

2015  
**ANNUAL  
REPORT**



**gmv**<sup>®</sup>  
INNOVATING SOLUTIONS



GMV business group believes that behind each new need, behind every new problem, there is a challenge and a chance to innovate. Technology is not an end in itself; it is the means to make something new or to 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 particular needs of each client, providing bespoke innovation and technology. We take on our clients' challenges as our own, spurring us on to new heights of innovation.

GMV goes beyond its clients' brief, 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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LETTER FROM THE PRESIDENT

# MÓNICA MARTÍNEZ

*GMV's turnover and staff, now well over 1200, grew by 8% in 2015.*



I often have to explain GMV to people who do not work in technology. Like other companies that are not listed on the stock market nor sell products to end consumers, GMV is largely unknown to the general public. But we are continuing to grow and GMV's strong reputation in the technology world occasionally spills over into our daily lives. We are known for the projects we take part in and, as our staff grows, increasingly also through relatives or friends who work or want to work for GMV.

GMV's turnover and staff, now well over 1200, grew by 8% in 2015. Two thirds of GMV's employees work in Madrid and one third in our subsidiaries elsewhere in Spain and in ten other countries, meeting our clients' needs all round the world.

Nearly half of GMV's staff works on space projects. These include missions like ExoMars, the satellite of the European and Russian space agencies that is now on its way to Mars. When it gets there in October 2016 it will send a lander to the surface. Missions like this allow us to actively participate in humankind's great discoveries and the development of game-changing technology. GMV contributes to keep ExoMars's on its Mars-bound trajectory and is also responsible for software controlling the lander's autonomous descent and touchdown on Mars.

Space systems call for the highest quality standards, which stand at the basis of all our activities also in other sectors.

In some cases, such as our projects in integrated modular avionics or the electronic control unit of the aircraft A400M's winch system, highest quality standards are set by client specifications. In others, such as our telemedicine system to allow for ophthalmological consultations at the optician, the quality is essential to ensure market success.

Our capabilities built up in cutting-edge projects have often enabled us to build new solutions and break into several other technological areas where we have acquired additional expertise. Companies and organizations of all types are now tapping into the advantages offered by digitalization to improve their interaction with clients and users, relying on GMV to develop the tools they need, ranging from mobile apps for insurance firms to portals and platforms allowing structured and simple access to major scientific databanks by diverse users throughout Europe. Major banks such as BBVA trust us with the security management of their internet-exposed infrastructure. And we are continuing to develop new capabilities in R&D projects like SUAC3I, focused on biometric user authentication and monitoring for critical infrastructures.

Fleet-management, passenger-information and fare-collection systems also need constant improvements and updates in order to meet passenger expectations on service flexibility and information. Our wide range of products today allows the efficient operation of large bus fleets in Spain as well as of new

light-rail train lines in Sydney, Australia. And we keep investing in further improvements.

These are only a few of the flagship projects within GMV's range of activities, all tackled with a common aim: to provide our clients with the best solutions for their particular needs, helping them to perk up their processes, offer new services and improve their own customer's experiences. This in turn earns us the satisfaction of a job well done and the recognition of our clients as a provider of trailblazing products and services that really work.

Our large team working in our worldwide subsidiaries this year has been reinforced by another 18 professionals in a new Los Angeles subsidiary. In 2015 GMV has taken a majority stake in the company Syncromatics, whose state-of-the-art public-transport solutions are currently being used in over 1400 vehicles of 40 US operators between Los Angeles and Boston. This new strategic alliance and the integration of Syncromatics' solutions with GMV's will open up new opportunities in the hi-tech but patchy U.S. market, where much still remains to be done to make public transport a more attractive option.

In addition to these benefits and synergies, Syncromatics' team shares GMV's hallmark features to ensure seamless integration with the company: the wish and will to be the best in the development and rollout of efficient

technological solutions for our clients, identifying and correcting any mistakes we may make and improving our performance when it is merely good. The requirements of our most demanding clients drive, guide and encourage us in quest of this goal.

Cordial greetings,  
*Mónica Martínez*

LETTER FROM THE CEO

# JESÚS B. SERRANO

*Long before internet  
and today's buzzword of  
globalization had become  
fashionable, GMV already had  
a clearly international outlook.*



Right from the word go GMV has always been a company used to working in the international arena. Its very first contract, soon followed by many more, was for the European Space Agency. The company soon boasted international clients, international partners and a clutch of employees working in various European countries. Long before internet and today's buzzword of globalization had become fashionable, GMV already had a clearly international outlook.

In its thirty-plus years of operations GMV has become a major technology multinational run by a 1200-strong staff of thirty different nationalities. It has companies in eleven countries of Europe, the Americas and Asia, rolling out systems in over seventy countries on all five continents.

We began working in the space sector and this is still one of the main driving forces of our business. GMV is now a worldwide benchmark and continues to up its profile in all its business activities. Satellite navigation in particular is one of its strong suits, and it remains the worldwide number one in control centers for telecommunications satellite operators. GMV's engineering, technology and systems have now been used for the development, manufacture and operation of over 360 satellites for more than 35 operators of 32 countries from all five continents.

GMV's ICT developments and knowhow are now driving the digital transformation of public authorities and companies, taking in such sectors as banking and

finance, telecommunications, healthcare and utilities. Our healthcare and cybersecurity products and solutions, now up-and running in over 20 countries from four continents, are helping to stave off worldwide threats and solve worldwide problems.

In the intelligent transportation systems market we are already a global benchmark and we are now working to become outright leaders. Over 250 operators from 100 cities in 35 countries of the five continents run over 22,000 buses, trams, trains or light-rail fleets with our fleet-management systems or electronic fare-collection systems. Add to this list over 1,300,000 automobiles running with telematics units using GMV technology.

In the defense and security market we are not only national leaders but are also strengthening our position with NATO in the field of C4ISTAR systems. Enormous knock-on interest is also being shown in our products and systems by other countries. GMV continues to help the EU to monitor its external borders with systems implemented in all member countries. This ongoing success is consolidating GMV's track record at international level and generating new business opportunities.

Our hallmark business trait is a customer-centered quest of excellence. This mainstay principle, together with the talent, motivation and commitment of our staff and the unfailing collaboration of our partners and shareholders, has enabled us to win, maintain and nurture the confidence of our clients and lay down the

base for the company's growth. Until this year, barring two exceptions, this growth was mainly from within, with no external takeovers.

The first takeover, in 2005, involved Skysoft, a Portuguese firm with very similar business lines and target markets to GMV. The second came in 2007 when GMV bought the Spanish firm Masiconvi. This firm's main business line was the design, development, manufacture and marketing of electronic fare-collection systems, so its integration with GMV helped to round out our range of public-transport telematics products.

GMV's current growth strategy is geared towards consolidation of its status as a major worldwide multinational and is based on its own internal growth bolstered by judicious high-value takeovers of companies with impeccable quality standards and a complementary range. This strategy came good in 2015. In late July we signed a purchase-and-sale agreement with the shareholders of the California-based technology company Syncromatics Corp. Under this agreement GMV made a strategic investment in the capital of this company, a supplier of Software as a Service (SaaS) solutions for the US intelligent transportation systems (ITS) market. This investment boosted GMV's expansion capacity in the USA and cemented its position in the global ITS market. Syncromatics's technological offer is well suited to the US market and is complementary to GMV's. This takeover will therefore bring commercial, technological and operational synergies into play between the two companies,

further boosting the Californian company's growth and the creation of value for GMV both inside and outside the USA.

The financial year we are now closing (2015) has been a good one for GMV, not only in terms of the abovementioned takeover but also the main financial indicators, which are all pointing the right way. Turnover, now adding up to €127 million, was up by 8% on the previous year. Net profit grew by 14% to €4.27 million while EBITDA came out at €9 million. The new contract rate continues to grow, now outstripping the annual sales figure. At the end of 2015 the order book was worth 95% of the sales figure. This bodes well for GMV's future business and ongoing growth.

Greetings,  
*Jesús B. Serrano*

# CORPORATE STRUCTURE

Grupo Tecnológico e Industrial GMV, S.A.

GMV Innovating Solutions, S.L.

## GMV Innovating Solutions, S.L.

**GMV Aerospace and Defence S.A.U.** / Aerospace and defense markets

**Grupo Navegación por Satélite Sistemas y Servicios S.L** / Galileo development and exploitation

**GMV Soluciones Globales Internet S.A.U.** / Telecommunications and e-business markets

**GMV Seguridad Integral S.A.U.** / Security market

**GMV Sistemas, S.A.U.** / Transportation and Industry markets

**GMV Innovating Solutions S.A.S.** / Aerospace, Defense, Transportation, and Telecommunications markets of COLOMBIA

**GMV Innovating Solutions SARL** / Aerospace, Defense, Transportation and Telecommunications markets of FRANCE

**GMV GmbH** / Aerospace, Defense, Transportation and Telecommunications markets of GERMANY

**GMV Innovating Solutions Pvt. Ltd.** / Aerospace, Defense, Transportation and Telecommunications markets of INDIA

**GMV Innovating Solutions Sdn. Bhd.** / Aerospace, Defense, Transportation and Telecommunications markets of MALAYSIA

**GMV Innovating Solutions Sp.z o.o.** / Aerospace, Defense, Transportation and Telecommunications markets of POLAND

**GMVIS Skysoft S.A.** / Aerospace, Defense, Transportation and Telecommunications markets of PORTUGAL

**GMV Innovating Solutions S.R.L.** / Aerospace, Defense, Transportation and Telecommunications markets of ROMANIA

**GMV Innovating Solutions Limited** / Aerospace, Defense, Transportation, and Telecommunications markets of UNITED KINGDOM

**GMV Innovating Solutions Inc.** / Aerospace, Transportation and Telecommunications markets of USA

**Syncromatics Corp.** / Transportation markets of USA



# GOVERNING BODIES

## BOARD OF ADMINISTRATORS CORPORATE MANAGEMENT

1. **MÓNICA MARTÍNEZ WALTER**  
Board President
2. **JESÚS B. SERRANO MARTÍNEZ**  
Member of the Board / Chief Executive Officer
3. **JAVIER LÓPEZ ESPAÑA**  
Director / General Secretary
4. **SUSANA MARTÍNEZ WALTER**  
Member of the Board
5. **FCO. JAVIER MARTÍNEZ CENDEJAS**  
Member of the Board / Chief Financial Officer
6. **MIGUEL ÁNGEL MARTÍNEZ OLAGÜE**  
Chief Business Development & Marketing Officer /  
General Manager Transport & Mobility
7. **IGNACIO RAMOS GOROSTIOLA**  
Chief Human Resources & Infrastructure Officer
8. **JORGE POTTI CUERVO**  
General Manager Space
9. **LUIS FERNANDO ÁLVAREZ-GASCÓN PÉREZ**  
General Manager Secure e-Solutions
10. **MANUEL PÉREZ CORTÉS**  
General Manager Homeland Security & Defense
11. **RICARDO TÓRRON DURÁN**  
Member of the Board (GMV Aerospace and Defence, S.A.U.)
12. **ALBERTO DE PEDRO CRESPO**  
Managing Director GMV Portugal
13. **PEDRO J. SCHOCH**  
President GMV NA



# COMPANY HISTORY

GMV was born in 1984 from the business initiative of Professor Juan José Martínez García. At first GMV centered on the space and defense sector, taking its initial steps in fields like mission analysis, flight dynamics, control centers, simulation or earth-observation and satellite-navigation systems, 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, quickly growing into a solid firm running a 100-strong staff by the late eighties. It was actively involved in ESA's first space missions and provided highly specialized services for the major 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 (ESA).

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, cybersecurity and telecommunication sectors and in the application of information technologies for the public and private sector. By breaking into these new markets GMV became a trailblazer in fields like internet solutions or satellite-navigation applications, still in their infancy in those days. In the transport field GMV became a pioneer in intelligent transportation systems, developing the first GPS-based fleet tracking and management systems. From the space sector the company thus began to transfer to other markets its knowhow and expertise in control centers, data processing, onboard software, Geographic Information Systems (GIS), satellite navigation, telecommunications services and data networks.

It was also during the nineties that GMV consolidated its position in the defense and security sector, especially in the fields of command and control systems, simulation and military satellite applications (communications, earth observation and navigation).

By the end of the nineties GMV's diversification process had been successfully negotiated, its business structure was solid and its staff had built up to almost 300. Turnover now topped 20 million euros, about 50% of which came from sectors like transport, cybersecurity, 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; the post of CEO was created while the presidency of the group was taken on by Dr. Mónica Martínez Walter.

In these years GMV embarked on 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 in other new ones. A big and forward-looking investment was made in the development of new products, services and solutions in space, defense, transport



and information technologies; company management also decided to break into new sectors and unfurled an ambitious program for internationalizing the longstanding business lines.

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

In May 2005 the business group GMV upped the stakes in its international growth and development strategy by buying a 58% stake in Skysoft, a Portuguese firm with very similar business lines and target markets to GMV's. In 2007 the operation was completed with the purchase of 100% of Skysoft, its operations then being knitted 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 multinational technology 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, manufacture and marketing of advanced ticket-vending and fare collection systems. This operation allowed GMV to round out its range of passenger-transport telematics, previously focusing on advanced passenger-information and fleet-management systems. In early 2011 GMV completed the 100% purchase of Masisconvi, S.A. and in 2012 it was wholly integrated into the group structure by means of a merger-based takeover.

In late 2007, giving a new kick to its worldwide expansion, GMV decided to internationalize those business lines that had attained number-one status in the Spanish market, such as the intelligent transportation business. This soon came good, the company winning

its first contracts in Asia and Eastern Europe by 2009. Since then this process has prospered, important new contracts being won in Poland, Malaysia, India, Morocco, Sweden, Mexico, Chile, United Arab Emirates, Australia and Cyprus, etc.

From 2008 to 2015 GMV's growth slackened but never ceased. Its strong suits of business specialization, unbeatable competitiveness and ongoing internationalization helped it to stave off the worst effects of the worldwide downturn. During this period important contracts were also won with new clients, such as telecommunications satellite operators like Measat, Azersat, Nilesat and international agencies and organizations like GSA-Galileo, EMSA, Frontex, ONU and Eumetsat. The company also made a decided effort to expand in growth areas where GMV had already built up a healthy client portfolio, such as physical security and cybersecurity, healthcare, automobile software, robotics, major scientific installations, Big Data, Internet of Things, testbeds and control and instrumentation.

In July 2015 GMV and the California-based technology firm Syncromatics Corp, a provider of Software as a Service (SaaS) solutions for public intelligent transportation (ITS) systems, signed an agreement under which GMV made a strategic investment in Syncromatics Corp's capital. This investment in the Californian technology company boosted GMV's expansion capacity in the USA and cemented its position in the global ITS market.

As a result of this international expansion process, initiated back in 2004 with the creation of the US subsidiary, by the end of 2015 GMV was running subsidiaries in Germany, Colombia, USA, France, India, Malaysia, Poland, Portugal, the UK and Romania, plus permanent establishments or project offices in Morocco and Mexico, among others. As of today GMV is a 1000-strong business group established in Europe, the Americas and Asia, trading in several hi-tech sectors with a swelling client portfolio in all five continents.

With this 30-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, far-sightedness and effort of its personnel.





# IN 2015

GMV  
MAIN FIGURES

Total Income: 127.12 M€

EBITDA: 9.00 M€

Net profit: 4.27 M€

Number of employees: 1,249



# ACTIVITY SECTORS

GMV provides turnkey systems and solutions, specialist hi-tech products and services. Its activities take in the whole life cycle, ranging from engineering and consultancy services, the design and development of software and hardware, to the integration of systems and subsystems, verification and testing, operational support and maintenance. Through its stable of subsidiaries this business is carried out in eight sectors: aeronautics, defense and security, space and major installations, transport, cybersecurity, information technologies for the public and private sector, telecommunications and healthcare.



GMV is chosen by CESA (Compañía Española de Sistemas Aeronáuticos) for developing the Electronic Control Unit (ECU) of the Airbus A400M's winch system. The A400M is one of the most important tractor programs of Europe's aeronautics industry.

## ACTIVITIES 2015

# AERONAUTICS

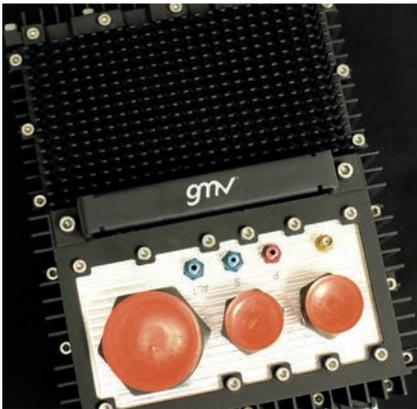
GMV is a tried-and-tested supplier of products and services not only for leading aeronautical manufacturers such as Airbus but also for providers of air navigation services and for regulatory authorities such as Spain's airport and air-navigation authority AENA, the International Civil Aviation Organization ICAO and Eurocontrol. GMV participates in the main aeronautics programs, providing engineering services and developing state-of-the-art aeronautical systems and software while always adhering to the highest quality standards. In particular GMV has spearheaded the development of aeronautical approach- and landing-systems based on Global Navigation Satellite Systems (GNSS) and is one of the few European companies with comprehensive knowledge of advanced avionics architectures, testbeds and verification systems and their associated regulations.

The most important areas of activity within the aeronautics sector are the following:

- Flight dynamics
- Development of safety critical software (DO-178B/DO-254)
- Avionics and equipment design
- Integrated Modular Avionics (IMA)
- Unmanned Aerial Vehicles (UAVs) and Remotely Piloted Aircraft Systems (RPAS)
- Engineering and operator- and pilot-training simulators
- Testbeds
- Approach and landing systems
- Aeronautical communications
- GNSS technical assistance for air-navigation operators and authorities

# AERONAUTICS. MAIN MILESTONES

- 1.** February 2015 sees completion of the Augmentation Solution for the Caribbean, Central and South America project (Solución de Aumentación para Caribe, Centro y Sudamérica: SACSSA). This was a three-phase, GMV-primed International Civil Aviation Organization (ICAO) project to plan and develop the necessary technical, financial, operational and institutional aspects for increasing navigation capacity in the region of the Caribbean, Central and South America ahead of the installation there of Europe's EGNOS navigation system.
- 2.** In this same area GMV supports Avanti Communications, prime contractor of the SBAS-Africa project. This project aims to demonstrate the potential benefits of SBAS in southern and eastern Africa by deploying an SBAS demonstrator that improves the GPS positioning service. The project includes the supply of various products from GMV's inhouse **magicGNSS** suite plus operator training, support and maintenance.
- 3.** GMV is awarded the European Union's PHANTOM project (Cross-layer and multi-objective Programming approach for next generation heterogeneous parallel computing systems), forming part of the Framework Programme for Research and Innovation Horizon 2020 (H2020). PHANTOM represents an important milestone in terms of improving the computational performance of embedded systems, helping software parallelization developers while also taking non-functional requirements like execution time into account.
- 4.** During 2015 GMV carries out several projects designed to improve the performance of future integrated modular avionics (IMA) architectures such as the DEWI project, geared towards integrated communications networks (including wireless networks), the DIMA project, in collaboration with the aeronautics manufacturer Embraer for the development of reconfigurable modular avionics, or the ongoing activities under the ASHLEY product, which will represent a new step forward in second-generation IMA technology (IMA2G).
- 5.** The European Maritime Safety Agency (EMSA) awards GMV a study to identify user benefits of Remotely Piloted Aircraft Systems (RPAS) in the maritime domain. This study will assess the viability of RPAS use in the creation and maintenance of a complete maritime picture in common with the many other resources involved, especially satellites, AIS networks, long-range identification and tracking (LRIT) information, and information passed on by member nations and European agencies.
- 6.** In the area of air-traffic-management systems, GMV, in collaboration with ARTSYS, provides the Portuguese Air Navigation Authority (Autoridade de Navegação Aérea portuguesa: ANSP) with an operational system for the training of future air traffic controllers. The system simulates any situation that air traffic controllers might have to cope with and can be expanded to different scenarios and also different airports, taking in aspects ranging from modifications of weather conditions to failures in the various modular systems.
- 7.** In September and October 2015 the tactical unmanned aerial vehicle UAV Atlante carries out, with GMV support, a busy campaign of flight tests from Matacán airbase (Salamanca). At the end of the year the Subdirectorate General of Armament and Material Procurement (Subdirección General de Adquisiciones de Armamento y Material) of the Spanish MoD awards a new contract for carrying out a further campaign of UAV-development flights tests in 2016, once more with the collaboration of GMV. GMV is responsible for the Flight Control Computer (FCC), in charge of the aircraft's guidance, navigation and control and also the Automatic Take-Off and Landing (ATOL) system built into the Ground Control Station (GCS).
- 8.** GMV is chosen by CESA (Compañía Española de Sistemas Aeronáuticos) for developing the Electronic Control Unit (ECU) of the Airbus A400M's winch system under a contract being primed by CESA. The Airbus A400 is a long-range strategic transport and air tanker aircraft designed to phase out the C-130 Hercules and the C-160 Transall; it represents one of the most important tractor programs of Europe's aeronautics industry.
- 9.** During 2015 GMV continues to provide various engineering services for Airbus Defence and Space. Pride of place here goes to its collaboration in the tankers program, where GMV is taking part in many aspects of the flight refueling system (control laws, onboard control software, onboard monitor software, system simulators, etc.), and the engineering services associated with the FITS systems (Fully Integrated Tactical System). These activities are rounded out by ongoing work on the A400M, where GMV has participated in engineering simulators (especially the landing-gear simulation models) and modelling of actions for the mission planning system, plus diverse collaborations in the Eurofighter project.
- 10.** GMV participates routinely in European air-navigation and airport-operation research projects. In 2005 it was awarded two projects co-funded by the European GNSS Agency (GSA). The purpose of the first was the training of air-navigation service providers from various European countries (Hungary, Montenegro, Moldavia, Kosovo, etc.) in the use of the satellite navigation systems EGNOS (European Geostationary Navigation Overlay Service) and Galileo. Thanks to the latter, Teruel airport will boast state-of-the-art GNSS approach procedures, thus moving on from visual to instrumental approach. During 2015 GMV also continues its activities under Eurocontrol's navigation radio-aid planning project, DEMETER.



## ACTIVITIES AND ASSESSMENT 2015

In 2015 GMV's growing GNSS expertise and product portfolio, especially its Satellite-Based Augmentation Systems (SBAS), enabled it to win new worldwide clients and projects in new parts of the world such as SBAS-Africa.

Also in the air-navigation area GMV collaborated in 2015 with the sector's main organizations, such as GSA, Eurocontrol, AENA and ANSP, working on several R&D projects in air traffic, security and airport operation. During this year GMV likewise teamed up with the main European firms (Thales, Airbus, Eurocopter and Dassault) in the development of flight-security and operational systems.

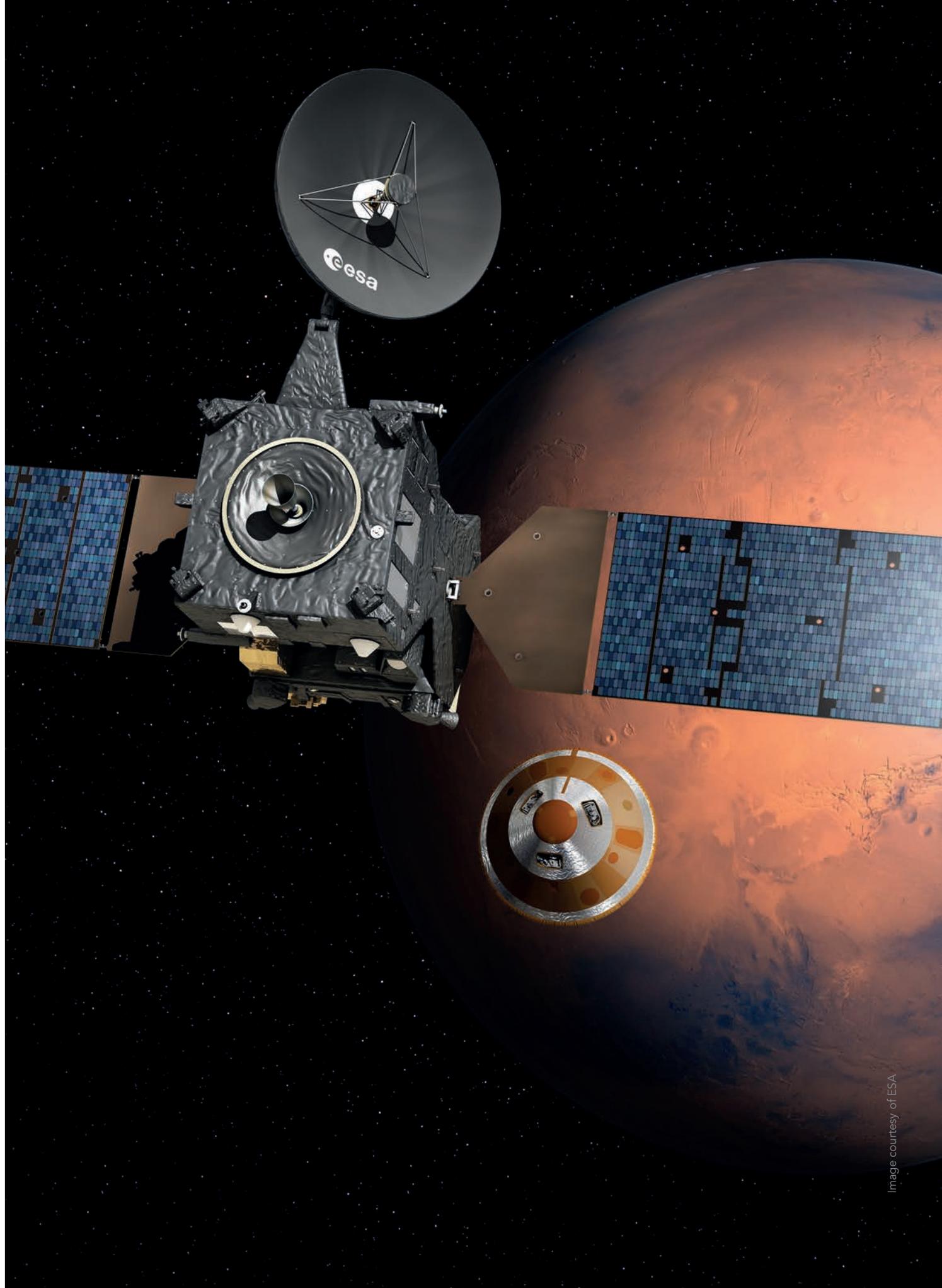
Another notable feature of 2015 was GMV's growing presence in the development of onboard systems for the promising UAV and RPAS market. GMV's work on the UAV Atlante or in the Portuguese PAIC Império program has won it pole position ahead of the upcoming research projects in this field, such as the European Maritime Safety Agency (EMSA)'s project for identifying the benefits of unmanned aerial systems in various fields.

The experience and expertise built up by GMV in key Integrated Modular Avionics (IMA) projects also came good in 2015. The company won new contracts not only with the European Commission but also Embraer, another of the sector's main manufacturers.

Last but not least GMV also upped its game in the development of onboard systems for major sector manufacturers such as CESA, Airbus and Eurocopter.



*GMV is awarded three new contracts for the ExoMars 2018 mission, comprising software development of the main onboard computer (Application SW) of the GNC system, development of the Software Verification Facility (SVF) used for testing and the On-Board Computer simulator (OBC1).*



# ACTIVITIES 2015

# SPACE

GMV is one of the world's top suppliers working for space organizations and agencies and also for the major satellite manufacturers and operators.

With over 30 years of experience behind it and nearly 400 satellites carrying its technology, GMV can safely claim to be a technological partner of cast-iron dependability, capable of meeting the most stringent needs under the strictest quality standards. It has now achieved CMMI Level 5 certification, covering the whole range of activities and services within the space sector:

#### - Flight Segment:

- System-engineering and mission analysis
- Guidance, Navigation and Control (GNC) systems
- Autonomy and robotics
- Satellite and mission simulators
- Ground validation and testbeds
- Onboard software and independent validation
- Processors and simulators of astronomy and earth-observation instrument data

#### - Navigation:

- Engineering and algorithms of satellite navigation systems
- Major global satellite navigation signal-generation and -processing systems
- Precise positioning solutions and augmentation systems

#### - Ground Segment:

- Design and integration of complete ground systems
- Satellite control centers and monitoring stations
- Science-mission operations centers
- Orbital dynamics systems
- Mission planning systems
- Payload management centers for telecommunications missions

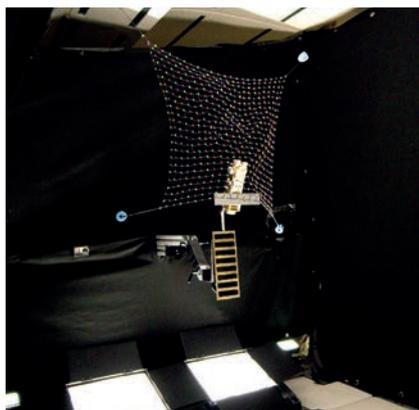
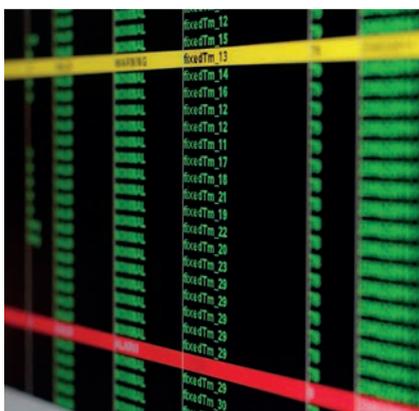
#### - Data Processing:

- Instrument processors for earth-observation and science missions
- Quality control and calibration systems
- Space applications, solutions and services

#### - Support for space-mission operators

# SPACE. MAIN MILESTONES

- 1.** In 2015 GMV consolidates its position as the world's number-one supplier of control centers for commercial telecommunications satellites: Hispasat turns anew to GMV for developing the orbital dynamic system and control and monitoring system of the satellites Amazonas 5 and Hispasat 1F; GMV wins the contract for developing the orbital dynamics system of Yahsat's Alyah3 satellite and Star One's C1/C2 satellite; and Hellas Sat contracts GMV to develop the orbital dynamics system and control center of the Hellas Sat 3 satellite. Lastly, September sees the launch of the Sky Muster communications satellite of the Australian operator NBN Co, for which GMV has developed the orbital dynamics system, the satellite's control and monitoring system plus the ground stations' control and monitoring system and the payload configuration and management system.
- 2.** The Intermediate eXperimental Vehicle (shortened to IXV), ESA's atmospheric reentry demonstrator vehicle, successfully blasts off on 11 February. The aim of the mission is to demonstrate critical reentry technology for both autonomous and crewed earth-return missions. GMV has played a key role in the development of the IXV technology demonstrator, holding responsibility for three activities: the Onboard Software (OBSW) and Software Validation Facility, vehicle navigation as part of the GNC system and Vehicle Model Identification (VMI) for identification of reentry aerodynamic parameters.
- 3.** On 14 February, right on schedule, ESA's final Automated Transfer Vehicle, the ATV Georges Lemaître, undocks from the International Space Station to embark on its last solo voyage before controlled destructive reentry, marking the end of its mission and also of the whole Automated Transfer Vehicle (ATV) program. GMV has been involved right from the start of the ATV mission, first taking part in ESA's preliminary navigation studies, providing mission analysis support for CNES, developing the operational Flight Dynamics System (FDS) for CNES's Control Center, providing in situ support for orbital dynamics operations throughout the whole mission and also holding responsibility for maintenance and updating of the orbital dynamics system of all ATV missions.
- 4.** Six new Galileo satellites are launched in 2015, bringing up to 12 the number of satellites of Europe's satellite-navigation system now in orbit. GMV has played a key part in the GALILEO program right from the word go. It has supplied several key elements for the system's ground segment such as OSPF (Orbit & Synchronisation Processing Facility), IPF (Integrity Processing Facility), SPF (Service Product Facility), FDF (Flight Dynamics Facility) and MNE (MDDN Network equipment). GMV is also currently the main contractor for providing Galileo's essential Timing and Geodetic Validation Facility (TGVF) services; it is co-leading development of the European Union's GNSS Service Centre (GSC) and is leading outright the development of Galileo's Commercial Service (CS) demonstrator.
- 5.** In the earth-observation and remote-sensing area, GMV signs a contract with EDP Distribuição - Energia, S.A., Portugal's biggest power distribution company, for providing satellite-based transmission powerline-monitoring services. The idea of the project is to take advantage of today's most sophisticated optical satellite capabilities to provide accurate monitoring services for the detection and mapping of the various risks threatening to disrupt the smooth operation of powerlines. In 2015 GMV also completes an urban change detection analysis for Shell Global Solutions International in Iraq, using Very High Resolution satellite images to ascertain land use and land-coverage changes.
- 6.** GMV carries out several projects for the Global Monitoring for Environment and Security program called Copernicus (formerly known as GMES) in both the ground and space segments. In 2015 Sentinel-3's mission planning facility (MPF), developed by GMV, is officially accepted. June sees the launch of Sentinel-2, for which GMV first developed the mission analysis and performance simulator and then took on responsibility for the control center and Precise Orbit Determination (POD) service. It is also contributing towards development of the orbital dynamics system and is leading the Integrity Processing Facility (IPF) and the performance monitoring center. Lastly, the European Commission signs a consortium contract with a GMV-primed consortium to define user requirements for the next generation of Copernicus satellites.
- 7.** GMV features prominently in the flagship mission ExoMars, currently being carried out by the European Space Agency (ESA) in cooperation with the Russian Federal Space Agency (Roscosmos). The aim of the mission is to send two spacecraft to the Red Planet, one in 2016 and another in 2018. In the first mission GMV develops the onboard software of the GNC system of ExoMars's Entry, descent and landing Demonstrator Module (EDM) and plays an active part in the mission's orbital control, including responsibility for the Flight Dynamics Manager. In 2015 GMV is awarded three new contracts for the ExoMars 2018 mission, comprising software development of the main onboard computer (Application SW) of the GNC system, development of the Software Verification Facility (SVF) used for testing and the On-Board Computer simulator (OBC1), as well as activities underway for providing the rover's control center and the Central Checkout System (CCS) of the carrier and descent module.
- 8.** At the end of the year ESA's LISA Pathfinder mission successfully blasts off on its way to demonstrate technology for observing gravitational waves from space. GMV has played a key role in the consortium responsible for the mission's payload or LTP (LISA Technology Package). Some of its most important activities are validation of LTP software; mission analysis support and orbit control from the European Space Operations Centre (ESOC); plus support for science data management from the European Space Astronomy Centre (ESAC).
- 9.** GMV reinforces in 2015 its capability for designing and developing complete critical space-vehicle subsystems, successfully taking on the complete cycle of design, development and flight demonstration of complex systems such as GNC, critical OBSW and analysis of data obtained. Some of the most noteworthy activities in 2015 are missions like OPS-SAT, ESA's first CubeSat mission, where GMV is responsible for onboard software and the software validation system; and design and development of the GNC system for the Phobos Sample Return mission. GMV also plays a key role in the Asteroid Impact Mission (AIM), holding responsibility for mission analysis, the GNC subsystem and several studies involved in the design of mission operations. Other notable projects of the year are NGTAATB (New Generation Launcher and Space Transportation Advanced Avionics TestBed) and OSRA-NET (Onboard Software Reference Architecture), both designed to enhance onboard software.
- 10.** In the area of autonomy and robotics, 2015 sees the presentation of the RAT (Rover Autonomy Test Bed) project carried out by GMV for the European Space Agency (ESA). The objective of this project is to develop a mobile planet exploration platform targeting moon exploration. In this same line of research ESA awards GMV the ASSIST project, which aims to design an autonomous refueling and approach system. GMV is coordinating all consortium activities and is also leading the requirements specification phase and the development of a dynamic simulator. Lastly, Foxiris, the GMV-led team taking part in the ARGOS (Autonomous Robot for Gas & Oil Sites) challenge, successfully passes the first knock-out round. ARGOS is a 3-year competition brokered by the oil company TOTAL, to encourage the development of advanced robotics capabilities in the oil and gas industry.
- 11.** GMV features prominently in Europe's analysis of the space-debris threat. During 2015 GMV keeps up its high-profile participation in ESA's SSA/SST program (Space Situational Awareness / Space Surveillance and Tracking), leading the development of the datacenter that Spain is setting up for integration in the EU-brokered European SST system, and it is still contributing towards CNES's space-debris activities in France. Other notable GMV activities in 2015 within this area are the research carried out in the Patender project, an ESA-funded activity within the Clean Space program, based on the use of nets as one of the most promising non-rigid space-debris capture methods, and the activities carried out within ESA's D4R project, focusing on Active Debris Removal (ADR).
- 12.** At the end of the year GMV organizes in Toledo (Spain) its sixth GMV Users Conference (GUC '2015) on satellite control systems. This year's conference involves nearly 40 representatives from 20 different organizations, including space agencies, communications-satellite operators and satellite manufacturers. This conference gives stakeholders a unique chance to get up on technological developments and future trends and swap notes on the burning issues.



## ACTIVITIES AND ASSESSMENT 2015

Taken as a whole, 2015 was a splendid year for GMV's space activity in both the public and private markets. Our prospects look even brighter for the years up ahead too, judging from the number of contracts awarded in the year and Spain's declared participation in the latest Ministerial Council of the European Space Agency (ESA).

In 2015, for the sixth year running, GMV retained its status as the world's top independent supplier of ground control systems for commercial telecommunications satellite operators. We kept up a brisk level of activity with our traditional clients such as Eutelsat, SES, StarOne and Hispasat while winning new contracts with the UAE operator Yahsat, the Greek operator Hellas Sat and the Australian NBN. At the end of 2015 GMV's client portfolio included all the major international space agencies and a total of 31 telecommunications operators, with systems now up and running in over 25 countries throughout the 5 continents. GMV once more met up with many of them during this year's sixth GMV Users Conference.

GMV has also retained an excellent position in Europe's other flagship programs, especially in the European satellite-navigation program Galileo, the European Union's Global Monitoring for Environment and Security program, Copernicus, and ESA's SSA/SST (Space Situational Awareness / Space Surveillance and Tracking) program. In all these programs GMV has several contracts now underway, and its wealth of experience in this field places it in pole position for the upcoming projects expected in the future.

In 2015 GMV also cemented its worldwide leadership in the development of Guidance, Navigation and Control (GNC) systems. To its roster of activities carried out under the missions PROBA-3, Prisma, IXV, Mars Sample Return, Lunar Lander and VEGA launchers, 2015 tagged on new activities in missions such as Phobos Sample Return, AIM and ExoMars.

The subsidiaries established in previous years in Germany, France, Poland, Romania and the UK all came good in 2015. The first major contracts were won in the space sector, driving a considerable growth of the R&D teams posted to these countries.



*During Trident Juncture 2015, a high visibility exercise to showcase NATO on the world stage, GMV provides support for the deployment, operation and maintenance of SAPIIEM service infrastructure (SAPIIEM stands in Spanish for support services to ensure interoperability of ISR resources) and also for operational personnel using SEISMO (Mobile ISTAR operating system) and ATENEA applications developed by GMV under this project.*

## ACTIVITIES 2015

# DEFENSE AND SECURITY

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

The products and services provided in the defense and security area cater for the most demanding needs and are developed under strict quality standards. They cover the following areas:

### DEFENSE

- Engineering and development of C&C systems and integration with C4ISTAR
- Intelligence systems, signal and data processing and fusion
- Cyberdefense
- Training, operational-research and R&D simulators
- Development of military systems based on GPS, EGNOS and Galileo
- Onboard equipment, military avionics software and testbeds
- Logistic and maintenance services for systems and software
- Military space applications

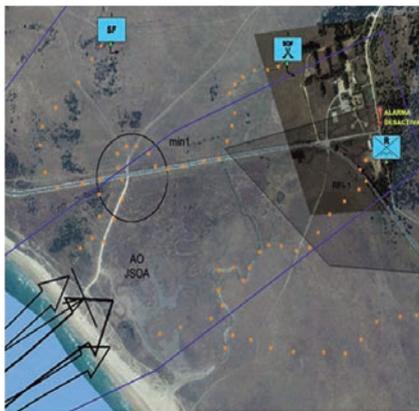
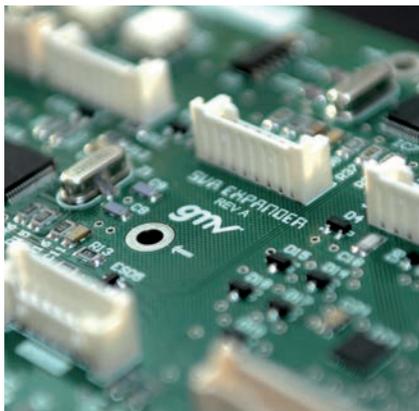
### SECURITY

- Perimeter-surveillance and access-control systems
- Border protection and surveillance systems
- Advanced security systems incorporating new technologies
- Emergency and crisis management systems, 112, SOS centers
- Monitoring and management systems for vehicles and personnel of security forces
- Onboard security and video-surveillance systems
- Inspection and surveillance systems for fishery and merchant ships in international waters

The company, its personnel and the various sites and facilities have all obtained the necessary security clearance for carrying out classified projects.

# DEFENSE AND SECURITY. MAIN MILESTONES

- 1.** GMV wins a contract for developing a system with satellite-enabled surveillance capabilities for the Guardia Civil police force. GMV's solution is based on tried and tested products like its in-house maritime monitoring service called SIMONS and an integral security system dubbed SOCRATES. This helps to cut down project costs and development risks. The project also includes a map-based dynamic data viewer, allowing users to interpret the system's information layers quickly and correctly.
- 2.** GMV forms part of the consortium carrying out the EU H2020 New Operative Sensing sYstem (NOSY) project, which aims to set up a tamper-proof platform for sensing and monitoring illegal or suspicious chemical substances to support the fight against organized crime. Miniaturized and highly sensitive devices will be integrated into law enforcement agencies' field equipment, enabling data exchange with remote stations and handheld devices through cryptographically secure channels.
- 3.** GMV is chosen as supplier of one of the solutions assessed under the CLOSEYE project, an FP7 European Commission project that aims to provide an operational and technical framework that increases situational awareness and improves the reaction capability of authorities surveying the EU's external borders. GMV's solution comprises an integrated command, control and coordination system rolled out in different centers and resources both of Spain's Guardia Civil and Portugal's Guardia Nacional Republicana. This system incorporates various pre-existing information sources plus a series of groundbreaking sensors.
- 4.** The High-Readiness Land Headquarters (Cuartel General Terrestre de Alta Disponibilidad: CGTAD), made over to NATO as its Rapid Deployment Headquarters, implements a set of management and operation tools of Joint, Intelligence, Surveillance and Reconnaissance (JISR) systems. This set of GMV-developed tools, called SAPIIEM, is the result of a project driven by the Directorate General of Armaments and Material (Dirección General de Armamento y Material) of the Spanish MoD. Its purpose is to ensure interoperability of ISR resources, thus maximizing the military usefulness of this information in a coalition.
- 5.** Spain is one of the hosts of Trident Juncture 2015, a high visibility exercise to showcase NATO on the world stage. During this two-month exercise the Spanish SAPIIEM systems (SAPIIEM stands in Spanish for support services to ensure interoperability of ISR resources) provide support for the various command levels in JISR capability. GMV itself provides support for the deployment, operation and maintenance of SAPIIEM service infrastructure and also for operational personnel using SEISMO (Mobile ISTAR operating system) and ATENEA applications developed by GMV under this project.
- 6.** In 2015 GMV is awarded several projects for integrating arms systems with the TALOS command and control system, developed by GMV for the Directorate General of Armaments and Material (Dirección General de Armamento y Material: DGAM) of the Spanish MoD. TALOS is a C4I system for the planning, management and execution of a military operation at tactical level, allowing integration of various combat sources in the same mission.
- 7.** GMV wins a contract for defining, studying and implementing secondary-channel data-broadcasting capabilities for Galileo-PRS receivers by means of military tactical networks. To vet the system a pilot scheme will be set up on GMV's command and control system, TALOS.
- 8.** Within the framework contract for maintenance, extension and development of the European Border Surveillance System (EUROSUR), awarded to GMV in 2013 by European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union (Frontex, shortened from the French *Frontières extérieures*), GMV provides in 2015 the necessary services for ensuring that the network runs smoothly for the 30 member states and Frontex itself. Together with network extension and maintenance work, GMV also designs, develops and rolls out new technical and operational capabilities plus new services to meet the agency's ongoing needs. It also leads necessary studies and analysis for phasing in future services. As part of the European Commission's border surveillance system, EUROSUR establishes a mechanism for cooperation and swapping information to help member states in border control and surveillance tasks.
- 9.** The Portuguese navy (Marinha Portuguesa) awards GMV a project for developing a command and control system for management of missions carried out by the intelligence and electronic warfare systems of all its operational units. The most notable capabilities of this system are: compilation, processing and storing of data furnished by the various sources; analysis, fusion, integration and interpretation of data compiled; production of libraries with the information required for the mission to be carried out by the intelligence and combat systems (SIGINT, COMINT, ACINT, etc.) of the operations units; and controlled distribution of this information on a "need to know" basis.
- 10.** GMV's 2015 access-control business includes, notably, commencement of device installation and deployment of presence- and access-control and security software of the two main buildings of the Barcelona bank called Caixa d'Enginyers. GMV also wins the development projects of the access-control and video-surveillance projects for the Restricted-Access Zones in two minesweepers of the Spanish navy plus the personnel and material access control system for the two new Maritime Action Ships (BAMs in Spanish initials) being built by Navantia for the Spanish navy. Lastly, GMV continues its work during the year on the corrective, preventive and evolutionary maintenance of Mapfre's alarm reception center.



## ACTIVITIES AND ASSESSMENT 2015

GMV strengthens its national leadership in C4ISTAR systems (Command, Control, Communications, Computers, Intelligence, Surveillance, Target Acquisition and Reconnaissance), winning new projects for integration of arms systems with GMV's command and control systems. It also consolidates its international activity in this field, winning a project for development of a command and control system for management of missions carried out by the intelligence and electronic warfare systems of all units of Portugal's navy.

GMV's ISR (intelligence, surveillance and reconnaissance) capabilities are doubly showcased this year, firstly in the deployment of a set of JISR tools (Joint, Intelligence, Surveillance and Reconnaissance) in NATO's High-Readiness Land Headquarters, and secondly in the performance of the SAPIEM infrastructure in Trident Juncture, a flagship NATO exercise making use of various GMV-developed tools.

For yet another year GMV's EUROSUR activity was notable. EUROSUR is the EU's border surveillance and control program. Together with network maintenance and extension work this year, GMV also carried out various activities for the development of new technical and operational capabilities and new services to meet the network's evolving needs.

GMV's activity was also eye-catching in various Europe-wide R&D projects for the European Commission within the field of border- and maritime-surveillance and the fight against organized crime.

Finally, GMV carried out new access-control and security projects for the Spanish navy, Mapfre, the Barcelona bank called *Caixa d'Enginyers* and Portugal's foreign ministry, consolidating its complete and advanced range in this area.



GMV, in collaboration with e-Health Vision and the Orduna clinic, launches **My Vision 360**. This service, which allows each opticians retail store or eye-care center to link up with an ophthalmologist at any moment, offers advantages such as synchronized device interconnection. It is the first system capable of making real time notes on shared documents, improving the decision-making processes and medical diagnoses of eye pathologies.



## ACTIVITIES 2015

# HEALTHCARE

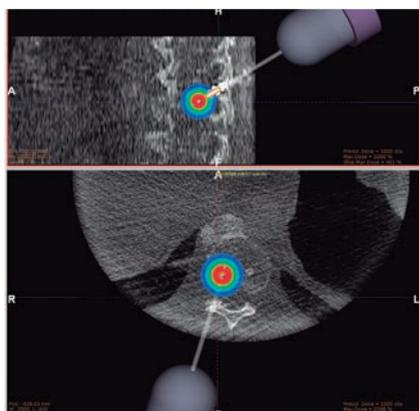
Information and telecommunication technologies, virtual-reality simulation and digital-image processing are all new arrows in the quiver of healthcare professionals, giving them a whole new set of techniques and resources to work with. ICTs are bound to play a crucial role in the development of a future healthcare system that is sustainable, personalized, patient-centered, ubiquitous and based on medical evidence.

GMV systematically draws on its technological expertise built up in sectors like aerospace and defense to produce groundbreaking spinoff products in the healthcare sector:

- Telemedicine, telediagnosis and teleassistance systems
- IntraOperative RadioTherapy (IORT) planning/simulation systems
- Medical image processing
- Mobility and emergency-management systems
- Aid systems for disabled people
- Humanitarian aid and emergency infrastructure based on satellite technology
- Early-warning public-health epidemiological systems
- Secure healthcare information systems based on the monitoring of standards and compliance with the Spanish data protection act (*Ley Orgánica de Protección de Datos: LOPD*)

# HEALTHCARE. MAIN MILESTONES

- 1.** Fruit of a marketing agreement signed between GMV and Carl Zeiss Meditec (CZM), GMV's intraoperative radiotherapy planner, **radiance**, is taken up by six important hospitals: the University Medical Centre Mannheim in Germany; Cleveland Clinic, Weill Cornell Medical College and Loyola University Medical Center in the USA; University Cancer Institute of Toulouse Oncopole (Institut universitaire du cancer de Toulouse Oncopole: IUCT Oncopole) in France and Italy's Ospedale di Catanzaro.
- 2.** In 2015 GMV obtains EC and FDA certification for the new version of its radiotherapy planner, **radiance**. As well as clearing the product for marketing in Europe and the USA, this certification, which also takes in the Monte Carlo algorithm for Intrabeam, represents the starting gun for marketing of the device and a new boost to the product's innovation process and international expansion.
- 3.** In this year GMV develops 20 new units of the arthroscopic training simulator ArthroMentor for Symbionix, the world's leading supplier of simulation-based medical education and training, plus various spare-part units, repairs and equipment updating schemes. GMV also carries out various engineering tweaks to bring system design into line with Symbionix's requirements, including adaptation of the system to a multi-voltage support. All these activities form part of the technology transfer and minimally invasive surgery simulation product line agreement signed in 2012 between both companies.
- 4.** **KidsCare**, the groundbreaking telepediatrics system set up by GMV and Ever Salud, has now been taken up by 50 schools in Spain, giving kids in-school specialist medical attention by teleassistance. This state-of-the-art telepediatrics service is based on GMV's inhouse, trailblazing telemedicine system **antari Primary Care**.
- 5.** GMV, in collaboration with e-Health Vision and the Orduna clinic, draws on its inhouse telemedicine system **antari** to launch **My Vision 360**, a visual health and ophthalmology service. This service, which allows each opticians retail store or eye-care center to link up with an expert ophthalmologist at any moment, offers advantages such as synchronized device interconnection. It is the first system capable of making real time notes on shared documents, improving the decision-making processes and medical diagnoses of eye pathologies.
- 6.** During the year the Uruguayan rural district of Cerro Largo continues to use GMV's telemedicine system **antari Primary Care** for monitoring patients with heart pathologies. Cardiologists working from top-level reference hospitals can now access electrocardiograms in far-flung primary-care health centers and give them an expert diagnosis in minutes.
- 7.** GMV joins EIT Health, one of the world's biggest health initiatives. Its aim is to promote a sustainable health system to favor a healthier lifestyle and wellbeing for people throughout the whole of Europe. EIT Health taps into the experience of over 140 leading organizations in key healthcare areas such as Pharma, MedTech, plus a varied array of universities and research institutes.
- 8.** GMV wins a contract from the Government of Senegal for setting up its **antari Primary Care** telemedicine platform. The objective of this project is to bring the population of Senegal within the umbrella of new and improved health services, as well as providing job-training opportunities, access to state services and promotion of the local identity.
- 9.** GMV forms part of the consortium selected by the European Space Agency (ESA) for carrying out the T4MOD project, which aims to provide new telemedicine systems for peace-keeping troops from Spain, Germany, France and Italy. The project has been backed by the defense ministers of these four countries and involves the collaboration of 6 European firms. GMV has rolled out **antari** as the telemedicine solution and has designed and developed the algorithms for satellite communications control. GMV has also taken on responsibility for deployment, installation and training in the Miguel de Cervantes base in Lebanon.
- 10.** During this year GMV continues its activity under the COVADONGA project of the Galician Health Service (Servicio Gallego de Salud: SERGAS). This project, which sets out to calculate clinical and epidemiological data for the purposes of clinical evidence and research support, is a far-reaching Big Data healthcare project. In 2015 SERGAS, in collaboration with GMV, installs HEXIN, a platform for mining all types of patient information in an Electronic Health Record for the purposes of clinical decision-taking, management and support in identification tasks of epidemiological cases.



## ACTIVITIES AND ASSESSMENT 2015

For over fifteen years now GMV has been working to improve people's quality of life, doing so by applying spinoff technology and knowhow from other sectors like space, ICTs, transport and defense to develop groundbreaking healthcare ideas. Its national and international healthcare business continued to thrive and grow in 2015, swelling its portfolio of solutions and looking even brighter for the future.

**radiance**, GMV's pioneering and still unique intraoperative radiotherapy planner, fruit of GMV's ongoing R&D efforts and collaboration with Spanish clinics and universities, was taken up by some of the world's most prestigious hospitals in 2015. The list of clients is confidently expected to continue growing exponentially, while the product itself continues to upgrade and enhance its already attractive performance features.

GMV's telemedicine platform, **antari**, is now riding high in the healthcare firmament of some Latin American and African countries. Pilot trials in countries like Peru, Uruguay and Angola were followed in 2015 by new projects in Senegal and new zones of Uruguay. It also played a crucial role in a European Space Agency (ESA) project for offering telemedicine services to troops from Spain, Germany, France and Italy deployed on peace-keeping missions.

For its part, **KidsCare**, the trailblazing tele-pediatrics service set up by GMV and Ever Salud in 2014, has now been taken up by over 50 schools and nurseries around the country, giving over 1200 children specialist medical attention in their schools by teleassistance. In this same year GMV also set up a pioneering ophthalmology teleconsultation service allowing opticians to make contact with expert ophthalmologists.

Equally eye-catching growth was chalked up by GMV's tele-rehabilitation and teleassistance activities in the homes of chronic patients. GMV has also broken into the promising Big Data healthcare field, within the COVADONGA project carried out by GMV for the Servicio Gallego de Salud, SERGAS (Galician Health Service).



*GMV's checker ATM Security® is now being used to safeguard ATMs of some of the world's biggest banks in parts of the world especially prone to cyberattacks and cyberfraud. The total number of protected ATMs now adds up to over 100,000 in Spain, Mexico, Brazil, Chile, Colombia, USA, Ukraine, Romania, Russia, Italy, India and Thailand.*

## ACTIVITIES 2015

# CYBERSECURITY

GMV has been Spanish leader in the development of network security services and technologies and information systems for over 20 years now. GMV provides integrated cybersecurity engineering and solutions, security governance and intelligence centers, managing the technological risks and ensuring compliance with applicable legislation.

- Protection of critical infrastructure
- Engineering, security services and solutions for information networks and systems
- Cybersecurity in industrial environments
- Security auditing
- National Security Scheme compliance plans
- Implementation of security management systems
- Security hardening of platforms, networks and services
- CERT managed services (monitoring, detection of vulnerabilities, etc.)
- Backup centers

# CYBERSECURITY. MAIN MILESTONES

- 1.** *Malayan Banking Berhad (Maybank), Malaysia's biggest bank and financial group, takes up GMV's inhouse solution checker ATM Security® to protect its ATMs from malware attacks.*
- 2.** *Purchases of checker ATM Security® in countries like Malaysia, Ireland, Portugal and Chile drive the ongoing growth and international expansion of GMV's inhouse ATM security development. By the end of the year checker ATM Security® was protecting over 100,000 ATMs in Spain, Mexico, Brazil, Chile, Colombia, USA, Ukraine, Romania, Russia, Italy, India and Thailand, and had been taken up by some of the world's biggest banks in parts of the world particularly prone to cyberattacks and cyberfraud.*
- 3.** *For over four years now GMV has been providing managed security services for the National Institute of Communication Technology (Instituto Nacional de Tecnologías de la Comunicación: INTECO), today the National Cybersecurity Institute (Instituto Nacional de Ciberseguridad: INCIBE). On the strength of this experience and the fine work carried out, GMV and INTECO sign in 2015 an agreement under which both organizations cooperate in the shared objective of encouraging and developing the information society, focusing in particular on the security demonstration center for SMEs.*
- 4.** *Under the framework collaboration agreement with the APWG Foundation, European chapter of the US association APWG (Anti-Phishing Working Group) GMV plays a prominent role this year at the event e-CRIME 2015, together with other organizations like FBI, Interpol, Spain's National Policeforce, finance institutions, international researchers and major private companies in the common endeavor of fighting cybercrime.*
- 5.** *During this year, drawing on its wealth of experience and expertise in countering ATM cyberattacks, GMV helps to draw up two key guides to shed light on the current situation of ATM logical attacks. Firstly it participates in the Handbook of Good Practices of the Spanish ATM Industry Association (ATMIA), and secondly in the publication called "Guidance and Recommendations regarding Logical attacks on ATMs" drawn up by the European Police Office (Europol). Both reports share the common aims of bringing the scale and seriousness of these threats home to the finance sector, mitigating the risks involved and setting out a series of recommendations on these types of cyberattacks.*
- 6.** *GMV's services take in the whole lifecycle of information security. In 2015 GMV carries out various analysis and diagnoses of specific environments to check their compliance and security risks, drawing up plans for various notable international organizations such as Eumetsat, Eurocontrol, ESA, Lusoponte and Thales, with the aim of endowing them with the necessary visibility for reliable decision-making and good governance.*
- 7.** *In 2015 the results of the SUAC3I (Secure User Authentication in Control Centers for Critical Infrastructures) project are presented. SUAC3I is an European-Commission-funded, GMV-led project for research into and development of groundbreaking critical-infrastructure security technology. It arose from the specific workstation or user-station needs of critical infrastructure control center personnel in terms of access authentication, authorization and control, without forfeiting any availability.*
- 8.** *For years now GMV has been demonstrating its experience in cybersecurity projects and its ability to bring something new to the market. In 2015 GMV is therefore officially recognized by the world's leading IT firm CISCO as "Advanced Security Architecture Specialization". This certification confirms that GMV fulfils all requisites for selling, designing and implementing integral solutions of CISCO's Advanced Security Architecture.*
- 9.** *GMV signs an agreement with the Spanish Chapter of the Association of Certified Fraud Examiners (ACFE Spain Chapter). ACFE is one of the world's largest anti-fraud organizations with more than 75,000 members in over 150 countries. GMV has now become a collaborator of ACFE Spain Chapter, with the main remit of supporting the fight against fraud, promoting society's awareness of the problem and training to solve it. As part of this overall endeavor, a series of information-raising activities will be held in the form of technical days, professional seminars and training courses for associates, professionals and companies.*
- 10.** *In 2015 BBVA turns anew to GMV for the identification, analysis and management of grupo BBVA's internet-exposed vulnerabilities, using its inhouse gestvul solution. GMV has been running grupo BBVA's cybersecurity for 13 years now, achieving excellent results throughout this period. Its gestvul solution carries out a periodical check of the vulnerabilities of Grupo BBVA's whole internet-exposed infrastructure, including any unsecured access to administration services, the existence of services that have not been updated and the detection of vulnerabilities that facilitate attacks such as phishing, etc.*
- 11.** *The Universidad de Santiago de Compostela turns to GMV for the migration of its SIEM platform (Security Incident and Event Management) into a new more complete and updated infrastructure. This platform is used by the university for centralized management of all security events and incidents that may crop up in its IT infrastructure, which is a key component of the university's security department.*



## ACTIVITIES AND ASSESSMENT 2015

GMV now has over 20 years of cybersecurity experience at its back. This now allows it to spearhead developments in this field and come up with IT solutions tailor-made to fit each client's specific cybersecurity problems. These solutions include **checker ATM Security**<sup>®</sup>, designed to protect ATMs from cyberattacks; **codelogin**, a dual-challenge, double identification person authentication system for ensuring secure transactions even from cell phones; and **arkano**, for the encryption of documents of daily use.

ATMs are nowadays facing a continually growing threat from organized crime, with the regular introduction of specific ATM-hacking malware. This has driven the worldwide expansion of **checker ATM Security**<sup>®</sup> in areas particularly prone to cyberattacks and cyberfraud. By the end of 2015 **checker ATM Security**<sup>®</sup> was being used in over 100,000 ATMs in Spain, Mexico, Brazil, Chile, Colombia, USA, Ukraine, Romania, Russia, Italy, India and Thailand.

By now GMV has also built up a huge experience in cybersecurity consultancy, auditing, diagnosis, monitoring and problem-solving. This means it is now able to collaborate with organizations and companies from sectors as diverse as finance, defense, aerospace, government authorities and telecommunications. Its client portfolio boasts organizations as important as Europol, the European Space Agency, Eumetsat, Eurocontrol, BBVA, INCIBE and Thales.

GMV is a past master in identifying its clients' cybersecurity risks. In recent years it has set up risk-identification mechanisms in emerging sectors conceived without proper security, such as cloud computing, smart cities, Big Data and the internet of things (IoT).



*GMV is chosen by Alstom Transport for supplying an advanced fleet-management system with in-station passenger information for the new light rail system now being built in the city of Sydney (Australia). The system supplied for Sydney's light rail network will be based on GMV's inhouse railway and tram fleet-management system (SAE-R®).*

## ACTIVITIES 2015

# TRANSPORT

GMV has consolidated its position as a leading and trailblazing firm in designing, developing, manufacturing and installing Intelligent Transportation Systems (ITS) based on GPS technology, mobile communications, GIS, plus data-capture, -management and -fusion. Not only do we offer all-in, turnkey, ready-to-go solutions but we also get involved in the complete development of the project, incorporating our own inhouse hardware and software along the way.

In GMV we furnish solutions for all the various means of overland, sea or railway transport.

- Advanced passenger-transport fleet management systems
- Fare and ticketing systems (electronic fare collection systems for vending and validation of various types of tickets, farecards and other travel credits)
- Ticket window management and self-service ticket dispenser platform
- Support systems for the management of public transport-on-demand systems
- State-of-the-art passenger information systems
- Advanced fleet-management systems for railway transport (**SAE-R®**)
- Transport services planning systems
- Passenger transport audio- and video-surveillance systems
- Specialist fleet-management products and services: municipal services, emergencies, etc.
- Advanced car telematics units
- Electronic tolling and information systems on toll-roads, highways and at bridges and tunnels
- AIS/VTS systems for maritime transport and port management
- DGPS coastal systems for navigational aid

# TRANSPORT. MAIN MILESTONES

- 1.** In 2015 ALSA grants GMV the contract for new improvements to Cartagena's public transport system. This involves an overhaul of the fleet-management software, phasing in the latest control and operation functions, installing a complete passenger-information system plus a groundbreaking fare-collection system. This year also sees installation and commissioning of the advanced fleet management system and passenger information system of Palencia's urban public transport system. Both these projects consolidate GMV's relation with ALSA and also reinforce the company's technology leadership in the region of Castilla y León, where Salamanca, Ávila, Segovia, Soria, Burgos, León, Ponferrada and Valladolid are all now running GMV systems.
- 2.** GMV wins the project for development and installation of a platform for integral mobility management of public passenger transport after a bid invitation from the Xunta de Galicia (Regional Council of Galicia) through the Agency for Technological Modernization of Galicia (Axencia para a Modernización Tecnolóxica de Galicia: AMTEGA) and the General Mobility Directorate (Dirección General de Movilidad). Under this large-scale, far-reaching project, the management of 51 firms running over 400 public-transport buses in the region of Galicia will be integrated in a single Operation and Control Center called COMGA. This project makes GMV a true benchmark in Spain in the supply and management of regional public-transport systems, following on from its participation in the regional projects of Madrid, Asturias, Castilla y León, Castilla-La Mancha, Andalucía (Andalusia), Murcia, Valencia, Balearic Islands and Catalunya (Catalonia).
- 3.** GMV also cements its international leadership position with the award of Malta's public bus-transport concession to the operator Malta Public Transport (MPT) of Grupo CMCXXI, belonging to the Cosmen family. MPT has phased far-reaching innovations into this modernization process and GMV has played a key supporting role by supplying the advanced fleet-management system and video-surveillance system (CCTV) plus the electronic fare collection system. GMV also signs a new contract for maintenance of the fleet management system with control center of the Polish city of Bydgoszcz.
- 4.** In 2015 GMV's North African business makes further headway. As technological partner of the Moroccan multinational CityBus, GMV collaborates closely in CityBus's expanding business in Morocco, where the company has won new public-transport concessions in the cities of Kenitra, Tetouan and El Jadida. GMV also supplies both the advanced fleet management system and fare-collection system for the transport systems of Fez and Meknes. Furthermore, GMV's longstanding collaboration with ALSA in Morocco, with projects up and running in the cities of Marrakech and Agadir, is rounded out with a new contract under which it supplies an electronic fare collection system in the public buses of the city of Khouribga. In the railway sphere GMV continues to roll out the advanced fleet management system (SAE-R®) for Morocco's national railway operator ONCF (Office National des Chemins de Fer).
- 5.** In 2015 SICE, priming the supply contract of the fare-collection system for the new lines 3 and 6 of the Metro of Santiago de Chile, turns to GMV as supplier of the ticket vending/recharging machines for both lines. GMV also signs a contract with the Island Council of Minorca (Consell Insular de Menorca: CIM) for upgrading of the whole island's fare collection system. In Granada meanwhile, One year after inauguration of Granada's high-capacity line (Línea de Alta Capacidad: LAC), its ticket-vending and read-write machines, inspection terminals and information panels, all supplied by GMV, have been warmly received and generously praised by users.
- 6.** In 2015 GMV is chosen by Alstom Transport for supplying an advanced fleet-management system with in-station passenger information for the new light rail system now being built in the city of Sidney (Australia). The system supplied is based on GMV's inhouse railway and tram fleet-management system (SAE-R®). GMV also continues to make headway in the Talgo project for construction of the high-speed train to run on the new line between the cities of Mecca and Medina in Saudi Arabia. Under this project GMV is supplying Talgo with four of the train's onboard systems: the intercom and public-address system; the video-surveillance system (CCTV); a specific event-recording and security-hardening system on the train's Ethernet backbone; and a final system providing an interface for displaying onboard diagnosis on each car of the train.
- 7.** Early in the year the European project REMOURBAN (REgeneration MOdel for accelerating the Smart URBAN transformation) is launched. The REMOURBAN project, funded from the European Union's Horizon 2020 research and innovation program, aims to develop and validate an integral and sustainable urban regeneration model, implementing groundbreaking ICT, mobility and energy technologies in the cities involved. Under the leadership of the CARTIF technology center, GMV's REMOURBAN activities center on the set of smart mobility measures in the city of Valladolid.
- 8.** GMV plays a leading role in the pan-European project HeERO (Harmonised ecall European Pilot), which aims to drive the new in-vehicle safety service eCall, based on the single European emergency number 112. In 2015 GMV continues to work on the project that builds on the earlier HeERO versions (HeERO1 and HeERO2), participating in the eCall rollout project in Portugal, the infrastructure of which is due to be ready by 2017. GMV is giving overall support to the national pilot trial and providing European-standard-compliant in-vehicle systems (IVS) capable of making e-Calls manually or automatically.
- 9.** In 2015, under a contract signed with the automobile company Ficosa for providing engineering services for onboard software and hardware technology, GMV is awarded a contract for the development of a fourth-generation telematics control unit TCU (4G or "LTE"), a standard initially proposed by NTT DoCoMo of Japan which has been adopted as the international standard for 4G mobile networks. Alongside this technical evolution, GMV is also supporting Ficosa this year in the development of new onboard services such as those required for electric vehicles as well as improving existing services.
- 10.** In its constant quest for new, sustainable mobility models, GMV signs a framework agreement with Alphabet España Fleet Management S.A., a car and light-vehicle hire firm. Under this agreement Alphabet will be marketing an advanced fleet-management system called Alphabet Telematics, based on GMV technology. In this same area GMV and ALD Automotive, the vehicle leasing and vehicle fleet management business line of the financial group Société Générale, continue collaborating in various mobility projects. In 2015, following on from the success of GMV's corporate carsharing system in Spain, a framework agreement is signed with ALD Portugal to offer this service in Portugal too. Furthermore, the companies CLH, IVECO and British American Tobacco, all of which hire vehicles from ALD Automotive, join the fold of over 1800 clients that have placed their trust in GMV's advanced fleet-management and -tracking system, MOVILOC®.
- 11.** Midway through the year GMV and Syncromatics Corp, a supplier of Software as a Service (SaaS) solutions for the public intelligent transportation systems (ITS) market, sign an agreement under which GMV makes a strategic investment in Syncromatics Corp's capital. This investment in the Californian technology company, which has built up an excellent reputation among its clients and developed a range of products perfectly suited to the US market, boosts GMV's expansion capacity in the USA and cements its position in the global ITS market.
- 12.** The Regional Public Works and Environment Ministry of Castilla y León (Consejería de Fomento and Medio Ambiente de Castilla y León) decides this year to prolong until March 2018 the contract awarded to GMV for management and maintenance of Castilla y León's transport-on-demand system. This system, which GMV has also set up in Portugal, offers new mobility options for far-flung, low-demand rural areas, based on passengers' phoned-in or online requests for particular connections at any one time.



## ACTIVITIES AND ASSESSMENT 2015

Thanks to the international expansion of this business line, GMV has now built up a solid position as one GMV has held a leadership position in the global intelligent transportation systems market for some years now. Never resting on its laurels, however, it decided in 2015 to boost the growth of its USA subsidiary by making a strategic investment in the Californian technology company Syncromatics, an agreement that looks set to drive the growth of GMV's USA business over the coming years.

The Spanish market this year saw further consolidation of GMV's leadership in advanced fleet-management systems, passenger-information systems, video surveillance and ticket-vending systems, the firm winning new contracts from bus and tram fleets in cities like Cartagena and Palencia. GMV also participated in the development and installation of a platform for integral mobility management of public passenger transport after a bid invitation from the *Xunta de Galicia* (Regional Council of Galicia). This involves a large-scale, far-reaching project for the management of 50 firms running a total of over 400 vehicles.

In the world arena GMV won flagship contracts this year. Some of the key projects it participated in were the Metro of Santiago de Chile in collaboration with SICE, and Malta's public bus-transport concession with *Grupo CMCXXI* belonging to the Cosmen family. Further afield still, it was also chosen by Alstom Transport for supplying an advanced fleet-management system with in-station passenger information for the new light rail system now being built in the city of Sydney.

The company also made notable headway in 2015 in North Africa, where its expansion strategy is coming good. GMV is still collaborating with Morocco's national railway operator ONCF and also has a notable share in the new public-transport concessions in Kenitra, Tetouan, El Jadida, Marrakech, Agadir and Khouriba.

Another notable and ongoing success story this year was the growth of GMV's business in supplying groundbreaking telematics systems for the automobile sector, involving implementation of the European eCall system, pay as you drive (PAYD) insurance systems, roadside assistance, advanced road toll systems and new, more sustainable mobility models. In 2015, as well as continuing to collaborate with Ficoso and ALD Automotive, GMV also signed an agreement with *ALPHABET España Fleet Management S.A.* Under this agreement ALPHABET will be marketing an advanced fleet-management system based on GMV technology.



Doñana Biological Research Station (Estación Biológica de Doñana) of the Higher Scientific Research Council (CSIC in Spanish initials) awards GMV several projects under the umbrella LifeWatch project, working towards a joint European biodiversity research infrastructure network. By means of a distributed e-infrastructure LifeWatch will facilitate the use of Europe's existing environmental and biodiversity databanks, ensuring their connectivity, interoperability and use by the science community, environment managers, companies and the public at large.

# ACTIVITIES 2015

# TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES

## FOR THE PUBLIC SECTOR AND LARGE CORPORATIONS

### TELECOMMUNICATIONS

GMV works closely with the main operators and providers of telecommunication and media services, offering tailor-made solutions to meet their needs:

- Development of and consultancy on value-added services
- Online channel and mobile apps
- Specialized cybersecurity services for operators
- Advanced network services testing and deployment of global services
- Third-party integration and provisioning systems
- Big Data solutions: network anomaly detection, client segmentation
- Network performance management
- Capacity planning
- 24x7 support services

### INFORMATION TECHNOLOGIES FOR THE PUBLIC AND PRIVATE SECTOR

GMV designs, develops and implements state-of-the-art ICT solutions to improve the processes of leading organizations, acting as long-term technological partner. GMV's proven ability to come up with secure solutions has won it the trust of government authorities and major companies.

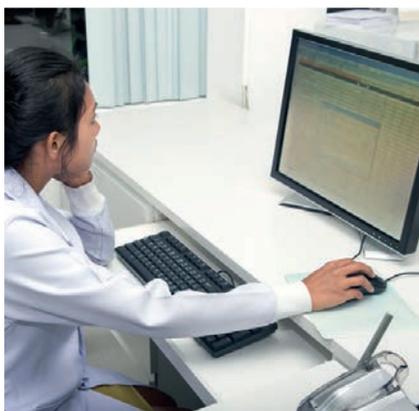
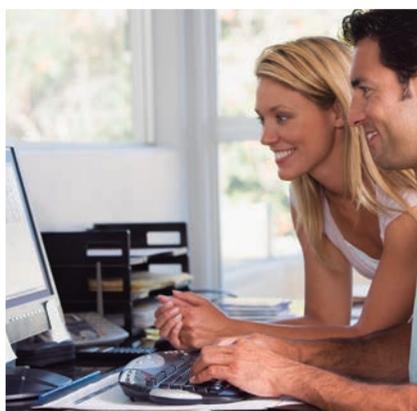
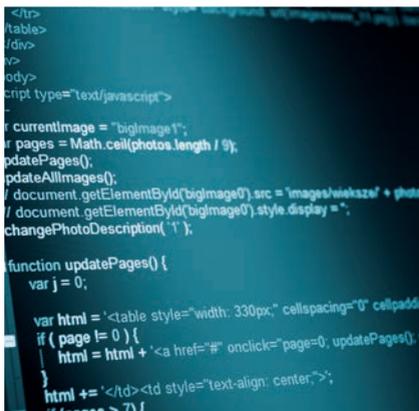
This sector is continually developing at breakneck speed and our range has to be made increasingly complete and groundbreaking to keep apace, anticipating market needs on the strength of constant research and mastery of new technologies.

- Corporate email and agenda solutions and synchronization with mobile devices
- e-Government solutions
- Email solutions
- Content management platforms
- Document management, website portals and intranet platforms
- Mobility and messaging solutions
- System and infrastructure architectures
- Process consultancy and technology consultancy
- Information networks and system security
- Open source software

# TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES

## MAIN MILESTONES

- 1.** The employer's corporation Red.es and the National Reference Center for the Application of Technologies (CENATIC), in collaboration with GMV, conduct a study on the business opportunities presented by open-source technology and identification of company needs for marketing Open Source Software (OSS) products and services, in the interests of setting up a national OSS Certification and Re-use Support Center.
- 2.** With the aim of speeding up and streamlining its sales processes, Sprinter, a Spanish fashion, footwear and sports-complements firm, taps into GMV's expertise and experience for setting up a new warehouse for managing orders made in both high-street shops and online shops, whenever customers ask for products not actually held in stock at that time.
- 3.** A consortium formed by GMV and the biometric software solutions firm GEYCE wins the contract for the development of an Integrated Consular Office Management System (eSGC in Spanish initials), after an international bid invitation held by the Portuguese Ministry of Foreign Affairs (Ministério dos Negócios Estrangeiros: MNE). The project comprises integral development of a new online consular management application (eSGC), fulfilling the functions of consular register, civil registry, electoral roll, plus economic management of the consular office's accountancy procedures and processes.
- 4.** In 2015 GMV signs a new framework agreement to unify the accounts contracts of ONO and Vodafone. GMV continues to collaborate in the development of value-added services and the online channel. It remains ONO's go-to cybersecurity firm, enlarging the scope of its corporate security services to phase-in ONO's assets, providing various cybersecurity services for protection of its systems, applications and networks.
- 5.** During this year GMV continues its activity under the COVADONGA project of the Galician Health Service (Servicio Gallego de Salud: SERGAS). This project, which sets out to calculate clinical and epidemiological data for the purposes of clinical evidence, is a far-reaching Big Data healthcare project. In 2015 SERGAS, in collaboration with GMV, installs HEXIN, a clinical- and epidemiological-data mining platform for exploiting the clinical information of groups of patients with common characteristics or symptoms. Its overall aim is to facilitate clinical decision-taking, management and support in epidemiological identification tasks.
- 6.** GMV is now a benchmark in developing and setting up web portals on GIS infrastructure. In 2015 GMV signs new contracts for the maintenance and development of new functions in the company's up-and-running projects with some of its marquee clients, such as the City Council of Lisbon, the Portuguese corporation EDIA (Empresa de Desenvolvimento e Infraestruturas do Alqueva, S.A) and the Inter-American Development Bank.
- 7.** GMV develops for Qualitas and Balumba, car insurance companies of Grupo Admiral, a mobile app designed by Admiral's own business department. Its aim is to harness the benefits of state-of-the-art technologies to provide clients with an autonomous and intuitive self-checking system of their vehicles, thereby improving user experience too.
- 8.** Doñana Biological Research Station (Estación Biológica de Doñana) of the Higher Scientific Research Council (CSIC in Spanish initials) awards GMV several projects under the umbrella LifeWatch project, working towards a joint European biodiversity research infrastructure network. By means of a distributed e-infrastructure LifeWatch will facilitate the use of Europe's environmental and biodiversity databanks, ensuring their connectivity, interoperability and use by the science community, environment managers, companies and the public at large. GMV has taken part in several projects within this initiative, such as Doñana's global change portal, the e-Labs virtual laboratory platform and implementation of the PaaS of Europe's e-Infrastructure.
- 9.** GMV collaborates in the development of the mobile app and website of the Ufeed project, a trailblazing technological solution that funds social projects by sending social-media messages. Under Ufeed users can decide which cause and which company's poverty-eradication endeavor they want to support. Instead of paying, they share a social-media message publicizing the company's donation.



## ACTIVITIES AND ASSESSMENT 2015

After several years of dwindling ICT investments by both public authorities and private companies, 2015 saw the first shoots of recovery. During the worst of the downturn, on the strength of its technological specialization and bulging client portfolio, GMV more than held its own in this sector. It is now thought to be one of the sectors with the brightest growth prospects.

GMV's telecommunications business with its longstanding clients like Vodafone thrived this year. In 2015 GMV remained one of its strategically important suppliers and a "Best Partner", signing several contracts, mostly notably a new framework agreement to unify the accounts contracts of ONO and Vodafone. The latter also certified GMV as system provider, an area run for the last 7 years under two major outsourcing contracts.

In coming years Network Function Virtualization (NFV) looks set to become a decisive factor in taking on current and future challenges posed by the delivery of mobile operator services. Security is bound to be an overriding concern in its implementation; this augurs well for GMV's future growth in this activity over the coming years.

In the area of mobile app development and portal and e-commerce solutions for major firms, noteworthy additions to the client portfolio were achieved in 2015, such as Qualitas, Balumba, Sprinter and Ufeed.

In the public sector GMV retained the ongoing trust of its longstanding clients such as Red.es, the City Council of Lisbon, EDIA and the Inter-American development Bank, while also winning new clients like the Portuguese Foreign Affairs Ministry and Santiago University.

Big Data business, for its part, looks good not only in matters of security but also problem-solving in the processes of data analysis, management, collection, storage or searches. In all these areas GMV is now a recognized authority after its eye-catching performance in projects such as Covadonga for the Galicia Health Service and also in the framework of the European LifeWatch initiative.



# SOCIAL RESPONSIBILITY

Mindful of its responsibility to the present and future society, GMV constantly strives to make a better use of its resources, improving its process efficiency by using state-of-the-art technology.

GMV's corporate social responsibility therefore includes a general set of long-term goals:



- Act in a responsible and ethical way in all our activities and ensure that our employees, clients and suppliers do likewise with their stakeholders.



- Reduce the environmental impact of our operations and carry out eco-friendly initiatives.



- Contribute to the creation of a more sustainable society, providing groundbreaking solutions that improve the quality of life of persons, helping them to integrate into society and the working world.

# HUMAN CAPITAL

Right from the word go GMV has made its personnel policy one of the linchpins 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 painstaking personnel-selection policy, a stable environment in which to pursue their careers and a continuous top-up training plan.

Attracting and nurturing talent is a difficult and time-consuming process. We have therefore been determined to make good this investment by retaining our whole personnel during the current worldwide downturn. By dint of a long-sighted commitment to technology and innovation, diversification of the business into various sectors and breaking into new international markets, GMV has indeed managed to ride out the crisis without shedding staff. This stands us in good stead for renewing our economic growth in the future. GMV closed the year with a staff of 1,249; 89% are university graduates and the average age comes out at about 36.

GMV has always pursued a painstaking personnel-selection procedure and has been equally determined to provide this pool of talent with a stable environment for developing their careers. On the strength of this policy, and despite the current economic climate, it has managed to maintain a high level of indefinite-term contracts, a rate of about 88% in 2015. 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 24% of GMV's staff are women, who also represent 17% of senior management.

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 461 training courses were held in 2015 on both an individual and group basis, adding up to a sum total of 15,158 training hours.

GMV liaises permanently with study centers and universities throughout the whole of Spain plus universities in other countries, either by way of internships to help university students join the job market or 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.

In 2015 GMV continued with its training, research, development and innovation work, running courses, seminars and lectures. The main vehicle for this activity is the GMV Chair, a joint academic initiative set up between the Polytechnic University of Madrid (*Universidad Politécnica de Madrid: UPM*) and the Higher Technical School of Aeronautical Engineers (*Escuela Técnica Superior de Ingenieros Aeronáuticos: ETSIA*). This chair kept up a brisk activity in 2015, holding various seminars, courses and debates involving the participation of many professors and leading experts. In this year, too, GMV and the university called *Universidad Rey Juan Carlos (URJC)* signed an agreement that aims to improve the practical training of future data scientists. As a result, students of URJC's Data Science Master will have the chance to put their theoretical knowledge into practice in the technological projects being carried out by GMV.

# 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 various 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.

Back in 2010 the subsidiary GMV Aerospace and Defence, S.A.U obtained level-5 maturity under the CMMI (Capability Maturity Model Integration) model, a prestigious international certificate granted by an independent body after the most thoroughgoing assessment. Level-5 maturity is the highest of this demanding quality-assurance model and only a handful of the world's firms possess it. In 2013 this subsidiary renewed CMMI level-5 accreditation and extended it to the subsidiaries of Portugal and Poland. GMV had already achieved level-3 CMMI maturity way back in 2005. This certification is to be added to the ISO 9001: 2008 certification, which it obtained in 1997, and also the additional specific certificates to cover its various areas of activity, such as EN 9100:2010, based on ISO 9001:2008 and specifically designed for aerospace developments, and AQAP 2110, 2210 and 2310, specific certificates for defense activities.

In 2015 the subsidiary GMV Soluciones Globales Internet S.A.U. continued its ongoing improvement process, particularly in its management systems, successfully passing the annual audits of its quality and IT services certificates, renewing the latter. Its quality-management system abides by the standard ISO 9001:2008 while its service management system complies with ISO 20000-1:2011. Since 2013, moreover, the quality management system of GMV Soluciones Globales Internet, S.A.U has boasted level-3 CMMI accreditation. During 2015 GMV Soluciones Globales Internet renewed ISO 27001 certification of its information security management system (ISMS) for the offices of Madrid, Seville, Barcelona, Boecillo and the East Coast. This certificate, in force since 2004, is the oldest in Spain. GMV Soluciones Globales Internet, S.A.U. has also renewed ISO 22301 certification of its business continuity management system (BCMS). GMV was Spain's second firm to certify its business continuity management back in 2010. As regards R&D, in 2015 GMV Soluciones Globales Internet, S.A.U. successfully passed the annual renewal audit of its R&D management system under the new standard UNE 166002:2014.

The subsidiary GMV Sistemas S.A.U. has likewise been certified under ISO 9001:2008, 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 of systems for the sectors of transport, remote control and satellite navigation, including the supply, installation and maintenance of onboard equipment in trains and web-based fleet management and tracking services.

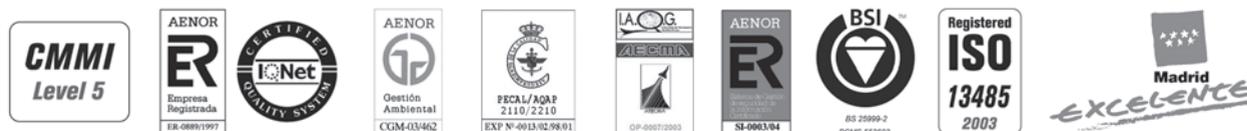
The quality management system of GMV's Portuguese subsidiary, GMVIS Skysoft, S.A. is compliant with the standard EN ISO 9001: 2008. During the year the subsidiary managed to attain accreditation under the standard EN 9100:2010, based on ISO 9001:2008 and specific for aerospace developments. The company also holds CMMI maturity level 5.

GMV's Polish subsidiary Innovating Solutions Sp. z o.o. for its part, likewise holds CMMI maturity level 5.

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, Seville and Barcelona, conforms to the UNE-EN ISO14001: 2004 standard. In 2015, too, and with the aim of cutting down energy consumption and thus curbing any environmental impact, GMV implemented and certified the power management system of its Madrid office under the energy-efficiency ISO 50001 standard.

Lastly, GMV renewed in 2015 the quality kitemark Madrid Excelente, awarded by the Madrid Regional Authority in recognition of management excellence in companies. GMV's healthcare product **radiance**, for its part, renewed both EC and FDA certification.

GMV is acutely aware that quality assurance is not just a matter of obtaining a given certificate or title; it needs to pervade the daily work of the whole personnel. The whole organization is pledged to the goal of achieving top quality in all its products and services. 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 enforced in all the work they do.







# GMV IN THE WORLD

- BRANCHES AND OFFICES
- PROJECTS



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# ECONOMIC AND FINANCIAL RESULTS

## FINANCIAL STATEMENTS 2015

### BALANCE SHEET

ASSETS			LIABILITIES		
	2014	2015		2014	2015
Fixed assets	28,732,964.21	31,947,022.84	Stockholders' equity	42,371,055.80	45,745,560.28
			Capital grants	666,306.11	435,131.74
			Minority interests	5,267,762.82	5,494,178.39
			Long-term funding	9,501,766.78	12,369,766.72
			Interest free credits	6,136,307.87	5,991,887.28
			Long term funding	3,365,458.91	6,377,879.44
<b>Total fixed assets</b>	<b>28,732,964.21</b>	<b>31,947,022.84</b>	<b>Total Long-term Funding</b>	<b>57,806,891.51</b>	<b>64,044,637.13</b>
Inventories	15,019,790.79	12,026,498.05	Short term liabilities	25,604,842.69	23,864,512.46
Accounts receivable	30,071,353.30	25,530,872.28	Bank loans and overdrafts	8,938,922.11	5,445,025.47
Trade debtors	38,758,543.78	35,117,693.59	Non-trade payables	16,665,920.58	18,419,486.99
Trade services on account	-9,943,917.51	-10,904,429.15	Deferred payments	1,459,932.23	1,939,249.90
Other debtors	1,256,727.03	1,317,607.84			
Cash	11,047,558.13	20,344,006.32			
<b>Total current assets</b>	<b>56,138,702.22</b>	<b>57,901,376.65</b>	<b>Total short term liabilities</b>	<b>27,064,774.92</b>	<b>25,803,762.36</b>
<b>Total assets</b>	<b>84,871,666.43</b>	<b>89,848,399.49</b>	<b>Total liabilities</b>	<b>84,871,666.43</b>	<b>89,848,399.49</b>
Working capital	29,073,927.30	32,097,614.29	Working balance	29,073,927.30	32,097,614.29
Working capital/Equity	50.29%	50.12%	Working balance/fixed asset	101.19%	100.47%

### PROFIT AND LOSS ACCOUNT

EXPENSES			INCOME		
	2014	2015		2014	2015
Purchase of goods	30,761,849.01	33,090,975.56	Turnover	113,998,968.07	124,258,985.15
Ancillary Services	9,885,393.55	11,460,953.26	Own expenses capitalized	2,319,261.61	2,303,331.20
Taxes	144,376.24	207,884.21	Operating grants	595,908.86	343,080.76
Employee Costs	67,579,888.93	73,028,244.21	Financial Income	629,136.23	79,654.54
Financial Expenses	1,534,108.04	786,746.02	Extraordinary Income		134,013.75
Extraordinary Expenses					
Period Depreciation and Amortization	3,386,893.46	3,237,897.62	<b>Total income</b>	<b>117,543,274.77</b>	<b>127,119,065.40</b>
Appropriations, transfer to Provisions	-30,396.07	328,062.79			
<b>Total Expenses</b>	<b>113,262,113.16</b>	<b>122,140,763.67</b>	<b>Pre-tax profit</b>	<b>4,281,161.61</b>	<b>4,978,301.73</b>
Corporate income tax	541,368.52	708,129.05	<b>Post-tax profit</b>	<b>3,739,793.09</b>	<b>4,270,172.68</b>

## CASH FLOW STATEMENT

OPERATING ACTIVITIES	2014	2015
Profit after tax	3,739,793.09	4,270,172.68
Depreciation and amortization	3,386,893.46	3,237,897.62
<b>Operating Cash Flow</b>	<b>7,126,686.55</b>	<b>7,508,070.30</b>
Net finance expense	1,534,108.04	786,746.02
Corporate income tax	541,368.52	708,129.05
<b>EBITDA</b>	<b>9,202,163.11</b>	<b>9,002,945.37</b>
(Increase) / decrease in trade and other receivables	1,254,667.71	7,533,773.76
Increase / (decrease) in trade and other payables	-468,810.48	1,753,566.41
(Decrease) / increase in provisions	-760,891.40	479,317.67
Deferred income (capital grants)	-595,908.86	-343,080.76
<b>Cash flow generated from operations</b>	<b>8,631,220.08</b>	<b>18,426,522.45</b>
Tax paid	-541,368.52	-708,129.05
<b>Net cash flow from operating activities</b>	<b>8,089,851.56</b>	<b>17,718,393.40</b>
<b>INVESTMENT ACTIVITIES</b>		
	2014	2015
Purchase of subsidiary undertaking (Goodwill)	0.00	-3,597,242.55
Capital expenditure - plant and equipment	-923,273.74	-584,814.66
Capital expenditure - intangible assets	-2,076,610.58	-2,269,899.04
<b>Net cash flow from investing activities</b>	<b>-2,999,884.32</b>	<b>-6,451,956.25</b>
<b>FINANCING ACTIVITIES</b>		
	2014	2015
Net new debt (debt increase + debt repayments)	-4,599,970.41	-625,896.70
Capital Grants and subsidies on capital	493,091.05	111,906.39
Interest paid	-1,534,108.04	-786,746.02
Dividends paid to equity shareholders	-609,685.35	-527,003.68
Paid-in capital / Adjustments to the equity value	348,390.32	419,525.57
Minority Interests	77,176.82	226,415.57
Results attributable to the Minority Interests	-720,140.54	-788,190.09
<b>Net cash flow from financing activities</b>	<b>-6,545,246.15</b>	<b>-1,969,988.96</b>
<b>(Decrease) / increase in cash and cash equivalents</b>	<b>-1,455,278.91</b>	<b>9,296,448.19</b>
Cash and cash equivalents at beginning of year	12,502,837.04	11,047,558.13
<b>Cash and cash equivalents at end of year</b>	<b>11,047,558.13</b>	<b>20,344,006.32</b>





