

ESRIN – Its Development and Role

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The Establishment's main activities

The Earth-observation activities

The ESA Member States have shown a sustained commitment to bringing the development of innovative European Earth-observation technologies and satellites to full fruition via an accompanying long-term programme of operations and exploitation. This has involved hundreds of scientific groups, institutional entities and commercial service companies world wide, for more than a decade. This firm programmatic commitment has acted both as a stimulus and as a determining factor in the evolution of the ESRIN site.

successful entry into operation of the ERS-1 satellite in 1991 and of ERS-2 in 1995 proved to be major milestones in the evolution not only of the Agency's Earth-observation programmes, but also of ESRIN.

More recently, responsibility for implementing the Payload Data Segment of the new Envisat remote-sensing platform, and for subsequent exploitation of the Envisat mission itself, was entrusted to the Directorate of Applications team at ESRIN. This in turn necessitated the

Created in 1965 as the European Space Research Institute, ESRIN has succeeded over the last 30 years in maintaining its own unique identity, despite the constant growth of and changes in its primary activities. Situated in the picturesque surroundings of the Castelli Romani, southeast of Rome, ESRIN has evolved, particularly over the last ten years, into a truly multidisciplinary centre. Although ESRIN's main role is still firmly linked to the Earth Observation Programme, especially since the launches of the ERS-1 and ERS-2 satellites and with management responsibility for the new Envisat ground segment, the Italian establishment is also in charge of the Agency's corporate informatics applications and associated infrastructures. ESA's new Vega small-launcher project has also chosen ESRIN as its base.

From the inception of the Earthnet Programme in the seventies, and the ERS programmes starting in 1985, ESRIN has become the focal point for the exploitation of all ESA Earth-observation satellites. The Establishment has become a regular venue of activity for all major European and Canadian industries involved in the development and exploitation of Earth-observation systems.

The ESRIN site is today widely appreciated as an easily accessible, modern and attractive technical centre, capable also of accommodating many international workshops, meetings and symposia throughout the year. It is familiar to earth scientists and industrialists coming from both advanced and developing countries all over the World. Hence the



installation of further major new facilities dedicated to Envisat exploitation on the site. Perhaps the most striking of these is a 10 m Ku-band receiving antenna, which will acquire real-time data transmissions from the polar-orbiting Envisat satellite, as they are relayed back to ESRIN via the Artemis data-relay satellite, itself located in a fixed geostationary position over the equator.

This new addition to the ESRIN facilities will enable ESA to respond promptly and efficiently to the ever-increasing demand for faster and easier access to Earth-observation data from anywhere in the World. Such data will be rapidly acquired, transmitted to ESRIN, processed there in near-real-time, and the resulting data products sent via high-speed telecommunications links directly to the end-user. This service will be of enormous benefit to users and decision-makers when prompt, up-to-date geospatial information is needed from inaccessible areas struck by natural disasters, anywhere on the planet.

The informatics activities

The Informatics Department at ESRIN became part of the Agency's Directorate of Administration in 1997. Managed from Frascati, but with a presence at all of the main ESA Establishments, the Department has been created to provide to the whole Agency with all of the informatics services that it needs for its daily operation, including:

- development and operation of corporate and Directorate-specific information systems for the automation of the various processes that management of the Agency requires



Aerial view of ESRIN in the 1970's



Aerial view of ESRIN in 1999

- provision of the infrastructure required to support the various systems (e.g. servers, local- and wide-area networks)
- planning, engineering, support and operation of the corporate data communications infrastructure
- provision of personal computers and other office-automation tools to some 2500 users located throughout the Agency.

The Department currently consists of about 63 staff, deployed mainly in ESRIN, but with a significant presence, designed to provide close contact with all the users, in the other main ESA Establishments.



The main entrance at ESRIN

The grouping of all of the activities pertaining to general-purpose data processing in the Agency within a single Department has allowed considerable standardisation of the often diverse components involved. Among the systems developed and deployed by the Department are the new ESA financial system (AWARDS) and several specialised Lotus Notes applications available to all ESA users. The unification of this task under a single Department has also allowed significant progress in the rationalisation of the ESA informatics infrastructure:

- All of the old mainframe computers have been replaced by a network of servers.
- All of the data-communication networks (with the exception of those supporting

spacecraft control) have been consolidated in ESACOM, the name given to the unified network that satisfies the general-purpose data networking requirements of the Agency. The Wide Area Network is now supplied by a major network provider through a single outsourcing contract.

- A number of related services previously supplied through separate contracts have been consolidated under a single, ESA-wide contract for the provision of informatics services. The new contract assigns to the contractor full responsibility for all of the tasks involved in operating and supporting the Agency's Common Information Technology Infrastructure, including
 - provision to end users of network, desktop-computer, office-automation, application and help-desk support
 - ensuring the existence of all management services required for the smooth running of the end-user services
 - reporting regularly to the Informatics Department to provide continuous visibility of the level of services provided.
- Personal computers for office automation have been standardised, and most users have now received a standard desktop computer and a standard software suite. This has greatly reduced the number of problems encountered due to incompatible software products experienced by the users, and at the same time has reduced the cost of maintenance and support.
- The Lotus Notes infrastructure has been rationalised and extended, and means have been put in place by which users who normally work with desktops other than PC's can make use of Lotus Notes and the applications based on it.

All of these developments have required the continuous adaptation over the years of the site infrastructure and services to the new structure and to the new technologies being applied. Space has had to be found, for instance, to house the ESA-wide Informatics Help Desk, and various upgrades to the site's electrical installations have been undertaken in order to ensure the smooth running of this and of all of the other informatics-related developments.

The Vega activities

ESRIN has also recently become the home for the Project Team charged with the management of the Vega small-launcher Programme. This results from a decision taken by the ESA Council in June 1998, when the Step-1 of the Vega development programme was approved and the associated management scheme endorsed. The latter includes the setting up of an Integrated

Programme Team (IPT) which, in addition to ESA staff, will include personnel from the Italian Space Agency (ASI) and from the French National Space Agency (CNES).

The Vega launcher, qualification of which is planned by the end of 2002, will offer Europe the opportunity to extend its launching capability to the lower end of the payload launch-mass range, namely:

- 800 kg into a 1200 km Sun-synchronous orbit
- 1000 kg into a 700 km circular polar orbit

although it can also service a wide range of other mission possibilities for, for example, scientific satellites.

Vega would eventually be launched from ESA's launch base in Kourou, French Guiana, where the dedicated ground infrastructure for the new small launcher is in an advanced stage of definition, making maximum use of available synergy with the existing Ariane launch facilities there.

Similarly, the choice of ESRIN as the location for the Vega launcher-development activities is logistically very rational given that the industrial prime contractor, the Vegaspazio company newly established by Fiat-Avio and Aerospaziale, is based in Colleferro, just a few kilometres south of Frascati.

The presence of the Vega team at ESRIN constitutes another addition to the site's reservoir of novel and highly-respected competences.

An integrated approach to development

The expansion on the ESRIN site has closely mirrored the evolution in the Establishment's activities and responsibilities, striving always to ensure the highest possible quality in the developments undertaken and the facilities and infrastructure provided, at reasonable cost.

From the mid-1980s, with the explosion in Earth-observation activities, ESRIN began to shake off its somewhat parochial image and gradually acquired the role of a fully-fledged - albeit small - ESA Establishment. Restructuring took place everywhere: the computer building was re-furbished, the newly created ISD Division (1988) was accommodated in a totally remodelled building, the main entrance hall was transformed, the archives relocated and offices created in their place, the canteen was doubled in size, the main building was extended, and a new conference room and a much-needed training room added.

In the 1990s, the Establishment has undergone a further metamorphosis, following the launches of ERS-1 and ERS-2, together with its being allocated the management of the Envisat Ground Segment, giving ESRIN a clear new role. ESRIN's customer base was thereby greatly expanded to include the very extensive remote-sensing user community, in addition to its long-established customer base on the informatics side.

The new role of acquiring, processing, archiving and distributing ERS data created the need both for sophisticated image-handling equipment and the upgrading of the existing installations to be compatible with the latest ESA standards. The launch at the beginning of the next millennium of a new generation of remote-sensing satellites, of which Envisat will be the first, will mean even greater challenges for ESRIN Site Services.

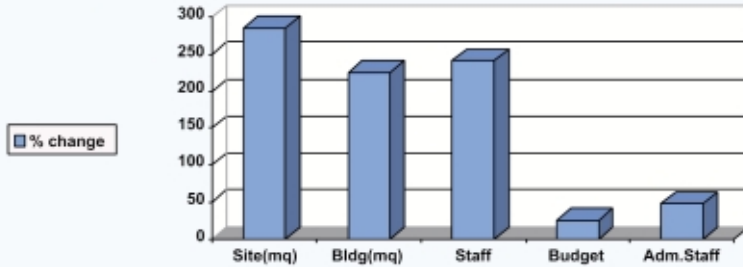


In the last few years, ESRIN has almost doubled in size: in 1994, the buildings covered 9000 m², while today they cover 18 000 m². Building activities in recent years have included enlargement of the canteen (1993), a new office building and new main entrance (1994), a new power plant (1996), a new technical building (1997) for the Envisat ground-segment activities, provision of a new parking lot, and enlargement of the gate house (1998). All of the computer rooms have been moved and

The new Envisat antenna at ESRIN

THE EVOLUTION OF THE ESRIN SITE 1990 - 1998

Site mq	28000	80000
Bldg. mq	8000	18000
Staff	170	410
Budget	4200	5200
Adm. Staff	25	37



The evolution of the ESRIN site, from 1988 to 1998

rationalised in order to optimise the use of space and to create synergy between them.

The main driver behind all of this work was not simply to build more offices for people to work in, but rather to create a functionally-integrated and architecturally-pleasing working environment which would give the Establishment an atmosphere of efficiency and harmony. A special effort has been made to blend the new buildings in with the existing environment, in order to promote communication and synergy between the various activities on the site, and to bring the standards of a number of services up to the highest European level.


Along with this physical expansion of the site, both the personnel and support services have had to be increased accordingly. The number of personnel on site has more than doubled, to approximately 450 today, one third of whom

are ESA staff and two-thirds are contractors. The relatively high percentage of young staff has undoubtedly contributed to the enthusiastic and lively atmosphere at ESRIN.

The growth of activities at ESRIN has also meant a significant increase in visitors, meetings and conferences, bringing new requirements for support and more complex services, as well as greater exposure of the Establishment to the outside world.

Conclusion

The main challenge for the site-management services at ESRIN over the past ten years has been the need to foster a unified corporate image on a site that has not always been blessed with a clear role and mission. This has involved rethinking both the physical infrastructure, where an architectural and design uniformity has been sought, and the service management approach, which has been directed towards providing a more cohesive link between the activities and the staff.

One of the keys to success has undoubtedly been the particular attention paid over the years to careful planning in order to get the most out of the investments made, despite the Establishment's sometimes uncertain future. The relatively small size of the site has allowed a personalised approach, still maintaining 'an Italian touch', and enough flexibility to make staff and visitors feel at home and properly cared for. This, combined with the surrounding environment has contributed to making ESRIN a very lively and pleasant place to work. 

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