to ocean and climate monitoring.

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#### Editor

Madeleine Pooley (EUMETSAT)

#### Editorial support

Michaela Gerum (EUMETSAT)

#### Editorial, artwork and print

Lucy Owens (SIMCOMM)

Correspondence on IMAGE should be sent to:  
EUMETSAT User Service, Am Kavalleriesand 31,  
D-64295 Darmstadt, Germany.  
Tel: +49(0)6151-807366  
Fax: +49(0)6151-807379  
E-mail: ops@eumetsat.de  
Web: www.eumetsat.de

## PUMA Outlook Activities begin

In December 2002, the Preparation for Use of MSG in Africa (PUMA) project was put on hold following discussions held in EUMETSAT on the MSG data dissemination mode.

Impact on the PUMA receiving stations of the potential use of Alternative Dissemination Method (ADM) for distributing MSG data is currently being assessed by industry.

The project has since been partially reactivated and PUMA stations will be tested in Europe using data disseminated through the EUMETCast service. As soon as the EUMETSAT Council has made a clear decision on how the MSG data will be distributed over Africa, the project will be fully resumed.

The installation of the test stations in Africa is now planned to start in November 2003, together with the first training activities.

Meanwhile, the Outlook Activities' component has been given the green light with the publication of a Call for Ideas, published on the project's website. In addition, an information workshop for western Africa, hosted by the AGRHYMET centre, was held in Niamey (Niger) in

February this year.

It should also be noted that the Belgian Technical Cooperation Office has decided to contribute to the PUMA project, and is financing a project aimed at helping the Democratic Republic of Congo (DRC) to prepare its site and personnel in readiness for the installation of the MSG receiving equipment.

Meanwhile, a feasibility study for an initiative planned as a follow on to PUMA started this Spring, after a meeting at the EUMETSAT headquarters in January 2003.

The principal stakeholders of AMESD, the African Monitoring of the Environment for Sustainable Development initiative, met to plan the way forward and discuss the potential co-operation between African and European researchers in the field of environment management based on satellite observations.

The PUMA Task Team, in charge of following the development of the AMESD initiative, recommended that links between AMESD and the European GMES initiative be established.

## CAL offers training options

A new computer-based system developed by EUMETSAT could soon be used to enhance the knowledge of thousands of meteorologists – without disrupting their operational shifts.

MeteoCAL, a EUMETSAT-conceived Computer Aided Learning (CAL) programme, solves a dilemma facing many managers of how to find the time to train weather forecasters efficiently without affecting operational forecasts.

The 'e-learning' training material – available through the Web or on CD-Rom – currently comprises three MeteoCAL modules.

They are a first contribution to an anticipated library to be created in the coming years that will address the use of data from the new EUMETSAT satellite systems, starting with Meteosat Second Generation (MSG).

The modules, together with their creation tools, were developed under contract to EUMETSAT by Intrallect (UK).

Initially, such 'e-learning' tools are expensive and time-consuming to create. However, they become extremely cost-effective when considering the disparate nature of the potential audience. Maintenance and updates can also be managed centrally.

The first modules were demonstrated to a selection of European and African experts in the field of training operational meteorologists at a MeteoCAL workshop in the training centre of the German Weather Service in Langen, Germany, in August 2002.

Using the new tools, participants gained experience in navigating their way through the new modules, and each working group was able to create a new 'mini' CAL module on a meteorological topic in only a few hours.

Further CAL initiatives, now under development in various training centres in Europe and Africa, will also make use of these new tools.



*European and African experts in the field of training operational meteorologists at a MeteoCAL workshop in Langen, Germany, August 2002*

## Russian agreement in Summer

A new Cooperation Agreement between EUMETSAT and the Russian Federation's ROSHYDROMET looks set to enter into force this Summer.

The finalisation of the new agreement, planned for signature in July 2003, was the main item on the agenda at the annual bilateral meeting in Moscow between EUMETSAT and

ROSHYDROMET on 13 March 2003.

In addition, Slovenia and Romania have officially notified EUMETSAT of their intention to become Cooperating States of the organisation, and preliminary discussions have taken place with Bulgaria. It is expected that Romania and Slovenia will join as Cooperating States on 1 January 2004.



### Director-General's Desk

With the first Meteosat Second Generation (MSG) image received on 28 November 2002, just five days after the 25th Anniversary of Meteosat, a question on many readers' minds must certainly be "when will we see the first MSG images for use on an operational basis?" I can assure you that since the satellite's successful launch, this has been given the utmost priority within my technical team.

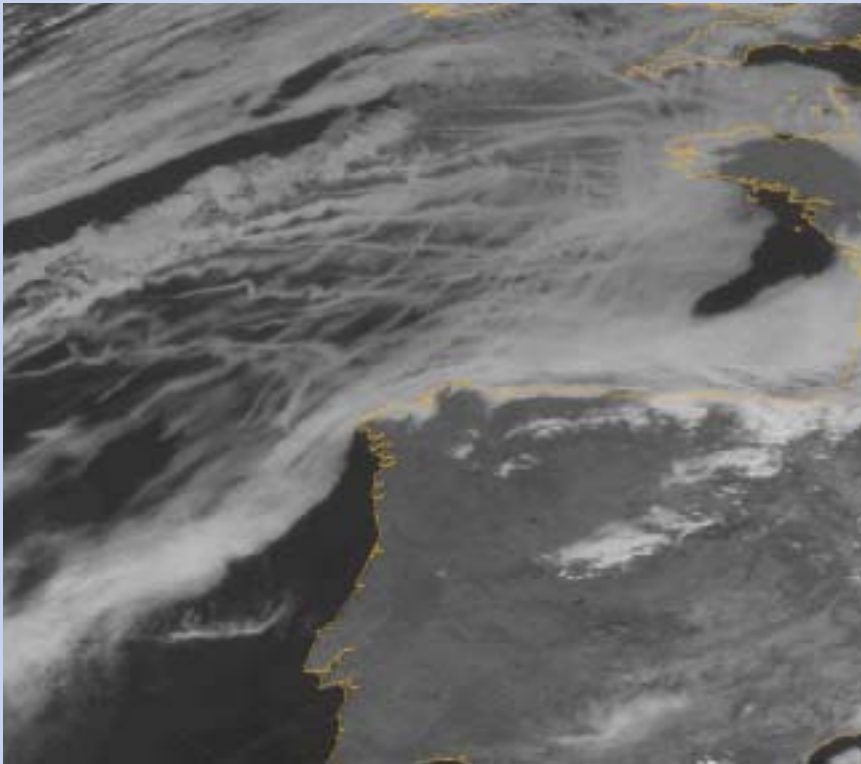
Since April we have been conducting dissemination tests with our European users and are currently looking at alternative methods of dissemination for the HRIT, LRIT and DCP operational services to address the Solid State Power Amplifier (SSPA) failure last October.

At a special Council meeting held in March, delegates unanimously agreed to implement a scheme based on standard Digital Video Broadcast (DVB) via a telecommunication satellite, a method already used for retransmission of EARS (EUMETSAT ATOVS Retransmission Service) data.

Users will be offered a dissemination service for MSG-1 data which will be implemented in two phases. Testing for phase one began in April 2003 and is expected to be completed by October 2003, whereas phase two tests will take place from July to December 2003. The EUMETSAT website should be consulted for more details.

I was also very much encouraged by the demonstration of strong support at this special Council meeting on the MSG Programme Extension Proposal. If all goes according to plan, full approval of the procurement of a fourth satellite should be reached by the end of the year. So, to coin a meteorological term, the outlook for the rest of the year certainly looks bright!

## From the archive



*This visible channel image by obtained by Meteosat-7 on 27 January 2003 (12:00 UTC) shows a large number of ship trails over the Bay of Biscay*

Exhaust fumes from large ships are helping researchers test theories of how man-made clouds are formed.

Volcanic ash, desert dust and biomass burning are the main natural sources of cloud-forming aerosols – but humans are producing increasing quantities through the burning of fossil fuels.

In most urban areas it is difficult to discern exactly how pollutants contribute to forming clouds because the atmosphere over the land is normally too well mixed.

So researchers have turned to studying ‘ship trails’ – clouds caused by enhanced droplet nucleation on particles associated with smoke from burnt diesel oil.

Ships release their exhaust fumes into the relatively clean and still marine air, where it is easy to measure the effects of fossil fuel emissions on cloud formation.

Normally, low-level clouds with large droplets tend to drizzle out and clouds dissipate but exhaust emissions from ships introduce aerosol and cloud

nucleation particles that don't exist naturally in marine air because they comprise small droplets that do not form drizzle.

Such trails can spread and persist for several days. They twist and turn in local winds, resulting in wild patterns, and the longer they persist the more spread out they become.

An exceptional case of ship trails was observed over the Bay of Biscay during a high-pressure system on 26-27 January 2003. The visible channel image above shows a large number of persistent ship trails, identifying the regular shipping lanes of the eastern Atlantic.

Most trails can be observed close to Brittany where ships enter or exit the English Channel. The image also shows how the trails are affected by the wind. In animated versions of the images the movement of some ships at the most narrow, pointed ends of the trails can be seen. More detail is available at the address below.

[www.eumetsat.de/en/area5/special/shiptrails\\_27012003.html](http://www.eumetsat.de/en/area5/special/shiptrails_27012003.html)

## MSG Research Anno

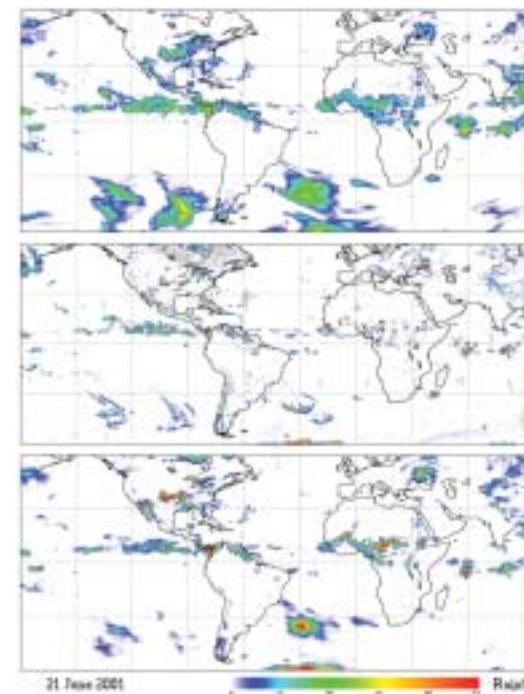
# Improving ro

**By Vincenzo Levizzani**

Senior Scientist, Institute of Atmospheric Sciences and Climate, CNR, Bologna, Italy; MSG ROA Principal Investigator

The Joint ESA-EUMETSAT Research Announcement of Opportunity for Meteosat Second Generation (MSG) focused a large number of scientists on key issues for the scientific exploitation of the satellite.

The Project 152 “Use of the MSG SEVIRI channels in a combined Special Sensor Microwave Imager (SSM/I), Tropical Rainfall Measuring Mission (TRMM) and geostationary Infra-Red (IR) method for rapid updates of rainfall” aims at using the Spinning Enhanced Visible and InfraRed Imager (SEVIRI) for improving rainfall measurements from space with the frequent repetition time necessary for operational applications. Participating scientists come from France (CNRM), Germany (DLR), Italy (CNR, Univ. of Bologna, Ferrara and L'Aquila, Regional Met. Service Emilia-Romagna), Israel (Hebrew Univ. of Jerusalem), UK (ECMWF, Univ. of Birmingham) and the US (NASA, NOAA, NRL).



*Daily rainfall global maps (mm) at 30 min and 12 km resolution. The top map shows the combined product, the middle map shows the IR overestimation correction, and the bottom map shows the Atoll with superimposed precipitation radar-derived rain areas. Numbers on the graphs refer to the lower levels in the cloud.*

## Announcement of Opportunity news

# Rainfall measurements

An early offspring of the project was the formation of the core group of EURAINSAT "European Satellite Rainfall Analysis and Monitoring at the Geostationary Scale", a 5th Framework Programme project funded by the European Commission for the period 2001-2003 (<http://www.isac.cnr.it/~eurainsat/>).

The project concentrates on exploiting SEVIRI data for cloud characterisation and screening within a rapid cycle of rainfall estimation based on passive microwave (PMW) and geostationary IR data.

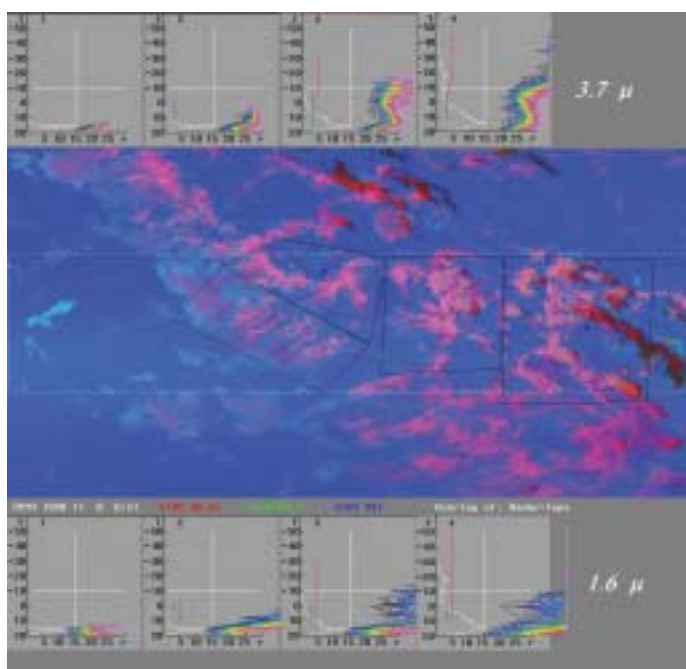
The idea is basically two-fold: to develop new PMW rainfall algorithms incorporating observed cloud microstructure and precipitation-forming processes from MSG, and to introduce such methods into rapid update rainfall cycles for near real-time rainfall estimations with the widest possible area coverage; and to identify data assimilation procedures that improve current analysis schemes for Limited Area Models (LAM).

The main achievements of the project include:

- Advancements in the understanding of the emission of ice crystal plumes on top of deep convection by modelling the

multispectral capabilities of the last generation sensors (Melani et al., 2003).

- The use of multispectral methods to understand the structure of precipitating clouds (see below right) and the role of aerosols in cloud formation (Rosenfeld et al., 2002).
- A new algorithm for the retrieval of cloud top microstructure, and a statement of guidance for VIS/IR sensors on board the environmental satellites (Rosenfeld et al., 2003).
- A series of rainfall algorithms produced and/or upgraded (see below left), using histogram matching, advection and neural networks (Tapiador et al., 2003) to blend IR and PMW data for operational rapid update techniques. Validation of satellite rainfall measurements (Turk et al., 2003), is also a key issue, particularly in view of the Global Precipitation Measurement (GPM) mission.
- The assimilation of satellite rainfall products in LAMs, which has already started, using the models BOLAM and RAMS (Orlandi et al., 2003).



...ion from three different algorithms: simple IR (top), PMW (middle), and combined IR/PMW (bottom). Note the ... method. (Courtesy of C. Kidd, Univ. of Birmingham). A multispectral image (right) from TRMM VIRS over the Kwajalein ... (stippled pixels) from 8 November 1998. The graphs report cloud top temperature vs effective radius. While the 3.7 μm ... delimits the various microphysical zones, the 1.6 μm channel response (bottom) suffers from contamination from the ... numbered boxes in the image. (Courtesy of D. Rosenfeld, Hebrew Univ. Jerusalem)

## MSG-1 update on commissioning

MSG-1 commissioning got under way on 25 September 2002 - following launch on 28 August 2002 - beginning with the demanding but successful verification of the platform's data handling and radio frequency functional and performances tests.

Just before switching on the imaging mission (SEVIRI) on 17 October 2002, a Solid State Power Amplifier (SSPA-C) failed. Operational conditions of the satellite were nominal but it led to an automatic payload switch-off. All attempts to restart the SSPA failed and commissioning was suspended while an enquiry board started investigations.

A new satellite configuration was applied - to allow transmission of SEVIRI images to the Earth whilst minimising the risk of another SSPA failure - and commissioning activities resumed on 26 November 2002.

Based on current knowledge of the failure, it is unlikely that the HRIT (High Rate Information Transfer) and LRIT (Low Rate Information Transfer) mission of MSG-1 will be reactivated. An alternative dissemination scheme is being put in place using Digital Video Broadcasting (DVB) technology via a telecommunication satellite. No decision has yet been taken concerning the Data Collection Platform (DCP) mission.

After a progressive, careful and thus long (11 hours) SEVIRI activation on 27 November 2002, the first image was taken on 28 November and disseminated live in EUMETSAT's foyer. It was well centred, showing the quality of the flight dynamics prediction and the relevance of the default SEVIRI parameters.

The GERB instrument was activated on 9 December 2002, and after a few days of tests (including data flow tests), the first image was acquired. The instrument behaved as expected during these tests and no major anomalies have been identified. Following the initial GERB commissioning activities, the instrument was placed in safe mode during the first Sun avoidance season between 11 February and 26 April 2003. GERB calibration tests are foreseen for May/June 2003.

# Fast data retransmission service up and running

A new service to deliver faster and more accurate data on the temperature and humidity in the atmosphere is proving a success just five months into its two-year pilot phase.

Users of the EUMETSAT ATOVS Retransmission Service (EARS), including National Meteorological Services, are now able to receive the data just 30 minutes from the time of measurement.

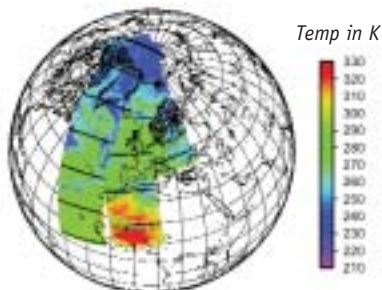
Information on the vertical profiles of temperature and humidity in the atmosphere, essential to the performance of all numerical forecasting model systems, is provided by data from the set of ATOVS (Advanced TIROS Operational Vertical Sounder) instruments on the satellites operated by the USA's National Oceanic and Atmospheric Administration (NOAA).

Until the introduction of the EARS service the meteorological instrument data from NOAA satellites could be received either via the once per orbit data download from the spacecraft to the central NOAA ground station or via the direct transmission from the satellite to a High Resolution Picture Transmission (HRPT) station on ground.

The new EARS service provides significant improvements by offering a regional geographical coverage combined with timely retransmission (see above illustration).

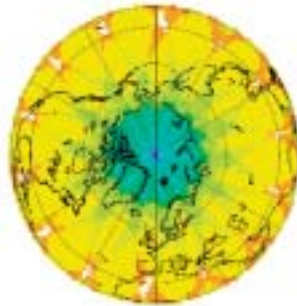
Since the pilot phase began, the EARS team has provided support to users in setting up equipment and in data utilisation. A network of existing HRPT stations around the Atlantic and Arctic Oceans has been established for the rapid acquisition of the instrument data. A satellite-based broadcast system for distribution to end users, an upgraded version of which will be used to disseminate MSG-1 data, is also in place.

Three of the six stations are currently acquiring data on an operational basis and the



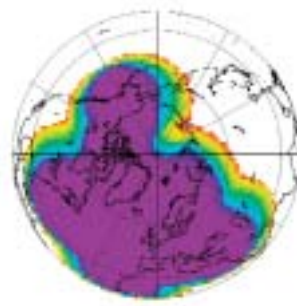
A visualisation of the sounder data from the ATOVS instruments on the NOAA satellites, which combines data from the operational stations of the EARS network located in Tromsø (Norway), Maspalomas (Spain) and Kangerlussuaq (Greenland). The EARS plot is from 18 March 2003 at noon. It shows the HIRS instrument, channel 8

Global Data Dump



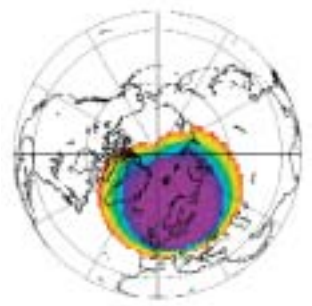
3-6 hours

EARS (Regional)



30 minutes

HRPT Reception (Local)



Immediate

Comparison of NOAA global dump, EARS coverage and HRPT reception

remaining three are planned to come on line in June 2003.

With only a low-cost commercially available receiving station, consisting of a standard PC with a small antenna, users can easily gain access to the service.

"The ATOVS retransmission service is an important source for Numerical Weather Prediction (NWP) particularly in data sparse areas such as the Atlantic Ocean, which is vital as the weather systems move from the Atlantic to Europe," said

Anders Meier Soerensen, EARS Project Manager.

"EARS certainly has a bright future and its potential uses are far-reaching with exciting options for a variety of novel applications."

Over the coming months the NWP experts will be engaged in an evaluation process to assess the value of the data before a final review and decision on future continuation of the service by the EUMETSAT Council in 2004.

Further information is available on the EUMETSAT website under [www.eumetsat.de/en/dps/atovs.html](http://www.eumetsat.de/en/dps/atovs.html)

## Quality accolade for EUMETSAT

Making better use of taxpayers' money, improving efficiency and reducing overheads are some of EUMETSAT's on-going aims since being awarded the latest version of the ISO 9001:2000 quality certification.

The new standard replaces the previous ISO 9001:1994 and is designed to reflect the increasing complexity of today's business environment.

It places greater emphasis on communications, customer service and resources management as well as making it possible to apply the general concepts to areas such as e-commerce and outsourcing.

The 1994 version excluded administration departments – such as communications, personnel and resources management – and EUMETSAT's Management Board agreed that to achieve the new version a clear plan was needed to bridge the gap.

These departments saw quite a change as employees were asked to measure the efficiency of processes, and to produce reports and documentation in situations where

previously nothing had been written down.

"Thanks to the process-oriented approach selected in 1997 for the EUMETSAT Management System, the amount of work, though quite considerable, could be minimised," said Georges Bernède, Head of Quality Assurance at EUMETSAT.

"Initially, some employees felt as though their skills were in question and that their job could not be reduced to a daily description, but over time the transition took place in a very structured, efficient manner and, we hope, was well received," said Georges.

All the hard work paid off at the end of 2002 when EUMETSAT reached the required standard and was awarded ISO 9001:2000 certification in under the allotted time.

"We are very pleased to have achieved such a prestigious and internationally recognised certificate in quality standards. Our goal is for continual improvement and our aim is to apply these benchmarks of quality throughout every EUMETSAT department," he added.

image

profile

## Dr. Volker Gärtner

*Head of the User Service Division*

who was appointed the Head of the User Service Division in the Operations Department of EUMETSAT in March 2003.

An equally important task is the facilitation of training on current and future satellite systems by means of providing material and support to training events inside and outside EUMETSAT's Member States.

Automated access to EUMETSAT's archived data is another challenge for the User Service, especially when considering the ever growing data volumes obtained by the Meteosat Second Generation and the future Metop satellites.

Volker Gärtner's career began with his diploma in meteorology at the University of Bonn. After graduating he worked as a research assistant at the University's Institute for Astrophysics and Extraterrestrial Physics where he studied the dynamical behaviour of the upper atmosphere (stratosphere, mesosphere and lower thermosphere).

In 1984 he obtained a PhD in natural sciences with a thesis on a two-dimensional numerical dynamical model for the upper atmosphere. A year later he joined the European Space Operations Centre (ESOC) of ESA where he worked in the Meteorological Information Extraction Centre (MIEC) of the Meteosat Exploitation Project. He became the MIEC Operations Manager in 1986 and remained so until 1994, when he became the Head of Meteorology at ESOC.

Volker joined EUMETSAT as a meteorological products expert in December 1995, just as the operations of the Meteosat satellites were transferred from ESOC to EUMETSAT, and he was appointed User Support Manager in 1996.

When not keeping an eye on the weather, Volker enjoys spending time with his three children, skiing and cycling. And, with a private pilot's licence to his credit, Volker also has a passion for flying.



*Dr. Volker Gärtner,  
Head of the User  
Service Division*

Providing an efficient and responsive information and Helpdesk service for EUMETSAT's user community is one of the goals for Volker Gärtner,

## EPS plans are on course to meet targets

Preparations, tests and reviews of the various elements of the EUMETSAT Polar System (EPS) are in full swing and making good progress towards the planned launch date of the first Metop satellite in July 2005.

The specification of the meteorological algorithms and products formats has reached completion, and the ATOVS processor and GOME-2 processor prototypes have been delivered.

The EPS team is now focussing on the preparation of data necessary to test and validate the operational processors and to verify and validate the EPS system.

Operations preparations are running to plan with an emphasis on the first Metop Service Module (SM) flight procedures. A first system validation test involving the Space and Ground Segments is planned for the end of this year.

A contract for the Launch and Early Orbit Phase (LEOP) has been given the go-ahead and the corresponding Preliminary Design Review is under way. The next major milestone will be the Critical Design Review scheduled for September 2003.

The successful closure of the Core Ground Segment Critical Review has enabled the contractor to start work on the development of the facilities, in particular on the pre-deliveries to EUMETSAT of the monitoring and control system necessary for



*The site of the Command and Data Acquisition (CDA) station for the EUMETSAT Polar System (EPS) on the Svalbard islands, within the Arctic Circle*

the preparation of operations activities.

All other facilities are being delivered to the Prime Contractor for integration onto a reference platform.

The polar site infrastructure service, which began in April 2002, is now ready with antennas installed and all outdoor activities completed. The final testing of the polar stations located in Svalbard (78° N) is planned to take place over the coming months. Compatibility tests between the stations and the Metop Space Segment are under way and results look promising.

The most recent key event was the start of the

Metop Qualification Review, kicked off in the first half of April 2003. It follows the successful thermal vacuum tests held at the end of last year. Instruments are currently being integrated on the Metop first flight model.

The integration of the Infrared Atmospheric Sounding Interferometer (IASI) is progressing well. The instrument has to undergo several test campaigns including vibrations, electromagnetic compatibility and thermal vacuum before its delivery to the Metop Space Segment during Summer 2003.

# Culture meets science in Weimar

The German city of Weimar, well known for its literary and music associations, will add a third, more scientific dimension to its cultural credentials this Autumn.

It will play host to scientists from the world's meteorological, ocean and climate communities who will gather from 29 September to 3 October for the 2003 EUMETSAT Meteorological Satellite Conference.

Co-organised with the German Weather Service, the Conference will provide the opportunity for participants to share their initial experiences with data from the Meteosat Second Generation (MSG) satellite before the service becomes truly operational later in the year.

This series of annual Conferences also offers a unique opportunity in the opening session for participants to appreciate a firsthand global picture of current and future programmes and systems from all of the world's meteorological satellite operators.

In this first session, EUMETSAT will place particular emphasis on infrared sounding from low Earth orbit. The programme will include around 70 verbal presentations, together with a high number of posters and software demonstrations.

To register as a participant please visit the EUMETSAT website ([www.eumetsat.de](http://www.eumetsat.de)).

## EUMETSAT spreads the word

EUMETSAT took the opportunity to brief more than 120 journalists from all over the world on its present and future activities during this Spring's International Weather Festival (IWF).

The festival was a back-to-back event with EUMETSAT's Fifth Central and Eastern European User Forum, held on 3-4 April 2003 in Zagreb, Croatia.

The possibility for Central and Eastern European countries to become Cooperating States of EUMETSAT was a focus of the Forum, which also included a workshop on MSG.

Reports on the outcome of the Forum will be included in the next issue of Image and further information on the IWF can be found on [www.weatherfestivalmeteo.org](http://www.weatherfestivalmeteo.org)



Scientists from the world's meteorological, ocean and climate communities will meet at this conference centre in Weimar, Germany, for the 2003 EUMETSAT Meteorological Satellite Conference

## 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 backup at 10°E). Meteosat-5 continues the Indian Ocean Data Coverage Service at 63°E. MSG-1 was launched on 28 August 2002 and is well into its commissioning phase. MSG-2 is currently planned for launch in January 2005 and the first Metop-1 in July 2005.

**USA:** GOES-8 (East) is functioning at 75°W. GOES-12 has replaced GOES-8 as the GOES East operational spacecraft on 1 April 2003. GOES-9 is acting as backup for the Japanese GMS-5 since April 2003. GOES-10 (West) is functioning at 135°W. GOES-11 acts as backup at 105°W. On 1 October 2002 NOAA-17 was declared the primary polar orbiting morning satellite. NOAA-15 is the backup satellite. NOAA-16 is the primary polar satellite in the afternoon orbit with NOAA-14 as the backup.

**Russia:** Meteor-3M-N1 was successfully launched on 10 December 2001 into a polar sun-synchronous morning orbit, inclined at 99.7°. Meteor-3M-N2 is planned to be launched in 2006. GOMS-Electro-N2, which will be positioned at 76°E, is planned for launch in 2005. One satellite of the Meteor-3 series continues to operate beyond its designed lifetime with reduced capabilities in circular orbits inclined at approximately 82°.

**China:** Fengyun-1D (FY-1D), a polar-orbiting meteorological satellite to replace FY-1C, launched on 15 May 2002, is fully operational. The geostationary FY-2B is stationed at 105°E. FY-2A continues to act as backup satellite at 86.5°E. FY-2C is planned for launch in 2004 and will replace FY-2B. FY-3A, the first of the second generation of Chinese polar orbiting meteorological satellites, is planned for launch in 2006.

**Japan:** GMS-5, Japan's current operational geostationary meteorological satellite, continues to operate at 140°E. The US satellite GOES-9 is acting as backup for GMS-5 at 155°E since April 2003 until MTSAT-1R becomes operational towards the end of 2003. MTSAT-1R is scheduled to be launched in the Summer of 2003. MTSAT-2 will be launched in the fiscal year 2004.

**India:** METSAT, India's first exclusive meteorological geostationary satellite, was launched on 12 September 2002 and is positioned at 74°E, colocated with INSAT-3C. INSAT-2B and INSAT-2C are colocated at 111.5°E and 48.0°E respectively. INSAT-2DT is positioned at 55°E, INSAT-2E at 83°E. INSAT-3A was launched in April this year. INSAT-3D and -3E launches are planned in the 2003-2005 time-frame. INSAT-1D was deactivated on 14 May 2002.