We in business group GMV believe that behind each new need, behind each new problem, lie a challenge and a chance to innovate. Technology is not an end in itself; it is the means to make something new or make something old better. In GMV we draw on our existing range of products and services or, if need be, we develop completely new ones to meet the specific and singular needs of our clients, furnishing bespoke innovation and technology. We take on our clients’ challenges as our own, spurring us on to new heights of innovation.

GMV goes even beyond the requisites of its clients, exploring their real needs with a total readiness to find solutions. This allows us to come up with the right response, often imaginative, sometimes unique and always honest.
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2009, just like the previous year, was hit hard by the worldwide slump, affecting both the public and private sector. In this difficult setting GMV managed to increase its turnover, albeit more moderately than in previous years. Total revenue is now climbing up towards 100 million euros, reflecting a growth in all our business areas.

As well as taking part in ESA’s advanced technology and exploration programs, GMV is also gaining ground in NASA’s programs, participating this year in the LRO moon mission launched in June and the Glory and Landsat earth observation programs, among others. It continues to play a key role in the Galileo satellite navigation program and the development of its many applications in other activity sectors. GMV is one of AENA and Eurocontrol’s main suppliers of GNSS technology applied to the aeronautics sector, participating in the future European air traffic management system and the development of unmanned aerial vehicles. In the transport area the Spanish railway network Renfe awarded GMV a new contract in 2009 for optimizing its local and medium haul services; taken together with the earlier contract awards this now means that GMV is supplying onboard systems for Renfe’s complete fleet. GMV is also spearheading research into road safety, developing services based on communication between vehicles and roadside equipment that are destined to become part of every driver’s daily equipment in the future. Witness the pilot ridesharing scheme developed by GMV within the MARTA project. Even in a sector as hard hit by the crisis as ICTs GMV has managed to up its sales and build up trust among a broader client base, leading to the success of groundbreaking products like checker®. Ongoing R&D investment is also bearing fruit in the healthcare sector, where GMV is a worldwide leader in arthroscopy training for orthopedic surgeons and has also won itself an unchallenged market niche as the only supplier of an intraoperative radiotherapy planning system.

Continuing with our ongoing policy of worldwide expansion, in June we opened a new subsidiary in Warsaw, Poland, to take on new business opportunities in Eastern Europe, where we already have advanced public-transport systems up and running. Another new subsidiary was opened in September in Darmstadt, Germany, to strengthen local support for our clients in the space sector while also boosting the promotion of our products and services in other sectors. We have also opened two commercial representation offices in Korea and in Malaysia to support business developments in Asia.
This year, besides aiming for a continuing growth of our business, we have also focused on improving productivity and harnessing group synergies to better effect, joining forces between subsidiaries and local offices and crossing borders to tap into knowledge and experience wherever it may be found. Along these lines we have also rejigged the group's corporate structure, setting up a new holding company GMV Innovating Solutions, S.L. which has taken over the tenure of all subsidiaries and incorporates the group's whole set of general services. At the same time the existing stock-option system in the various subsidiaries has been reconverted and broadened to incorporate the executive team into the shareholding structure of the new holding company. GMV's top executives thus all share in the common, overarching GMV project, whichever subsidiary they may work for.

Prosperity makes friends, adversity tries them. This hoary old adage also applies to the supplier-client relationship: in hard times, when investments are trimmed to the bone, confidence in the quality of the supplier and the performance of its products is paramount. With a track record of 25 years behind it, GMV is continuing to grow and drive onwards thanks to the trust that our clients place in us. We are convinced that it is our unswerving commitment to quality and our philosophy of proactive, bespoke innovation that has made us worthy of this trust and will serve as the springboard of our future success.

Cordial greetings,

Mónica Martínez
When taking stock of 2009 there is one aspect that is sure to be on everyone’s lips: the worldwide economic depression. It has affected the whole of society and all activity sectors. Although it has hit some countries and sectors harder than others, none has gone unscathed. The only difference is the degree of suffering.

In GMV’s case, whereas in 2008 we chalked up a whopping 19% turnover growth, in 2009 this was trimmed back to 9%, while the profit margins of the different business lines held steady. In the tricky global context, however, we consider this to be a very worthy performance. It is also notable that GMV has continued to grow in all its business lines.

GMV’s competitiveness in all the markets we trade in is based on cutting-edge technology and clear-sighted, long-term innovation. This is why we have always been keen right from the start to develop new technology and new products, challenging our personnel to come up with groundbreaking solutions to our clients’ problems and stealing a march on the future demand of the sectors we trade in. With this aim in mind we currently plow back over 10% of our sales revenue into R&D and personnel training.

Perhaps this is the main reason why in this year of crisis we have been able to maintain (or even slightly increase) our turnover. Our developments and our products are all client-centered. We put ourselves in the client’s shoes and try to design solutions and products that provide the highest possible added value to its operations, streamlining its operations in the interests of the highest profit. This goes for both the public and private sector. At the end of the day, our clients’ profit (or their efficiency if we want to generalize the concept for the public sector as well) is our own profit too as clients turn to us again and again with satisfaction in past performance and ongoing loyalty and trust for the future. This could well be the key to the satisfaction level of our clients who, in times of crisis, find in us a key partner to minimize the impact of this slump on their income statement and costs. In such hard times our clients have pulled in their horns somewhat but we adapt ourselves to the situation and try to come up with our best solutions for those short-term investments that oil the wheels of their daily business.

Another strategic aspect that has had a notable influence on GMV’s results is its diversification. Breaking into new business lines has enabled us to draw on the experience and knowhow developed in one sector to apply them successfully in others. This guarantees us a better return on our investments and also spreads our risk, helping to iron out the ups and downs in the different sectors.

Finally we are pressing on with our internationalization strategy, already initiated in previous years, with the aim of becoming a worldwide leading light in the technology sectors we trade in. In 2009 we set up new subsidiaries in Germany and Poland and we also boosted our commercial representation offices in ASEAN (Association of Southeast Asian Nations) and Korea. This global strategy is beginning to bear fruit. We now have a solid business footing in North America and Europe to take on new activities in both continents and export our activities even further afield to Asia and the other continents.
When speaking of 2009 a special mention must go to our employees. In GMV we are firmly convinced that the policy of hiring and retaining the best professionals is one of the surest guarantees of our competitive edge in the future. Attracting and stimulating the top professionals and developing their careers is no easy task and we stint no effort in this endeavor. In this year of crisis, therefore, we set our sights on at least maintaining our staff, trying to cut costs without forfeiting efficiency. The whole staff has responded to this effort, throwing themselves into their development and marketing tasks with even more enthusiasm, if possible, than hitherto. This greater effort has been necessary to keep up our competitiveness in these belt-tightening times of fierce competition. Holding on to the best professionals and retaining the trust of our partners and tried-and-tested suppliers ensures that we will be first out of the blocks when the upturn comes, after which GMV can continue to compete and grow in all its markets on the strength of the talent it has nurtured within the firm.

As in every year, and even more so in such as challenging one, I would like to wind up with some words of gratitude for the trust placed in GMV by all our clients. I would also like to pass on my thanks to all GMV employees, our partners and suppliers and all the other organizations and persons we do business with.

In this special year, my thanks to each and every one of them.

Jesús B. Serrano
In this financial year there were important corporate changes that resulted in a restructuring of the whole GMV business group. The parent company, Grupo Tecnológico e Industrial GMV, S.A., governing a whole set of companies, carried out two important actions. Firstly, it took over one of its subsidiaries in a merger and absorption transaction and secondly it set up a new company by inputting part of its own capital.

In terms of the first transaction, a merger by absorption operation was mounted with its subsidiary company GMV de Inversiones, S.A., thereby pooling all GMV’s most important real-estate assets in one company, ensuring a better use of resources and a clear improvement in the management.

Likewise a new holding company was set up, GMV Innovating Solutions, S.L., which, besides coinciding with the trademark and logo of GMV, has taken over the tenure of all the subsidiaries’ share capital. To this end the parent company has subscribed in the capital of this new holding company, mainly by inputting all its financial assets bound up with the tenure of the capital in the various investee companies.

The improvement from a managerial point of view is evident, pooling the management of all the subsidiaries’ capital assets as the sole shareholder of all of them. It also sets the pattern for the general structure of GMV, i.e., the set of general services giving coverage to each of the various investee companies. Thus, all the areas giving support to the various subsidiaries are brought together in a single center. This is obviously conducive to a greater specialization and better allocation of resources, streamlining certain admin tasks and improving the whole managerial procedure.
After these changes GMV’s corporate structure ends up as follows:

GMV Aerospace and Defence S.A.U.
(100% capital of GMV Innovating Solutions, S.L.)

Grupo Navegación por Satélite Sistemas y Servicios S.L.
(14% capital of GMV Aerospace and Defence S.A.)
Galileo development and exploitation.

GMV Space Systems, Inc.
(100% capital of GMV Innovating Solutions, S.L.)

GMV Sistemas S.A.U.
(100% capital of GMV Innovating Solutions, S.L.)

Masisconvi S.A.
(99.69% capital of GMV Innovating Solutions, S.L.)

GMV Soluciones Globales Internet S.A.U.
(100% capital of GMV Innovating Solutions, S.L.)

GMVIS Skysoft S.A.
(100% capital of GMV Innovating Solutions, S.L.)

GMV Innovating Solutions Sp.zo.o
(100% capital of GMV Innovating Solutions, S.L.)

GMV Seguridad Integral S.A.U.
(100% capital of GMV Innovating Solutions, S.L.)

GMV GmbH
(100% capital of GMV Innovating Solutions, S.L.)

Over recent years various company managers have taken up certain stock options in the various subsidiaries where they normally work. After the above restructuring operation they have been able to swap these old stakes for new stakes in the holding company GMV Innovating Solutions, S.L. This involved a capital increase of this new holding company during the year, entirely subscribed and paid up by various members of GMV’s executive team and members of the Board of Directors. As a result they have obtained ownership of 23.5% of the capital of the new holding company, either by swapping their previous stakes or by personally inputting new funds.

This significant change has bonded the whole executive team even more closely together in a common, forward-looking project, making them even more aware, if possible, of the importance of maintaining GMV’s overarching identity, collaborating in its ongoing development regardless of the particular section they work for on a daily basis. This spirit of collaboration, integration and awareness of all pulling together in a common project has now been formalized by the legal backing of this new corporate situation.
BOARD OF ADMINISTRATORS

President
MÓNICA MARTÍNEZ WALTER

Director
JAVIER LÓPEZ ESPAÑA

Member of the Board
JESÚS B. SERRANO MARTÍNEZ

Secretary
ENRIQUE REVILLA PEDREIRA

Member of the Board
SUSANA MARTÍNEZ WALTER

Member of the Board
FOCO. JAVIER MARTÍNEZ CENDEJAS

Member of the Board
LUIS FERNANDO ÁLVAREZ-GASCÓN PÉREZ

Member of the Board (GMV Aerospace and Defence S.A.U.)
RICARDO TÓRRON
CORPORATE MANAGEMENT

Chief Executive Officer
JESÚS B. SERRANO MARTÍNEZ

General Secretary
ENRIQUE REVILLA PEDREIRA

MANAGEMENT OF SUBSIDIARY COMPANIES

GMV SPACE
JORGE POTTI CUERVO

GMV DEFENCE AND SECURITY
MANUEL PÉREZ CORTÉS

GMV SISTEMAS, S.A.U.
JUAN A. MARCH GARCÍA
GMV was born in 1984 as fruit of the business initiative of Professor Dr. Juan José Martínez García. At first GMV centered on the space and defense sector, taking its first steps in fields like mission analysis, flight dynamics, control centers, satellite navigation or simulation, all areas in which GMV is nowadays a leading light worldwide. It started out with a small group of engineers who won a contract for ESA’s European Space Operations Centre (ESOC) in an open international tender. GMV then went from strength to strength, growing into a solid firm boasting a 100-strong staff by the late eighties. It participated actively in ESA’s first space missions and provided highly specialized services for the main international satellite manufacturers and operators.

In a few short years the sheer quality of its work won GMV a cast-iron reputation in the European space sector. In 1988 it was declared to be a Center of Excellence in Orbital Mechanics by the European Space Agency.

In the early nineties GMV decided to branch out into other sectors by way of technology transfer. This gave rise to new business lines in
the transport and telecommunication sectors and in the application of information technologies for the public and private sector. By breaking into these new areas GMV became a trailblazer in fields like internet or satellite navigation applications, still in their infancy in those days. In the transport field GMV became a pioneer one of in intelligent transportation systems with the development of the first GPS-based fleet tracking and management systems. The company thus began to transfer to other markets the knowhow and expertise built up in the space sector in control centers, geographic information systems (GIS), satellite navigation, telecommunications and data networks. It was also during the nineties that GMV consolidated its position in the defense market, especially in the fields of command and control systems, military applications of satellite navigation systems and simulation.

By the end of the nineties GMV’s diversification process had been successfully negotiated and its staff had built up to almost 300. The turnover now topped 20 million euros, of which about 50% came from sectors like transport, telecommunications and information technologies.

In 2001 the founder and president of GMV, Professor Juan José Martínez García, passed away. This led to a change in the executive structure of the business group GMV, creating the post of CEO while the presidency of the group was taken on by Dr. Mónica Martínez Walter.

In these years GMV entered upon a new stage with a twofold objective: firstly to maintain its business independence and secondly to develop a future plan that would guarantee ongoing profitable growth both in its traditional areas and the new ones. A big investment was therefore made in the development of new products and solutions in space, defense, transport and information technologies; the decision was also taken to break into new sectors and an ambitious program was unfurled for internationalizing the long-standing business lines.

As a result of this international expansion policy GMV took a crucial step forwards in 2004 with the creation of its US-based subsidiary, thus becoming a company trading in two continents. The new subsidiary focused on the US aerospace market with the aim of carving itself out a niche as a tried and trusted supplier of the US industry and institutions of the sector.

In May 2005 the business group GMV confirmed its strategy of international growth and development with the purchase of a 58% stake in Skysoft, a Portuguese firm with business lines and target markets very similar to those of GMV. In 2007 the operation was completed with the purchase of 100% of Skysoft, thereby knitting its operations seamlessly into the rest of the business group.

GMV’s new corporate identity was officially launched in September 2006, to bring it into line with the actual situation of the business group GMV. The group had by now broken into many new sectors and expanded its business internationally. To make sure the corporate brand did not lag behind this new situation we decided to carry out a thoroughgoing overhaul of the group’s identity, unifying all the corporate brands under a single denomination. As a result, all the subsidiaries took on the new GMV brand as a single corporate identity.

In June 2007, GMV purchased a 66% stake in Masisconvi, S.A., a company specializing in the design, development, manufacturing and marketing of ticket-vending and fare collection systems, using cutting-edge technology. Later, in 2008, GMV completed the purchase of 99.69% of Masisconvi, S.A. This operation allowed GMV to round out its range of passenger transport telematics, hitherto focused on fleet management systems.

In late 2007 GMV drove the internationalization of its business even further afield towards Asia and Eastern Central Europe. This endeavor soon bore fruit, the company winning its first contracts in countries like Malaysia and Poland. To cater for this new business it decided in 2009 to open offices in Korea and Malaysia and to set up new subsidiaries in Poland and Germany.

Over these twenty five years GMV has evolved from a tiny three-person engineering firm working almost exclusively in the space sector into a 1000-strong business group established in Europe, the USA and Asia, trading in several hi-tech sectors with a swelling order book in all five continents. With this 25-year track record behind it GMV still looks to the future with undimmed zest and enthusiasm, maintaining its original aim of building up a strong knowledge-based company whose main resource is still the talent, imagination and effort of its personnel.
Our goal is to support our client’s processes by dint of technologically advanced solutions, providing integrated systems, specialized products and services covering the whole life cycle. These range from consultancy and engineering services up to the development of software and hardware, the integration of turnkey systems and operational backup.

Technological development is now accelerating at breakneck speed and change has become the byword of modern life. The institutions and companies making up our markets are therefore obliged to innovate continually to cater for these changes and rise continually to new challenges. New needs for improvement, new processes or operational problems crop up every day. Innovation, the incorporation of new technologies, is no longer just an opportunity to stand out from the pack; it has now become a must to avoid slipping back in the race.

In GMV we are firmly of the belief that behind every new problem lie a challenge and a chance to innovate. Technology is not an end in itself; it is the means for making something new or something old better. In GMV we draw on our range of existing products and services or, if necessary, we develop completely new ones to meet the specific and singular needs of our clients, furnishing bespoke innovation and technology. We take on our clients’ challenges as our own, spurring us on to new heights of innovation.
A NEW FORWARD-LOOKING BRAND

Over the years GMV has broken into many new sectors and expanded its business internationally. To make sure the corporate brand did not lag behind this new situation GMV decided in 2006 to revamp the whole group’s corporate image. The new identity conveys the image of a well-knit multinational business group working in many different technological sectors, all pulling together towards the same forward-looking aim of onward growth. The new image draws on this common denominator to create a unified image in keeping with the common strategy, culture and roots of the whole group: continual innovation, unstinting desire to improve, keenness for challenge and leadership in technological excellence.

Since then, throughout 2007 and 2008, the group carried out an ambitious communication and marketing campaign plan to set up the new corporate image, with publicity in specialized media of the sectors GMV trades in and widespread participation in trade fairs, congresses, etc. The result of these actions was a significant increase in knowledge and recognition of the GMV brand, with a 700% increase in its number of mentions in the media.
GENERAL DEVELOPMENT AND TRENDS

For yet another year GMV has held onto its position as Europe’s top independent supplier of satellite control systems and the second in the world. In 2009 15 satellites with GMV technology were launched. Bearing in mind that there was a total of 133 launches in 2009, this means that 15% of the satellites launched all around the world were carrying GMV technology on board. Proof of GMV’s growing importance in the worldwide space sector is the fact that in 2009 it featured again among the ranking of the world’s 50 most important space companies, drawn up by Space News. By the end of 2009 over 224 satellites of the world’s main manufacturers, operated by the main commercial agencies and operators, were being controlled with GMV technology. GMV’s client portfolio boasts all the main international space agencies and operators. It now has systems up and running in 25 countries throughout the Americas, Africa, Asia, Europe and Oceania. GMV’s contracts for the development of critical ground segments of Galileo make it the third biggest European participator in the satellite navigation system. In the USA GMV continues to build up a strong position in the various programs of NASA. GMV is still the world’s only firm whose flight-dynamics and satellite-control systems are being simultaneously used in Europe and in the USA: in Europe at the operations center of ESA, EUMETSAT and CNES and in the USA at NASA’s Goddard Space Flight Center.

In the defense sector the Spanish Ministry of Defense has considerably cut down on its R&D investments. Nothing daunted, GMV has cast its net further afield, winning new R&D projects from the European Defense Agency and becoming one of its main European suppliers. Despite the budget cut-backs, GMV is still working for the Spanish MoD on its ongoing strategic R&D activities, such as the electronic warfare projects with the Spanish National Defense Staff (EMAD) and the command and control systems of the future combat system, making GMV the main supplier of this type of technology for the Spanish army.
Within the aeronautics sector GMV won itself in 2009 a leading position within the main programs of unmanned aerial vehicles, such as the Spanish ATLANTE and the Portuguese PAIC. GMV has also continued to consolidate its activity in this sector, both in the field of integrated modular avionics, where it has won significant new contracts and in the field of air traffic control working together with Eurocontrol. Mention must also be made of the increasing business with EADS and Airbus Military, with whom GMV has been a preferred supplier since 2007, and with Eurocopter for the Tiger helicopter and NH-90.

As in 2007 and 2008, despite the budget cutbacks in some public authorities, GMV once again clocked up in 2009 a healthy growth in the field of technology applied to public land-, railway- and sea-transport. This growth was largely fuelled by the latest contract award from the Spanish railway operator Renfe for its local and medium-haul services, making GMV the only supplier in Spain of systems of this type and winning it a leading position worldwide. Contracts are also still flowing in for its public-transport fleet management systems, with new implementation projects; it now has systems up and running in 50 cities and metropolitan areas. It has also recorded a notable growth in sea transport activities with new DGPS and AIS projects and the signing of several contracts with the European Maritime Safety Agency (EMSA).

Although the Information and Communication Technology (ICT) sector’s own reports claim that it has been especially hard hit by the recession, GMV obtained a solid growth in this sector in 2009, supplying advanced solutions and services in the areas of information security, ICT integration and mobility for the public and private sector, banking, insurance and telecommunication operators. The sale of over 10,000 licensees of the GMV-developed checker® product for security hardening of ATMs played a significant part in this success story. Ongoing business was also brisk with traditional clients such as Vodafone, of which GMV is a “Best partner”, Telefónica and the Havas group. GMV has also continued to increase its business with the public sector; in 2009 it joined the fold of ICT suppliers of the Generalitat de Catalunya (Catalunya Regional Government) and it also carried out marquee projects in the development and implementation of email platforms and website portals for various government authorities, pride of place going once more to the Junta de Andalucía (Regional Council of Andalucía) and the Junta de Castilla y León.
In 2009, following over six year’s of R&D in computer-based simulation techniques and medical image processing, GMV became global leader in arthroscopy training for orthopedic surgeons and has won itself an unchallenged niche as the world’s only supplier of an intraoperative radiotherapy planning system. Sales of the arthroscopy surgery training simulator insightArthroVR® have spread to hospitals, universities and prestigious institutions of Germany, the USA, Spain, Norway and the UK. GMV has also broken into the technology-related rehabilitation field, winning and leading a far-reaching R&D project with CENIT for the radical improvement of rehabilitation techniques.

In a macroeconomic context marked by the worldwide economic crisis, which has hit investment projects throughout the whole public and private sector, GMV has continued to weather the storm with notable success, even closing the year with a bigger turnover than in 2008. Internationalization, diversification and its unflinching determination to develop hi-tech solutions and specialized services have all helped it to overcome such a difficult year for the industry. This fine performance has enabled GMV to keep up its R&D investments and its internationalization drive. In fact, in 2009 GMV doubled its international presence, opening offices in Malaysia and Korea and subsidiaries in Poland and Germany, giving its business a much firmer footing in these countries, especially in the transport and ITC markets.

MAIN FIGURES

| Turnover: 100 M€ |
| EBITDA: 10,2 M€ |
| EBIT: 6 M€ |
| Net profit: 4 M€ |
| Number of employees: 1,024 |
ACTIVITY

SECTORS

GMV provides solutions, integrated systems, specialized hi-tech products and services. Its activities take in the whole life cycle of the system, ranging from consultancy and engineering services up to the development of software and hardware, the integration of turnkey systems and right through to operational backup. These products and services are supplied through its various subsidiaries to eight different sectors: aeronautics, defense, space, healthcare, security, information technologies for the public and private sector, telecommunications and transport.
ACTIVITIES IN 2009

AERONAUTICS

GMV works for the main manufacturers of the aeronautics sector as well as organizations like Eurocontrol as a specialist in engineering, development of aeronautics software and systems under the strictest quality standards. The most important areas of activity for the aeronautics sector are the following:

- Development of safety-critical systems and software under the standard RTCA DO-178
- Development of onboard software for certifiable avionics systems
- Mission and test-bed systems
- Development of experimental systems and equipment
- Integration of flight testing platforms
- Navigation systems
- GNSS Infrastructure (SBAS, GBAS, LAAS)
- Backup systems for air traffic management
- Simulators
- Test-beds
- Aeronautical telecommunications
In 2009 GMV consolidated its leading position in the market of Unmanned Aerial Vehicles (UAVs), participating in various UAV development programs both at home and abroad.

GMV is playing a key role in the ATLANTE program, a project that aims to develop an advanced UAV to be used by the army for target identification, shot correction, damage assessment, and also ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) missions. In this program GMV is responsible for some of the vehicle’s most critical equipment as well as the Flight Control Computer (FCC), which controls, guides and navigates the aircraft. GMV has also taken on responsibility for the automatic take-off and landing system (ATOL) of the ground station and is participating in the development of other components of the ground station.

Also within the field of UAVs, GMV forms part of the Portuguese Aerospace Industry Consortia (PAIC), created in 2009 to develop a civil UAV in collaboration with Lockheed Martin. GMV is responsible for the specification, implementation and validation of avionics systems. Apart from the aircraft itself, the project also includes the development and implementation of all its systems, including onboard sensors, avionics equipment and the ground stations for mission control.

In 2009 GMV continued to work on the Atlántida project. This CENIT project is co-funded by CDTI (Industrial Technology Development Center) under the Ingenio 2010 program, with the main aim of contributing towards the Single European Sky ATM Research program (SESAR). The main purpose of Atlántida is developing a UAV-using experimental platform for integration and operational testing of prototypes of the main elements of the future air traffic management system (CNS/ATM). GMV is helping to develop the navigation system carried onboard the UAVs to be used in the project. It has also taken on responsibility for the ground deployment of a GNSS augmentation system and the development of flight planning (AOC) and air traffic flow management (ATFM) systems.

In March 2009 the first results were presented in Amsterdam of the Next Generation Integrated Surveillance System (NG-ISS), which will be applied as a new in-flight safety system in civil aviation of the coming decade. The project, headed by Thales and with Airbus, Eurocopter and Dassault as collaborating partners, aims to eliminate the main causes of accidents in the aircraft approach phase. GMV has actively participated in the development of subsystems that have been integrated into the system platform, specifically with the development of a meteorological data management system and another to prevent false TCAS alarms (Traffic Collision Avoidance System).

CHESS kicked off in 2009 (Composition with Guarantees for High-integrity Embedded Software Components Assembly), an R&D project co-funded by the European Commission within the ARTEMIS program (The Embedded Systems Technology Platform). In this project GMV is providing an integrated solution for developing real time software for critical onboard systems. The technology produced under the CHESS project will slash the development and lifecycle costs of high-integrity embedded systems. The project results will be applicable...
not only in aeronautics but also in other fields with safety-critical software such as railway transport, space and telecommunications.

GMV forged even closer bonds with Eurocontrol after winning a new contract for the development of the next generation of DEMETER (Navigation Aid Coverage Calculation Tool), a tool to help in planning ground navigation aid systems both en route and on approach and landing.

At the end of the year GMV won from Eurocontrol the TRIM project (Trajectory Improvement and Monitoring Aids Study), whose main remit is to analyze and improve the aircraft trajectory prediction models. This project opens up a new line of collaboration with Eurocontrol while also enabling GMV to make further headway in the field of aircraft trajectory calculation and forecasting, a field that will be strategic for air traffic management in Europe. The ultimate aim of the project is to improve prediction performance for medium-term conflict-detection systems in Europe’s air traffic control centers.

GMV is also continuing with the satellite navigation support contract (GNSS) with personnel posted to Eurocontrol’s Experimental Center in Paris. This support focuses mainly on ground based augmentation systems (GBAS) and includes, among other responsibilities, active participation in international working groups dealing with the standardization, certification and operational commissioning of GBAS systems and maintenance of the Pegasus system, which Eurocontrol distributes to give support to the operational implementation of GNSS systems for air navigation.

In the field of operations systems GMV is also continuing to work on the project awarded to GMV by Eurocontrol in 2008 for modernizing the operations support system of Eurocontrol itself and also of associated air navigation agencies.

GMV also continued working on the EURONOTAM contract, another Eurocontrol project. After finishing the first phase of the project in 2008 GMV won in 2009 the contract for the second phase of the project, leading a consortium of companies including GrupoEAD and AENA. The main aim of this part of the project is to set up in EESP (European Satellite Services Provider, the EGNOS operating firm) the NOTAM1 generation system, associated with the SBAS approach procedures in Europe.

GMV is one of AENA’s main suppliers of GNSS technology as applied to the aeronautics sector. This was further borne out in 2009 with the award to a GMV-led consortium of a new consultancy contract for the operational implementation of GNSS systems.

In 2009 GMV also updated the GNSS Analysis Support Infrastructure (ISAGNSS). ISAGNSS is an in-flight test-bed designed to support operational validation and certification of the GNSS systems (SBAS and GBAS) in the aeronautics field, applied mainly to approach and landing operations. As part of this testing platform the RADIANT project also

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1. NOTAMs (Notice to Airmen) are informative notes sent by the air-navigation services provider of each state to alert all airspace users of any potential flight security threat, such as the unavailability of a GPS+EGNOS-based approach and landing procedure due to a problem in these systems.
kicked off at the end of the year, with the objective of calibrating the diagram of the GBAS VHF antenna fitted to the aircraft (Beechcraft A-100).

In 2009 AENA also awarded GMV a contract for analyzing the environment and assessing the ionospheric threat in the Canary Isles ahead of setting up a future Ground Based Augmentation System (GBAS) for GNSS augmentation.

In 2009 GMV also went from strength to strength in the field of new systems of integrated modular avionics (IMA), winning several far-reaching projects.

GMV is participating in the SAFAR (Small Aircraft Future Avionics Architecture) project. Part of the European Commission’s FP7, this project aims to introduce groundbreaking technology into the general aviation segment, such as fly-by-wire and fault-tolerant GNSS-based navigation systems, designed and developed by GMV.

Work also ended this year on the first phase of the DIANA project (Distributed equipment Independent environment for Advanced avioNic Applications), a project financed within the European Commission’s FP6 and carried out by a consortium of companies led by GMV, bringing together several of the world’s main stakeholders in the area of integrated modular avionics (IMA). This project, due to finish in 2010, represents the world’s first step towards the creation of a platform allowing distributed execution of avionics systems in virtual machines.

2009 also saw completion of the IDEFIX project within the technology procurement program of the Spanish Ministry of Defense, in collaboration with the defense ministries of Great Britain, France, Sweden, Germany and Italy. This project also involved the certification bodies of the participating countries, including Spain’s Technical Aerospace Institute (Instituto de Técnica Aeroespacial: INTA). The IDEFIX program comes up with advanced technology solutions for the ASAAC (Allied Standard Avionics Architecture Council) military system, building on the activity begun by GMV back in 2005 under the EUCLID program (European Cooperation for Long Term in Defense).

In the field of air traffic management and surveillance activities GMV is carrying out three engineering projects included in the “Green Regional Aircraft” segment as part of the European Clean Sky program. The aim of this program is to validate the technological development of the Regional Transport Aircraft (RTA), co-produced by ALENIA and EADS. The WEMACS (Detailed Weights and Manufacturing Costs) project aims to design and develop software for estimating aircraft weight and manufacturing costs in terms of their configuration parameters. The purpose of the AeroDesign (Preliminary Design Techniques) project is to create an integrated group of applications that support the initial aircraft design phase and build a bridge towards market requirements (e.g. range, number of passengers, payload and technical implications in the airframe, etc.). The third project, GRA3M, sets itself the task of studying and comparing various technologies for the implementation of onboard...
digital systems with the aim of cutting down their weight when they are fitted on board the aircraft, using IMA technology.

In 2006 GMV was officially listed by EADS-CASA (nowadays Airbus Military) as preferred supplier of onboard software, after several years of providing this service on an ad-hoc basis. This has enabled it to step up its development of aeronautical safety-critical software. In particular, GMV has developed safety-critical software for Airbus Military’s air-to-air refueling control unit (tail boom) installed on the Airbus A-330 MRTT (Multi Role Tanker Transport Aircraft), currently being marketed with such success by Airbus Military. This software is being developed under the strictest standards, such as RTCA DO-178B, including components classified at Level B and Level A (the most restrictive in terms of safeguarding and safety requisites and where the most advanced IMA concepts are applied) in accordance with the standard ARINC 653. As well as the aforementioned participation in the flight control laws (FCL) and the design and implementation of the Boom Control Computing System (BCCS) GMV has also developed various modules for engineering and training simulators.

Further collaboration with Airbus Military came as part of the supply operation of C-295 type VIMAR aircraft for the Portuguese Airforce. GMV’s Portuguese subsidiary is continuing to work successfully on this program’s activities, comprising the development and integration of diverse subsystems both in the ground segment and flight segment of these aircrafts’ Fully Integrated Tactical System (FITS).

In 2009 the FLYSAFE and ANASTASIA projects were also brought to completion, both keynote projects for new implementations of onboard systems. This year also saw completion of the SOFIA project, which has enabled GMV to develop and hone a new set of skills in air traffic management and surveillance, while the SCARLET project is still in full swing, geared towards modular technology for the next generation of aircraft.

GMV’s expertise and knowhow built up in key modular avionics projects bore fruit in 2009 with the commercial launch of the SIMA product (Simulated Integrated Modular Avionics), a simulation system for integrated modular avionics (IMA) based on the ARINC 653 standard, which has now been successfully tried and tested by the world’s main manufacturers of onboard systems.

In 2009 GMV continued to work on star programs of the armed forces in the aeronautics field: the Eurofighter-Typhoon fighter aircraft, the Tiger attack helicopter and A400M transport aircraft. For the Eurofighter aircraft, under a contract with EADS, GMV is developing software for the Ground Loading Unit (GLU), phasing in new functions for tranche 2. For the A400M, under a contract with Airbus Military, GMV is developing several simulation models for the landing gear and other aircraft systems. In the Tiger program, under a contract with Eurocopter, GMV is providing the software design, development and testing for the mission
and attack computer AMCSG (Armament and Mission Computer and Symbol Generator). A new collaboration with Eurocopter also kicked off in 2009, for adaptation and development of the avionics software for the tactical transport helicopter NH-90.

Within the area of aeronautics telecommunications, September 2009 saw the start of the DAPHNE project (Developing Aircraft PHotonic NEtworks), a 14-partner FP7 project co-funded by the European Commission. The project will analyze, design and validate future airborne fiber optic networks for commercial aircraft and helicopters. GMV, on the strength of its expertise built up during work on the AFDX network of the A380, is one of the main participants in network architecture and modeling, taking on leadership in the safety of critical aspects.

Throughout 2009 GMV also continued to play a key role in various international groups for aeronautical standardization and specification in its various fields of expertise, such as approach and landing systems, UAVs, system safety and development of the standard RTCA DO-178B for critical software.

Mention must finally be made of the company’s continuing strategic investment in several aeronautical research projects. Work was completed this year on the SAFEE security project, in particular involving a new generation of onboard threat-detection systems. The COOPAIR project, for its part, aims to lay down the bases for greater cooperation between the European Union and Latin America on research and development in air transport.
GMV has won itself a position as one of the world’s main suppliers of international space organizations and agencies and also of the main satellite constructors and operators.

With a track record of 25 years behind it, GMV is one of the world’s top two suppliers of satellite control centers and one of ESA’s main contractors in this field, playing a key role in most of its space missions. GMV supplies all the following:

- Satellite control centers
- Flight dynamics systems
- Ground infrastructure of global satellite navigation systems (EGNOS and Galileo)
- Mission planning systems
- Data processing centers of earth observation satellites
- Scientific satellite operation centers
- Guidance, navigation and control systems
- Mission analysis services and systems
- Development of onboard software
- Simulators and test-beds
- Space applications
- Space telecommunication systems and network engineering
- AIT Electronic Ground Support Equipment (EGSE)
In 2009 GMV held onto its position as Europe's top supplier of satellite ground segment systems and the second biggest in the whole world. By the end of 2009 over 224 satellites of the world's main manufacturers, operated by the top commercial agencies and operators, were being controlled with GMV technology. GMV's client portfolio now includes all the major operators of commercial satellites and also a host of small and medium-sized operators around the world.

In 2009 GMV was selected by the trade review Space News as one of the main companies of the worldwide space sector. Every year this review, of great international prestige, publishes a ranking of the top 50 companies in the sector. Featuring in this ranking, alongside companies such as EADS, Thales Alenia Space, Boeing and Lockheed Martin, is one more example of the international recognition now given to GMV's space activity.

Throughout 2009 GMV's family of products for satellite control and monitoring (hifly®), flight dynamics (focusSuite), communications payload management (smart rings) and mission planning (flexplan) have all helped to swell its client portfolio and business activity in the market segment of commercial satellite operators.

GMV has built up a close relationship with the European satellite operator Eutelsat over more than fifteen years, supplying the control systems for its whole fleet of satellites. In 2009 Eutelsat declared its provisional acceptance of GMV's Neo-S4K project, which involved adapting Eutelsat's GMV-developed Neo-SCS satellite control system for performing operations with satellites based on the Spacebus 4000 (S4K) platform. The first operational use took place during the W2A satellite's launch and early orbit phase (LEOP). Immediately afterwards it came into use for the satellite's nominal operations.

GMV's long and proven track record in satellite collocation² using focusGEO prompted the Australian satellite operator OPTUS to choose this flight dynamics system for supporting its whole fleet. The project ended in 2009 with the installation of focusGEO in the OPTUS control center, as well as the configuration and adaptation to the operator's equipment and the corresponding personnel training period. This project is a development from other activities previously carried out by GMV for OPTUS, beginning in 2007 with the delivery of matool, as a mission analysis system for geostationary satellites.

GMV supplied the flight dynamics system (focusGEO) and the payload control tool (smart rings) for the THOR6 satellite, belonging to the Spacebus 4000 platform owned by the operator Telenor Satellite Broadcasting. The THOR6 satellite was successfully launched in October 2009 joining the rest of this operator's fleet. GMV is providing in situ support for this satellite's initial control operations. This new contract for Telenor gives GMV a strategic position as a client of one of the satellite operators with the greatest growth potential in the countries of northern and eastern Europe.

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² Placing a satellite in orbit in relation to a nearby group of satellites.
Since 2004, under a contract with the satellite constructor EADS Astrium, GMV has been busily working away on the development and delivery of control systems. In early 2009 SEA ASTRAS’s A1M satellite reached its final orbital position in readiness for commercial operations. Since then GMV’s multi-satellite control and monitoring system hifly has been successfully supporting its operations. Launched in November 2008, the A1M satellite, with a Eurostar E3000 platform and built by EADS Astrium, provides high-definition, direct-to-home, digital television services with Europe-wide coverage.

The US operator SES Americom, belonging to the SES group (the world’s second biggest operator of geostationary satellites), chose GMV’s smart rings product in 2009 for its AMC-5R satellite. This system had already been chosen by SES Americom for its AMC-14 satellite back in 2006. This new contract was obtained through Orbital Sciences Corporation, manufacturer of the AMC-5R satellite and its payload, and also prime contractor of the system. The list of firms that have turned to smart rings is now very lengthy, including, as well as the abovementioned ones, operators like Telenor and SES Sirius, as well as manufacturers of the stature of Lockheed Martin and Thales Alenia Space.

EADS-Astrium, prime contractor of both the ground segment and flight segment of the new ArabSat satellite ABSC, chose the GMV-developed satellite control and monitoring product hifly® in 2009 as the control system of this satellite. This is the fifth ArabSat satellite on the trot for which GMV has supplied the control system. The new system will be installed and integrated as an extension of the hifly® systems with which ArabSat operates the satellites AB4AR, AB4B and those already supplied for the satellites ABSA and ABSB (or Badr5).

October 2009 saw the launch of the civil communications satellite Amazonas 2, based on the Eurostar E3000 satellite and owned by the Spanish operator Hispasat. GMV is supplying the flight dynamics system on the basis of its focusGEO product, which is already being used by Hispasat for operating the other satellites of its fleet, and also the control and monitoring system, based on hifly®, of proven prestige and application in different operators around the world.

GMV signed a new contract in 2009 with the satellite operator WorldSpace for flight dynamics backup for its AfriStar satellite. Back in 2005 WorldSpace awarded GMV a contract for updating the flight dynamics system of its two geostationary satellites AfriStar and AsiaStar, which provide telecommunication services. One year later GMV handed over both systems to WorldSpace, based on focusGEO, the advanced, operational, multi-mission and multi-satellite system developed by GMV and geared towards the support of geostationary commercial satellites.

Midway through 2009 GMV’s site served as the venue for the acceptance tests of the ground segment developed by GMV for StarOne, South America’s biggest satellite operator. These tests form part of the
contract awarded to GMV by StarOne for complete updating of the
ground segment of its Brasilsat series B fleet, comprising 4 satellites
of the Boeing 376-W type. The tests, all successfully passed, cover the
functions of the complete ground control segment, including the two
key subsystems based on GMV technology: the satellite control and
monitoring system hifly® and the flight dynamics system focusGEO.

In late 2009 GMV’s flight dynamics system for the satellite constellation
of the operator Globalstar was officially accepted by Thales Alenia
Space. October also saw the start of the shadow operations between
Globalstar’s old FDS system and GMV’s new one, as preparation for
running the current constellation formed by satellites of Space Systems
Loral.

GMV also continued this year to set up its hifly® and focusGEO products
controlling the Nilesat 201 satellite, owned by the Egyptian satellite
operator Nilesat, and carrying out its flight dynamics operations. This
satellite, based on Thales Alenia Space’s Spacebus 4000B2 platform, is
fully compatible with GMV’s systems. The supply includes the creation of
a main control center in Cairo and a backup control center in Alexandria.
The system also includes optional components such as GMV’s autofly
system, to automate the operations of the satellite itself and the ground
station and the archiva system, another inhouse GMV development, for
long term archiving operations and obtaining quick access to satellite
telemetry from hifly® clients.

In 2009 GMV also continued to build on its time-honored relationship
with the European Space Agency (ESA) now dating right back to 1984,
taking an active part in many of ESA’s programs.

GMV has been working for many years with the European Space
Operations Centre (ESOC). 2009 was no exception with several new
contracts in mission analysis, flight dynamics, navigation, control centers,
operations and engineering, making GMV one of the benchmark
suppliers for ESA’s operational systems.

GMV has played a key role in the design of space missions such as Gaia,
Bepi Colombo and Exomars. GMV engineers also participated in the
orbital dynamics operations of most ESA missions. Special mention must
go to Rosetta’s earth swing-by, the launch of GOCE and the start of the
development of orbital dynamics software for the LEOP of the Galileo
satellites.

In open competition with the whole European industry GMV won
this year a framework contract taking in the whole development of
ground systems for ESOC. This contract includes development of the
infrastructure, monitoring and satellite-control systems, satellite and
ground stations, flight dynamics, satellite simulators, mission analysis and
satellite navigation systems. This contract award further reinforces GMV’s
leadership position in all these areas.
GMV also won other ESA development products. Worthy of special mention is the migration of the user's graphic interface of SCOS-2000, the infrastructure of ESA’s satellite control system, to the new EclipseRCP technology, an important project awarded after the clients’ complete satisfaction with the previous data display project. The result of the current development will be a new generation of control centers with an advanced user interface. Another important contract award is maintenance of the latest version of SCOS-2000, thus rounding out GMV’s complete coverage of this control infrastructure for ESA.

The unexpected collision in February 2009 of two orbiting artificial satellites, the USA’s Iridium33 and the Russian satellite Cosmos-2251, highlighted the importance of space-debris reduction policies. Since 1997 GMV has been collaborating with ESA on the maintenance of the DISCOS database recording the space objects and their trajectories. GMV is also developing solutions both for the ESA and for its product systems that are capable of analyzing and forestalling collision risk with any element orbiting the earth. GMV has thus become involved in ESAs Space Situational Awareness (SSA) program, for the preliminary design of a system for detecting and monitoring natural and artificial objects of space meteorological activity, with the aim of preventing or lessening the possible adverse consequences both for the orbiting space systems and the ground systems and the public at large.

In 2009 GMV continued working on the design and definition of the Rover Control Center of the future Exomars mission. GMV is leading this highly complex technical activity for the Exomars Mars exploration mission. Phase B of the development process was successfully brought to completion in late 2009, ushering in the review, detailed-analysis and prototyping of the technical aspects pinpointed as most important and critical for the mission, before going ahead with the final implementation process.

By early 2009, after the success of the previous Jules Verne ATV mission, ESA, CNES and GMV were already working on the second ATV, in this case called Johannes Kepler, scheduled for launch in 2010. GMV is responsible for the maintenance and updating of the orbital mechanics system to keep it abreast of any changes with respect to the Jules Verne ATV and also for upgrading the system on the basis of the lessons learned during the flight of the first ATV. Likewise, GMV is maintaining its representation within the orbital mechanics operations team and is responsible for the orbital mechanics database for operational deployment of the flight dynamics system and for pre-flight qualification tests.

In May 2009 ESA’s space telescopes Herschel and Planck were successfully launched. These telescopes will study star and galaxy formation and the cosmic microwave background radiation left over from the Big Bang. Both telescopes have been built by an industrial consortium led by Thales Alenia Space in Cannes (France), ESA’s prime contractor for this dual mission. Within this consortium GMV has been responsible for the complete development and deployment of the
Herschel/Planck System Database (HPSBD) and also for the satellite data management program and operational validation in Cannes until the telescope is brought into service.

For some time now GMV has maintained close relations with ESA’s European Space Astronomy Centre (ESAC). GMV is now working on the framework science contract signed between ESTEC and GMV, taking in all the agency’s ESAC activities. GMV personnel have been posted to ESAC’s site to work on diverse missions planned and controlled from ESAC, such as XMM-Newton, Integral, Rosetta and BepiColombo.

During 2009 GMV successfully completed the first development phase of the ground segment of the WSO-UV mission. The WSO-UV mission (World Space Observatory Ultraviolet) is an international project led by the Russian Space Agency ROSCOSMOS, involving the participation of Spain, Germany, Ukraine and China. The telescope will cover the space left by Hubble at the end of its mission, making it the only ultraviolet observatory of the earth during its useful life. The mission will be run jointly by Spain and Russia. GMV is responsible for development of the mission’s ground segment, including the mission control center and science control center, to be set up in Madrid and Moscow. This development phase has concluded with the first demonstration of the concept of simultaneous telescope operation from the control centers of Moscow and Madrid.

In 2009, within the field of earth observation activities, mention must be made of the coming into operation of ESA’s GOCE mission control center (Gravity field and steady-state Ocean Circulation Explorer) successfully launched from Russia in March. As prime contractor Thales Alenia Space is leading an exclusively European 40-company consortium to prepare the mission and construct the GOCE satellite. GMV originally took charge of the mission analysis. Subsequently it led the design, development and maintenance of the mission control system, which has been fully operational from the word go. GMV engineers have provided backup during the phases leading up to launch and LEOP. During 2009 GMV also continued to work on the control center of Cryosat-2, due for launch in 2010, and of SWARM, due for launch in 2011.

GMV, in a consortium with INTA, won a contract in 2009 for developing the performance simulator and prototype of the high-resolution optical instrument processor of the Spanish earth observation mission, Ingenio/Seosat. This contract forms part of the development of the mission’s space segment, financed by the Spanish Ministry of Industry and awarded to GMV by EADS CASA Espacio, responsible for the mission’s flight segment under the supervision of ESA and CDTI.

GMV is continuing to fulfill its ongoing pledge of working towards planet sustainability, playing an important and growing role in the large-scale European program GMES. The GMES program focuses on the overall

By early 2009, after the success of the previous Jules Verne ATV mission, ESA, CNES and GMV, were already working on the second ATV, in this case called Johannes Kepler, scheduled for launch in 2010.
monitoring of the environment and security and is jointly brokered by the European Commission (service component) and the European Space Agency (space component).

GMV continues to work on projects within GMES’s data-using programs such as the Data User Element (DUE) and the Value Added Element (VAE), having successfully brought to completion, among others the GLOBAEROSOL project for determining aerosol profiles and starting up the DRUID project for determination of the biomass.

GMV’s experience in the provision of data management services, taken together with its broad range of satellite control products, were both decisive factors in its winning a four-year contract from Thales Alenia Space for the provision of satellite data management backup for the Sentinel-3 mission. The Sentinel program, which forms part of the GMES program, comprises five satellite families: Sentinel-1, designed to guarantee the continuity of the radar data of the satellites ERS and Envisat; Sentinel-2 and Sentinel-3 for surveillance of the earth and ocean; Sentinel 4 and 5 will be used for meteorology and climatology missions, based on a study of the composition of the atmosphere. Sentinel-3, penciled in for a 2012 launch, will improve weather forecasting and enhance our knowledge of the relation between the oceans and the atmosphere while also helping to control the impact of climate change.

In 2009, GMV consolidated its market position in the analysis and working up of earth observation data as backup in fire detection work and analysis of the fire’s impact and aftermath, working on a wide range of projects with ESA (PYROS), the Joint Research Center (FIREHARM, FUELMAP) and the European Commission (FIRESMART).

In November 2009 ESA’s Soil Moisture and Ocean Salinity (SMOS) satellite was successfully launched. GMV has been responsible for the development of the data processing chain of the level 1 data of the MIRAS (Microwave Imaging Radiometer using Aperture Synthesis) instrument on board SMOS and also for the level 3 and 4 processors under the supervision of CSIC. GMV’s participation in the SMOS mission is not limited to the development of processors but also takes in the development of key elements of the ground segment, such as the SMOS Product Quality Control (SPQC), SMOS Plan Generation Facility (SPGF) and the Payload Operations and Programming Center (PLPC), as well as other elements of the calibration center.

Also within the earth observation area GMV is continuing to work on the implementation, validation and integration of the operational processor of the European Space Agency’s SWARM mission. This mission belongs to the Earth Explorer group of earth-observation space missions, designed to measure the fundamental physical parameters that will enhance our understanding and analysis of the environment. GMV is carrying out the operational processing and will also validate
the whole system and hand it over in the ESA’s ground segment in ESRIN (Italy).

Finally, within the activities carried out in the earth observation field, significant headway has also been made in the project of adapting the MERISAT tool to Linux and optimizing algorithms to improve their performance in the ENVISAT satellite’s processing chain.

In 2009 GMV also gained a more solid footing in the area of Electronic Ground Support Equipment (EGSE) to support satellite AIT activities, increasing its collaboration with Astrium in important projects for future missions. It also won a new contract under the Sentinel-2 mission, consisting in the support for EGSE hardware and the AIT activities (Assembly, Integration and Test) of its multi-spectral instrument (MSI).

GMV is one of the main industrial providers in the field of satellite navigation. This was borne out back in 2006 with the award of 5 Galileo projects worth 40 million euros. This made GMV the third biggest supplier of Galileo in Europe, behind only Thales-Alenia Space and EADS-Astrium. Work continued on these contracts in 2009, with GMV leading the development of four of Galileo’s main ground segment systems, two of which are critical for final system performance. In mid 2009 this joint effort, involving directly about 70 specialists, resulted in a series of milestone events for the development of the OSPF (the element that calculates the precise position of the Galileo Satellites and synchronizes all the system clocks) and IPF (the element responsible for calculating the integrity parameters that allow Galileo to be used for critical applications). During 2009 acceptance was completed of the FDF (flight dynamics facility) to prepare for its integration into Galileo’s control center within the In-Orbit Validation (IOV) phase. The acceptance process was also completed of the Service Product Facility (SPF). The SPF acts as a communications interface between Galileo’s ground segment and the various external organizations outside the platform, with whom contact is established by means of standard IP communication protocols (HTTP, FTP, etc.), only its final deployment remaining stored in the two Galileo control centers.

GMV is also responsible for developing the operational network software to be installed in all stations of the Galileo ground system as part of the Mission Data Dissemination Network (MDDN).

The GIOVE-B satellite of the Galileo system, successfully launched back in 2008, represented a historic moment for satellite navigation, since it was the first time that a common GPS-Galileo signal was ever sent from space. GMV coordinates the experiments of GIOVE’s mission segment and participates in the in-orbit-test phase of this satellite, the main objective of which is to carry out an early characterization of the atomic clocks onboard the satellite. The experimentation and testing activities around this satellite continued throughout 2009.
On 1 October 2009 another crucial milestone in GMV’s GNSS activities came with the official kickoff of the operations of the European EGNOS system (European Geostationary Navigation Overlay Service). EGNOS is a GNSS SBAS system that aims to upgrade and complement GPS to improve its performance at the level required by critical users such as civil aviation. EGNOS is a joint program of the European Union, Eurocontrol and ESA and represents the first step towards Europe’s own satellite navigation infrastructure. GMV has been one of the key firms in the whole EGNOS development, from the incubation of the first ideas up to operational development of key elements such as the CPFPS processing center. Along the same lines GMV is participating in a new development phase brokered by the European Commission and geared towards a new operational delivery of the system, designed to improve the robustness and operability of EGNOS for operators and also a detailed definition phase of what is going to be the next EGNOS generation for 2012, including new services.

In 2009 GMV continued its longstanding collaboration with ESA’s Navigation Office, consolidating its position as the main company in this area. GMV’s teams have helped to build up this navigation office as a worldwide benchmark in the supply of a growing array of high precision navigation products. Especially noteworthy are the new improvements brought into the orbit- and clock-calculation software of satellites from constellations such as GPS, helping to raise ESOC to top ranking among the quality of IGS products.

In 2009 GMV unveiled the new version of the magicGNSS product, a GNSS-data-processing web application allowing users to perform a wide range of calculations and analyses to do with GPS and its augmentation systems without the need for any infrastructure. This new version incorporates Precise Point Positioning (PPP), a relatively new technique for calculating coordinates, the tropospheric delay and GPS receiver clock offsets. The processing is done autonomously with user data, using orbits and clocks of the GPS satellites calculated with fine precision by the International GNSS Service (IGS) instead of the navigation message sent by the satellites. The advantages of PPP are that it works in receivers located anywhere on earth and has innumerable applications in diverse fields. Throughout 2009 GMV also kept up its contribution to the pilot project IGS Real Time as an integral part of magicGNSS.

GMV has also been working for years on the development of an increasingly broad and attractive range of GNSS products to meet its clients’ needs, thus helping to improve and develop their operations and activities in general. In early 2009 magicSBAS was born, a new GMV product in the field of satellite navigation to be added to the wide-ranging portfolio of GMV products and solutions. magicSBAS is a multi-constellation SBAS (Satellite Based Augmentation System), currently including GPS and GLONASS, with Galileo to be phased in later. It includes all the essential elements of a complete SBAS system, carrying out all the data collection functions from reference stations.
and calculating all necessary SBAS information (ionosphere, orbits and satellite clocks, integrity, etc.). It publishes the SBAS messages on internet using different formats (SISNET, RTCA, RTCM). In early 2009 GMV won an ESA contract for carrying out a study into the benefits of using GLONASS in EGNOS; shortly afterwards AENA contracted GMV for studying improvements to EGNOS performance. The central plank of both projects is the use of the magicSBAS product.

Also within the field of satellite navigation GMV continued to work under a contract with ESTEC on the development of technology for navigation inside buildings and other closed environments, using a combination of GNSS signals with other signals such as mobile telephony, Wi-Fi, DWB (Digital wideband), UWB (Ultra wideband) or MEMS. Work carried out during 2009 included development of the equipment and software corresponding to the various navigation technologies considered in the project (high sensitivity Galileo and GPS for indoor reception, complemented by Wi-Fi navigation based on fingerprinting and by a personal browser based on MEMS sensors). This project has the brightest prospects for the future, placing GMV as it does at the head of research and development into new technologies that will enable systems such as GPS to be used even inside buildings. This will open up GNSS use to other professional markets and also mass consumption.

GMV is participating actively in six projects within ESA's GNSS development program, whose objective is to lead research aspects related to technologies, development and verification in the GNSS field. As regards the developments of current systems, GMV completed work in 2009 on two contracts for studying possible improvements in the integrity service provided by the Galileo system. MASSTRA (Matrix SISA and Matrix SISMA) studies potential improvements in the integrity performance that might be obtained by sending information to users in matrix form. ADVENT (Advanced Integrity for Satellite Navigation Systems) assesses the possibility of improving integrity performance by automatic monitoring of orbits and clocks onboard the satellites.

In the field of inhouse R&D projects special mention must go to the completely successful development of a GPS receiver based on software that GMV has been working on for several years. Unlike a conventional GPS receiver, a software receiver carries out the signal processing and other essential processes by means of software and on a conventional processor. This solution, slashing production costs, offers notable advantages in large-volume applications. The receiver developed by GMV includes all the necessary components and is one of the few in the world that allows real-time navigation on a low-performance processor such as the ones used in navigators for vehicles and PDAs. This breakthrough means that GMV has now developed technology with excellent application prospects in sectors in which it is already trading. It also rounds out GMV’s technological capacity, making it one of the few firms in the whole world working on all the key elements of satellite navigation: infrastructure of the system itself, navigation receivers,
applications and services. Another noteworthy event in this same area was completion in 2009 of the NUSAR contract for ESA, whose objective is to develop some of the elements of the software receiver that have to be adapted for real time processing of Galileo signals.

In the field of space exploration, and in line with its overall objective of playing a leading role in the area of advanced technologies, GMV won an ESA project in 2009 for assessing the use of telemetry and data transmissions from interplanetary vehicles (landers, rovers or aerobots) as a tool for remote assessment of the geophysical parameters of planets and moons.

In February 2009 ESA awarded GMV the RF-WIPE project (Radio-Frequency Wireless for Planetary Exploration). The main aim of this project is application of wireless technology to planet exploration scenarios (Moon, Mars, Titan, etc.). Under this project GMV has taken on responsibility for defining applications of interest for the use of these wireless networks in the fields of earth exploration and aerial exploration. In a second phase GMV will also be responsible for defining two use cases of these networks with a different topology (star against mesh topology) and different sensors (temperature and relative humidity in one case and solar radiation in the other).

In 2009 GMV continued to work on ESA’s EGP–Rover project awarded the year before. EGP–Rover is in turn part of another larger project called EGP (Eurobot Ground Prototype) led by Thales Alenia Space. EGP is a prototype system of the “centaur” concept comprising a rover type autonomous mobile platform (EGP-Rover) and 2 articulated arms (Eurobot). GMV is leading the development of the rover, weighing 800 Kg and measuring 1.5 x 2m, and is responsible for its integration and the development of an autonomous navigation system based on odometry and stereoscopic vision sensors and an inertial measurement unit (IMU).

GMV also participated in 2009 in the fourth Global Trajectory Optimisation Competition (GTOC), a competition set up in 2005 by ESA’s Advanced Concepts Team with the purpose of stimulating research into techniques for finding the optimal trajectory for different space missions. This year’s competition was organized by France’s Centre National d’Etudes Spatiales (CNES). Forty seven teams registered for the competition, including some of the most prestigious institutions, companies and universities from around the whole world (USA, Europe, Russia, China, Japan, Canada, etc.). GMV came in a very creditable fifth.

GMV won the contract for the SSRDB project (Satellite System Reference Data Base), which aims to analyze and improve the engineering processes of the current satellite systems, applying techniques based on data models to obtain a more detailed virtual representation of these systems. SSRDB forms part of the VSD project (Virtual Spacecraft Design) which EADS Astrium GmbH is carrying out for the ESA with the final aim of building up a detailed monitoring of data design, analysis and
verification and smoothing the transition between the various phases of the project and/or between the various disciplines involved.

GMV kept up a brisk activity in technology development programs, spawning a good number of projects in the areas of maneuver optimization and algorithms, space system engineering, guidance navigation and control systems, simulation, autonomy, etc. It is also playing an evermore prominent part in ESA’s main programs of exploration and advanced technology, such as Aurora, CSTS, Exomars, IXV, Proba-3 and NEXT-MOON.

NEXT-MOON, scheduled for launch in 2017-2018, is the first step in a more ambitious program that aims to set up a large lunar outpost in the future. Phase A of the mission design was brought to completion in mid 2009, led in one of its contracts by OHB and with GMV playing a critical role. GMV has taken on responsibility for the preliminary design and demonstration of the performance features of the descent and landing system, including total responsibility for the wholly autonomous guidance, navigation and control (GNC) system, associated with the descent and touchdown phases.

Together with Thales Alenia Space as prime contractor GMV participated in 2009 in the consolidation phase of ESA’s IXV project (Intermediate eXperimental Vehicle), a technology demonstrator that aims to build up the necessary knowledge for developing future re-entry vehicles, reinforcing Europe’s capability in the atmospheric re-entry field. GMV is leading the development of onboard software (OBSW) and VMI (Vehicle Model Identification) for identification of aerodynamic re-entry parameters. In this new phase GMV has also been awarded the navigation contract within the GNC subsystem and the development of the software validation facility (SVF).

In 2009 GMV took part in the development of a manned vehicle for making low earth orbit flights (to the International Space Station) and moon flights within a program called CSTS/ARV. GMV is playing a leading role in the vehicle development, with responsibility for mission analysis and the design of optimum trajectories for launching, aborting, transfer to moon orbit and return to earth, as well as identifying the best maneuvering sequence for approach and docking in earth and lunar orbit.

GMV formed part in 2009 of the industrial consortium led by OHB to address phase A of the Marco Polo mission and the JGO mission (Jupiter Ganymede Orbiter), belonging to ESA’s “Cosmic Vision 2015-2025” program. The objectives of the JGO mission are the study of Jupiter’s moons Ganymede and Callisto and of Jupiter’s magnetosphere, while the Marco Polo mission will collect samples of an asteroid and bring them back to earth. Within the consortium GMV is responsible for analysis of the mission and of the Guidance, Navigation and Control system (GNC) of both missions.
In September 2009, under an ESA contract, GMV successfully completed the ARMADA project, consisting in the design and prototyping of an autorotation system for the entry, descent and landing system on diverse planets with an atmosphere (main target Mars, secondary target Venus and Titan). GMV is the prime contractor of the project. The study includes making a series of system mockups for testing and demonstrating the system in two wind tunnels (supersonic and subsonic).

2009 also saw completion of the contract signed by GMV the year before for defining Phase A of the NEXT-Mars mission. This is an intermediate ESA mission running from the launch of ExoMars, scheduled for 2013, to Mars Sample Return, due to be launched in 2020. GMV is responsible for the GNC and analysis of all matters related to the RendezVous and Capture Experiment (RVCE). The aim of this part of the mission, using the Orbiter satellite, is to collect a dummy sample container previously placed in Martian orbit, which simulates the one actually to be launched from the Martian surface during the mission, the Mars Sample Return.

During 2009 GMV also kept up its leadership in ESA’s DAFA project, which aims to demonstrate the advantages of using distributed agents in space systems. The introduction of a new design based on the technology of several agents offers great opportunities for exploring new solutions for some of ESA’s most complex missions, such as ExoMars, GMES and Darwin.

Late 2009 saw the kickoff of the Goal-Oriented Autonomous Controller (GOAC) project led by GMV and involving the participation of some of the recognized worldwide leaders in various fields related to robotics and artificial intelligence. The project, due to run until 2011, aims to design and develop a controller for space robotics systems of any type (aerial or surface), allowing summarized plans to be drawn up on board. GOAC’s plans are flexible in time and function, favoring their adaptation to the prevailing conditions, largely unpredictable, of non-structured environments such as planet exploration. The system will be tried out in a high-fidelity simulation environment and also on a real rover. In both cases the reference mission is ExoMars and an assessment will be made of the performance improvements that a system of this type might bring to a conventional system.

Ever since it set up its US subsidiary back in 2004 GMV’s business with NASA has grown steadily and surely. In 2009 GMV continued working on the flight dynamics system of the Glory scientific satellite mission being carried out by Orbital for NASA. The Glory satellite, due for launch in late 2010, forms part of NASA’s A-Train constellation for measuring the earth’s climate. This is the second NASA A-Train mission for which GMV has supplied the flight dynamics system based on GMV’s inhouse development focusLEO.
In June 2009 NASA’s Lunar Reconnaissance Orbiter (LRO) space mission successfully blasted off from Cape Canaveral. After entering lunar orbit it began its mission of exploring the moon’s surface and measuring the space radiation ahead of possible manned exploration in the future. GMV has developed the mission planning system, the authentic “brain” on the ground, which coordinates the whole mission and receives information both from the satellite and the involved infrastructure. The supplied system was based on the GMV-developed flexplan mission-planning product, which has already been successfully used on ESA and EUMETSAT missions. LRO is the first mission of NASA’s Vision for Space Exploration program and its first moon mission since the launch of Lunar Prospector in 1998.

In 2009 two components of the Mission Operations Element (MOE) of the Landsat Data Continuity Mission (LDCM) were integrated into and tested in NASA’s Goddard Space Flight Center. The MOE is the critical component of the operations center of this mission of the U.S. Geological Survey (USGS), which has been making a vital input to earth observation since 1972. Under a contract with the Hammers Company, prime contractor of the MOE, GMV is providing the Mission Planning and Scheduling System and the Memory Management System, based on GMV’s inhouse products flexplan and archiva. The team was congratulated for the excellent work carried out when running to such a tight schedule.

ACTIVITIES IN 2009

DEFENSE

GMV is a tried and trusted supplier of the armed forces and international defense organizations. Its activities in this field take in the engineering, design, development, integration and maintenance of defense systems covering their whole life cycle.

The products provided in this area are capable of meeting the most demanding needs and are developed under strict quality standards. They cover the following areas:

- Engineering, development and integration of command, control and communication systems (C3I)
- Processing of data and signals, intelligence systems
- Training, operational research and R&D simulators
- Development of military systems based on GPS, EGNOS and Galileo
- Onboard equipment, avionics software and test-beds
- Logistic and maintenance services for systems and software
- Military space applications
- Physical and logical security systems and engineering
- Engineering and development of multimedia training systems
- Demilitarization and humanitarian demining applications and services
In 2009 work continued on the MUSAS project (Multi Sensor Anti Sniper System). This R&D contract, awarded in 2007 by the European Defence Agency (EDA) to a GMV-led consortium, is a €5.7-million, 30-month research project to develop an advanced system for detecting, locating and classifying snipers. Within this project research has been carried out into different areas of activity: acoustic and radar sensors, image processing, honing of detection techniques by fusion of data from information services, human-machine interfaces, etc. When finished the project will lay down the bases of the prototype demonstrator to be developed during 2010 and then used for carrying out the performance-assessment field trials.

EDA’s ongoing confidence in GMV was further confirmed with the signing of new contracts in all the following projects during 2009: SLSSS (Seaborne Logistics Support Stocktaking Study), which aims to take stock of the current assets of the EU navies; MARSUR, whose objective is to define, specify and implement the European maritime surveillance system (see the security section); EMWARE (Architecture for Embarked Middleware) for analyzing how to use open architecture middleware for implementing communications in distributed systems, especially on autonomous platforms; and SUM (Surveillance in an Urban environment using Mobile sensors) for identifying and studying surveillance capacities in built-up environments and eventually leading to the development of a low-cost vehicle-protection system based on the use of multiple sensors.

Within the same context of EDA-GMV collaboration, 2009 saw completion of the SIGAT and SCORED projects. The former studied the military frequency spectrum allocations required for insertion of unmanned aerial vehicles into the GAT. The second studied the Military Software-Defined-Radio Capabilities including application of cognitive-radio-based spectrum management to the security and defense domains.

In 2009, after a long and thoroughgoing assessment process, the United Nations officially accredited GMV as a UN service provider in humanitarian demining by awarding the technical certificate of the UNOPS Mine Action Team. With the awarding of this accreditation GMV joins a select group of only a score of international organizations that have successfully managed to meet the UN’s stringent demining performance standards.

In 2009 GMV carried out several other projects within this same area of demining and demilitarization. These included verification of “non contamination” by munitions on the land of the old powder magazine of Retamares (Pozuelo de Alarcón), the cleaning of munitions around the Firing and Maneuvering Range of the Base General Álvarez de Castro (San Climent de Sescebes- Gerona) or rectification of the shortfalls in the cleaning and enclosing of the power magazines of Sierra de San Cristóbal (Puerto de Santa María- Cádiz). Several agreements with international firms of the sector were also signed during the year for drawing up or collaborating in various demining projects.

During the year GMV also continued working on the supply of a field hospital under a three-year contract awarded back in 2007 by the Weapons Systems Directorate of the Spanish army’s Logistic Support
Command. The field hospital is a single-unit healthcare facility of modular composition. It is a fundamental part of healthcare backup in the third scale of operations, capable of providing medical-surgical and specialized treatment wherever the army is deployed. Within the project GMV is responsible for designing and supplying the elements making up the various systems, including a telemedicine system.

The PAFAD project was completed in 2008. PAFAD, standing in Spanish for Firing Support Prototype for Artillery Landing (Prototipo de Apoyo de Fuegos para la Artillería de Desembarco), is a command and control system for tactical planning of firing support within an amphibious operation. The system was duly handed over to the Spanish navy and successfully passed all the end-of-contract tests. In 2009 GMV sponsored the technical-scientific expedition, organized by the Spanish MoD, to the Altai Mountains in southern Siberia on the border between Russia, Kazakhstan, Mongolia and China. GMV sent along a team comprising a module of tracking, messaging and communications of PAFAD to improve communications between expedition members and thereby enhance their safety.

GMV also continued to work on the R&D program called “Future Combat System” (“Combatiene del Futuro” : COMFUT) under a contract awarded in 2006 by the Directorate General of Armaments and Material (Dirección General de Armamento y Material: DGAM) of the Spanish Ministry of Defense to a consortium led by EADS. GMV has a key role, being responsible for the design and development of the command and control subsystem and also the communications and information system (CIS), the veritable heart of the system, which provides soldiers with all necessary information for carrying out their mission. A key feature here is “situational awareness”. In 2009 the first version of the 36 communications and information systems was integrated into the future combat system.

GMV also continued its work in developing command and control systems for firing support of the field artillery, the marine artillery and mortar artillery. In 2009 the Directorate General of Armaments and Material of the Ministry of Defense awarded GMV the TALOS project, a command and control system whose objective is to develop a new fire-support prototype, modifying, adapting and broadening the functions of the existing systems. Under this project GMV developed a single system with conditions, characteristics and specifications that can be used by army and navy units alike. Planning and implementation of a command and control system for mortars also began in 2009, on the technical base of TALOS, and also integration of the firing support functions under a single system, favoring coordination among the different echelons.

Also this year the TALOS system was fitted with NFFI capacity (NATO Friendly Force Information), which was then validated with great success in international exercises (Combined ENDEAVOUR 09).

Moreover, the Landing Craft Control System for the Naval Group, developed by GMV and successfully fitted on the amphibious assault ships Galicia and Castilla and on the LCMs of the Spanish Navy, featured in the
celebration of Armed Forces Day in Santander on 30 May. GMV's system allowed crew members in the assault ship Galicia's Combat Information Center (CIC) to control the landing craft during the assault phase of an amphibious operation.

Work was also completed this year on the development of the Mobile ISTAR Operating system awarded by the Directorate General of Armaments and Material (DGAM) of the Spanish MoD. The SEISMO program, part and parcel of Spanish participation in the multinational MAJIIC program (“Multi-sensor Aerospace-Ground Joint ISR Interoperability Coalition”), consists in the design, development and commissioning of an ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) data operating system for processing and working up the various kinds of information and products. In 2009 with GMV participation, the sixth MAJIIC exercises were held in the laboratories of NATO’s Consultancy, Command and Control Agency and the SEISMO project came through all the interoperability evaluations with flying colors.

In 2009 GMV continued its longstanding work on the development of evaluation stations and technical analysis centers as part of the electronic warfare program of The Spanish Defense Staff (EMAD), the Spanish Chief of Staff’s support and command body in charge of defining and developing military strategy and planning and running military operations. In this year GMV provided maintenance services in several of the centers now up and running, with the number of centers maintained by GMV thought likely to increase in coming years.

Also noteworthy this year was the company’s participation in several research projects in the defense area. One good example is the GESFFAS project, in which GMV, under a contract with the Spanish Ministry of Defense, is designing and developing a Frequency Management System for the armed forces and Guardia Civil, which satisfies the spectrum-management requisites laid down by the armed forces.

Lastly, in 2009, GMV joined the Association of Spanish Technology Firms of Aeronautics and Space Defense (Asociación de Empresas Tecnológicas Españolas de Defensa Aeronáutica y Espacio: TEDAE) a new association created with the remit of representing sector companies before government authorities and the various national and international organizations, defending the industry’s common interests, promoting the sector and inter-company collaboration. At this moment GMV forms part of TEDAE’s management board and takes an active part in its committees.
Information and telecommunication technologies, virtual-reality simulation and digital-image processing are all new arrows in the quiver of healthcare professionals, giving them a whole new set of techniques and resources to work with.

GMV draws on the technologies developed for sectors such as defense and aerospace to create groundbreaking healthcare products:

- Surgical training simulators based on virtual reality
- Planning/simulation systems in aid of diagnosis and treatment
- 3D anatomical modeling
- Medical image processing
- Teleassistance systems
- Mobility solutions
- Vehicle management and tracking systems
- Aid systems for disabled people
- Humanitarian aid and emergency infrastructure based on satellite technology
- Early-warning systems of epidemiological outbreaks
- Secure healthcare information systems based on the monitoring of standards
Following more than six years of research and development in computer-simulation and medical-image processing techniques, GMV has now become world leader in arthroscopy training for orthopedic surgeons and is also the world’s only supplier of an intraoperative radiotherapy surgery (IORT) planner.

During 2009 GMV continued to invest in the training simulator for minimally invasive surgery insightArthroVR®, grafting on important new features and significantly upgrading its performance, making it a powerful arthroscopy teaching tool. Simulator promotion activities were stepped up during the year. Many presentations of the product were given and it was also taken to congresses, courses and workshops in hospitals, medical organizations and institutions in Europe, Asia and the Americas. In 2009 GMV took part in such important international congresses as ISAKOS in Japan or AANA in Florida.

These promotion activities, together with official recognition of insightArthroVR® as a useful teaching tool by prestigious institutions, have prompted many hospitals and clinics around the world to set up permanent insightArthroVR® facilities. This group now includes Japan’s Tsukuba University, Denmark’s Hospital of the Region, Sweden’s Karolinska Institute, Germany’s Mainz University, the William Beaumont Army Medical Center, the Southern California Orthopedic Institute and Chicago University in the USA, the UK’s Berkshire Independent Hospital plus diverse FREMAP centers in Spain. Further additions to this fold came in 2009 with the Complexo Hospitalario Universitario A Coruña, Hospital Quirón, the CLINIC of Barcelona, Leicester University Hospital and Bridgewater Hospital of the United Kingdom, Germany’s Mainz University (second unit), Norway’s Sørlandet Hospital HF Arendal, the Department of Veterans Affairs Medical Center, the Philadelphia College of Osteo Medicine, Dartmouth-Hitchcock Medical Center and the Albany Medical Center, the last three all in the USA.

GMV’s collaboration with the Fundación ICOMEM of the Madrid Physician’s Association (Ilustre Colegio de Médicos de Madrid) dates back to 2007 with the signing of the framework contract between the Foundation and GMV for promoting teaching and training activities in the medical field. In 2009 regular virtual surgery workshops continued to be held, based on the use of GMV’s insightArthroVR® simulator. In 2009 collaboration was also kept up with the arthroscopy courses organized by the prestigious ESSKA (“European Society of Sports Traumatology, Knee Surgery and Arthroscopy”).
Hands-on medical training activities loomed large under the Bologna process in 2009. *insightArthroVR®* technology and the results of GMV’s research into virtual reality technology for learning modern surgical skills will help to standardize teaching contents and favor objective assessment of skills.

In 2009 Chicago University confirmed the effectiveness of GMV’s surgery simulator in a publication giving its conclusions on the usefulness of surgical simulation for training residents. It defines *insightArthroVR®* as a tool that can be used for documenting skills under the requisites laid down by the Accreditation Council for Graduate Medical Education (ACGME). The study published in 2009 by the William Beaumont Army Medical Center also came to the conclusion that hands-on practice with *insightArthroVR®* could be just as useful as traditional training practices with anatomical parts for assessing the performance of trainee surgeons.

In 2009 GMV also stepped up its promotion and marketing of *radiance*, GMV’s intraoperative radiotherapy planner. This system is unique and trailblazing at world level, ensuring better planning and documentation of the whole intraoperative radiotherapy process. The system, by means of a previous simulation of the treatment to be given, enables the medical personnel to plan and forecast the decision-making processes outside the pressures of the operating theater, reducing the stress for the doctor and increasing the safety of the whole procedure. It also boosts the information of existing registers, ensuring more feedback for ongoing improvement of the process.

The first demonstrator of the system was presented in the international conference of the International Society of Intraoperative Radiotherapy ISIORT, arousing keen interest and expectation among the market stakeholders. In 2009 GMV took part in many important congresses, such as the international congress of the American Society for Radiation Oncology (“ASTRO Annual Meeting”).

The busy research activity in this project, coordinated by GMV and the Hospital General Universitario Gregorio Marañón, world leader in this specialty, has involved the collaboration of top researchers from the Hospital Provincial de Castellón, Clínica La Luz, Clínica Universitaria de Navarra, Hospital Ramón y Cajal, Complexo Hospitalario Universitario A Coruña, and the universities of Valencia,
Granada, Politécnica and Complutense of Madrid. All this spadework is now bearing fruit with publications in prestigious congresses of the specialty, such as the congress of the American Society for Therapeutic Radiology and Oncology (ASTRO) and the American Association of Physicists in Medicine (AAPM) and is also producing results of great commercial interest. This research work is backed up financially by the Ministry of Industry, Tourism and Trade, the Ministry of Science and Innovation, the Madrid Development Institute (Instituto Madrileño de Desarrollo) and its business group (IMADE) and the Instituto de Salud Carlos III. Diverse public and private institutions have shown a great interest in the results of this research.

Clinical assessment studies of the technology have also been carried out, such as the research project “Evaluation of the feasibility and clinical utility of an intraoperative radiotherapy simulation and planning tool”, led by the Hospital General Universitario Gregorio Marañón and subsidized by the Instituto Carlos III, also involving the participation of the Hospital Provincial de Castellón. In this study radiance was used for planning the retrospective IORT treatment of a group of patients between different hospitals. This study proves the validity of radiance for systematizing, standardizing and increasing the safety of the procedure while also improving training of the specialist. In late 2009 this study spawned the project “Multi-hospital study of simulation and training systems in the optimizing of clinical practice in intraoperative radiotherapy” which hopes to delve further into the standardization of the procedure on the basis of the new tools available.

In 2009 GMV continued to support the healthcare platform Living Lab Salud Andalucía of which it is a founding member. The top priority given by the European Union to the creation of a new innovation culture places the idea of Living Labs and a European Network of Living Labs at the forefront of the European Innovation System.

As regards the application of new technologies to the management of healthcare emergencies, GMV was responsible during 2009 for the design and integration of SAFE, a Europe-wide early warning system of epidemiological outbreaks. The project, completed this year, was carried out in close collaboration with experts of the World Health Organization. Preoperational demonstrations have ascertained its potential for dealing with epidemiological outbreaks, natural disasters and terrorist attacks.
GMV has been participating for some years now in GlobAerosol, a project for measuring the air concentration of aerosols throughout the world. In 2009 a wealth of data was analyzed from the readings of various onboard satellite instruments, which will be passed on to users for pollution control and healthcare purposes; it will also be used in atmospheric and meteorological chemistry models for improving the forecasting of atmospheric phenomena. Research groups were also trained up to apply different dispersion models to the products generated during this project phase, the conclusion being drawn that GlobAerosol has obtained the best products to date.

Within the area of Information and Telecommunications Technologies applied to the healthcare sector, the Spanish Society of Healthcare Information (Sociedad Española de Informática de la Salud: SEIS) turned to GMV in 2009 for setting up its collaborative portal, a tool that converts the SEIS Conference in Andalucia into a totally interactive event with a host of 2.0 applications. The Príncipe Felipe Research Center (Centro de Investigación Príncipe Felipe: CIPF), as an organization belonging to the Valencia Regional Government (Generalitat Valenciana) in the field of biomedical research, also called on the expertise and knowhow of GMV for carrying out a project for the supply and installation of an Intrusion Prevention System (IPS) with the aim of forestalling any unauthorized access to the researchers’ websites, plus a website security consultancy service.

The HL7 association arose in the United States as an idea to promote the use of the international HL7 communication standard. In 2009 the association HL7Spain and GMV reached a collaboration agreement under which the business group became the main, and first, sponsor of the association. The prime aim of the HL7 standard is to promote the use of communication protocols for exchanging information between different healthcare information systems in pursuit of real interoperability between the various healthcare systems and applications. HL7 has a clear international vision. In the US it is used by over 90% of healthcare institutions and now boasts a worldwide network of over 30 affiliate organizations.
One of the most interesting R&D projects taken on by GMV in 2009 in its ongoing strategy to improve healthcare systems was Rehabilita. This is a €15-million CENIT project co-funded by the CDTI with the aim of radically overhauling rehabilitation procedures in their three main forms: cognitive, physical and cardiorespiratory. The objectives of this important project are clear: develop and revolutionize current rehabilitation processes, set up new knowledge management platforms applicable to different healthcare fields, and design and create new rehabilitation devices, technology and contents, thereby offering a new range of services in new scenarios. The main benefits of the project are that it will cut down the rehabilitation period, and hence the patients’ unproductive downtime, while also improving citizen safety and facilitating the creation of a national healthcare system with clear, streamlined costs, thus boosting its efficiency.
ACTIVITIES IN 2009

SECURITY

GMV has been spearheading the development of network security services and technologies and information systems for over 15 years now. GMV provides engineering products and integrated solutions for security, intelligence centers, emergency management and crisis management:

- Engineering, security services and solutions for information networks and systems
- Security auditing
- Security planning
- Unified user management
- Implementation of security management systems
- Security hardening of platforms, networks and services
- Security services (monitoring, detection of vulnerabilities, etc.)
- Backup centers
- Perimeter surveillance and access control systems
- Advanced security systems incorporating new technologies
- Emergency and crisis management systems, “112” emergency call centers, SOS
- Monitoring and management systems for security forces’ vehicles and personnel and dealing with emergencies
- Onboard security and video-surveillance systems for public passenger transport companies
GMV has always maintained a close working relationship with the National Institute of Communication Technologies (Instituto Nacional de Tecnologías de la Comunicación: INTECO) ever since the institute was first set up; this collaboration has involved mainly information system security. GMV soon joined the catalogue of security solution manufacturers of INTECO’s Security Demonstration Center for SMEs. GMV also collaborates with INTECO in its security training courses in León. This relationship became even closer in 2008 with the opening of a GMV work center on INTECO’s León site, thus setting up a new center of excellence in the areas of software quality, security and accessibility, with special stress on product R&D and the development of online services for government authorities, SMEs and the public at large. This ongoing story of successful cooperation opened a new chapter in 2009 when INTECO turned to GMV for certification of its information security management system (ISMS) under the ISO 27001 standard. By obtaining this certification INTECO becomes the first state corporation to set up and certify its information security management system, reinforcing its status as a center of excellence and management role model.

In 2009 the Ministry of Economy and Finance awarded GMV the contract for technology-based security backup services for the Subsecretariat of Economics and Finance. This two-year project has the main remit of covering all the subsecretariat’s information security needs, including consultancy, legal and technological advice plus the running of technology platforms.

February 2009 saw the end of the €-Confidential project, subsidized by the Ministry of Industry, Tourism and Trade as part of the PROFIT program. Its main goal is the development of a platform for hardening the security of sensitive applications such as internet checking of academic records or banking information. The platform set up ensures proper control and trustworthy performance of the most delicate operations, such as data authentication and encryption and passwords.

GMV has been lending assistance to the implementation and commissioning of the communications services and infrastructure of the I*Net Model for the Spanish Ministry of Defense since 2006. In 2009 GMV embarked on a new activity to enhance the performance of this model, phasing in the emergency working network (RENEM in Spanish initials) of the Military Emergency Unit (Unidad Militar de Emergencias: UME) to increase this unit’s communication possibilities and favor its rapid intervention in the event of any emergencies.

GMV has by now built up a wealth of experience in security services for the banking and security sector, on the strength of which it won diverse contracts in this area in 2009.
In 2009 GMV became a key technological ally of the banking group BBVA with the provision of information-security and fraud-prevention services. BBVA also turned to GMV for complete security hardening of the banking group’s ATMs in Colombia and in Spain (a total of 6000 ATMs). Both projects include the supply of checker®, the ATM security-hardening product developed by GMV, as well as integration backup and training for both integrator and client.

SERMÉPA, for its part, a company offering technological, communication and R&D solutions and leader in the means-of-payment sector in Spain, signed an agreement with Dynasty Technology Group for implementing the checker® product and guaranteeing the security of its new Multivendor ATM Software. Also through Dynasty, GMV will supply checker® to over 4000 ATMs of Redbanc, Chile’s most important ATM network.

GMV also won a project this year in an open tender for the supply and installation of a single authentication infrastructure in the Bank of Spain’s IT systems.

In 2009 GMV renewed the managed security service it has been running for the Caja de Ahorros del Mediterráneo (CAM), forging even closer bonds with this bank. The project is based on the provision of security intelligence, incident-detection, correlation and centralization services through GMV’s managed services center.

In 2008 GMV carried out a pioneering initiative, enabling the Regional Council of Castilla la Mancha (Junta de Castilla la Mancha) to obtain in a single process dual certification of its information security and quality processes under ISO 27001 and ISO 9001, respectively. As follow up, in 2009, the Council’s Regional Economics and Finance Department signed a two year contract whereby GMV will provide expert security-related consultancy services.

In 2009 Grupo CIMD, one of the most relevant consultancy and brokerage group in the energy and financial markets, awarded GMV the contract for a consultancy study with the aim of renewing certification of its quality and information-security processes, ISO 9001 and ISO 27001.

GMV is the acknowledged as a leader in the development of network security services and technologies and information systems. On the strength of this leadership position GMV participates in many initiatives to spread its expert knowledge further afield, improve IT security and drive the development of the information society.
In 2009 GMV published the book “Gestión Estratégica de Seguridad en la Empresa” (Strategic In-Company Security Management) with the collaboration of the Association for Promotion of Business E-Commerce and New Technology in the Valencia Region (Asociación para el fomento del comercio electrónico empresarial y de Nuevas Tecnologías en la Comunidad Valenciana: ANETCOM). The book lays down a series of good practices, approaches and useful tools to ensure companies’ IT security and forestall the growing threats of computer viruses, phishing or theft of confidential information.

In 2009 GMV also joined the Innovative Business Grouping (Agrupación Empresarial Innovadora: AEI) created by INTECO in collaboration with the main companies of León’s ICT sector for network security and the information society.

Particularly noteworthy within these initiatives was the development of the AGUIDA solution for managing users’ access rights to information, both in hard copy form and online, centralized in a single console. This solution ensures a more efficient and complete management of an organization’s information and simplifies the management of users’ access rights.

In the area of access control GMV set up in 2009 the new access control system in its Valladolid office. Like the one set up in the head office the previous year this new system incorporates a new infrastructure of turnstiles and readers, the Sócrates application software and a new card design for distinguishing between different types of people (personnel, collaborator or visitor) and determining their respective access rights to specific parts of the building. In 2009 GMV also designed the all-in access control and perimeter surveillance systems for one of the Ministry of Defense’s military intelligence operations centers. The Sócrates version for personnel and material control has also been installed in various ships of the Spanish Navy.

Within the area of emergency and disaster management GMV put the finishing touches in 2009 to its groundbreaking system called osmógrafo (osmograph), which involves fitting a positioning device to sniffer dogs in search-and-rescue operations to find people buried under rubble after a catastrophe. In 2009 the osmógrafo® carried off the prestigious “Galileo Masters 2009” prize in the European Satellite Navigation Competition.
GMV is playing a key role in several security-related initiatives of the European security project GMES ("Global Monitoring for Environment and Security") such as MARISS, LIMES, MARCOAST, RiskEOS, MAGES, SecureSPACE and 2SI, SAFER and G-MOSAIC.

In the MARISS project GMV is in charge of providing maritime security services for Puertos del Estado (Spanish Seaports Authority) and the Guardia Civil and also in providing the service to Portuguese end users, including the Portuguese Navy and the authorities of the archipelagoes of Madeira and Azores. In 2009 the project consolidation phase came to an end, during which the maritime security services have been progressively honed and new information sources have been phased in, such as AIS receivers onboard the satellite.

The object of the LIMES project is to define and develop pre-operational services based on space technology to back up security management in different areas. In 2009 there was close, ongoing liaison with the various system users to identify their needs and also to establish the services to be provided in what will be the first security services within the European Commission’s GMES program. In 2009 LIMES continued to provide security services for various users. GMV, as the party responsible for all land security services, has been culling the necessary feedback from users to phase in improvements and tag on new functions to existing capacities. New satellites have therefore been incorporated, all of which became operational in 2009.

The aim of the RiskEOS project, coming to an end in 2009, is to provide early-warning services to improve risk management in various areas, including floods and spates in high-risk areas.

GMV also worked on two projects for the European Commission’s DG-JLS (Directorate General for Justice, Liberty and Security) in 2009, both coming to an end within the year: SecureSPACE and 2SI, for the analysis of space technologies as a key security elements. The first considers space infrastructure as critical infrastructure underpinning the economic and social well-being of the public at large; the second considers space as a key element for the protection of critical infrastructure of all types: energy, transport, water, communications, etc.

In 2009 two new GMES security projects kicked off. Firstly, the SAFER project aims to implement preoperative versions of the Emergency Situations Management Service and reinforce Europe’s emergency response capacity in the aftermath of fires, floods, earthquakes, volcanic eruptions, landslides or humanitarian crises. Within the project-running consortium GMV’s participation centers on the provision of services.
to deal with flood risk and humanitarian aid in the event of a crisis. Secondly, G-MOSAIC, focuses on service provision for operations management, knowledge of the situation and intelligence for regional crisis.

GMV has been playing a very important role in several projects of the Preparatory Action Security Research (PASR) of the European Commission and security-related Framework Programs such as: ASTRO+ (demonstration of the possibilities of using Space facilities – earth observation, telecommunications and navigation – in Homeland Security applications), SOBCAH (research into the surveillance of border coastlines and harbors in Europe), ISCAPS (real time reduction of the risk of malicious events in crowds of people), GEDCREW (development of a global architecture for the use of geospatial data to improve crisis situations). These projects all came to an end during the year. In 2009 GMV was still working on the WINTSEC project (development of secure wireless communications), due to finish in 2010.

At the start of the year GMV presented a groundbreaking system for in situ monitoring of urban air quality as part of the OSIRIS project, an R&D project of the European Commission for standard monitoring of all types of geographically referenced phenomena based on in situ sensors. Within the consortium led by Thales Alenia Space GMV is organizing the air quality scenario. The objective of this project is to implement intelligent sensor networks while working towards the use of a European information-exchange standard.

Under the security heading of the European Commission’s FP7, work began in 2009 on the ESS project (Emergency Support System). This is an R&D project for improving management and control during crisis situations like terrorist attacks, industrial accidents or natural disasters. The system is based on a real time merger of the various types of field sensors (radioactivity, biochemical, audio/video, meteorological) helping to reduce the uncertainty of crisis situations and reduce their scope. The elements of the ESS architecture will be developed, subsequently integrated and lastly validated in crisis drills. GMV’s role in the project focuses on the design and development of the ESS website portal based on GMV’s palview® technology and Microsoft’s .NET.

In 2009 and also within the European Commission’s FP7, GMV continued working on the COPE project (Common Operational Picture Exploitation) carried out by a consortium including GMV’s Portuguese subsidiary, Skysoft. This is a security R&D project which aims to improve the effectiveness of First Responders in civil crisis management operations. A better view of the apparatus situation by the responders,
firemen, police and the alarm centers will cut down the margin of error and strengthen cooperation as a whole.

During the year GMV won two new contracts in fire detection and prevention, firming up its business position in this area. The first (PYROS), awarded by ESA, involves the development and validation of a fire data processing system. In this project GMV, as project coordinator, will be responsible for definition, development and testing of all tools. The second (FireSmart), awarded by the European Commission within FP7, has the general goal of contributing towards fire prevention by analysing the most important prevention practices and theories. As consortium leader GMV is responsible for general project coordination and leads one of the project’s most important work packages involving the collection and exchange of information between the various organizations working on extinguishing and fire prevention tasks.

To conclude this account of security activities under the European Commission’s FP7, activities continued in 2009 within the MAGES project, whose objective is to analyze the use of Galileo for emergency management purposes. GMV is helping to prepare and fine-tune a series of demonstrations of the system in diverse emergency scenarios. In this year GMV took part in several of the demonstrations carried out under the project and organized the demo held, on Yalde reservoir, which helped to ensure perfect implementation of the established emergency plan.

In 2009 the European Maritime Safety Agency (EMSA) selected GMV as one of the suppliers for each lot of the “framework contract for the provision of IT services related to traffic monitoring applications hosted and operational in EMSA”. This framework contract, divided into three lots, will provide GMV with a potential turnover of about 5 million euros over the following years.

GMV also formed part of the consortium that is developing and implementing the second generation of EMSA’s CleanSeamnet system. The aim of this system is to detect marine oil spills almost in real time in the waters of the European Union and find out who is to blame.

Also within the area of maritime security the European Defence Agency (EDA) awarded to a GMV-led consortium the contract for a study within the MARSUR (“Maritime Surveillance”) program. MARSUR aims to define, specify and implement the European maritime surveillance system (EMS). The goal of this particular study is to specify, design and develop a testbed for integration of the EMS’s main communications system. The nature of both the whole program and this study, plus their
possible synergies with other EU studies, mean that they are being watched with great interest by many European maritime-surveillance and border-surveillance organizations.

To wind up this account of maritime security affairs, the company Mediterráneo Señales Marítimas (MSM) awarded GMV the contract for developing and integrating a remote control system for monitoring the new navigation aid network for the Gulf of Guayaquil in Ecuador. The project involves the supply of 200 flashing beacons and complete remote control of the whole network through a control center developed by GMV. This control center includes an alarm monitoring and management center for remote configuration of all flashing beacons; it also records and displays all alarms that may be triggered during habitual use of the system.

In the field of operational backup for security forces, in mid 2009 GMV was awarded the contract for the supply and implementation of the future “Fleet-management and offence-reporting system for the City of Melilla”. Under this project GMV will provide Melilla’s local police force with an all-in policing system based on GMV’s inhouse development hegeo®, designed for managing public service and emergency fleets.

Lastly, in the same area, 2009 saw the presentation of the results of the study conducted by GMV for the City Council of Gerona. This study involved the setting up of a local 112 emergency call system for managing the city’s police, tow-trucks and video surveillance systems.
GMV has become a leading and trailblazing firm in designing, manufacturing and installing Intelligent Transport Systems based on GPS technology. Originally trading only in its longstanding market of fleet management systems, it has now branched out with new spinoff developments for the maritime sector (AIS systems) and the railway sector (Railway Fleet Management Systems: SAE-R®). GMV's solutions in this field are designed to streamline operations and boost service quality:

- Passenger-transport fleet management systems
- Ticket vending and fare collection systems
- Backup systems for the management of on-demand passenger transport
- Fleet management systems for railway transport
- Transport services planning systems
- Specialist fleet management products and services; municipal services, emergencies, etc.
- Electronic tolling systems
- Public-thoroughfare parking-management systems
- AIS/VTS systems for maritime transport
- Coastal DGPS systems for navigational aid
In 2009 the Public Transport Organization (Entidad Pública del Transporte: EPT) of Murcia region awarded GMV a contract for developing and supplying a multi-operator, multi-fleet management system of a regional character; this contract confirms the company’s number-one position in advanced public transport management systems in this region. The technological platform will unify transport information from the whole region of Murcia, favoring an all-in, across-the-board management approach. It will also provide EPT with descriptive information on the network and active timetables, furnishing the transport operators with a set of shared fleet management services. The fleet management system of the urban buses of the LATBUS firm, a system also developed by GMV in the past, has now been grafted onto the new system.

In 2009 Tranvía de Cádiz a San Fernando y Carraca, S.A awarded GMV the contract for supplying and installing a fleet management system for its urban transport concessions in Cádiz and San Fernando and the metropolitan transport between both cities. This is an advanced multi-fleet management system equipped with the most complete functions as well as a powerful passenger information platform comprising bus-stop information panels and also real time information systems on state-of-the-art website platforms and cell phones.

GMV continues to carve itself out a bigger share of the passenger transport market of Catalunya. In 2009 GMV continued working on the development and implementation of a fleet management system for Transports Pujol i Pujol of Gerona, awarded in 2008, taking in its 14-bus urban fleet in the town of Lloret del Mar and 11-bus interurban fleet. The fleet management system is being integrated with the fare collection system of GMV’s subsidiary, Masisconvi. The system represents another satisfied customer for GMV in the field of Intelligent Transportation Systems in Catalunya. Its growing list of clients here now include such important firms as ATM Barcelona, ATM Tarragona, ATM Girona, TMB Barcelona, TUS Sabadell, Autobuses de Lleida, SARFA Girona, Reus Transport, Mataró, Tarrasa, Manresa and Vilanova i la Geltrú.

In 2008 the Andorra Interurban Cooperative (Cooperativa Interurbana Andorrana) awarded GMV a contract for installing a state-of-the-art, GPRS/UMTS-based fleet management system for urban passenger transport in Andorra la Vella and also for long-haul vehicles. The project, with continuing work underway in 2009, includes an onboard passenger information system and a passenger counting system on each bus of the fleet.

GMV also won a contract from Metro de Madrid for developing an application for optimum planning of its service operation, based on GMV’s optisae® system. This new system will in turn allow Metro de Madrid to enhance the consultancy services it offers to other worldwide metro firms, providing timetables and work shifts that trim the metro
running costs. This project consolidates GMV's position in the world of resource optimization and service planning in the transport sector, which began with the development of optisae® for the company Transportes Interurbanos de Tenerife (TITSA).

Valencia's Metropolitan Transport Organization (Entidad de Transporte Metropolitano: eTM), responsible for coordinating the various metropolitan transport services (metro, urban buses, metropolitan buses, the local train network, Renfe and taxis), turned to GMV for upgrading its website portal. The proposed solution is based on implementation of the Liferay portal administrator and the development, within this portal, of a functionality for importing timetables from Excel templates. By introducing these new features eTM seeks a smoother interaction between the various metropolitan public transport services and the most comfortable up-to-date and user friendly service.

Within the area of advanced electronic fare collection systems for public transport, at the beginning of the year the Guatemala firm Maprisa successfully organized an event for presenting a prototype bus equipped with state-of-the-art fare collection technology supplied by GMV’s subsidiary, Masisconvi. The event was held as part of Guatemala’s passenger transport modernization project, SISTRAM, and was attended by high-ups from within Guatemala’s local authorities, especially representatives from the Association of Urban Transport Entrepreneurs (Asociación de Empresarios del Transporte Urbano: AETU). This event confirms GMV’s position as a beacon of innovation in transport technology in the Central American market.

In 2009 Nex Continental- Grupo ALSA was running a 315 bus fleet fitted with electronic fare collection equipment for onboard vending developed by GMV’s subsidiary, Masisconvi. During the year Nex Continental awarded GMV two new projects. The first involved integrating the monetic system of its BUS-PLUS smartcards, standardized in all fleets of Grupo ALSA, while the second involved fitting GPRS devices in all onboard equipment and automating the data download center.

Midway through 2009 two Metropolitan Transport Consortia were set up, one in Jaén and the other in Almería, with GMV playing an important role in both consortia through its subsidiary Masisconvi. GMV completed the whole fare collection range of the company SURBUS, which runs the urban service of Almería, while also updating the equipment of several operators of the Jaén consortium. The new cards to be used in both consortia represent an improvement on the transport network services and a cost-saving for users; they work as single cards in any metropolitan area of Andalucía with a region-wide recharging network.
In 2009 GMV launched the technological solution called ‘Grúa Express’ (Express Tow Truck) for Madrid Movilidad, the company in charge of removing badly-parked vehicles from the public thoroughfare in Madrid. Up to now traffic wardens or municipal police had to be on the spot before the vehicle could be removed. With Grúa Express this is no longer necessary. Data and photos are received in the central office and the reported infraction is then dealt with remotely, thus saving time and improving the efficiency of the vehicle removal service.

Throughout 2009 GMV continued to work on the design and development of the On-Demand-Transport system, promoted by the Regional Ministry of Public Works and Procurement of Castilla y León, an original and trailblazing system in Europe that allows an efficient and effective public transport system to be set up in farflung country areas with a low population density. GMV’s solution consists of a real time technological platform including onboard GPS equipment with receivers and a GPRS data communication modem fitted on the vehicles, interactive information panels in the various localities and website tools for booking the bus journey. As well as improving the public passenger transport system and making it viable in country areas, this system also encourages people to settle down in such areas and increases the quality of life and well-being of the people already living there.

During 2009 several upgrades were phased into the GMV-developed and -operated Moviloc® service for web-based fleet management and tracking. These improvements, involving both the central platform and peripherals, were brought in to cover all the needs of an increasingly diverse portfolio of clients, adding up by the end of 2009 to over 4500 vehicles. One of the most important of these improvements was connection to the digital tachograph for remote downloading of files, temperature sensors and door opening, the panic button and also the various tools for displaying and handling all the former. This has further boosted the already considerable attraction of Moviloc® for sectors such as freight transport, security, the transport of living animals or control of concrete quality, etc.

An especially important development is the specialization of Moviloc® for the concrete sector. By fitting the standard equipment included in Moviloc® and connecting it to the concrete mixer’s pressure gauge, flow meter and drum rotation sensor, concrete manufacturers can gauge the quality of the cement mixing in real time, find out about any delivery delays, calculate how much concrete was delivered on each site, tally the delivery notes with each trip, etc. This new development meets the concrete quality traceability requirements laid down by the European standard EHE 08.
After these new developments one of the biggest concrete manufacturers in Europe, HANSON, turned to Moviloc® as the most robust and trustworthy product for guaranteeing traceability of its concrete quality in the plants of Zaragoza and Zona Franca. Throughout 2009 it fitted its vehicles with the complete range of necessary sensors for culling data from the cement mixer (flow, hydraulic pressure and drum rotation), using Moviloc® for monitoring the daily performance of its fleet.

During 2009 Moviloc® also developed specific applications geared towards driving safety (speed analysis report) and the waste collection sector, becoming a member of REPACAR, the Spanish Association of Paper and Cardboard Recovery, and a recommended supplier of that association.

GMV also developed during the year several tracking projects for specialist fleets with implementation of its Moviloc® system for diverse clients. For example Maitours, a company specializing in passenger-transport vehicle hire with driver, fitted Moviloc® to all its vehicles running on IBERIA’s crew transport service between their homes and Terminal 4 of Barajas Airport. This gives fleet managers instant notice of any delay or incident that might crop up on the vehicle routes, allowing them to solve the problem as quickly as possible. At the moment the Moviloc® service is being used by a total of 75 vehicles covering a daily 400 Km route between Terminal 4 and the metropolitan and outlying area, all of which have been fitted with the A30 onboard equipment and the C10 message console.

In 2009 GMV continued working on the project for the company GES (Global Energy Services), which further swelled Moviloc®’s bulging client portfolio in 2008. GES runs a fleet of about 750 windfarm-maintenance vehicles. GMV also continued working on the project for the armored vehicles of the security firm Grupo Norte in its 9 offices spread throughout the whole country; this contract shows that Moviloc® is also regarded as a viable and robust option for such a high-risk sector as cash transportation. It includes the installation of diverse peripherals on the mobile equipment, such as door-opening sensors, acoustic alarm and panic button.

Finally, GMV’s Moviloc® service clocked up another satisfied customer in the waste collection sector when SERALIA, of the BEGAR group, extended its Moviloc®-fitted fleet in 2009 to 75 vehicles. This company uses Moviloc® tools to keep its clients (local and provincial councils, etc.) abreast of the waste collection routes covered, informing them of any incidents encountered and providing a journey streamlining mechanism.
In the area of railway transport Renfe in 2009 awarded GMV the contract for supply and installation of a new onboard communication and control center platform for its local and medium-haul services. This platform keeps track of each train at each moment and reports any operation incidents that may crop up. This contract, in conjunction with those signed with the railway operator in 2007 and 2008 for the high-speed AVE trains and long-haul, means that GMV is now supplying onboard platforms for 100% of Renfe’s fleet, totaling over 1700 trains.

SAE-R®, the railway fleet-management equipment developed on the strength of the previous contracts awarded by Renfe, passed in 2008 the certification tests under the ruling railway standards, establishing this system as a beacon for the rest and paving the way for more progress in the railway world during 2009. This equipment, designed in light of GMV’s wealth of experience in the public transport market, is shaping up as a standard to be incorporated in future railway projects, not only of trains but also trams and light rail transit systems.

Within FP7 and run by the European GNSS Supervisory Authority, work continued on the STANDARDS project this year. GMV is coordinating the study of the standardization aspects of the use of GNSS in the road sector and in other fields, including intermodal transport and emergency management.

This time within FP6, the MENTORE project continued in 2009. Its objective is to encourage the use of GNSS technology for tracking and tracing purposes in EU regulated domains. In this project GMV is responsible for the pilot livestock transport tracking system, which has to abide by the applicable Council Regulation 1/2005.

In 2009 GMV participated in the development and implementation of diverse solutions and projects involving the use of satellite positioning systems for electronic toll collection purposes, as well as infraction detection projects.

In this area in 2009 GMV began development work on one of the two projects awarded by the European GNSS Supervisory Authority (GSA) in the first Galileo FP7 R&D project call for the road sector. The GINA (GNSS for INnovative road Applications) project, involving the participation of 12 European firms led by GMV, will use the position integrity system as a key part of a nationwide road-pricing scheme. The project includes a large-scale trial, fitting 100 vehicles with the I-10 units, designed and developed by GMV; these vehicles will then run on Dutch roads for 6 months.
In 2009 GMV set up a pilot trial of the ridesharing scheme developed by GMV itself under the aegis of the MARTA research project ("Automotive Mobility with Advanced Transport Networks"), which forms part of the Spanish government’s CENIT program. GMV’s role in this project is to develop the services that drivers will be able to use in the future: sending of information in the event of an accident, monitoring tailbacks and traffic congestion, precise tracking of vehicle fleets, pay-as-you-drive (PAYD) schemes for insurers and accident prevention.

In the maritime transport area GMV was selected by the Autoridad Portuaria de Cartagena (Cartagena Harbor Authority) in 2008 for supplying an Automatic Identification System (AIS). The project included a study of AIS coverage in waters of the port zone, integration and deployment of an AIS base station, together with the AIS ASM control center plus storage and working up of all information culled by the system. During 2009 the project entered its guarantee phase, within which the quality of GMV’s supplied system is monitored by means of ongoing client liaison.

Also within the area of applications of AIS technology to the maritime sector GMV continued its ongoing work under the contract signed the year before with REPSOL for the supply of an AIS network in the port of Tarragona. This contract included deployment of an AIS ground station in REPSOL’s jetty, an AIS AtoN (Aids-to-Navigation) in the single buoy mooring plus the necessary applications for monitoring the buoy and maritime traffic in the coverage area of the AIS base station. During 2009 GMV stockpiled the supply and trained up the personnel who are going to work in REPSOL’s Tarragona site. It then proceeded to set up the AIS ground station in REPSOL’s jetty while also installing the software for database recording, communications control and monitoring of maritime traffic.

2009 was also the third year running of work on the contract awarded by Puertos del Estado (Spanish Seaports Authority) for technical assistance in Spain’s DGPS (Differential GPS) network for maritime navigation. GMV is providing services of supervision, technical backup and data management of this network, made up by 18 differential-correction transmitting stations, 6 zonal control centers and a national monitoring center in the Puertos del Estado headquarters in Madrid. In 2009 a RINEX data download service was set up to receive the data from the 18 coastal stations involved in the project.

Also within the field of DGPS networks for maritime transport, GMV, in collaboration with its Malaysian partner Astronautic Technology Sdn Bhd (ATSB), completed the work of setting up Malaysia’s coastal DGPS network, a contract won in 2007 from the Peninsular Malaysia
Marine Department. The network is made up by 4 transmitting stations, 2 remote monitoring stations and a control center. As well as coordinating the installation of the various systems, GMV also oversaw a series of field tests with data taking during navigation through the strait of Melaka and the waters of Singapore, conducting a real-time desk-based study of the performance of the system set up by GMV and ATSB. The project now enters guarantee and maintenance phase.

This year also saw the start of the ARIADNA project, an FP7 R&D project that aims to design a new concept and build a new series of navigation support systems to allow optimization of the maritime infrastructures, safe navigation in ports and access areas with dense traffic (such as rivers, channels, lock access areas and traffic separation areas), thereby guaranteeing efficient and environmentally-friendly operations. Within this three-year project, coordinated by ISDEFE, GMV is leading the development and integration of the system while also collaborating in the design and testing of the systems together with leading companies of the maritime sector.

Finally, it also worthy of mention that, throughout 2009, GMV exhibited its wares at some of the most important transport events, along with the main organizations, operators and companies of the sector. These included the world congress of the International Association of Public Transport (UITP) held in Vienna (World Congress and Mobility & City Transport Exhibition), the International Forum of ICTs in the Automobile Industry, the ITS World Congress in Stockholm, ITS Poland in Warsaw, TransNav’09, the 8th International Navigational Symposium on Marine Navigation and Safety of Sea Transportation in Gdynia and Transexpo in Kielce (Poland), among others. During these events GMV presented its whole array of solutions for the transport market, such as its fleet management systems for public transport (for both urban and regional organizations), the on-demand-transport solutions for improving the efficacy and profitability of public transport in the countryside as well as its electronic fare collection systems.
ACTIVITIES IN 2009

TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES FOR THE PUBLIC SECTOR AND LARGE CORPORATIONS

TELECOMMUNICATIONS
GMV works closely with the main operators and providers of telecommunication services, offering bespoke services and solutions to meet their particular needs:

- Platform reengineering and development, consultancy
- SS7/IN voice services
- Development of SIP/IMS convergence services
- High performance messaging services
- Detection of terminal capacity and service use
- Core-Network and services dashboard
- Developments on handhelds
- Solutions for monitoring compliance with the data protection laws
- Fraud control solutions
- e-nmediato: management and control of data communication
- Integration solutions for mobile virtual network operators
- Capacity Planning
- Publicity campaign management and planning platform
- Internet publicity campaign monitoring platform
- Payload reconfiguration systems for satellite operators
- System consolidation and virtualization
- ITIL process backup tools
- 24/7 backup

INFORMATION TECHNOLOGIES FOR THE PUBLIC SECTOR AND LARGE CORPORATIONS
GMV provides the most technologically advanced ICT products to improve the processes and innovation capacity of leading organizations. Government authorities, major corporations and banks all turn to GMV sure in the knowledge of receiving secure solutions based on the experience of specialist professionals:

- Corporate mail and agenda solutions and synchronization with mobile devices
- E-government solutions
- Email solutions
- Content management platforms
- Intranet platforms, portals, document management
- E-learning platforms
- Mobility and messaging solutions
- System and infrastructure architectures
- Process consultancy and technology consultancy
- Information network and system security
- Open source software
For yet another year GMV has enjoyed the status of “Best Partner” of Vodafone, a technology ally for setting up its product plans and campaigns, inputting the detection of terminal capacities and use of services in real time, as well as the new service subscription and provision models. The development of terminals linked to the new flat-rate schemes also facilitated the offering of more interactive and user-friendly services. GMV has therefore steered its platforms towards the creation of access channels such as Widgets as well as traditional access such as USSD or SMS or integration with publicity and promotion channels. In 2009 GMV continued to provide and develop the centralized statistical system for network operations, allowing any incident to be detected in real time in a preventive manner, processing a vast amount of data adding up to several Terabytes of information.

In 2009, GMV spread and diversified its client base, adding important new accounts like ONO, leader in advanced communication and training services. Collaboration includes the develop and implementation of critical information systems, the hosting of infrastructure plus round-the-clock backup and operation.

Telefónica, one of the world’s leading communication operators, once again turned to GMV, awarding it the contract for the analysis service of the capacity and yield of information systems, prolonged for the fourth year running, while TMN, the mobile operator of group PT and leader of the Portuguese market, continues to place its trust in GMV for service provision in the areas of bespoke systems, quality services and validation of critical applications.

GMV’s relation with the Havas media group, one of the most important news agencies in the advertising world, dates back to 2007. In these three years GMV has been providing this group with services in the development and implementation of critical information systems while also bringing the underlying infrastructure into line with these new systems. In 2009 Havas group turned to GMV for phasing in the new developments in the ArtemisTM marketing support system and also in other platforms used by group companies in Chile, Mexico, Portugal and Spain and their corresponding backup and maintenance services.

Some years ago GMV developed for Renfe its web portal and, later on, an instant messaging platform based on GMV’s e-smovil® product. In 2009 the platform was broadened and reinforced with the development of an SMTP interface based on new GMV products, esmessaging and eslocator, which will allow unified management of the various communication channels available on Renfe: email, SMS, MMS and even voice services.

GMV also continued to work on worldwide deployment of its atlas GMV product. The unique feature of this product is that it allows companies and public authorities using BlackBerry terminals to use corporate email architectures based on open source software.

GMV’s wealth of experience in developing website portals, email architectures and integration of content management systems for universities won it new contract awards in 2009.

In 2009 the Autonomous University of Madrid (Universidad Autónoma de Madrid: UAM) felt the need to upgrade and modernize its email
architecture. After preliminary consultancy, GMV was chosen to provide UAM with the suitable email architecture, meeting the required characteristics of virtualization, high availability, scalability, performance and administration.

Valencia University also awarded GMV the contract for setting up a web content management system and creating its new web portal WUV 2.0 within its Strategic Plan 2008-2011. The WUV 2.0 portal is born with the aim of becoming mainly a collaborative tool. Across-the-board involvement of all the university’s units will therefore be sought throughout, as well as the heads of centers, departments, research organizations, foundations, etc. The portal will allow each center to have its own personality within an overarching corporate identity for the whole university.

At regional government level GMV has been collaborating for some years now with the Regional Council of Castilla y León (Junta de Castilla y León) in various projects to do with the Single Administrative Information System (known by its Spanish initials of SIAU). Since 2004 GMV has been developing and updating this system, phasing in new technology to make it more user friendly. In August 2009 the Junta’s new corporate portal was launched, for which GMV has carried out new applications and improvements, making sure that the Junta continues to have one of the most modern and advanced websites.

The City Council of Mataró also chose GMV for renewing its corporate website. The web 2.0 functions fed into the system are geared towards e-government, the creation of participative spaces for citizens and the promotion of the city. GMV’s development also ensures total accessibility and navigation for the physically or sensorially handicapped.

GMV also forged even closer bonds with the Regional Council of Andalucía (Junta de Andalucía) in 2009 with the award and prolongation of several contracts.

Firstly, GMV developed the portal of the Virtual ITC Coordination Office for the Regional Ministry of Innovation, Science and Enterprise of the Junta de Andalucía. The aim of this portal is to show all relevant information on the Junta de Andalucía’s IT policy and serve as an instrumental tool for the Directorate General of Innovation and Administration (Dirección General de Innovación y Administración), enabling the regional ministries and bodies of the Junta de Andalucía to connect up to each other. Also in 2009 GMV broadened the functions and improved interaction with other agenda systems of the Junta de Andalucía’s Corporate Agenda System (Ag@ta).

GMV also developed for the Junta’s Regional Environment Ministry a support and control system for integrating the information of the Andalucía Environmental Information Network (Red de Información Ambiental de Andalucía: REDIAM). For the Regional Ministry of Public Works and Transport GMV developed a horizontal information system to the services it currently possesses for the management of regular transport of passengers of special uses and for the management of the Juntas Arbitrales de Transporte (Transport Claim-Arbitration Boards).

In the infrastructure area GMV in 2009 renewed and improved the services and hardware and software infrastructure of EGMASA, a public corporation of the Regional Environment Ministry of Andalucía and
also provided technical assistance for the Regional Health Ministry (Consejería de Salud de la Junta) for the publication of website applications.

During this year GMV also provided different security consultancy and diagnosis services for the Regional Ministry of Justice and Public Administration (Consejería de Justicia y Administración Pública), the Regional Ministry of Economics and Finance (Consejería de Economía y Hacienda) and the Andalucía Society for the Development of the Information Society (Sociedad Andaluza para el Desarrollo de la Sociedad de la Información: SADESI).

In 2009 GMV joined the fold of ICT providers of the Generalitat de Catalunya. In 2008 the Catalan Government approved the ICT services framework agreement award scheme for the departments of the Catalan Government and the organizations participating in the central procurement system. The aim of the scheme was to shortlist suppliers in various fields of the ICT services so that the whole set of departments, organizations and public authorities can run their own tenders in a uniform contractual framework. GMV was approved and selected in six sections, obtaining a maximum score in two of them.

Within the activities carried out for Portuguese government authorities, 2009 saw the end of the process of updating and adapting the Business Intelligence solution developed by GMV for Lisbon City Council to serve as analysis support for the city’s town-planning work. Another project that came to an end in the year was the development of a new and complex solution for managing processes, documents and files through an intranet for the Technology and Science Foundation (Fundación para la Ciencia y la Tecnología: FCT). The success of the project, which has included consultancy and reengineering work, will spawn new activities this year for the support of the Foundation’s business processes.

Work also continued during 2009 on the business solutions based on geographical information systems for the City Council of Lisbon, such as the activity on the Lismapas application for other marquee clients such as Eurocontrol and for other new clients such as the Institute for the Conservation of Nature and Biodiversity (Instituto da Conservação da Natureza e da Biodiversidade: ICNB), which awarded GMV a contract for designing a database system with the SIPNAT project for modernizing the natural heritage information system.

GMV continued to collaborate on the diverse portals associated with the events run by João Lagos. In the area of document management the agreements formalized with Xerox began to bear fruit with a series of product maintenance and development projects.

For the central Portuguese government GMV started working on products and services in the area of information systems for the consolidation of technological infrastructure run by the Administrative Modernization Agency (AMA).

To wind up this account of activities for government authorities, in 2009 the River Duero Water Board (Confederación Hidrográfica del Duero) awarded GMV a contract for incorporating cartographic information into the special data infrastructure node of its Hydrological Plan Information System (GIS-Duero). The project will help to improve and extend the information input channels and display the data properly.
Right from the word go GMV has made its personnel policy one of the lynchpins of its whole business project. In GMV we are convinced that a staff of top professionals is the best way to gain a competitive edge over the rest. GMV therefore aims to attract the best professionals and then ensure they stay with the company to pursue their careers and realize their full potential. GMV offers them a unique teamwork environment where their talent, imagination and mettle are continually challenged and stimulated.

In line with this overall policy GMV has been applying a human resources strategic plan based on three mainstays: a thoroughgoing personnel-selection policy, a stable environment in which to pursue their careers and a continuous top-up training plan.

Attracting and nurturing top talent is a long and difficult process. We have therefore been determined to hang onto this staff during the slump to avoid having to repeat the whole hiring and training process from scratch when the upturn comes. By dint of a longsighted commitment to technology and innovation, diversification of the business into various sectors and breaking into new national markets, GMV has indeed managed to ride out the crisis without shedding staff. This places us in a fine position to renew our economic growth in the future. GMV closed the year with 1024 employees; 85% have university degrees and their average age is about 32.

GMV has always pursued a painstaking personnel-selection procedure and has been equally determined to provide this talent with a stable environment for developing their careers. On the strength of this policy, and despite the current economic juncture, it has managed to maintain a high level of indefinite-term contracts, a rate of about 88% in 2009. To meet our commitment to our employees, we have set up personnel policies that guarantee equal treatment of all our staff, from the job-selection process and then throughout their whole careers in the company. In fact 25% of GMV’s staff are women, who also represent 20% of the management staff.

One of the main planks of the human resources policy is training, since the company’s business lines call for specialist and bang-up-to-date knowledge of the most advanced technologies. To develop the professional skills of its employees GMV works with an integrated training model to pinpoint its employees’ knowledge and skills. In all about 517 training courses were held in 2009 on both an individual and group basis, adding up to a sum total of 12,896 training hours involving over 70% of GMV’s personnel.

GMV liaises permanently with study centers and universities throughout the world, either by way of temporary agreements, with grants to help
university students join the job market, or more permanent project-based collaboration agreements. This habitual liaison with universities has been reinforced by an increasing participation of GMV in various employment forums, both at home and abroad.

GMV is a member of the collaboration program between the Portuguese government and Carnegie Mellon University (CMU). The main aim of this program is to boost the scientific and technological capacity of Portugal’s scientific institutions and also up their profile on the world stage.

In the year GMV continued with its training, research, development and innovation work, running courses, seminars and lectures. The main vehicles for this activity were, firstly, the GMV Chair, a joint academic initiative set up between the Polytechnic University of Madrid (Universidad Politécnica de Madrid: UPM), the Higher Technical School of Aeronautical Engineers (Escuela Técnica Superior de Ingenieros Aeronáuticos: ETSIA) and GMV, and secondly the Aula CriptoRed GMV UPM (UPM GMV CriptoRed Classroom). Both chairs kept up a brisk activity in 2009, holding various seminars, courses and debates involving the participation of professors and leading experts.

GMV participates in several initiatives to nurture budding talent, either single-handedly or in collaboration with other institutions. Pride of place here goes to the Best-GMV Engineering Competition, a joint initiative of the Board of European Students of Technology (BEST) the Polytechnic Universities of Catalunya, (UPC), Madrid (UPM), Valladolid, the Universidad Carlos III de Madrid and GMV, which aims to boost the practical knowledge and skills of students and encourage team working among engineering students.

GMV’s unwavering commitment to the development of talent in the technological field prompted it in 2009 to embark on a series of activities designed to foment an interest in engineering and technology among the very youngest.

In 2009 GMV was again one of the main sponsors of the First Lego League, an international robotics competition for children, born as offspring of the FIRST and LEGO® alliance in 1988. Such has been the resounding success of this competition in previous years that the challenge set in 2009, Climate connections, involved over 1200 participants in eight different venues.

For the second year running GMV also sponsored the Valdemates event again in 2009, an initiative of some secondary schools in Madrid, which advocates a fun-based approach to mathematics to encourage students to take up the subject.

Finally, mention must also be made of GMV’s sponsorship of the robotics workshop of the Miguel Hernández School, Complubot, a team of budding young technologists who develop and build their own robots. Among other activities this team takes part in diverse international competitions with excellent results.
QUALITY

The commitment of the firms of business group GMV to their clients, their concern for excellence, innovation and continual improvement are all reflected in GMV’s management processes.

The sheer technological complexity of all GMV’s developments calls for the highest quality standards in all its processes. The various firms of GMV are therefore all in possession of the quality certificates to match their areas of activity and specialization.

The subsidiary GMV Aerospace and Defence S.A.U has certificates under the requisites of the ISO 9001: 2008 standards. It has also been awarded additional specific certificates to cover its various areas of activity, such as EN 9100:2003, based on ISO 9001:2000 and specifically designed for aerospace developments, or Pecal 2110 and 2210, specific certificates for defense activities. Since 2005 it has formed part of the small and exclusive club of firms that have obtained level 3 maturity under the CMMI model (Capability Maturity Model Integrated), a prestigious international certificate granted by an independent body after the most thoroughgoing evaluation. Measures were also stepped up this year for obtaining the highest level of this demanding quality-assurance model with an audit planned for September 2010.

The Quality Management System of the subsidiary GMV Soluciones Globales Internet S.A.U also abides by the ISO 9001:2008 standard. GMV Soluciones Globales Internet also boasts an information security management system certified under standard ISO 27001, with a nod towards ISO 27002, which takes in the offices of Madrid, Seville, Barcelona and Boecillo and the East Coast Office. In 2009 this subsidiary certified the support and maintenance services under UNE-ISO/IEC-20000-1, certifying the IT services management system (ITSM) for the support and maintenance of HW/SW systems based on information technologies and the communications provided from head office. This subsidiary is also making final preparations for obtaining business continuity certification in 2010.

The subsidiary GMV Sistemas S.A.U. has likewise been certified under ISO 9001:2008, the standard guaranteeing that the subsidiary’s Quality Assurance System conforms to the requirements of the standard UNE-EN ISO 9001:2008. This system covers all the following: the design,
development, production and after-sales service for the sectors of transport, remote control and satellite navigation, including the supply, installation and management of onboard equipment in trains and web-based fleet management and tracking services.

The quality management system of GMV’s Portuguese subsidiary, GMVIS Skysoft, S.A. meets the requisites of the standard ISO 9001: 2008. During the year efforts were stepped up to obtain level 3 of CMMI (Capability Maturity Model Integrated).

Lastly, GMV has undertaken to carry out its activity within the parameters of sustainable development, keeping a proper control over all the environmental aspects involved in its work. Hence the fact that the Environmental Management System covering the activities in GMV’s central Madrid site and the offices of Valladolid and Seville conforms to the UNE-EN ISO14001: 1996 standard.

GMV is mindful of the fact that quality assurance is not simply a matter of obtaining a given certificate or title; it needs to pervade the daily work of the whole personnel. The organization to a man is pledged to the goal of achieving top quality in all its products. They often participate in the design of procedures and regularly attend all necessary courses so that they fully understand GMV’s quality system and make sure it is applied in all the work they do.
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ANALYSIS OF THE
FINANCIAL SITUATION
THE COMPANY’S OVERALL FINANCIAL PERFORMANCE

GMV closed the financial year 2009 with a turnover of about 100 million euros, representing an increase of about 9% on the total gross revenue of the previous year.

In 2009 GMV posted a net post-tax profit of 4 million euros, representing a 5% rise in the net results figure. Stockholders’ equity thus increased by about 10% to more than 31 million euros. As for its end-of-year valuation, GMV recorded a 15% ROE with a net profit sales ratio of 4% and an asset turnover of 5%.

The net financial debt figure recorded in the balance sheet is below 21 million euros, still well within the maximum gearing ratio allowed by the financial structure. Most of this debt financed the increase in fixed assets after phase 3 enlargement of the firm’s head office in Tres Cantos, funded by means of a property leasing transaction.

The financial leverage rose slightly, keeping the company’s financial structure within very sound creditworthiness limits, with low insolvency risks and a high immunity to any rise in interest rates.

Certain changes in the financial structure, already evident in previous years, followed the same trend in 2009: reduction in the average weighted cost of the capital employed while the average yield of operating assets held steady. The ratio of net profit to shareholders’ equity held firm and economies of scale were enhanced by the growing size of the business.

In terms of the financial evaluation, very positive end-of-year values were still observed in the 2009 liquidity and solvency ratios (1.38 and 1.92 respectively), with hardly any change in the debt to equity ratio. This means that the financial structure is still ideal for harnessing capital-intensive growth opportunities calling for a higher degree of financial leverage.

As a result of the growth of total assets, the relative weight of working capital declined in relation to total assets employed, despite the recorded increase in working capital used.

As a result of all the above the financial statements continue to show a growth of sales, 7% this year. The increase in working capital investments released a lower cash flow, as a result of the growth-driven tying up of capital in new clients.

The consolidated effective tax bill for 2009 fell from the previous year’s figure, standing at about 15%.

These figures clearly show that the company is going through a business cycle of moderate and profitable growth on a more mature basis with normal needs for external financing of working capital. The recorded growth rate still falls within the sustainable growth rate limits marked by the growth in ROE and is conducive to a controlled debt scenario and a better harnessing of investment opportunities in other business, which can be tapped into as quickly as market conditions allow.

The net result of all the above is that the operational cash flow stands at 8.2 million euros, and the consolidated EBITDA rose above 10 million euros.
DISTRIBUTION OF RESULTS

GMV maintains a conservative self-financing policy. Indeed it has no dividend distribution plan. As a company that trades in the hi-tech market, GMV has plowed back its profits to build up the business group, reinforce its financial structure and ensure its financial autonomy. These retained profits have enabled it to step up its investment in its own inhouse research and development projects. GMV's total cumulative investment in its own R&D projects now adds up to over 18 million euros.

BUSINESS UNITS AND SUBSIDIARIES

GMV's business units grew out of a diversification process to broaden the customer base and increase revenue in other related markets where the Group could offer its technological products. This process has had a beneficial effect on the revenue mix and has also helped to spread market risk. This policy has been maintained and combined with an effort to break into new geographical areas. The set of companies making up GMV has been maintained unchanged, with business units taking the legal form of joint stock companies (sociedades anónimas). This is thought to be the best way of bringing their human, financial and material resources into line with the specific needs of each business and thus ensuring their long-term viability.

The controlling stake has been maintained in the US company GMV Space Systems Inc, set up with the aim of promoting our range of products and services in the target market. The commercial activities taken on have shown a satisfactory development, chipping in with their own contribution to the overall revenue figure. This profitability, albeit still modest, looks set to blossom in the coming years.

In May 2007, GMV acquired a controlling stake in the company Masisconvi S.A. In January 2009 this stake was increased to 99.69%. Masisconvi S.A. has gradually been knitted into GMV's operational structure: commercial, production and financial operations and resources. The company was fully integrated into the group during the previous year.

### MAIN FINANCIAL FIGURES

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total turnover</td>
<td>91.5</td>
<td>100.0</td>
<td>9.2%</td>
</tr>
<tr>
<td>NOPAT</td>
<td>5.8</td>
<td>5.4</td>
<td>-7.4%</td>
</tr>
<tr>
<td>Operating Cash Flow</td>
<td>7.6</td>
<td>8.2</td>
<td>7.9%</td>
</tr>
<tr>
<td>EBITDA</td>
<td>10.0</td>
<td>10.2</td>
<td>2.1%</td>
</tr>
<tr>
<td>EBIT</td>
<td>6.6</td>
<td>6.0</td>
<td>-9.0%</td>
</tr>
<tr>
<td>Net Income</td>
<td>4.2</td>
<td>4.0</td>
<td>-4.9%</td>
</tr>
</tbody>
</table>

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Since October 2007 GMV has also held a 100% stake in the company Skysoft Portugal Software e Tecnologias de Informação S.A, (which changed its name to GMVIS Skysoft S.A in 2009) now fully integrated into the group’s operations.

The company GMV Soluciones Globales Internet S.A.U provides the legal structure for the network engineering and applications activities while GMV Sistemas S.A.U does likewise for our business unit dealing with transport- and logistics-engineering, whose target market now includes electronic fare collection systems after the Masisconvi takeover. GMV Aerospace and Defence S.A.U. still gives legal coverage to the space and defense activities in Europe and GMV Space Systems Inc. occupies an identical position in the US market. GMVIS Skysoft S.A, for its part, exploits GMV's target-market opportunities in Portugal.

In June 2009 Grupo GMV established itself in Poland by setting up the company GMV Innovating Solutions s.p. z.o.o. based in Warsaw, to give the firm a strong foothold for exploiting business opportunities in Eastern Europe.

In September 2009 Grupo GMV also set up a subsidiary in Germany to be run under the tradename of GMV GmbH with head office in Darmstadt (Frankfurt). The idea is to harness business opportunities in the German space market.

To support the business growth in Asia, Grupo GMV opened two commercial representation offices, one in Korea and the other in Malaysia.

Lastly, Grupo GMV also set up a specialist company in physical security systems in 2009, trading under the name of GMV Seguridad Integral S.A.U. with the main aim of drumming up business in the home security market.

These initiatives are expected to produce a healthy revenue mix in Grupo GMV in the short term while also spreading business risks.

Above them all in the organization chart comes GMV Innovating Solutions S.L. acting as parent company, supporting the whole value chain and laying down the strategic guidelines.

This organization model has proven to be fruitful in terms of business, resource efficiency, profitability and viability. With this business strategy, based on specialization in the various production lines and designed to make the processes more productive, GMV has been able to record a sharp growth in its whole set of activities.

**CHANGES IN THE CORPORATE STRUCTURE**

As explained in the first section of this annual report, significant corporate changes were made in the year, resulting in a restructuring of the whole business group GMV with the scope and content described in said section.
ANALYSIS OF THE SUBSIDIARIES’ PERFORMANCE

We recorded a rise in net income in all GMV’s business lines, particularly in the transport and logistics telematics market. There was also an improvement in the standard operating margin in the rest of the business segments, albeit with a somewhat uneven distribution.

In this year GMV’s subsidiaries have thus been able to keep up a satisfactory level of operational profitability in a turbulent and fiercely competitive environment that has tended to squeeze profit margins. We have recently introduced some new products and we plan to launch more in the future. We are also looking to expand our business to geographically scattered markets. The general gross margin may be trimmed in the future, due firstly to this expansion in products and markets (some of these activities having tighter margins) and secondly to the constant downward price pressure exerted by the competition in certain business areas. To a certain extent these new products and services are still in start-up phase. This calls for an outlay both to develop the new product and to gain a foothold in the new market. We are confident that this will then usher in a phase of rapid growth with brighter financial results. As for the performance in 2009, the space and defense business put in a very good showing, recording a 2.5% growth in gross turnover and making an additional input of 1.3 million euros to the business increase. The areas of e-solutions and security have held steady. The area of transport and logistics clocked up a 7% increase in gross turnover, with an additional contribution of 1.1 million euros to gross sales.

BREAKDOWN BY BUSINESS SEGMENT

<table>
<thead>
<tr>
<th>Revenues Streams (segment) (gross sales)</th>
<th>2008</th>
<th>% total</th>
<th>2009</th>
<th>% total</th>
<th>delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace &amp; Defense</td>
<td>52.4</td>
<td>59%</td>
<td>53.7</td>
<td>59%</td>
<td>2.43%</td>
</tr>
<tr>
<td>ICTs for the Public Sector &amp; Large Corporations</td>
<td>21.7</td>
<td>24%</td>
<td>21.5</td>
<td>23%</td>
<td>-0.96%</td>
</tr>
<tr>
<td>Transport Telematics</td>
<td>15.3</td>
<td>17%</td>
<td>16.4</td>
<td>18%</td>
<td>6.98%</td>
</tr>
<tr>
<td>Total revenues</td>
<td>89.4</td>
<td>91.6</td>
<td>91.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revenues Streams (segment) (net sales)</th>
<th>2008</th>
<th>% total</th>
<th>2009</th>
<th>% total</th>
<th>delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace &amp; Defense</td>
<td>40.0</td>
<td>62%</td>
<td>40.0</td>
<td>61%</td>
<td>0.07%</td>
</tr>
<tr>
<td>ICTs for the Public Sector &amp; Large Corporations</td>
<td>15.8</td>
<td>25%</td>
<td>16.3</td>
<td>25%</td>
<td>2.90%</td>
</tr>
<tr>
<td>Transport Telematics</td>
<td>8.6</td>
<td>13%</td>
<td>9.9</td>
<td>15%</td>
<td>14.43%</td>
</tr>
<tr>
<td>Total revenues</td>
<td>64.4</td>
<td>66.2</td>
<td>66.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EBITDA (segment)</th>
<th>2008</th>
<th>% total</th>
<th>2009</th>
<th>% total</th>
<th>delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace &amp; Defense</td>
<td>5.9</td>
<td>59%</td>
<td>5.6</td>
<td>55%</td>
<td>-6.02%</td>
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<tr>
<td>ICTs for the Public Sector &amp; Large Corporations</td>
<td>2.6</td>
<td>26%</td>
<td>2.9</td>
<td>29%</td>
<td>13.75%</td>
</tr>
<tr>
<td>Transport Telematics</td>
<td>1.5</td>
<td>15%</td>
<td>1.7</td>
<td>17%</td>
<td>14.55%</td>
</tr>
<tr>
<td>Total revenues</td>
<td>10.0</td>
<td>10.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) The revenues figure, gross sales and EBITDA include inter company operations
In terms of EBITDA, the space and defense business posted a value of 5.6 million euros, despite having made a big commercial effort on three fronts: firstly, to win itself a good position in the Galileo program, secondly to increase its profile in the defense market and thirdly to break into the US institutional space market. These efforts augur well for 2010 and subsequent years.

The area of e-solutions and security, for its part, recorded an EBITDA of 2.9 million euros, a 14% increase on the previous year’s figure. This makes it the group’s second biggest source of added value, with excellent prospects for the coming year 2010.

Lastly, the area of transport and logistics grew by 15% with a clear improvement of profitability on resources used and an EBITDA contribution of 1.7 million euros.

The financial year 2009 confirmed a consolidation of all our business lines, with satisfactory financial results, the formation of important strategic lines of action, all contributing to the establishment of GMV in a leading position in the market of hi-tech services. We foresee an even brighter picture for the financial year 2010. All our market areas also firmed up their market positions considerably in 2009, in a time of sweeping changes and fierce competition in the telecommunications and telematic applications market. This poses a sterling challenge in terms of breaking into new markets and integrating the new business into the existing market of our products and services.

SCOPE OF CONSOLIDATION AND STAKES IN OTHER COMPANIES

The consolidated financial statements for this year include a total scope of consolidation with respect to the investee companies. Pursuant to the equity method, exclusion is made only of those companies in which GMV’s stake is less than 20%, which would form part of the financial assets in the consolidated balance sheet.

GMV holds a 14.3% stake in the company Grupo Navegación por Satélite, Sistemas y Servicios S.L. (formerly Galileo Sistemas y Servicios SL); other stakes in this company are held by Indra Espacio SA, SENER SA, Hispasat SA, AENA, EADS CASA and Alcatel Espacio. This company, set up in July 2000 by the main companies of the Spanish aerospace sector, aims to promote the development, operation and commercial use of applications and services based on the future Galileo satellite navigation system.

INVESTMENT POLICY

The overall fixed asset investment in 2009 amounted to almost 3 million euros. The main outlay here was the technical and IT equipment and fixtures needed for the day-to-day business activity. This figure also includes the R&D investment made in 2009 in those seedbed activities likely to capture market shares in the medium term.
In 2009 GMV made a big investment in training, adding up to nearly 1 million euros, and plans to continue this policy in the future. An increase of over 3% is scheduled for 2010, with the clear strategy of attracting and training highly qualified personnel.

**USE OF EBITDA**

GMV assesses its operational performance on the basis of several factors, including the main financial measurement of earnings before interest, taxes, depreciation and amortization, omitting the company financing structure and form (EBITDA). GMV considers EBITDA to be a good indicator of the operational strength and performance of its business activities, including the capacity of generating cash flow to finance debt and capital costs. The use of EBITDA cancels out the irregular effect in business segments of the depreciation of tangible fixed assets and intangible fixed assets as recognized in business combinations by the traditional accounting method. In any case the EBITDA factor should be considered not as a substitute but rather as an addition to net operating profit and other measurements of financial performance presented in accordance with generally accepted accounting principles.
## BALANCE SHEET AND PROFIT AND LOSS ACCOUNT

### BALANCE SHEET 2009

<table>
<thead>
<tr>
<th>ASSETS</th>
<th>2008</th>
<th>2009</th>
<th>Liabilities</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed assets</td>
<td>32,106,939.68</td>
<td>35,109,134.71</td>
<td>Stockholders’ equity</td>
<td>28,396,580.90</td>
<td>31,192,401.85</td>
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<td>Deferred charges</td>
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<td>Capital grants</td>
<td>2,076,379.95</td>
<td>1,522,259.32</td>
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<td></td>
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<td>Minority interests</td>
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<td>4,281,381.53</td>
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<td></td>
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<td></td>
<td>Long-term funding</td>
<td>12,205,276.00</td>
<td>10,776,125.50</td>
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<td></td>
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<td>Interest free credits</td>
<td>1,189,970.87</td>
<td>1,622,328.14</td>
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<td></td>
<td></td>
<td>Long term funding</td>
<td>11,015,305.13</td>
<td>9,153,797.36</td>
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<td>Total fixed assets</td>
<td>32,106,939.68</td>
<td>35,109,134.71</td>
<td>Total Long-term Funding</td>
<td>43,438,603.77</td>
<td>47,772,168.20</td>
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<td>Inventories</td>
<td>5,638,530.23</td>
<td>8,663,210.37</td>
<td>Short term liabilities</td>
<td>27,015,186.34</td>
<td>31,265,039.59</td>
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<td>Accounts receivable</td>
<td>28,630,044.14</td>
<td>31,943,455.58</td>
<td>Bank loans and overduates</td>
<td>10,960,382.61</td>
<td>15,173,031.93</td>
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<tr>
<td></td>
<td>34,529,273.09</td>
<td>33,195,584.74</td>
<td>Non-trade payables</td>
<td>16,054,803.73</td>
<td>16,092,007.65</td>
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<tr>
<td></td>
<td>-7,136,592.79</td>
<td>-4,576,565.08</td>
<td>Deferred payments</td>
<td>1,283,630.04</td>
<td>1,691,827.56</td>
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<tr>
<td>Cash</td>
<td>5,361,906.10</td>
<td>5,013,234.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total current assets</td>
<td>39,630,480.47</td>
<td>45,619,900.64</td>
<td>Total short term liabilities</td>
<td>28,298,816.38</td>
<td>32,956,867.15</td>
</tr>
<tr>
<td>Total assets</td>
<td>71,737,420.15</td>
<td>80,729,035.35</td>
<td>Total liabilities</td>
<td>71,737,420.15</td>
<td>80,729,035.35</td>
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<tr>
<td>Working capital</td>
<td>11,331,664.09</td>
<td>12,663,033.49</td>
<td>Working balance</td>
<td>11,331,664.09</td>
<td>12,663,033.49</td>
</tr>
<tr>
<td>Working capital/Equity</td>
<td>26.09%</td>
<td>26.51%</td>
<td>Working balance/fixed asset</td>
<td>35.29%</td>
<td>36.07%</td>
</tr>
</tbody>
</table>

### PROFIT AND LOSS ACCOUNT 2009

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th>2008</th>
<th>2009</th>
<th>INCOME</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase of goods</td>
<td>16,950,467.94</td>
<td>22,618,386.53</td>
<td>Turnover</td>
<td>86,299,058.49</td>
<td>92,325,572.58</td>
</tr>
<tr>
<td>Ancillary Services</td>
<td>9,550,465.29</td>
<td>9,091,468.76</td>
<td>Own expenses capitalized</td>
<td>3,422,941.11</td>
<td>3,912,003.87</td>
</tr>
<tr>
<td>Taxes</td>
<td>47,726.03</td>
<td>140,573.99</td>
<td>Operating grants</td>
<td>1,232,896.56</td>
<td>3,330,505.84</td>
</tr>
<tr>
<td>Employee Costs</td>
<td>54,656,813.45</td>
<td>56,834,694.71</td>
<td>Financial Income</td>
<td>128,345.99</td>
<td>112,324.53</td>
</tr>
<tr>
<td>Financial Expenses</td>
<td>1,593,847.76</td>
<td>1,370,456.95</td>
<td>Extraordinary Income</td>
<td>457,532.57</td>
<td>285,803.62</td>
</tr>
<tr>
<td>Extraordinary Expenses</td>
<td>13,033.73</td>
<td>17,346.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period Depreciation and Amortization</td>
<td>3,368,567.43</td>
<td>4,171,687.89</td>
<td>Total income</td>
<td>91,540,774.27</td>
<td>99,966,210.44</td>
</tr>
<tr>
<td>Appropriations, transfer to Provisions</td>
<td>351,888.76</td>
<td>1,083,188.20</td>
<td>Pre-tax profit</td>
<td>5,007,963.88</td>
<td>4,638,406.81</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>86,532,810.39</td>
<td>95,327,803.63</td>
<td>Post-tax profit</td>
<td>4,195,288.75</td>
<td>3,987,724.17</td>
</tr>
<tr>
<td>Corporate income tax</td>
<td>812,675.13</td>
<td>650,682.64</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# CASH FLOW STATEMENT

## OPERATING ACTIVITIES

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit after tax</td>
<td>4,195,288.75</td>
<td>3,987,724.17</td>
</tr>
<tr>
<td>Depreciation and amortization</td>
<td>3,368,567.43</td>
<td>4,171,687.89</td>
</tr>
<tr>
<td>Operating Cash Flow</td>
<td>7,563,856.18</td>
<td>8,159,412.06</td>
</tr>
<tr>
<td>Net finance expense</td>
<td>1,593,847.76</td>
<td>1,370,456.95</td>
</tr>
<tr>
<td>Corporate income tax</td>
<td>812,675.13</td>
<td>650,682.64</td>
</tr>
<tr>
<td>EBITDA</td>
<td>9,970,379.07</td>
<td>10,180,551.65</td>
</tr>
</tbody>
</table>

| (Increase) / decrease in trade and other receivables | -196,535.69 | -6,338,091.58 |
| Increase / (decrease) in trade and other payables   | 4,193,945.35 | 37,203.93    |
| (Decrease) / increase in provisions                  | -725,931.75  | 408,197.52  |
| Deferred income (capital grants)                     | -1,232,896.56| -3,330,505.84|
| Cash flow generated from operations                  | 12,008,960.42| 957,355.68  |
| Tax paid                                             | -812,675.13  | -650,682.64  |
| Net cash flow from operating activities              | 11,196,285.29| 306,673.04  |

## INVESTMENT ACTIVITIES

| Purchase of subsidiary undertaking (Goodwill)       | -373,008.42 | -97,298.56  |
| Capital expenditure - plant and equipment           | -9,505,082.86| -5,088,334.07|
| Capital expenditure - intangible assets             | -961,006.04 | -1,988,250.29|
| Net cash flow from investing activities             | -10,839,097.32| -7,173,882.92|

## FINANCING ACTIVITIES

| Net new debt (debt increase + debt repayments)      | 31,562.89  | 2,783,498.82 |
| Capital Grants and subsidies on capital             | 248,761.60 | 2,776,385.21 |
| Interest paid                                       | -1,593,847.76| -1,370,456.95|
| Dividends paid to equity shareholders               | -376,532.90 | -868,500.83  |
| Paid-in capital                                     | 1,172,683.83| 496,883.43   |
| Minority Interests                                  | 225,382.08  | 3,521,014.61 |
| Results attributable to the Minority Interests      | -124,771.74 | -820,285.82  |
| Net cash flow from financing activities              | -416,762.00 | 6,518,538.47 |

| (Decrease) / increase in cash and cash equivalents  | -59,574.03 | -348,671.41 |
| Cash and cash equivalents at beginning of year      | 5,421,480.13| 5,361,906.10 |
| Cash and cash equivalents at end of year            | 5,361,906.10| 5,013,234.69 |