ESOC and The Stations

The Establishment

More than 6000 people visited ESOC in 2003, in particular on the occasions of the Mars Express and SMART-1 launches, and the Mars Orbit Insertion manoeuvres at Christmas time. Mrs Edelgard Bulmahn, German Minister of Education, Science and Research, and currently Chair of the ESA Council at Ministerial Level, participated in the Christmas Day event. The citizens of Darmstadt could witness the 2003 launches through the re-transmission of these events to a well-known theatre in the town centre.

An extension to the Operations Control Centre to house the engineering model of the Rosetta cometary probe was inaugurated in February. Apart from serving a public-relations role, this model will be used operationally for, for example, troubleshooting potential spacecraft problems and checking out software modifications in a realistic spacecraft environment.

A plot of land was secured outside ESOC which will enable the setting up of a crèche for the children of staff, thereby supporting ESA's gender-equality policy. ESOC is also playing a key role in supporting the establishment of international schools in the Darmstadt area.

The Control Centre

The ESOC facilities underwent several reconfigurations during the year to house the control and support teams for the various missions being launched. New dedicated control and support areas for SMART, Mars Express and Rosetta were prepared, which will remain assigned to these missions throughout their lifetimes. For the critical operations during and immediately after launch, and also for the delicate Mars orbit-insertion manoeuvre, the corresponding multi-mission facilities at ESOC were specially configured and equipped.

In preparation for the coming year, which will have a less hectic schedule of launches, a number of infrastructure upgrades have been initiated, including the installation of a modern digital voice conferencing system and a powerful video distribution system.

The Main Control Room at ESOC

The Svalbard ground station in Norway

The 35 metre deep-space antenna at New Norcia in W. Australia

ESA's Villafranca satellite tracking station in Spain, near Madrid

Artist's impression of the completed 35 metre deep-space antenna at Cebreros, in Spain

The Stations

Using its worldwide TT&C station network, ESOC accumulated approximately 36 000 hours of contact time during the year with the satellites in orbit, including:

- Cluster through Vilspa I and Maspalomas (Spain)
- XMM through Perth (Australia) and Kourou (French Guiana)
- ERS-2 and Envisat through Kiruna (Sweden) and Svalbard (Norway)
- Integral through Redu (Belgium)
- Mars-Express through New Norcia (Australia)
- SMART-1 through Vilspa II and Maspalomas.

The migration of ESA's ground station network to X-band, initiated in 2002, continued with the conversion of the 15 m antenna in Kourou. The project will be completed with the upgrading of Perth in 2004 and the Villafranca I terminal in 2005. Thereafter, the ESA 15 m network will also be suitable for deep-space mission support, as a complement to the two 35 m terminals (New Norcia and Cebreros).

Redu

In addition to its TT&C services and IOT services for third parties, Redu operated data-relay services for Envisat and Spot-4 via Artemis, the optical terminal on Spot-4, and Proba. A new building was erected to provide additional office capacity.

Villafranca

This ESA station serves as the prime and backup TT&C station for a large number of missions. In addition, it hosts the XMM-Newton Science Operations Centre and the ISO Archives. In 2003, preparations were started for housing the ESA Planetary Mission Archives, covering Giotto, Mars Express, Rosetta, Huygens and Venus Express. On 25 November, ESA and the Spanish authorities hosted the celebration of Villafranca's 25th Anniversary.

European Deep-Space Network

The New Norcia 35 m antenna was used operationally for the first time for the Mars Express mission, and its performance was outstanding. All planned contacts with the European Martian orbiter were successfully executed.

To increase its ability to support further deep-space missions, ESA initiated the procurement of a similar antenna to be located at Cebreros in Spain. The Agreement between the Kingdom of Spain and ESA for the 'Establishment of Ground Tracking and Data Acquisition Facilities, including a Deep Space Antenna' at the Cebreros (Avila) was signed in July by the Secretary of State of the Ministry of Defence, the Ministry for Science and Technology, and ESA's Director General. This antenna should be ready for operations at the beginning of 2005, and will be used initially to support the Venus Express mission.

International Cooperation

The cooperation with CNES (France), JAXA (Japan), Eumetsat and Eutelsat in the area of station cross-support continued. A significant development was the signature of a Letter of Agreement between ESA and NASA ensuring mutual cross-support using each other's deep-space ground facilities. This arrangement will apply to both the critical and routine phases of missions in orbit. Support has already been provided by the ESA New Norcia station to the NASA/JPL Mars Odyssey and Mars Global Surveyor spacecraft. In December, the Agency provided ground-control support to China for the Double Star Project using its Villafranca station. Such cooperation with China will grow in 2004.