European GNSS Agency

2011 Annual Activity Report

FINAL

European GNSS Agency

GSA AB 12-06-20-33-02

Foreword by the Chair of the Administrative Board

The second half of 2011, when I took over as Chair of the European Global Navigation Satellite System (GNSS) Agency's Administrative Board, was marked by several important events. Most significantly, in October 2011 the first two operational Galileo satellites were launched from the European Spaceport in Kourou, French Guiana. Many people invested a great deal of effort to make the launch possible. It also brought the Agency, the European Commission, European Space Agency and the Member States closer together, working as a real team. I would like to specifically mention the security experts from the Agency and the Member States who had a great deal to accomplish in a short time and with limited staff. It is of utmost importance to keep up the pace and to follow with the launch of the next satellites, to ensure that the first Galileo services will be available in 2014/2015 as planned.

Regarding the role of the Agency, apart from the GNSS Agency Regulation 912/2010 which was to be implemented in 2011, the European Commission proposed the draft of a new GNSS Regulation in November, kick-starting the Agency for new tasks including the exploitation of EGNOS services and the upcoming availability of the first Galileo services. Discussions on the draft regulation have begun in the Council and the European Parliament. One of the key issues is the clear allocation and separation of competences of the Agency, the Commission and ESA. It is crucial for this regulation to enter into force before the end of 2013.

To accompany the Agency's way forward to its new tasks, the Administrative Board approved the new internal organisation and adopted the Annual Work Programme 2012.

In 2011 preparations were already underway for relocation of the Agency to its new seat in Prague. It is important for the move to go as smoothly as possible, both for staff and for ensuring full and continuous operations of the Agency.

Sabine Dannelke

Sabine Dannelke

European GNSS Agency

ADOPTED
by the GSA Administrative Board

GSA AB 12-06-20-33-02

Foreword by the Executive Director

My first year as Executive Director was a key year for the Agency. 2011 heralded a new chapter for the Agency, bringing it back into the centre of the EU GNSS Programmes.

Four programmatic achievements were instrumental for such a fundamental paradigm shift:

1. European Geostationary Navigation Overlay Service (EGNOS) certification for civil aviation (March 2011). This provided the first of the EU GNSS services intended to bring concrete, tangible benefits to European citizens;
2. European Commission proposal for adequate funding of the EU GNSS programmes in the next Multiannual Financial Framework (June 2011). This provided the proper financial sustainability, which is crucial in order to earn the confidence of downstream market industrial players and, most of all, users;
3. Launch of the first two Galileo operational satellites (October 2011). The launch was an essential step forward needed to gain credibility among many European and international stakeholders;
4. European Commission-proposed a new GNSS Regulation (December 2011), which provided the basis for the upcoming exploitation phase in which the Agency will play a pivotal role.

2011 also set the stage and created conditions for the relocation of the Agency to Prague, in accordance with the 2010 Council Decision.

Much of the year centred on developing the required Agreements with the government of the Czech Republic, which were successfully achieved at end of 2011. Special attention was paid to minimise staff turnover, especially as not all staff are in a position to move to Prague. Though the transition process is not complete, the Agency will retain all of its key competences.

2011 was also the first year for the fully functioning Security Accreditation Board (SAB), which effectively leveraged the Agency's competences and enduring support. Despite the critical lack of resources over the year, the Agency's contribution was significant in the build-up the Galileo Security Monitoring Centre (GSMC) nucleus and the first authorisation to launch (ATL1). The foundations were put in place to achieve other ambitious objectives required by the programme such as ATL2 and, further on, system deployment completion and operations.

By the end of the year, new life was breathed into the Agency. While in the early part of the 2011 there was a lack of human resources in several key functions and a degree of uncertainty, today GSA has taken a new shape. This is reflected in the new way it interacts with the Commission Services, Council and European Parliament. The Agency now has recognised competences over key programme areas and is preparing to rapidly build on many others in view of the exploitation phase – specifically in operations and service provision.

Today the Agency is actively reassessing its internal processes, procedures and workflows in order to improve management efficiency and flexibility. GSA has truly evolved into a 'service-oriented' Agency - an organisation fully focused on user requirements. We are now in the right place to develop and successfully face the exciting challenges ahead.

Carlo des Dorides

Foreword by the President of the Security Accreditation Board

In 2011 the Security Accreditation Board faced the challenging task of delivering initial key decisions just a few months after its operations began.

Galileo is the largest ever 'EU SECRET-level' system, and with it the European Union is stepping powerfully into the field of strategic systems that were once only in the playground of superpowers.

The whole point of fielding an independent satellite navigation system for Europe would be missed if it were vulnerable in crisis situations when access to other GNSS systems would not be available.

An estimated 6-7% of the EU's GDP depends either directly or indirectly on these systems – and this reliance is growing. EU security will also increasingly benefit from Galileo's Public Regulated Service (PRS).

Unfortunately, the security environment for information and space systems continued to become more challenging in 2011, as illustrated by the disclosure at the end of the year by the US Congress about the sophisticated, initially undetected, hacking of some US civil satellites.

The Board constitutes the EU GNSS Security Accreditation Authority and operates independently to support the collective security of the EU and its Member States in the interest of the EU citizens. It is supported by a dedicated security accreditation team from the GSA and the invaluable contribution of experts from Member States and Norway.

Board experts conducted on-site inspection of ground facilities worldwide in 2011. Crypto components were analysed in top notch laboratories, a special body intervened during the launch campaign, and last but not least, a comprehensive security screening of the overall system was conducted, both to verify compliance with the specifications and to ensure the treatment of all significant residual risks.

These efforts successfully culminated in the authorisation to launch the first two Galileo satellites in October 2011.

In spite of the massive improvements over the past two years, the progress needed in 2012 and 2013 to reach the necessary level of security for the operational milestones is daunting.

It will require continued efforts, both at management and technical levels, by the European Commission, the European Space Agency and industry.

On the Security Accreditation Board (SAB) side, the understaffed Agency accreditation team will need improved resources to fulfil its duties in the delicate context of the relocation to Prague. The continued support of Member States expertise will be essential.

As a result of this collective effort, it is our hope that Europe will demonstrate to the world that it has, in little more than a decade, become capable of fielding a civil strategic system able of withstanding the current and future world security environments with the highest level of reliability.

(signed)

Michel Iagolnitzer

Contents

1. Introduction

In 2011, the Agency continued to carry out its remit and responsibilities while continuing to position itself as the centre piece of the European Union's strategy for GNSS. In this context, the Agency continued its progress towards establishing smooth inter-institutional relations between the primary actors in European GNSS: the European Commission, the European Space Agency, the Member States and industry.

Following the election of its new Executive Director, Mr Carlo des Dorides, the Agency focused on its core tasks: providing security accreditation of all aspects of the Galileo network; preparing for Galileo Security Monitoring Centres (GSMCs); expanding and developing the existing markets that use the European GNSS programmes; researching new markets that could benefit from GNSS and managing a number of projects under the auspices of the Seventh Framework Programme (FP7). Much work was done in close cooperation with other European entities, notably the European Commission.

2011 was a crucial year for the Agency. For example, it hosted a stand on Public Regulated Service (PRS) at the Tetra World Conference in Hungary. This was the first time the Agency communicated the benefits of the PRS to its target audience in this way. Similarly, the Agency continued to be active in many other spheres of interest and spoke at the eighth annual Road User Charging Conference (Brussels), the Munich Satellite Navigation Summit (Munich), the sixth European Aeronautics Days (Madrid), the fourth Regional Airlines Council conference (Cagliari, Italy), the ASECAP Information Days (Brussels), the Intelligent Transport Systems Congress (Lyon, France), the Geodesic Infrastructure in Europe Seminar (Umea, Sweden), the Institute of Navigation's International Conference (Portland, USA), the Intergeo Conference (Nuremberg, Germany), the Intelligent Transport Systems World Congress (Orlando, USA) and Agritechnica (Hannover, Germany).

Throughout the year, the Agency concentrated its efforts to manage its eventual relocation to Prague. In December 2011, all agreements were signed between the European Commission and the government of the Czech Republic to allow the Agency to move in 2012. Considerable behind-the-scenes work by the Prague Task Force ensured that three key documents were ready:

- The Host Agreement, which describes the conditions under which the Agency could be established in the Czech Republic;
- The Lease Agreement, which determines the terms and conditions under which the Czech Ministry of Finance is to provide premises to the Agency;
- A Hospitality Package, which contains the conditions that Agency personnel will have when based in Prague.

In 2011, following the new GNSS Regulation adopted on 30 November 2011, the Agency started to plan for 2012 and beyond. Among these plans is for the Agency to become in charge of the operations and the service provision of EGNOS and the Galileo system in 2014.

2. The Agency

By developing a new generation of Global Navigation Satellite Systems (GNSS), Europe is opening new doors for industry development, job creation and economic growth. With Europe in the driver's seat, Galileo has the potential to become a cornerstone of the global radio navigation positioning system of the future.

Given the strategic nature of European satellite positioning and navigation programmes, (which include Galileo and EGNOS) the European GNSS Agency, a European Union Regulatory Agency, was established in 2004. The Agency is responsible for a range of activities, including:

- Preparing for the successful commercialisation and exploitation of the systems, with a view to smooth functioning, seamless service provision and high market penetration;
- Ensuring the security accreditation of the system and operation of the Galileo Security Monitoring Centres (GSMCs)[1];
- Accomplishing other tasks entrusted to it by the European Commission, such as managing EU GNSS Framework Programme Research; the promotion of satellite navigation applications and services; and ensuring the certification of the components of the systems' components.

Staffed with skilled professionals bringing relevant experience from both the public and private sectors, the Agency is in a unique position to contribute to one of the most important and ambitious projects ever undertaken by the European Union. The Agency has the motivation and know-how to help ensure that Europe fully accomplishes its GNSS aims and truly reaps the benefits of the EGNOS and Galileo for its citizens.

Europe's Satellite Navigation Programmes: EGNOS and Galileo

Galileo is the future of the European Global Navigation Satellite System (GNSS). In the future, GNSS users in Europe will no longer be dependent upon the American GPS or the Russian Glonass system for their satellite positioning, navigation and timing needs. While European independence is an important reason for undertaking the Galileo programme, by being interoperable with GPS and other international systems, it will also be a cornerstone of a truly global navigation satellite system that will be under civilian control. With its state-of-the-art technology and full complement of satellites, Galileo will open the door to a new era of higher positioning accuracy, better coverage and reliability, new services and increased resistance to interference.

EGNOS - It's there. Use it.

EGNOS (European Geostationary Navigation Overlay Service) is Europe's first concrete venture into satellite navigation. It already delivers valuable services by augmenting and improving GPS signals and retransmitting them to users via geostationary satellites.

EGNOS renders GPS signals suitable for safety critical applications – such as guiding aircraft during approach or other safety-relevant procedures, or navigating ships through narrow channels – and increases the accuracy of existing satellite-positioning services. It also provides a crucial 'integrity message', informing users in the event of problems with the satellite signals.

Along with valuable transport applications, the increased accuracy and reliability of EGNOS also supports users on the ground, for example in precision agriculture and mapping.

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[1] Implemented in accordance with decisions taken pursuant to Article 13 of Regulation (EC) No 683/2008 of the European Parliament and of the Council of 9 July 2008 on the further implementation of the European satellite navigation programmes, and instructions provided under Council Joint Action 2004/552/CFSP of 12 July 2004 on aspects of the operation of the European satellite radio-navigation system affecting the security of the European Union (OJ L 246, 20.7.2004, p. 30.)

Supporting the use of EGNOS and Galileo

Satellite navigation has made massive inroads in many areas of society, impacting in increasingly profound ways on business, public services and consumer behaviour. Along with delivering economic benefits to innovative service providers and related businesses, satellite navigation devices – which are now integrated within a wide variety of transport systems as well as handheld devices like smartphones – have changed the way we manage the mobility, safety and security of people and goods.

The GNSS market, including upstream infrastructure and downstream user applications, has been growing at double-digit rates over the past decade. This growth is expected to accelerate as new satellite systems with superior performance, such as EGNOS and Galileo, become operational and increase the number of applications.

The Agency plays a key role in the development of commercial markets for EGNOS and Galileo services. Today, GSA Market Development activities focus on:

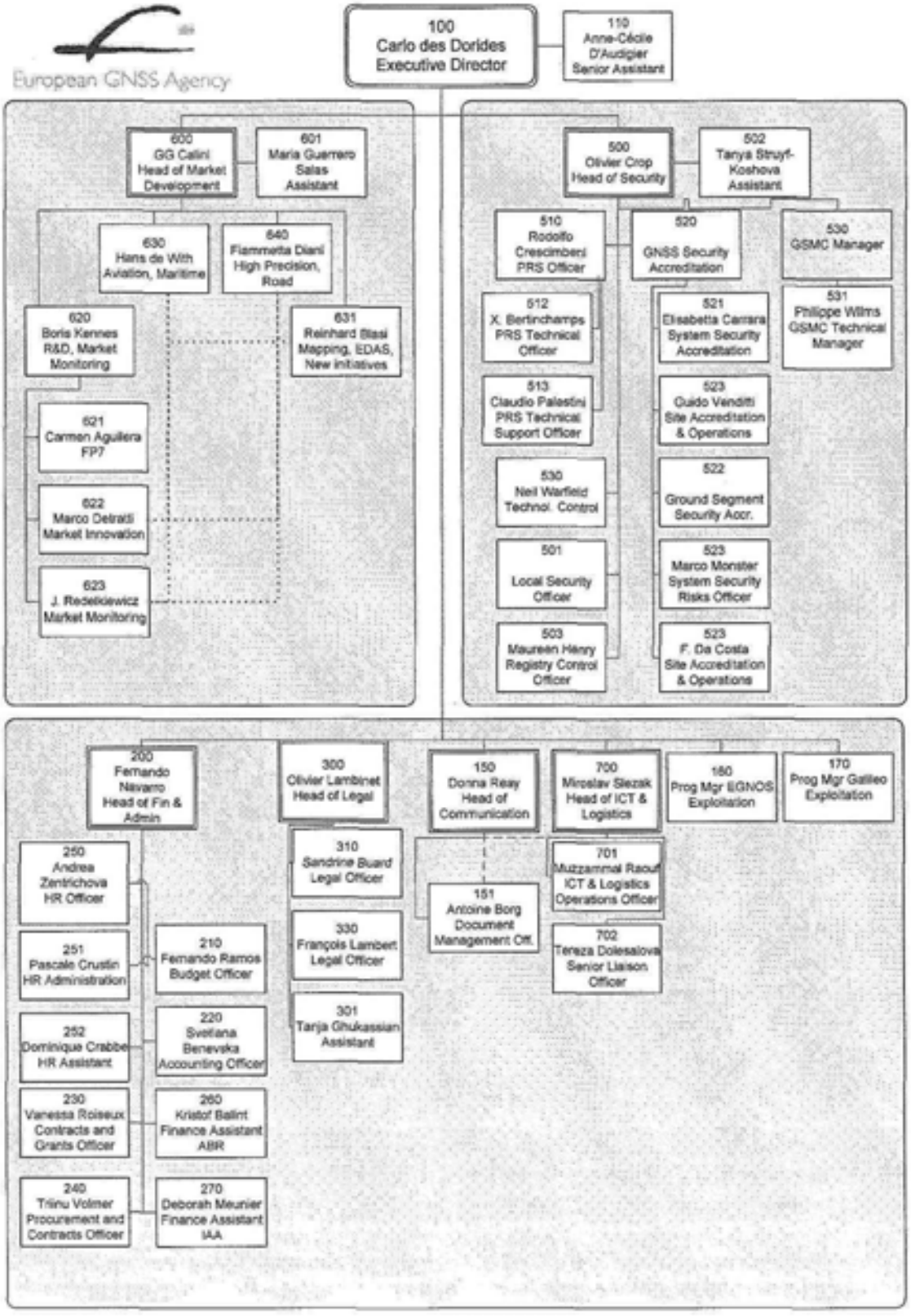
- Marketing EGNOS to high-potential user sectors (for example, aviation, road and high-precision applications);
- Managing EU-funded research on innovative satellite navigation applications and technologies;
- Promoting the use of EGNOS;
- Supporting the European Commission in the preparation of the Galileo exploitation phase;
- Monitoring the GNSS market and forecasting future developments.

Ensuring the Security of European GNSS Programmes

The proper functioning and performance of the Galileo system and services require that a range of highly sophisticated and state-of-the-art security measures, facilities and plans be put in place now. The **GSA Security Department** handles a range of matters relating to the safety and security of GNSS systems. In 2011, the Agency's security development activities focused on three key areas:

- Operating the **Galileo Security Monitoring Centre (GSMC)** – as the hub of European GNSS security, the GSMC will allow the Agency to monitor the security-related status and performance of EGNOS and Galileo and the operation of the Public Regulated Service (PRS), as well as ensuring that sensitive information relating to the use of the PRS is suitably managed and protected;
- Ensuring the **security accreditation for Galileo** – including the support of the EU Member State accreditation committee; site accreditation; system and component accreditation; and PRS user segment accreditation;
- Securing the **Public Regulated Service (PRS)** – ensuring its availability, integrity and confidentiality.

3. Organisational Structure



4. Overview of Activities in 2011

4.1. Security

4.1.1. Systems Security

The European GNSS (EGNSS) programmes (Galileo and EGNOS) provide global services with a strategic dimension while maintaining and protecting the security and interests of EU Member States (MS). The security doctrine supports an overall system policy enabling the European Union to maintain full control of EGNSS at all times.

It has two objectives:

- Protect the system from accidental or deliberate attack that could result in disruption of the service;
- Mitigate subversive use of the system in line with the interests of EU Member States.

In order to ensure their credibility both inside the EU and on the international scene, Member States and institutions must satisfy the associated security requirements and develop the following capabilities:

- A regulatory link with the **Security Accreditation Board** (SAB) for European GNSS established by the Agency and consisting of MS representatives. The SAB acts as the Security Accreditation Authority for the EGNSS systems and for receivers containing Public Regulated Service (PRS) technology;
- An operational chain of command with the Council of the EU as political authority and with the **Galileo Security Monitoring Centre** (GSMC), which shall be operated by the European GNSS Agency (GSA). The GSMC acts as an executive body and ensures interfaces with MS governments and with the EGNSS operators for all aspects related to security and access to governmental applications.

According to Article 16 (a) of the GNSS Regulation, the Agency shall, for what concerns the security accreditation of the EU GNSS, 'initiate and monitor the implementation of security procedures and perform system security audits'. As a consequence of this GNSS Regulation, a new GSA Regulation entered into force on 9 November 2010. This new regulation significantly changes the governance and organisation of the GNSS Security Accreditation activities.

As laid down in Article 11(2) of the GNSS Agency Regulation, the Security Accreditation Board shall take 'security accreditation decisions', in particular on the:

- Approval of the security accreditation strategy and of satellite launches;
- Authorisation to operate the systems in their different configurations and for the various services;
- Authorisation to operate ground stations and in particular the sensor stations located in third-party States;
- Authorisation to manufacture the receivers containing PRS technology and their components.

As laid down in Article 5 of the PRS Decision[2], the competent PRS authority of a Member State shall ensure that a body established on the territory of that Member State may only develop or manufacture PRS receivers or security modules if such a body:

- Has been duly authorised by the Security Accreditation Board in accordance with Article 11(2) of Regulation (EU) No 912/2010; and
- Complies both with the decisions of the Security Accreditation Board and with Article 8, point 2, of the Annex regarding the development and manufacture of PRS receivers or security modules, in so far as these relate to its activity.

According to Article 7 of the PRS Decision, the Security Accreditation Board may at any time revoke the authorisation it has granted to a body to manufacture PRS receivers or the associated security modules if the measures have not been complied with.

On 1 December 2010, the Agency established a new **'Security Accreditation Board for European GNSS'** (SAB) acting as the **Security Accreditation Authority (SAA)** for the EU GNSS systems and for receivers containing PRS technology.

The SAB also set up in 2011 special subordinate bodies to deal with specific issues. In particular, while ensuring necessary continuity of work, it will set up a:

- Panel (called the **Galileo Security Accreditation Panel, or GSAP**) to conduct security analysis reviews and tests. It will also produce relevant risk reports in order to assist the Board in preparing its decisions;
- **Crypto Distribution Authority** (CDA) to assist the Board particularly with questions related to flight keys.

In this context, the GSA team is required to perform different technical tasks at different levels[3], including:

- **System level**: perform system design review and system audits to verify that all Galileo security requirements are met;
- **Local sites level**: support audits and on-site inspections to ensure that local security requirements derived from Galileo security requirements mentioned above, national security rules and regulations are being met by the sites hosting Galileo stations;
- **Security components level**: to review the security requirements (security targets) of system components implementing security functions and to follow the component evaluation and certification process;
- **PRS User Segment level**: to define and implement the Galileo PRS receiver certification, evaluation and accreditation process, as well as for the Galileo PRS manufacturers' accreditation process;
- **GSAP management tasks**: including chairmanship, technical secretariat and organisational secretariat;
- **CDA management**: including chairmanship, technical secretariat, organisational secretariat and organisation of Flight Key Cell (FKC) activities for each launch campaign;
- **SAB management tasks**: including organisational secretariat, coordination and preparation of relevant files for accreditation decisions.

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[2] Decision 1104/2011/EU of the European Parliament and of the Council of 25 October 2011 on the rules for access to the Public Regulated Service provided by the global navigation satellite system established under the Galileo programme

[3] It is anticipated that new tasks will be undertaken by the GSA Accreditation Team, for example the security accreditation of the EGNOS system.

4.1.1.1. Objective and Scope

The main objectives of Systems Security during 2011 were the following[4]:

- Authorisation to Launch (ATL1, mid-2011);
- Initialisation and support to the CDA and to the flight key cell;
- Organisation, chair and secretary of the Galileo Security Accreditation Panel (GSAP).

The tasks associated to these three core objectives included setting up the SAB and its secretariat and providing support to it according to the work and managing plans.

Other principal tasks included coordinating and chairing the work of the GSAP and the CDA. The scope of this work also involved defining the Flight Key Cell Operations and implementing them for the IOV launches.

During 2011 Systems Security participated in the Galileo procurement reviews on accreditation-related matters and provided support to the Security Accreditation Strategy (SAS). In addition, it reviewed all technical documents needed for Galileo security accreditation at system, segment and element level. They also assessed and review the security of the system design and system deployment and associated risks and produced the respective accreditation reports. Security Systems also notably prepared the site security strategy and conduct site security accreditation inspections, defined and prepared Independent Testing activities regarding the security of the Galileo system; participate in and analyse results of security audits (statements of compliance) at system, site and component level; and defined the PRS receiver accreditation framework and PRS manufacturer accreditation.

4.1.1.2. Main Achievements in 2011

All objectives were achieved – on several different levels – by the end of 2011, including:

System level:

- Six releases of the ATL1 report were prepared; a final version 1.1 covering 90 risks scenarios was approved by the GSAP on 6 October 2011;
- Security Accreditation Board (SAB) 'Authorisation To Launch Statement', including a vote organised on 7 October 2011, was confirmed in writing on 13 October 2011 (25 out of 27 MSs were able to vote and authorised the Launch);
- Review of risks analysis (System Security Plan, SSP and Preliminary Risk Assessment, PRA);
- Review of system implementation (System Qualification Review, SQR1a/ORR1);
- Test witnessing: e.g. key generation and loading into real satellite (part of System Compatibility Test Campaign);
- Independent testing: the plan was submitted to the Galileo Security Accreditation Panel, GSAP;
- S-CDR Report (for SAB, extract of June 10 release);
- GSF PDR Report;
- SAT PDR Report.

[4] Two objectives have been postponed to 2012 due to Programme delays: IOV Start Endorsement and the preparation of the System Interim Approval to Operate (IATO).

Local Sites level:

- **Eleven sites and nine locations** were necessary for the first launch. The related certificates were prepared for all, following inspections achieved with the support of the Agency;
- One Launch site (Kourou, French Guiana);
- One Galileo Sensor Station (GSS) in Fucino, Italy;
- One Uplink Station (ULS) in Kourou;
- Two Telemetry and Telecommand (TTC) stations (Kourou and Kiruna, Sweden);
- One In-Orbit Testing (IOT) (Redu, Belgium);
- One Spacecraft and Payload Manufacturers facility - SATMAN (Ottobrunn, Germany);
- Two Galileo Control Centres - GCCs (Oberpfaffenhofen, Germany-GCS, Fucino-GMS);
- Two External Satellite Control Centres - ESCCs (Toulouse, France and Darmstadt, Germany).

Security Components level:

- Review of 12 Component Security Certificates[5] as part of ATL1 configuration.

Public Regulated Service (PRS) User Segment level:

- Approval by the SAB of the document 'PRS User Segment Accreditation Strategy - Main Principles' prepared by the Agency;
- Drafting of the document 'Security Accreditation Strategy for the PRS User Segment'.

Crypto-Distribution Authority (CDA) level:

- CDA provisional mandate approved by SAB in May 2011 for covering FKC activities (The full mandate shall be established and activity will be implemented in 2012);
- The Agency released at the end of 2011 a proposal on CDA mandate to be consolidated at the beginning of 2012 with the support of EU Member States.

Flight Key Cell (FKC) level:

- FKC Work Programme 2011 established;
- FKC Risk Analysis achieved by the Agency as requested by GSAP;
- Training in Fucino and Rome for seeds loading, generation of keys, key loading in BBKME and in satellites, key verification test;
- Generation of flight keys;
- Transportation of keys to Kourou, successful loading in satellites security components (PxSU);
- Participation in the Launch Campaign for ensuring the security of the satellites and related operational keys.

[5] Common Criteria (CC), TEMPEST and Crypto, depending on components

Management level:

- Seven GSAP meetings (GSAP#16 to GSA#22) were organised and chaired by the Agency, each including three formations[6]. The **Galileo Security Accreditation Panel (GSAP)**, together with the support of the Agency, achieved the tasks mentioned above at system, site and component levels. In addition, the GSAP contributed to the preparation and submission for approval of SAB Framework Documents including GSAP ToR, CDA/FKC ToR, SAB Management Plan, Security Accreditation Strategy, High level principles for PRS User Segment Security Accreditation Strategy, etc.
- Extensive work was done to implement a specific body of **the Crypto Distribution Authority (CDA)**, called **Flight Key Cell (FKC)**, which ensures the governmental confidence of all the Member States involved in the Galileo programme for the adequate handling of keys and crypto initialisation parameters ensuring the security of Galileo satellites, including security of communications with ground stations. Members of the FKC are the Member States hosting Galileo facilities supporting Flight Keys security operations (France, Germany and Italy) and the Agency.
- An **expertise framework support contract** was awarded by the Agency to QinetiQ in December 2010 for 4 years. Due to the Agency resource availability, performance of all the described tasks, especially those requiring in-depth technical competences, need specific technical support. This will be achieved through this specific framework contract which allows the Agency to fill the competences required to meet the accreditation goals. In 2011, the main tasks achieved through this contract were the following:
    - SC1 (launched on 26 Nov 2010): coverage of the Galileo original vulnerabilities by the System Specific Security Requirements Statement (SSRS), Galileo Threat scenarios, document review, report on main security related issues, compliance to the SSRS, security risk assessment, comparison between risk assessment and System Security Plan (SSP), site inspection report template, implementation of Accreditation Reference Library, definition of Galileo Risk Management File, proof of concept for risk management tool;
    - SC2 (launched on 14 Sep 2011 for a duration of 8 months): applicability of security requirements, check of the Statement of Compliance (SoC) to the SSRS, technical Note on Denial of Service, technical Note on Advanced Persistent Threat, technical Note on PROTECTOR risk analysis (anti-jamming), SECOPS flow-down check;
    - SC3 (launched on 12 Dec 2011 for a duration of 8 months): independent testing, check of the SoC to the SSRS, technical review, draft accreditation documents, review site accreditation files.

4.1.2. GNSS security requirements

The Agency dedicated substantial efforts to coordinating the SSRS update process with national experts and ESA, starting from the SSRS 3.4 which was the applicable one in the IOV phase from 2003.

The SSRS versions 3.5 and 3.6 prepared by the Agency were approved by the Member States on 22 April and 14 November 2008, respectively but the SSRS 3.4 was still the one applicable to the Galileo programme at that time.

Therefore, an MRD and SSRS Change Control Board Meeting was held on 12 November 2008 to discuss with ESA the possible implementation of the SSRS 3.6 and prepare an SSRS version

[6] Plenary Session, Formation 1: System activities, Formation 2: Site activities, Formation 3: Components and crypto.

3.7 that could be made applicable to the Galileo programme and attached to the delegation agreement between the European Commission and ESA for the Galileo FOC procurement.

As a consequence, the Agency prepared a draft for the SSRS 3.7 , considered acceptable by ESA and by the Commission. This proposal for a version 3.7 was considered as an intermediate step in the finalisation of the SSRS to be used for the FOC phase, especially as some aspects of the proposal submitted by the Member States were not included in this version and still under discussion between ESA and the Commission. Main discrepancies were about the list of applicable and reference Documents, the GSMC concept and Security Assurance Level.

Therefore, the work restarted under the initiative of the Agency in March 2009 which submitted to the Commission and to the Member States a new proposal for the SSRS 3.7, starting again from the SSRS 3.6 which was the last version approved by the Member States.

It was a major step in the maturity of the SSRS evolution process as this new proposal contained, compared to the 232 requirements of the SSRS 3.6, 307 new requirements and 39 changes. It was in particular a way to solve the last discrepancies as mentioned here above. On the basis of this proposal, the Commission released a final version of the SSRS 3.7 applicable to the FOC phase in March 2009.

After approval by the EC of the SSRS 3.7, the Member States have nevertheless maintained for the rest of 2009 and in 2010 a recurrent activity (technically supported by the Agency) aiming at releasing an evolution of the SSRS 3.6 (actually the last version directly approved by Member States).

This work converged in 2010 in coordination with the Commission, ESA, Member States and again with the support of the Agency through the approval of a new SSRS 3.9 dated on 8 September 2010 and approved by the GNSS SB.

The SSRS 3.9 was immediately submitted by EC to the Programme CCB in order for ESA to produce a Preliminary Change Implementation Proposal (PCIP). Such a PCIP was produced by ESA in February 2011, and did present very significant programmatic impacts. In order to trade-off the implementation of the new security requirements introduced by SSRS 3.9 with respect to their programmatic impacts, the EC initiated in March 2011 an SSRS Task Force with the participation of EC, ESA, the Agency and Member States. This Task Force concluded on agreed assumptions and boundary conditions for the implementation of SSRS 3.9. Following this agreement, ESA proceeded with the preparation and negotiation of Change Requests with industry. This process will be ongoing in 2012.

4.1.2.1. Objectives 2011

Objectives for 2011 included maintaining the Galileo SSRS DOORS database for security accreditation purposes and updating the Galileo SSRS. Other objectives included updating GNSS (Galileo and EGNOS) security policies, threats and vulnerabilities analysis and risk assessment and establishing any relevant EGNOS security-related requirements and updating specific security documentation.

4.1.2.2. Achievements

Only two of these objectives were achieved as no specific request was issued by the EC:

- Maintain the Galileo SSRS DOORS database for security accreditation purposes: SSRS has been implemented in DOORS by GSA contractors;
- Support updating of the Galileo SSRS: a minor update of the SSRS has been proposed, based on independent risk analysis outsourced in 2011. Formal recommendations on SSRS evolution should be developed by the Agency in the timeframe 2012-2013.

4.1.3. GNSS Security Board and Associated Working Groups

The **GNSS Security Board (GNSS SB)** assists the Commission in implementing the provisions of Article 13(1) of Regulation (EC) No 683/2008 and in examining matters concerning the security of the European GNSS systems. The Commission consults it prior to defining the main requirements, provided for in Article 13(2), concerning the security of the systems and it provides on-going support to the Commission as regards the implementation of the provisions of Article 13(3).

In 2010 the GNSS SB set up working groups and task forces in order to be in the best position to advise the Programme Manager. The roles of the working groups and task forces are the following:

- The **Working Group National Expert Team's (WG-NET)** main task is to advise and report to the GNSS SB on all issues relating to support of the Programme on security, e.g. supporting the Commission in defining the applicable security requirements (SSRS) and on the threat and vulnerability analysis.
- The **Working Group Public Regulated Service's (WG-PRS)** mission is to advise and report to the GNSS SB on all issues relating to Public Regulated Service (PRS) development.
- The **Working Group Protection of Classified Information's (WG-PCI)**[7] main job is to advise and report to the GNSS SB on all issues relating to protection of classified information.

4.1.3.1. Objectives 2011[8]

The 2011 objectives included providing expertise and support to the GNSS Security Board Working Group PRS (WG-PRS), especially regarding the definition of guidelines and rules for the management of PRS in EU Member States and the definition and implementation of the PRS implementation plan. Other objectives were to provide technical support to the Working Group National Expert Team (WG-NET) and to the TF-PSI (and to the WG-PCI).

Another primary objective for 2011 was to establish and manage a Documentation Management System (DMS) to ensure coordination and update of the GNSS Security Board documentation, the Systems Security Accreditation documentation and of the PRS User Segment documentation.

4.1.3.2. Achievements

The main task was the permanent technical, secretarial and logistical support of the Agency to the Working Group Public Regulated Service (WG-PRS) and Working Group Common Minimum Standards (WG-CMS, part of WG-PRS). A proposition for the DMS was elaborated but has not yet been implemented. The support to TF-PSI and WG-PCI focused on making a proposal to update the Security Classification Guide. The main results were the following:

- Support to the preparation of the agendas and input documents;
- Drafting of the minutes of the 8 WG-PRS meetings (WG-PRS#10 to WG-PRS#17) and the associated WG-CMS meetings;
- Reporting on progress of PRS contracts managed by the Agency: PIONEER2, PROPHET, PROTECTOR, PROGRESS, FORTRESS, PRS4PMR, ULTRA, PREMISE, ARMOURS;

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[7] Initially set-up as the Task Force on Programme Security Instructions (TF-PSI)

[8] Initially this list included 'Chairmanship, technical, secretarial and logistical support to the TF-Control' as an objective. This TF was dismantled at the end of 2010 after releasing its recommendations it was not maintained by the Commission in 2011.

- Definition of guidelines and rules on PRS;
- PRS Concept of Operations (CONOPS);
- GSMC Concept of Operations (CONOPS;
- Proposal for PRS Common Minimum Standards (CMS);
- Security Classification Guide for the PRS User Segment;
- PRS Service Definition Document;
- PRS Denial Policy, based on PRS Access Rules and policies foreseeable in Participant & User Communities;
- Market analysis on PRS.

Other achievements related to PRS Receivers Standardisation include:

- PRS Receiver System Specific Security Requirement Statement (SSRS-PRS-RX);
- PRS Receiver System Interconnection Security Requirement Statement (SISRS-PRS-RX);
- PRS Receiver Concept of Operations (CONOPS) and Security Operating Procedures (SECOPS);
- PRS receiver and PRS Security Module Protection Profiles;
- Technical report on PRS Secondary Channel Architecture Concept;
- Technical report on PRS PMR Communications Channel Architecture Concept.

Management of the PRS user segment documentation tree:

- Definition of the Document Management System;
- Definition of the PRS User Segment Documentation Structure.

Other achievements were:

- GSA Executive Summary of FP7 and Internal contracts on PRS;
- Organisation of a workshop with support of industry on PRS standardisation;
- PROPHET High Level Concept Summary;
- Phase A study of the PRS key management.

4.1.4. PRS Pilot Project

Galileo's Public Regulated Service (PRS) is an encrypted location service that will be used by European governmental agencies, such as police and emergency services. The first PRS signals will be available from the first half of 2012 with the launching of the four In Orbit Validation satellites.

To ensure that the PRS can be used as soon as Galileo is operational, the concept of a PRS Pilot was proposed in 2008 to specifically target the validation of PRS users' functions and to accelerate preparatory activities in Member States.

The overall objective of the PRS Pilot is to perform in a single framework an optimised pre-operational validation of all PRS users' functions.

This pre-operational validation is essential as the PRS environment and is more complex than other Galileo services. In addition to the deployment of a service with particular technical features and performances, a security framework must be put in place. Beyond the Galileo infrastructure, this security framework will require the involvement of Member States. The PRS Pilot is intended to provide a work programme to facilitate Member States in setting up of joint projects, validating and optimising a PRS infrastructure and enabling synergies between the PRS activities of different Member States.

A study in 2009, financed by internal funds[9], supported the Agency's work in **defining and launching the implementation of the PRS Pilot**. The main aims of this definition study were:

- To agree on the scope of the PRS Pilot, specifically in terms of mission objectives and participants;
- To identify the possible financing mechanisms of the PRS Pilot Projects, and to identify the interest of Member States to be engaged in PRS Pilot Projects as leaders;
- To define architecture and concepts for specific PRS Pilot Projects, including the identification of opportunities for using national initiatives and existing capabilities in the EU;
- To provide an implementation plan for the phasing of these PRS Pilot Projects and enable the effective initiation of the projects.

All Member States were invited to join this initiative. A **first workshop** was organised in 2009 based on a questionnaire and was sent to the Council, 27 EU Member States and 2 ESA Members (Switzerland and Norway). Detailed responses were received from 13 Member States and the Council. Those responses have allowed candidate scenarios to be drawn up for PRS Pilot Projects and associated possible involvement of the Member States.

A **second workshop** was organised in September 2009 based on validation meetings with Member States potentially interested in the Pilot Project process. Pilot Projects were defined according to the feedback received during the validation exercise. In addition, a number of further initiatives were also identified to deliver the technological innovations required to support the PRS Pilot Projects.

An initial set of Priority and Enabling Projects were established along with a set of longer term follow-up projects to be further elaborated at a later stage. Based on the workshop discussions, the PRS Pilot Study team made a planning for the Pilot Projects as well as a technology roadmap for the PRS Receivers.

The PRS Pilot Study has successfully achieved its objectives. It was established that several Pilot Projects with specific objectives, participants and timescales will be launched. At this stage four phases have been identified:

- **PRS Awareness** – answering Member States' technical and operational questions regarding PRS;
- **Pilot Preparation** – clarifying user needs and service definitions, designing and developing tools, processes and prototypes of operational PRS receivers;
- **Trials** – for both equipment and processes, using In Orbit Validation and then Full Operational Capability features, prototypes and early PRS receivers;
- **PRS pre-accreditation** – using the Galileo system progressively as it becomes operational but with System and Production receivers' accreditation still in progress.

In December 2009, the Agency released to the Commission and all EU Member States the main results of this definition study, including the following documents:

[9] through the GSASS contract (ref. GSA/OP/04/07-03), Task 5

- **PRS Pilot System Concepts** describing the Pilot scenario concepts, discussing the potential Member State engagement in the scenarios, in particular in terms of participation, and proposing a timeline for the scenarios based upon the input dependencies (e.g. availability of tools from procurement activities);
- **PRS Tools Concepts** providing an overview of the tools that are relevant to the scenarios defined with a timeline for the tools based upon the input dependencies (e.g. availability of tools from procurement activities), describing especially the receiver tools that are relevant to the scenarios defined;
- **PRS Pilot Project Plan** providing further details for each of the recommended pilot projects, including objectives, success factors, participants, deliverables, dependencies and a work breakdown structure and providing an overview of the activities related to the PRS User Segment (Receiver) Roadmap proposed to be undertaken within the frame of the Pilot in order to ensure that users can make use of the PRS service as soon as it is available;
- **PRS Pilot Initial Costs Estimates** providing a summary analysis of the initial cost estimates for the PRS Pilot projects and giving background on the assumptions made in generating the cost estimates.

The Commission launched bilateral consultations with the EU Member States in February 2010 with the objective to set up a multilateral agreement between the parties. This consultation has not provided concrete results (i.e. no agreements are in place); however, a PRS delegation agreement has been established to authorise the Agency to launch the first PRS Pilot Project (PIONEER2).

4.1.4.1. Objectives 2011

The main objectives allocated to the Agency were the following:

- Issue calls for tenders, select, negotiate and award contracts supporting the implementation of the PRS Pilot Project in accordance with the Commission guidelines and in accordance with the working arrangement with the Commission. More specifically, and in line with the PRS Delegation Agreement, further objectives were to launch a contract (PIONEER2) in order to procure at least 20 PRS pre-operational user receivers to be used in the frame of the PRS Pilot Projects, and to allow pilot project activities necessary for the European Commission to be able to declare the IOC PRS as planned in 2016. The procurement and field testing of these pre-operational PRS receivers will indeed contribute to the preparation of future generations of PRS Receivers and Security Modules (SM).
- Develop cost studies, concept of low-cost receivers, support the development of demonstrators or PRS receivers (in particular fitting the purpose of trials foreseen in the PRS Pilot Project) and propose a standardisation strategy and process for the next five years.

4.1.4.2. Achievements

The main achievement was the finalisation of the Tender Information Package (TIP), which permitted the launch of an official Call for Tender on 3 January 2012 (called 'Early Availability PRS Receivers Project'. Additionally, the Agency released an Executive Summary Procurement PIONEER 2010-2011.

4.1.5. Galileo Security Monitoring Centre (GSMC)

Galileo is the first European space programme to be financed and managed by the European Union in association with the European Space Agency (ESA). It is expected to contribute to the development of numerous applications in areas that are associated, directly or indirectly, with Union policies, such as transport (positioning and measurement of the speed of moving bodies), insurance, motorway tolls, law enforcement (surveillance of suspects, measures to combat crime), customs and excise operations (investigations on the ground, etc.), agriculture (grain or pesticide dose adjustments depending on the terrain, etc.), fisheries (monitoring of boat movements). Galileo will provide a global service for a variety of certifiable operations.

Due to the strategic nature of Galileo for the European Union, European legislation has established a framework to ensure that threats to the Galileo infrastructure and signals, as well as protection against unauthorised use of the navigation signals, are addressed, thus enabling the European Union to maintain full control of the system at all times with two key objectives:

- To protect the system from accidental or deliberate attack that could result in disruption of the service;
- To mitigate subversive use of the system against the interests of EU Member States[10].

The Galileo Security Monitoring Centre (GSMC) is a part of the Galileo overall system:

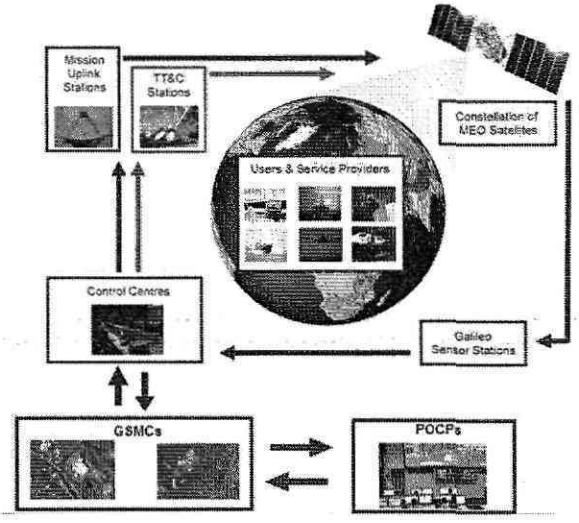

Figure 1: Simplified relationship of GSMC in Galileo overall system

The Point of Contact Platform (POCP) provides the interface between user communities, through a national Point of Contact (POC) and the GSMC. Each Member State, as well as authorised EU bodies and third nations, may have a POC and therefore a POCP. The managers of PRS user communities who arrange the PRS use of individual users (e.g. an emergency service HQ) communicate with the GSC via the POCP. The high-level mission of the POCP is to enable a POC to perform the interactions required with the GSMC, allowing users to effectively utilise the Galileo services (in particular the PRS), as well as supporting European GNSS security.

The GSMC is required to deliver the following specific missions[11]:

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[10] For example, GNSS signals may provide a force multiplier for unsophisticated weapon systems such as low cost missiles and unmanned air vehicles (UAV), increasing the navigation accuracy by a factor 10 to 100, and enabling precise targeting capability. These signals also greatly facilitate the development and testing of weapon systems that use other navigation means.

[11] As formally defined in the following documents: Galileo MRD V7.0 (16 January 2009), Galileo SSRS 3.9 (8 September 2010), PRS Decision 1104/2011.

- European GNSS Security and Status Monitoring;
- Command and Control of European GNSS in Accordance with Joint Action;
- Management of PRS access;
- Provision of PRS and GNSS security expertise and analysis;
- Crypto Distribution Authority Roles, including the key management flight cell;
- PRS Service support[12].

4.1.5.1. Objectives 2011

The main objectives of GSA tasks related to the preparation of its future role of GSMC operator are the following:

- Prepare the GSMC initial operations;
- Follow-up the preparation and procurement of the hosting facilities for the GSMC;
- Follow up GSMC technical definition and procurement undertaken by ESA.

4.1.5.2. Achievements

- Prepare the GSMC initial operations
    - Support the drafting and validation of the Commission documents named **'Galileo High Level Operations Concept'** and **'GSF OPS Statement of Work'**, which were peer reviewed at the beginning of 2011;
    - Visit of **Syracuse III OPS Centre** (Maison Lafitte, France) on 22 March 2011 and of the **EU Satellite Centre** (Torejon, Spain) on 7 April 2011 in order to gather lessons learnt from similar operational centres;
    - Establishment and operations of the **GSMC Nucleus**[13]: The GSMC Nucleus was created as requested by the Commission to support the security of the first two Galileo satellites; a GSMC standby team was defined and trained on procedures that needed to first be developed and validated. The team worked closely with ESA and the Galileo system operator;
    - GSMC Management Plans 2011 & 2012 were prepared in order to organise the first activities of the Agency on the GSMC;
    - Preparation of a Framework Contract to be launched at the beginning of 2012, to obtain PRS and GSMC expertise support;
    - Preparation of a GSMC Multi Annual Budget Policy Plan 2013-2015;
    - First GSF CONOPS was delivered and introduced properly at WG-PRS level;
    - GSF Operations were kicked off in December 2011, demonstrating the credibility of the Agency as future operator of the GSMC

[12] i) Acting as Competent PRS Authority as required for the Council, the Commission, the EEAS, Union agencies and international organisations; ii) Provide technical assistance to competent PRS authorities requesting the support of the Agency, in order to perform its tasks and ensure that the costs of this support of the Agency to competent PRS authority shall be borne by the PRS participants who have designated it.

[13] This was not in the Agency's Annual Work Programme 2011 but was requested by the Commission through a specific letter 'Transfer of operational responsibilities to GSA during IOV phase' (24 February 2011) which the GSA provided an answer to on 14 June 2011, confirming implementation of early GSMC operations by the GSA before the first launch of IOV satellites on 21 October 2011.

- Recruitment of the Interim GSMC Operations Manager, GSMC Technical Manager and a further 11 recruitments in 2012[14].

- Follow-up the preparation and procurement of the hosting facilities for the GSMC, including:
  - Participation in site design intermediate reviews in the UK and France;
  - Early negotiation of a lease agreement with UK Hosting Entity;
  - Strong review of the hosting agreement of the GSMC to be established between the EC, France, the UK and the Agency;
- Follow-up GSMC technical definition and procurement undertaken by ESA. The Agency prepared at the beginning of 2011 a document[15] containing a summary report of the GSA Security Department's involvement in the Galileo Security Facility (GSF) Preliminary Design Review (PDR)[16] for the SAB. The report covers the scope of the Agency's involvement and also presents the major areas of concern identified by the Agency and presented to the review panel.

4.1.6. Security Research & Development

4.1.6.1. Management of FP7 1st Call Contracts

The Agency's contribution to the first call of FP7 was limited to one contract on security and PRS which called PROGRESS. The PROGRESS[17] study provided specification and standardisation for PRS receivers and security architecture. The objects of the study were:

- The implementation of the standardisation, security and safety certification, security accreditation requirements and roadmap for PRS receivers;
- The definition of the functional analysis of the Security Modules of the PRS receivers and of the relevant security architecture and protection profiles;
- The assessment of the performance of the PRS receivers and the preparation of the development of PRS receivers prototypes;
- The provision of guidelines and recommendations for Industry and Member States for the development of PRS receivers.

This contract kicked off on 23 January 2009 for two years with a cost of EUR 2,498,642.00. Its main tasks were:

- The establishment of European Standardisation Committees and fora;
- The definition of preliminary performance specifications (MOPs);
- The definition of the technical and security requirements for PRS receivers and Security Modules (PRAMs);
- The definition of operating concepts and security requirements for PRS receivers;

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[14] Assistant to the GSMC, CDA COMSEC Officer, Galileo Security Monitoring Officer, GSMC Administrative Manager, GSMC Manager, GSMC Operational Product Quality Officer, GSMC Operations Analyst, GSMC Operations Manager, GSMC System Administration Officer, GSMC Technical Officer, PRS Access Officer.

[15] 'Preliminary Report on Galileo Security Facility Preliminary Design Review', version 0.1, Brussels, 1 February 2011

[16] The GSF PDR review was organised by ESA during the second quarter of 2010 although the review closeout was achieved only in the first quarter 2011.

[17] PROGRESS: PROgramme for Governmental Receivers

- The elaboration of guidelines for security certification and accreditation of the PRS receivers and their Security Modules;
- The identification of requirements for receiver safety certification;
- The production of an Interface Control Document (ICD) and Protection Profile (PP) for PRS Security Module;
- Assessment of the PRS receiver performances by simulations;
- Elaboration of a PRS Implementation Plan.

4.1.6.2. Achievements

All PROGRESS deliverables were delivered and the contract was closed during 2011, including:

- Propositions for setting up Standardisation frameworks;
- Definition of preliminary performance specifications for the different expected PRS receiver application domains, and production of the corresponding MPS (Minimum Performance Standards);
- Production of **standardisation documentation** defining the technical and security requirements for PRS Receivers and Security Modules;
- Definition of **operating concepts and security requirements** for PRS receivers (CONOPS, SECOPS, System-specific Security Requirements Statements, System Interface Security Requirements Statements);
- Elaboration of **guidelines focused on security certification and accreditation** of the PRS receivers and their Security Modules and accreditation of the PRS-SM Manufacturers;
- Identification of the **performance and regulatory requirements** that the PRS receivers would have to fulfil for qualification in the frame of certification of safety applications;
- Production of the **Interface Control Document and Protection Profile** for PRS Security Module;
- Assessment of PRS receiver performances through **simulations**;
- Elaboration of a **PRS Implementation Plan** identifying schedules for a timely development of the key PRS products and the conduct of the associated Standardisation and Certification process.

4.1.6.3. Management of FP7 2nd Call Contracts

For FP7 second call, the Agency prepared the three following contracts that were awarded and signed at the end of 2009:

- **PROPHET[18] Simulator** (Seventh Framework Programme, FP7, second call for Space procurement) will be an end-to-end simulation tool which simulates all the mechanisms of PRS management within the Galileo system. It should allow the assessment of key performance characteristics related to PRS access control policy (propagation duration of denial orders), modelling of the behaviour of the Galileo system from a PRS management point of view (including robustness issues), assessment of PRS operational use cases and demonstration to member states, support for design optimisation of the system by evaluating the impact of some possible design evolutions on these performance characteristics. This contract was signed on 10 November 2009, kicked off on 19 November 2009 for 3 years with a cost of EUR 2,750,000.00.

[18] PROPHET: PRS Operations Performance Handy Evaluation Tool

- The **FORTRESS**[19] study will provide a demonstrator of anti-tampering technologies. The need to develop and evaluate new technologies for the PRS Receivers' Security Module (SM) makes it essential to put in place a demonstrator on security technology, which would have the following objectives: securing the technological roadmap to have PRS receivers available by 2013, validating the feasibility of the critical security requirements (protection profile) produced in PROGRESS study, proving the technical feasibility of the implementation of security functions induced by PROGRESS, defining the security functions to be offered to Member States intending to develop PRS security modules. This contract was signed on 16 December 2009, kicked off on 16 February 2010 for 30 months with a cost of EUR 3,998,895.91.
- The **PROTECTOR**[20] study: in several past studies (EuroGNSS, GSMC, PACIFIC), it was highlighted that interferences and jamming are serious and realistic threats to existing and future GNSS. Even GNSS services with enhanced robustness such as the Galileo PRS would only bring full benefits to users and European governments if they come together with interference and jamming monitoring capability. The roadmap for the user exploitation of PRS produced during the PACIFIC study advises the Agency that **each Member State will have to define its approach and response to these threats and interference monitoring**. It appears in recent discussions between the Agency and Member States representatives that the Member States would like the GSMC to take care of the interference monitoring capability. Therefore, studies on an interference monitoring system dedicated to the detection and localisation of GNSS disruption sources to European users and in particular PRS users are of high interest. This contract was signed on 5 February 2010, kicked off on 17 March 2010 for 18 months with a cost of EUR 1,000,000.00.

4.1.6.4. Achievements

These three contracts provided the results expected.

PROPHET and FORTRESS should be closed in 2012. The main activities going on for these two contracts are the following:

PROPHET

- System Analysis and Architectural Design;
- Scenarios Definition;
- Software Technical Specification and Design;
- Software Coding, Testing and Validation;
- Performance Assessment of PRS Management – Baseline System;
- Software Update for PRS System Evolution;
- Performance Assessment of PRS Management – System Evolution;
- Software and Hardware Delivery and Initial Training.

FORTRESS

- Security module (SM) risk assessment and management;
- Security functions specification;
- Design, prototyping and testing of the security chip;
- Design and prototyping of the casing;

[19] FORTRESS: FORge of Tamper-RESistant Security module

[20] PROTECTOR: PRS Operational Tool to Evaluate and Counteract Threats Originating from Radio-sources

- Functional test and evaluation of the security chip;
- Interaction with PROGRESS programme;
- Evaluation of future techniques and technologies;
- SM export control issues.

PROTECTOR has been closed at the end of 2011, producing the following results:

- Analysis and risk assessment of interference sources in GNSS bands. This first technical task inventoried the possible interference and jamming sources that could degrade Galileo and/or EGNOS performances or block the services offered to users. In parallel, and in order to highlight the credibility of the threats defined, several scenarios of interference and jamming were proposed and simulated to illustrate the operational impact they might have on GNSS systems and users. Starting from these inputs, this task produced a **threat and vulnerability analysis** assessing the risks and proposed countermeasures to be potentially incorporated in Galileo and EGNOS security requirements.
- **'Jamming and Interference Monitoring System (JIMS) concept definition'** was at the heart of the PROTECTOR project since it included the elaboration of the global JIMS concept and each of its different elements/contributors. This task also included a review of existing capabilities available in selected Member States; the objective was to investigate the potential extent of member states contribution to the JIMS.
- **Galileo and EGNOS in JIMS**: in this task the role of Galileo and EGNOS within the JIMS system was defined. Galileo and EGNOS system elements intervened at two different levels in the JIMS concept. Firstly, Galileo and EGNOS elements constitute critical parts of the system that need to be protected by the JIMS. As such, a study of the different means to improve Galileo and EGNOS sites robustness against interference sources was conducted. In parallel, Galileo and EGNOS sites can contribute to the global achievement of the JIMS mission by exploiting infrastructures, hardware and the vast amount of data collected by the systems at different locations.
- **PRS receivers in JIMS**: this task was concerned with the definition of the role played by PRS receivers within JIMS. This activity produced an analysis of requirements for a PRS receiver equipped with enhanced mitigation capabilities as well as secured communication capabilities to transmit and receive interference related information. The work notably included the identification and performance assessment of suitable techniques for interference mitigation (at receiver level) and investigated the feasibility of using PRS receivers to contribute to a map showing where interference/jamming were affecting PRS receivers.
- **National and European deployable means in JIMS**: the objective of this activity was to define the means and capabilities that Member States and European bodies could involve and operate to contribute to JIMS mission fulfilment. The communications links that were to be established were also investigated. This task included the drafting of the Guidelines and Common Minimum Standards (GDL/CMS) for the implementation of interference management in Member States.
- **Interaction JIMS-GSC**: this activity concerned the communication links between the JIMS and the GSC and POCPs. As part of this task, the current architectures of the GSC and POCPs were reviewed and other 3rd parties who may have an interest in getting information produced by JIMS were identified.
- **Management and costing models of the JIMS**: The need for this task was twofold. First a comprehensive identification and evaluation of the different possible management models for the JIMS system and services was required in order to ease the selection of the most efficient and cost effective model. Secondly, and in parallel to the definition of

the management models, it was necessary to produce a clear view on the cost and practical implication of the JIMS.

- **Towards JIMS implementation**: This task drew conclusions from the overall programme and prepared the way forward for the implementation of the JIMS. This included the production of an implementation plan that includes all major activities needed to move towards the operational capability of the JIMS, the deepening of Galileo PRS receivers' contribution to the JIMS and national and European means contributions.

4.1.6.5. Launch of FP7 3rd Call Contracts

Based upon the Work Programme 2011, the Agency prepared a 'Guide for Applicants' for the FP7 3rd Call, including for the first time specific security rules and procedures for easing access of applicants to sensitive projects associated with the PRS.

In addition, an initiative was taken by the Agency to reinforce the cooperation with FP7 Security Projects (Security Calls) in order to propose synergy in particular for the development of critical technologies needed for PRS security modules embedded in the receivers.

4.1.6.6. Achievements

The FP7 3rd call, which was published on 20 July 2010 with a budget of EUR 38 million (covering also calls for tenders and evaluation costs), was evaluated and projects selected in the course of 2011. Regarding PRS, the PRS Team, will manage four projects from the FP7 3rd call, i.e. one tender (PRS4PMR) and three collaborative projects (ARMOURS, PREMISE, ULTRA).

PRS4PMR

PRS4PMR is the only tender in the FP7 3rd Call dedicated to PRS, and originated from the call for tenders entitled 'Integrated PMR (Professional Mobile Radio) and Galileo PRS receiver architecture.'

The Commission expects that a large part of governmental users of the Galileo PRS would be interested to have it embedded into their Professional Mobile Radio (PMR) set, as is already the case for the GPS SPS. The potential targeted market is currently several million units across Europe, including PMR terminals currently in-operation and used for example in peace-keeping operations.

The objectives of the contract PRS4PMR (i.e., PRS for PMR) are as follows:

- Demonstrate practicality of PRS-PMR Integration;
- Raise awareness of beneficial possibilities of PRS-PMR integration;
- Prepare a cost benefit analysis for PRS-PMR;
- Demonstrate benefits of PRS for PMR applications;
- Validate PRS-PMR phase-A study managed by the Agency;
- Demonstrate PMR contribution to PRS;
- Define secondary channel specifications for PRS-PMR;
- Show that the PRS and PMR security objectives can be achieved;
- Prepare standardisation activities for PRS-PMR.

The PRS4PMR tender was published on 28th June 2011. Following a two-step evaluation process, the contract is expected to be signed in Q2 2012, for a total duration of 18 months and an allocated budget of EUR 900,000.00.

ARMOURS

ARMOURS (Antenna and fRont-end MOdules for pUblic Regulated Service applications) is a Collaborative Project originated by the Call FP7-GALILEO-2011-GSA-1-a.

The ARMOURS contract aims to **develop novel technologies** for the implementation of future multi-frequency PRS Radio Frequency Front End, filling some of the technological gaps to enable affordable and robust solutions for future demanding applications relying on the continuous availability of the PRS service.

Target segments are low-end and medium-end PRS receiver implementations, with the widest potential market in the PRS application domain. The developments that will be addressed in the frame of the project aim to give a tangible response to the problem of low-cost implementation of multi-frequency radio modules for professional applications. More precisely, ARMOURS will design, develop and integrate compact multi-frequency antenna and FE modules for PRS applications relying on advances beyond the state-of-the-art in the fields of broadband multi-frequency, GNSS FE ASIC, MEMS RF filtering for GNSS applications, and smart wearable as well as ultra-miniaturized antennas at multiple GNSS frequencies.

The ARMOURS consortium is composed of Acorde Technologies S.A. (Coordinator, ES), 'Ecole Polytechnique Fédérale de Lausanne' (CH), SOFANT Technologies (UK), and Interuniversitair Micro-Electronica Centrum vzw (BE).

The duration of the contract is 24 months, and the overall requested EC contribution is 833 k€ as part of an overall cost of EUR 1,510,000.00.

PREMISE

PREMISE (PRs receivers with EMbedded hardware Intrinsic Security Enhancements) is a Collaborative Project originated by the Call FP7-GALILEO-2011-GSA-1-a.

The PREMISE project aims to embed Physically Unclonable Function (PUF) technology in Galileo's PRS receiver Security Module in order to achieve low-cost of silicon security and higher tamper resistance.

Security is a vital part of PRS receivers as they handle sensitive data in uncontrolled environments. PRS receivers combine a challenging set of requirements including low cost, security and tamper-resistance.

PREMISE will research and derive the advantages which can be obtained by introducing PUF technology into PRS design, focusing on both the end product itself as well as the manufacturing process. The project will analyse PRS constraints and requirements and combine these with the intrinsic PUF security and cost benefits to obtain architectural building blocks that will serve as a basis for prototyping but also as reference to analyse potential side-channel attacks and countermeasures to protect against these. Major achievements expected are **protection against tampering and counterfeiting, higher security** at an acceptable cost and **robust, secure authentication**.

The work will integrate results from on-going PUF technology work in the FP7 FET Future Emerging Technology (FET) scheme. Integrated circuits containing the physical part of the silicon PUFs will be used and integrated to build an FPGA-based PREMISE prototype.

PREMISE consortium is composed by Technikon Forschungsgesellschaft mbH (Coordinator, AT), Intrinsic-ID (NL), Thales Communications S.A. (FR) and Université Catholique de Louvain (BE).

The duration of the contract is 24 months, and the overall requested EC contribution is EUR 1,461 k as part of an overall cost of EUR 2,721,000.00.

ULTRA

ULTRA stands for 'Ultra Low Cost PRS Receiver'; it is a Collaborative Project originated by the Call FP7-GALILEO-2011-GSA-1-a.

The project starts from an analysis showing that the overall market for the Galileo PRS is dominated by low-end applications, accounting for 80% of the market. The focus of the ULTRA proposal is to develop an ultra-low cost PRS receiver capable of addressing low-end applications.

The ULTRA project has been proposed as an accelerator to provide stimulus to the support and **uptake of PRS across a range of users and applications**. This shall be achieved by developing and integrating key technologies that result in a significant reduction in the costs of PRS receivers and making them affordable to a larger customer base that have an interest in PRS for low-end applications, for instance tracking of containers, supplies, assets, equipment, goods, valuables, cargoes and personnel. The concept of ULTRA is that the receiver does not compute the position by itself but relies on a remote processing of the Signal in Space by a secure server. In fact, in the case of these tracking applications, most of the time only the secure control centre requires knowledge of the position of the receiver, for integration into the end-application.

The ULTRA project will analyse, design and develop new technologies for PRS receivers. This is expected to result in the generation of new IP, thus enabling the partners to strengthen their businesses and build new opportunities through the outputs of the project.

A clear goal is to **identify and quantify the real commercial potential for low-end PRS receivers** and to assemble the right business model to enter the market and secure early adopters who would be prepared the take the technology to a pilot following the conclusion of the ULTRA project.

The ULTRA consortium is composed by M3 Systems Belgique (Coordinator, BE), M3 Systems France (FR), Nottingham Scientific Ltd (UK) and Teletel (GR).

The duration of the contract is 20 months, and the overall requested EC contribution is EUR 550,000 as part of an overall cost of EUR 862,000.00.

4.1.7. Security 2011 Key Performance Indicators

In 2011, the Security team introduced **internal** Key Performance Indicators (KPIs) tracking system. Below are the extracts with KPIs per segment.

4.1.7.1. GNSS Security Board and Associated Working Groups

ID	KPI	2011 results	Additional Information
1	Technical, secretarial and logistical support to the WG-PRS.	90%	Around 8 meetings yearly. Agenda mainly based on technical inputs from GSA.
2	Technical support to the WG-NET and to the TF-PSI (and to the WG-PCI).	90%	Limited contribution of the GSA in 2011.
3	Chairmanship, technical, secretarial and logistical support to the TF-Control.	10%	Limited contribution based on proposal submitted in 2010 by the GSA.
4	Establishment and management of a Documentation Management System (DMS) ensuring a coordination and update of	80%	DMS defined; procurement of the software ongoing. Full establishment foreseen next year after recruitment of a security documentalist.

	the GNSS Security Board documentation, the Systems Security Accreditation documentation and of the PRS User Segment documentation.		

4.1.7.2. Galileo Security Monitoring Centre (GSMC)

ID	KPI	2011 results	Additional Information
1	Prepare the GSMC initial operations.	100%	Mainly through the development of GSMC-N procedures and the preparation of a support contract including development of GSMC procedures.
2	Follow-up the preparation of the hosting facilities for the GSMC.	80%	Regular bilateral meetings with FR & UK. UK site designs were still preliminary at end of 2011.
3	Follow-up the procurement of the hosting facilities for the GSMC undertaken by ESA.	50%	ESA no more in charge of this procurement which is ensured directly by EC, with goal of having agreements with FR & UK under the terms of of agreements with EC and GSA to come. Process only started with FR/UK in Q4 2011. GSA provided many comments to initial EC drafts, and to UK specific drafts.
4	Follow up GSMC technical definition and procurement undertaken by ESA.	100%	Review of PDR close-out DP. Presentation of results to the SAB through a specific report with recommendations.
5	NEW: Establishment and operations of the GSMC Nucleus	100%	GSMC Nucleus ORR declared on 14 October 2011 (main task of the year on GSMC)

4.1.7.3. PRS Pilot Project and User Segment

ID	KPI	2011 results	Additional Information
1	Issue calls for tenders, select, negotiate and award contracts supporting the implementation of the PRS Pilot Project, in accordance with the Commission guidelines and in accordance with the working arrangement with the Commission.	80%	PRS Pilot Project currently limited to the development of PRS pre-operational receivers (P3RS2). Contract award foreseen before end of 2012.
2	Provide expertise and support to the GNSS Security Board Working Group PRS (WG-PRS), especially regarding the definition of guidelines and	90%	GSA submited a proposal to the WG-PRS for CMS (PRS CONOPS, PRS CMS, PRS Receivers PPs, SSRS, SISRS, outcomes of PROGRESS / PROPHET / PROTECTOR contracts, PRS4PMR architecture ...) and to the EC for the PRS Implementation Plan. No document approved by the WG-PRS in 2011.

	rules for the management of PRS in EU Member States and the definition and implementation of the PRS implementation plan.		
3	Develop cost studies, concept of low cost receivers, support the development of demonstrators or PRS receivers (in particular fitting the purpose of trials foreseen in the PRS Pilot Project) and propose a standardisation strategy and process for the next 5 years.	80%	GSA MKD unit now supporting the follow-up of market studies, including a specific survey to be launched before end of 2011 at GNSS SB level. Technological aspects limited to the FP7 3rd Call (3 projects) including one relevant for low cost receivers. P3RS2 tender well advanced for the development of 20 pre-operational receivers (available in 2015). Standardisation strategy proposed end of 2010 but not supported by WG-PRS (no continuity ensured).

4.1.7.4. Galileo Security Accreditation

ID	KPI	2011 results	Additional Information
1	Set up the SAB and ensure its secretariat.	90%	SAB Terms of Reference approved on approved on 16 December 2010. SAB Management Plan 2011-2012 approved on 1 June 2011. 6 SAB meetings organised in 2011 by the GSA.
2	Provide all required support to the SAB according to the work plan (management plan) approved by the SAB.	80%	Disruption in the continuity of expertise support expected due to the leave of 3 out of 6 people in the GSA Accreditation Team.
3	Set up, coordinate and chair the work of the GSAP.	90%	9 Meetings of the GSAP prepared and chaired by the GSA in 2011. New Terms of Reference endorsed on 1 June 2011. All MSs are now Members of the new GSAP. Nominations of new GSAP representatives should be concluded for the end of 2011.
4	Set up, coordinate and chair the work of the CDA.	50%	CDA provisional Terms of Reference approved by the SAB on 1 June 2011, practically limited to FKC activities. Full CDA still to be established. Very limited resources in the GSA for supporting the development of the CDA (CDA COMSEC Officer should be recruited in 2012)
5	Define the Flight Key Cell Operations and implement them for the IOV launches.	100%	FKC OPS defined and implemented for L1 successfully.
6	Participate in the Galileo procurement reviews on accreditation-related matters.	10%	Limited support requested by the EC on IOC procurement.
7	Provide support to the Security Accreditation	100%	New SAS approved by the SAB on 1 June 2011. PRS SAS under preparation with high level principles

	Strategy (SAS)		approved by the SAB on 3 May 2011.
8	Review the technical documents needed for Galileo security accreditation at system, segment and element level.	80%	Main contributions of the GSA were: - on IOV: SQR1/ORR1, SSP, SSEG QAR, TUS QAR - on IOC: SSEG CDR Expertise support limited in the second half of 2011 due to leave of 3 out of 6 experts in the GSA Accreditation Team.
9	Assess and review the security of the system design and system deployment and associated risks and produce the respective accreditation reports.	100%	Drafting of the ATL1 report (6 releases).
10	Prepare the site security strategy and conduct site security accreditation inspections.	100%	All ATL1 critical sites inspected by the GSA, including the maintenance of a full site report available at GSAP and SAB levels.
11	Define and prepare Independent Testing activities regarding the security of the Galileo system.	60%	Drafting of an Independent Test Plan from April 2011 (3 releases). Establishment of a support contract for preparing the implementation of this plan as soon as approved.
12	Participate in and analyse results of security audit (statements of compliance) at system, site and component level.	0%	Audits will start only in 2012 on ATL1 operated configuration.
13	Define the PRS receiver accreditation framework and PRS manufacturer accreditation	50%	Draft PRS SAS prepared by the GSA. High principles on PRS SAS already prepared by the GSA and approved by the SAB on 3 May 2011. GSA proposed PRS CMS including requirements on PRS manufacturer accreditation. Finally, GSA proposed a specific PRS receiver accreditation framework for the development of PRS pre-operational receivers (PIONEER2 or P3RS2).

4.1.7.5. Research and Development (FP7).

ID	KPI	2011 results	Additional Information
1	Manage and close out the FP7 1st Call and 2nd Call contracts (PROGRESS, FORTRESS, PROPHET, PROTECTOR).	90%	PROGRESS and PROTECTOR concluded in 2011. FORTRESS and PROPHET well advanced (around 70% achieved).
2	Launch and manage security related projects under FP7 3rd call	90%	4 contracts on PRS (ARMOURS, ULTRA, PRS4PMR, PREMISE), 3 being Grants and 1 a Tender.

4.2. Market Development

4.2.1. EGNOS Marketing

4.2.1.1. Objective and Scope

The objective of this activity is to ensure the adoption of EGNOS in market segments identified as having the greatest short-term or medium-term potential. The development of penetration in EGNOS target segments will leverage on the FP7 activities, which have been delegated to the Agency by the Commission.

EGNOS is a satellite-based augmentation system that improves the accuracy of the GPS signal while also providing an integrity signal.

In 2009, the Agency proposed to the Commission that EGNOS market entry activities should target three priority market segments selected on the basis of their respective potential in terms of economic benefits and maturity: **aviation**, which will remain a priority, followed by **road transport** and high precision segments such as **agriculture** and **mapping**. Penetration results show a growing GNSS interest in other segments such as maritime and rail.

In 2011 the Agency continued to carry out priority actions derived from the aforementioned EGNOS market entry approach, in the context of the Commission 'Application Action Plan,' including: developing and presenting cost-benefit analyses, disseminating trial results, co-marketing with players in the value chain, building market awareness and supporting promotional activities.

In 2011 one of the key pillars was EGNOS' entry in the **aviation market**. The Agency developed the market entry strategy for aviation in line with the Application Action Plan. The Agency contributed to the promotion of adoption schemes for aviation via initiatives targeted at airlines and airports, leveraging on FP7 call projects and on partnerships with major stakeholders such as Eurocontrol and manufacturers of avionics and aircrafts.

EGNOS, Europe's SBAS[21], provides very clear benefits for the aviation sector, especially for regional and business aviation as well as helicopter operations, whose aircraft / rotorcraft performance is not specifically catered for by the current Air Traffic Management system.

The use of EGNOS will allow **Approach with Vertical Guidance (APV)** everywhere in Europe and will:

- Improve flexibility and enabling advanced arrival, approach and departure procedures;
- Improve accessibility by providing lower approach minima at non-ILS-equipped runways;
- Improve operational capability by providing a back-up for ILS approaches;
- Reduce environmental impacts and costs by enabling more efficient routes, time and fuel savings, and lower CO_2 emissions;
- Increase safety by allowing Instrument Flight Rules (IFR) approaches at difficult locations or under meteorological conditions where previously such approaches were not possible due to safety concerns.

EGNOS also benefits from an international effort to have full interoperability among the **Satellite Based Augmentation Systems (SBAS)** systems already operational and those about to come into operation.

In 2011 the Agency performed activities to increase the adoption of EGNOS in Road Pricing. In particular, it leveraged the EETS Decision of the Commission that foresees the start-up of this

[21] See: http://egnos-portal.gsa.europa.eu/discover-egnos/about-egnos/what-sbas

new service in October 2012, preparing the industry and the service providers for EGNOS and Galileo adoption in this new pan-European tolling service. At the same time, the Agency started focusing on other ITS sub-segments, such as safety systems and assistance to the driver and specialised logistics. It leveraged on results of FP7 projects in this domain.

Companies that transport goods need to know where their vehicles are at all times, as do public services such as police, ambulance and taxi services. **EGNOS will be a key tool for better managing land transport in Europe**, and increase both capacity and safety.

The challenges now faced by road transport are evident and serious:

- CO_2 emissions from road transport are rising – the sector already accounts for 85% of EU transport emissions and 70% of its total oil consumption;
- Meanwhile, congested roads cost the EU economy around EUR 50 billion per year;
- 38,000 people were killed on European roads in 2008;
- Road freight transport is forecast to increase by 50% by 2020; passenger road transport will rise by 35% over the same period.

Along with Galileo, EGNOS is expected to be a key element in the greener, smarter, more efficient and safer road transport system of the future.

EGNOS is a satellite-based augmentation system that improves the accuracy of the GPS signal while also providing an integrity signal. Along with Galileo, it is expected to be a key element in the greener, smarter, more efficient and safer road transport system of the future.

Precision agriculture is a highly effective farming strategy that increases yield and productivity, while lowering costs and minimising environmental impact. With costs perpetually on the rise and environmental demands gaining ground by the day, efficient and sustainable farming solutions are needed more than ever.

In 2011, the Agency continued marketing EGNOS in the agriculture sector, with the intent to increase market share among GNSS devices in Europe. It began to focus on Central Europe where the performances of EGNOS will be improved along with the expected EGNOS extension.

Traditionally, the barrier to precision agriculture has been a substantial equipment investment and costly on-going subscriptions. Now, EGNOS can change this equation by offering an affordable precision solution.

In addition, the Agency continued the marketing of EGNOS in **mapping**, identified as another priority sub-segment in the High Precision domain.

GNSS provide an efficient technology for mapping and are widely used by organisations such as utility companies as well as regional and local authorities. The use of GNSS in mapping often means services with centimetre level accuracy and substantial costs. It can also imply significant investment in infrastructure for service providers or regional authorities as well as complex and costly equipment and software solutions for professionals. EGNOS can contribute in increasing the use of GNSS in real-time mapping solutions by providing free accuracy that is widely available.

For many mapping applications the meter level accuracy provided by EGNOS is sufficient. Applications such as thematic mapping for small and medium municipalities' forestry and park management as well as surveying of utility infrastructures (e.g. electrical power lines) can benefit from EGNOS.

Most of the location devices used for mapping are now EGNOS-ready and the EGNOS signal is free of charge. Besides the professional users, EGNOS also allows more and more non-professionals to access GNSS mapping technologies, thanks to the affordable and simple solutions enabled by EGNOS.

Maritime is a new segment identified together with the Commission. Based on the 'Prioritisation of sub-segments and applications' study conducted in 2011, a set of actions in

line with the EC Application Action Plan has been defined for 2012: awareness of the current use and further research into advanced port and inland waterways applications.

The beta test of EDAS, started at the beginning of 2009. It provided important information regarding demand (e.g. customer profile and benefits, market potential) and suitability of the current mode of access to service data. The Agency evaluated the economic potential, designed the service model and identified service improvements. The Commission is managing the implementation of service improvements which should be made available to existing users. EDAS has become an integral part of the EGNOS offer in road, agriculture and mapping and will be marketed in conjunction with EGNOS.

At the request of the Commission, the Agency has implemented an EGNOS Applications Development Portal, aggregating information of special interest for investors and developers of new applications and for potential users in general.

Finally, the GNSS Agency performed promotion activities with the objective of communicating the operational status of EGNOS to the market; including effective communication of EGNOS value proposition and developing specific instruments to raise EGNOS awareness in target segments.

4.2.1.2. Main EGNOS Achievements in 2011

Achievements in Aviation Segment

Concrete results in this area included the participation and organisation of workshops for Member States to promote EGNOS procedure roll out in Germany, the UK and Spain[22]. Also during 2011 the first scheduled passenger flight to an EGNOS destination in occurred in December 2011, less than 1 year after certification. Solutions for helicopters were demonstrated and approved in the course of the year (PinS, SOAP procedures)[23].

In addition, three new FP7 projects were launched: **FillGAP** ("Filling the gap" in GNSS Advanced Procedures and operations); **SHERPA** (Support ad-Hoc to Eastern Region with Pre-operational Actions on GNSS); and HEDGE NEXT (Helicopter Deploy GNSS in Europe).

Achievements in Road User Charging

2011 clearly showed that GNSS is the best solution for many road pricing schemes and the ideal tool for European Tolling Service Provider. This was proven through cost-benefit analyses, sample cases in specific MS and putting in place a business plan for EETS providers using GNSS as main the enabling technology.

It was also established that EGNOS is to be used in the French ECOTAX road charging scheme.

Notably, a CEN Agreement – standardised set of data output from mass market receivers, enabling application and/or service providers to easily build their own software solutions based on EGNOS/EDAS[24] -- was put in place in 2011.

Achievements in Intelligent Transport Systems

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[22] Overview of planned procedures available on: http://egnos-portal.gsa.europa.eu/aviation/experimental-or-planned-egnos-procedures-europe-2012

[23] Knowledge available on portal: http://egnos-portal.gsa.europa.eu/aviation

[24] Available on: ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA16390.pdf

In the course of the year EGNOS demonstrated added value in Road applications. The EGNOS market entry plan in other ITS applications beyond Road Charging was finalised.

EGNOS/EDAS and Galileo enable new generation of intelligent driving system. Two examples includes, FIAT lane level navigation prototype and demonstration (which will be repeated at the ITS World Congress in October 2012)[25] and VOLKSWAGEN urban assistant for dangerous crossing prototype and demonstration[26].

Also, 7 new FP7 projects were launched:

- QualiSaR (Development of a Qualification Procedure for the Usage of Galileo Satellite Receivers for Safety Relevant Applications);
- TACOT (Trusted Multi-application Receiver for Trucks);
- DETECTOR (Detection, Evaluation and Characterisation of Threats to Road applications);
- OCD (OpenCarData);
- TAXISAT (A new TAXI application guided by SATellite);
- Easy-OBU (Enhanced (EGNOS/EDAS) Accuracy SYstem with GNSS Outage Bridging Unit);
- GAIN (Galileo for Interactive Driving).

Achievements in Agriculture

In 2011 the great potential and benefits of EGNOS in agriculture and technology in Precision Farming was demonstrated.

Four case studies – as well as a cost-benefit analysis – are available to showcase this, including:

- Precision Agriculture;
- Yield Mapping;
- Cost reduction & environmental impact;
- EGNOS success story[27]

In addition, a market study shows EGNOS with more than a 60% market share.

Two agricultural FP7 R&D projects were kicked off: Geopal (interfield logistics, (http://www.geopal-project.eu/) and Unifarm (a network of excellence).

Achievements in Mapping

[25] http://egnos-portal-staging.esn.eu/news/covel-project-demonstrates-lane-level-road-navigation-system

[26] http://egnos-portal-staging.esn.eu/news/cars-foresight-enter-world-enhanced-satellite-based-driver-assistance

[27] http://egnos-portal.gsa.europa.eu/agriculture

Market studies show potential for EGNOS in the Mapping segment (already 20,000 devices in 2012). During the year, the European landscape of reference network ground infrastructure was drawn up, including ground infrastructure mapping in the EU-27 and Galileo's readiness assessed.

Also, successful cooperation was launched with a leading European surveyor association and device manufacturer.

Mapping projects in FP7R&D successfully kicked off, including WalkEGNOS-project[28] and 'Possum'.

4.2.2. Market Monitoring

4.2.2.1. Objective and Scope

An important task for the Market Development team is the **improvement of market knowledge**. The market monitoring and forecasting process is crucial for this activity. It provides a structure for the market research data. Market analyses and forecasts based on this information enable a better understanding of the GNSS market and of the overall public benefit created by the systems. The Agency and the Commission closely coordinated their efforts, ensuring availability and use of the most updated information, contributing to the Commission's communication policy. As the market is continuously evolving, an effort is needed to ensure the models remain up to date.

Therefore in 2011 the market monitoring activities focused on updating and expanding the previously developed **Market Monitoring and Forecasting Process (MMFP)**. The econometric model that encompasses GNSS segments in numbers and calculates the forecast for the upcoming 20 years has been updated with 2011 figures for segments already covered: aviation, road, location-based services (LBS) and agriculture. Two new segments have been added to the analysis: maritime and Surveying. The work resulted in content for the second issue of the GNSS market report that is expected to be published in Q2 2012.

The market monitoring process was also used to respond to ad hoc requests from the Commission such as the impact assessment for the GNSS action plan and for the further implementation of the European satellite navigation programs. Finally, the objective of the market monitoring process is to **supply information to industry and general public**. The results of market analysis have been used by many stakeholders, among others representatives of Member States, by the industry and research community. About a thousand downloads of the GNSS market report confirms the usefulness of this analysis.

In 2011 the Agency launched the **technology monitoring process** (TMP). The objective is to complement the current MMFP with more technology oriented/receiver perspective. It will provide information on receiver development news, plans for adoption of new systems and technology trends.

Within horizontal activities, the Agency conducted the study to identify funding opportunities for initiatives in GNSS. A funding guide enriched with the description of supporting activities has been created and will be published in 2012.

4.2.2.2. Main Achievements in 2011

Achievements in Horizontal Activities

[28] http://www.walkEGNOS.eu

Market monitoring:

- GNSS Market Report, issue 1 – almost 1000 downloads 1 year after publication (GNSS market report issue 1 available[29])

Sources of funding for GNSS projects

- Major sources of funding for GNSS projects were identified;
- Support services available to access the above funds were also identified.

4.2.3. Development of the Galileo Market

4.2.3.1. Objective and Scope

This task is focused on promoting new applications of the European satellite navigation systems. It is crucial to ensure the sustainability of the systems and to give an edge to the European industry in the global satellite-navigation market. The development of new applications is based on the FP7 funds, the management of which has been delegated to the Agency by the Commission.

With regards to new applications, the GNSS Agency will continue to follow closely the development of the market using information available on the market and on the evolution of technologies.

In 2011 with the **first two Galileo satellites in the sky**, the focus of Market Development activities has shifted from EGNOS to the new services of Galileo: Open Service (OS), Public Regulated Service (PRS) and Commercial Service (CS). The market inputs have been provided to support the definition of the services and the forecasting of possible return on investment. Public benefits of Galileo and its impact on GNSS constellation have been calculated within market monitoring activities.

The GNSS Agency focused on the markets where Galileo will offer the highest value added, as identified in the Commission Application Action Plan, such as LBS, Road Management, Road ADAS, High precision and Maritime.

The Agency initiated Galileo Open Signal (OS) market entry activities. This included preparation of a preliminary help desk function (to be launched in 2012).

In order to follow market trends and gather relevant insights to stimulate a wider Galileo adoption, the Agency focused also on interaction with receiver manufacturers in order to check and stimulate the plans for Galileo adoption.

For the Galileo PRS, the Agency performed top-down research to gain understanding of the two priority market segments for the service – Military Defence Platforms and Public Safety and Security – and prepare the market entry plan.

As for the development of trusted position service, i.e. commercial service, the Agency performed several market studies to understand the target user requirements and cost recovery possibility. A focused market analysis and technical feasibility study on authentication and high precision markets have both been carried out to evaluate the relevance and feasibility of the Commercial Service (CS), based on concrete service propositions as input to the CS business case to facilitate evaluation and decision at EU level.

An attractive business opportunity for the CS was highlighted in the dedicated CS business plan developed in cooperation with the EC.

[29] http://www.gsa.europa.eu/go/home/galileo/the-gsa-virtual-library/

The Agency launched a project to align closely with user communities with focus expert groups. In 2011 two validation sessions were organised in the areas of road applications and surveying/mapping.

The Agency supported the Commission in the context of the GNSS Action Plan and the ITS Action Plan.

4.2.3.2. Main Achievements in 2011

Commercial Service

- Consolidation of previous Galileo CS studies (including users' feedback, including a market study on high accuracy and trusted PVT market)
- Technical concepts for the Galileo CS were identified

Public Regulated Service

Top-down market analysis for main PRS user groups, including a PMR market report and a Military and Defence Market report was carried out.

4.2.4. Seventh Research Framework Programme (FP7)

4.2.4.1. Objective and Scope

FP7 funding for GNSS applications supports vertical market acceleration strategy and the action plan to stimulate the most valuable or mature market segments. It also offers opportunities for breakthrough innovation independent of the area of application.

Main activities in 2011 focused on the evaluation of the FP7 3rd call for proposals and project launch, together with the management of the portfolio of on-going projects from previous FP7 1st and 2nd calls. By the end of 2011 a total of 51 projects (covering both satellite navigation applications and security) were managed by the Agency and 37 new contracts were ready for signature.

In managing the projects, the Agency's objectives are:

- To keep the projects in line with the strategic objectives;
- To maximise the project results; and
- To produce an effective communication action for each project.

4.2.4.2. FP7 3rd call

The 3rd Call for proposals was launched in 2010 with a budget of EUR 38 million. The amount allocated for collaborative projects (CP) is EUR 30.5 million (including receivers topic managed by DG ENTR); a budget of EUR 6.7 million is dedicated to tenders and the residual budget of EUR 1 million is allocated to administrative support, communication, results dissemination and independent experts. This Call comprises FP7-GALILEO-2011-GSA-1-a and FP7-GALILEO-2011-GSA-1-b, and the latter refers to a two-stage call for small projects targeting SMEs. For the first time, classified proposals on PRS receivers were accepted and an appropriate methodology was put in place.

A total of 148 proposals were received for both stages. This is a 155% increase with respect to the 1st Call and clearly shows a growing interest from industry and the research community. The evaluation of the 74 proposals received in FP7-GALILEO-2011-GSA-1-b stage 1 took place in late 2010, leading to 26 proposals which passed to the second stage. A total of 74 proposals

were received directly in response of the call FP7-GALILEO-2011-GSA-1-a. The evaluations of the second stage of Call 1b and single stage for call 1a took place in January and February 2011involving a total of 39 independent experts.

The Agency looked into potential classified Collaborative Proposals in the ranked and/or in reserve list. Those proposals were subject to a security scrutiny in May 2011. Conclusions were applied during the ranking and negotiation stages. Redress cases were evaluated by the Redress Committee in May 2011. Before proceeding to the final ranking due note was taken of the security scrutiny and the results of the redress committee.

A total of **37 proposals were selected for funding**. After receiving the results of the Commission Inter Service Consultation on 31 August 31, the Agency conducted negotiations with the 37 consortia on the main list, which were successfully concluded in November 2011. Draft grant agreements were provided to all winning consortia before the end of the year and most of them were signed and launched in the first quarter of 2012.

4.2.4.3. FP7 1st and 2nd calls

The FP7 1st Call allocated EUR 19.4 million for collaborative projects and all the 18 contracts were awarded by the end of 2008. In 2011, all the application projects funded in the 1st call were successfully closed.

The FP7 2nd Call had a budget of EUR 34.5 million. The amount allocated for collaborative projects (CP) is EUR 25.1 million; a budget of EUR 7.7 million is dedicated to tenders (T) and the residual budget of EUR 1.7 million is allocated to administrative support, communication, results dissemination and independent experts. The 29 application projects were kicked-off in 2010 and 13 were successfully closed in 2011.

4.2.4.4. Overview of portfolio management activities

The Agency has continually improved the way it manages R&D activities in order to maximize the value of the portfolio and the return to the GNSS programme and the organisations involved. At the same time the Agency remained focused on management efficiency as we have limited resources. The Agency project management approach builds on the FP7 rules and grant agreements.

In particular, innovative aspects were introduced in the management of the projects funded in the 2nd and 3rd Calls.

Greater use of the **GSA Knowledge Management Facility** (GKMF) was enforced in 2011. Apart from being used as a common repository for project documents, deliverables are categorised based upon their sensitivity. If they can be shared with the general public, an internal process to tag the documents is started and these are then made available through the website and the EGNOS portal via the Public Library feature for all EGNOS and EGNSS researchers. Additionally, an intensive review process was undertaken to review existing data and FP6 projects to ensure that all documents which should be shared with the general public are available for them, including:

- Allocation of a technical reviewer and business reviewer to each project;
- Set up of the management IT infrastructure, based on GKMF, to facilitate information exchange among coordinators, reviewers and GSA project officers. The main benefit is to have a central repository for all information generated by the projects;
- Design of a management guide for coordinators and reviewers;
- Design of dissemination guidelines;
- Provision of templates for Quarterly reporting and final deliverable.

4.2.4.5. Main Achievements in 2011

Achievements in R&D

During 2011 EU innovative companies were funded, including:

- 3 Calls for Proposals on GNSS applications;
- Portfolio of 80 R&D projects with a budget of EUR 70 million;
- 425 beneficiaries, of which 41% are SMEs

The full list of FP7 projects in annex to this catalogue*

In addition, the full project portfolio is available on the Agency website[30].

Also, on the R&D investment side, two Call results were published, including:

- 14 Proof of concept;
- 26 Prototypes;
- 23 Pre-commercial products;
- 44 Trials.

4.2.5. Market Development 2011 Key Performance Indicators

In 2011, the Market Development team introduced **internal** Key Performance Indicators (KPIs) tracking system, updated every quarter. Below are the extracts with KPIs per segment.

4.2.5.1. EGNOS Adoption in Aviation

ID	KPI	2011 results	Additional Information
1	# CA Airlines with EGNOS receivers	3	AirNostrum declared plans to equip part of fleet; Aurigny interested to equip entire fleet; CityJet part of ACCEPTA
2	# GA operators with EGNOS receivers	5	Royal Star (PL). REGA (CH), Hebridean, Blink, London Exec (UK)
3	Participation in key events	10	2 RATF Eurocontrol, ATC Global, MRO Avionics Munich, AeroDays Madrid, Aero Friedrichshafen, ACI SMAG, EBACE, Le Bourget, ERA General Assembly

4.2.5.2. EGNOS Adoption in Precision Agriculture

ID	KPI	2011 results	Additional Information

[30] http://www.gsa.europa.eu/go/randdxv-2/project-portofolio/

1	# of brands (tractor and device manufacturers) selling EGNOS products	9	2010 (Trimble, Leica, Claas, Challenger, Fendt, Massey Ferguson) 2011: (Muller Elektronic, Raven, ARAG)
2	Participation in key events	4	Participation at SIMA 02/11 and at AGRITECHNICA 11/11, CBA results presented at CAPIGI conference, Amsterdam 05/04/2011 and at Prague International conference on 12/07/2011

4.2.5.3. EGNOS Adoption in Road Transport

ID	KPI	2011 results	Additional Information
1	# of EGNOS trials performed	6	2011 (GSC, EGNOS2ROAD, COVEL)
2	# of articles (FP7 and GSA) published in sector magazines	5	2011 (2 in ITS International, 2 in Traffic International, 1 in Inside GNSS)
3	Participation in key events	7	ISEP 2011, ASECAP days, Intertraffic, ITS Europe, 8th Annual RUC Conference, ITS World Congress, ITN

4.2.5.4. EGNOS Adoption in Mapping

ID	KPI	2011 results	Additional Information
1	# of contacts with key industry players	6	Ashtech, Geneq, Topcon, Handheld, Trimble, Leica Geosystems
2	Participation to key events	3	Intergeo, First Day of the European Surveyor and Geoinformation – Mercator Day, Symposium on the Geodetic Infrastructure in Europe

4.2.5.5. Market Monitoring

ID	KPI	2011 results	Additional Information
1	# of GNSS market data presentations for stakeholders	6	Individual presentations for stakeholders followed by participation in events
2	# of experts interviewed	88	Source: LE/Booz expert interviews database, FDC PRS survey
3	# of market segments covered by analysis	7	LBS, Road transport, Agriculture, Surveying/mapping, Maritime, PRS
5	# of downloads of GNSS Market Reports	960	Only downloads from GSA website

4.2.5.6. Commercial Service

ID	KPI	2011 results
1	Creation of business plan for Commercial Service in cooperation with European Commission	Business Plan completed

4.2.5.7. Research and Development

ID	KPI	FP6-1	FP6-2	FP6-3	FP7-1	FP7-2	FP7-3
1	Budget for applications and market preparation	11.3	32.8	9.5	16	25.1	27.5
2	# of pre-commercial products	0	1	0	12	11	Tbd
3	# of patents/trademarks registered	0	4	0	3	0	tbd
4	# of successful trials conducted				25	19	tbd
5	# of papers in scientific publications, industry magazines, participation in workshops, press releases	8			186	268	Tbd
6	# of SW libraries or tools published in open source	1			1	0	tbd
7	# of proposals above threshold received in call	35	52	31	35	77	27+64
8	# of proposals submitted to the call				57	94	148
9	# of participations				399	650	712

4.3. General Administration

4.3.1. Legal and Institutional Activities

The Legal Department of the Agency was entrusted with all procurement and contract management activities in the first quarter of 2011 (and in support to the Finance and Administration Department in the remaining quarters) and continued to provide legal support to other GSA departments. Thus, most of its activities are already included in other sections of this report. The following activities shall be highlighted:

4.3.1.1. Procurement

The procurement activities managed in 2011 can be summarised as follows:

- Forty-nine purchase orders corresponding to an overall amount of approximately €720,000;
- One negotiated procedure corresponding to an overall amount of €39,600;

- Four open calls[31] corresponding to an overall indicative amount ranging between €14,675,000 – €20,175,000;

4.3.1.2. Contracts

Contract management activities in 2011 can be summarized as follows:

Grants

Open in 2011:

- FP6: PACIFIC; GALILEOSOL; TENT-T-2005 EUROCONTROL; MAGES
- Fp7 1st and 2nd Call: Total of 36 open grant agreements in the end of 2011.

Closed in 2011:

- FP6: MATIMOP; PROGENY
- FP7 1st and 2nd Call: total of 11 grant agreements closed by end of 2011 (final payment)

Contracts

- 27 new contracts signed during 2011

Experts (evaluators and reviewers)

- 46 new contracts signed in 2011 related to experts evaluators (3rd FP7 call)

4.3.1.3. Framework documents

The Legal Department helped in the drafting of framework documents (e.g., work programme; annual activity report; delegation agreements with the European Commission) in view of maintaining the Agency legal framework and in its support capacity to the Administrative Board.

The Legal Department was also heavily involved in the drafting and successful negotiation of the Host Agreement on site and support, privileges and immunities between the Government of the Czech Republic and the Agency.

4.3.1.4. Transfer of Assets

The Agency continued its effort to transfer assets to the Commission as globally initiated by a decision of the Administrative Board in March 2009. The particular transfer of EDAS related activities and assets was requested by the Commission in its letter to the Agency dated 14 June 2010 which the Agency agreed with in its letter of 6 September 2010, requesting the acceptance of the identified assets. By Commission Decision C(2010) 9730, the transfer of the EDAS assets to the Commission was formally approved on 12 January 2011 and finalised during the course of 2011.

In September 2011 the Agency followed up on the transfer of funds to the European Commission which amounted to €2,123 thousand relating to the following activities:

International Activities	56
Joint Research Center	32
Technical support ESA	2,000

[31] (1) PIONEER2 (Security area - launched in 2011, to be concluded in 2012); (2) Information and Communication Services for GSA – 3 lots (Communications area); (3) Engineering Services (Security area – launched in 2011, to be concluded in 2012); (4) PRS4PMR (Security area - launched in 2011, to be concluded in 2012).

NRSCC(National Remote Sensing Center of China)	35
	2,123

In addition, the Agency proceeded with the recovery of the unspent amount of MEDA Programme totalling €19 thousand.

4.3.2. Information System/Information Technology

At the beginning of 2011 the Agency finalised the procurement procedure for General IT Support and started to implement the new contract. After a rather complex start-up phase the Agency reached the first objective: significant **financial savings** resulting from the merge of the general IT helpdesk and the specialised helpdesk for the document management system (which previously was operating remotely from Spain) into one single facility located at the Agency's premises in Brussels. The savings in 2011 were around EUR 50,000 and will reach approximately EUR 90,000 in 2012 with a potential for further decrease. The second main objective of the contract, a significant **increase of support capacity in the IT area**, has also been achieved.

The ICT and Logistics team participated in the work lead by the security department in the area of the development of a **Document Management system** for PRS and Accreditation activities in view of the distribution of the collected information to Member States. The work on the requirements analysis was successfully completed, which allowed the Agency to prepare and sign a specific contract with Logica UK for the implementation of a pilot phase of this project in 2012.

The ICT and Logistics team invested an enormous amount of time in the preparation of the technical project of the new **Agency infrastructure in the new headquarters in Prague** and the Galileo Security Monitoring Centre (GSMC). The first version of the technical project, was used as a basis for the necessary budgetary calculations and allowed the Agency management to launch in September a formal request for additional resources needed for the relocation to Prague. Work continued in the security area, through a series of consultations with different consultants and vendors, and resulted in a detailed concept document. This was presented to the Agency management in December 2011 and approved by the management in the role of the IT Steering Committee.

From there, a detailed procurement plan for the delivery of the necessary goods and services in 2012 was drawn up.

The ICT and Logistics team continued to work on the necessary preparations and improvements of the overall service to the Agency staff with the following goals:

- Delivery of a service aiming at **providing staff with the most efficient tools** to allow them to optimise their work;
- Provision of traceable and auditable projects using **Prince 2 methodology**;
- Accreditation of the new IT systems in Prague and GSMC for compliance with ISO 27001;
- Full implementation of Business Continuity;
- Improvements in the use of collaborative tools like SharePoint and project management software in order to **improve the internal collaboration and higher transparency** of all GSA administrative processes.

The Agency is confident that the effort invested in the procedural work during 2011 will pay dividends in 2012 during the relocation to Prague, and will contribute to the smooth relocation and migration to new IT systems built in Prague.

The work on the accreditation of the new IT Systems, ISO 27001 and business continuity tasks has been covered by another specific contract with Logica, which will be executed during 2012.

4.3.3. Communications

In 2011 GSA Communications activities covered three main areas:

- EGNOS Market Communications
- PRS Awareness Activities
- GSA Corporate Communications

4.3.3.1. EGNOS Market Communications

A range of communications initiatives were implemented this year to raise the awareness and uptake of EGNOS in the following sectors:

- Aviation
- Road/ Intelligent Transport Services (ITS)
- Precision Agriculture
- Mapping

Aviation

To promote EGNOS to the aviation sector, the GSA focused communications activities to target users at events that attracted key potential EGNOS users. Since EGNOS was certified for civil aviation in March 2011, this message was emphasise in the following events:

- ✓ **Aerodays Madrid** (30/3-1/4/11) the 'EGNOS for Aviation' stand was implemented and information was distributed, alongside stands for SESAR, Clean Sky, EASA, and Eurocontrol. Presentations on EGNOS were also made during the conference and press conference and an interview with video footage were provided to Euronews for their ESA/Space EGNOS segment.
- ✓ **Aero Friedrichshafen** (13-16/4/2011) EGNOS was once again a sponsor of the event (the largest general aviation event in Europe). The 'EGNOS for Aviation' stand was implemented and the EGNOS message was displayed throughout the venue on large banners.
- ✓ **ACI European Regional Airports conference** (8-11/5/2011) EGNOS was an event sponsor, had a table top stand, information was provided to participants and the EGNOS logo was printed on all event materials.
- ✓ **EBACE** (the European Business aviation event) (17-19/5/2011) the 'EGNOS for Aviation stand' was implemented and information was distributed.
- ✓ ***ERA*** *(European Regions Airlines association)* ***General Assembly*** (28-30/9/2011, Rome). The 'EGNOS for Aviation' stand was built and key contacts were made. ERA ran a special 2-page article on EGNOS in their September magazine issue.

Road/ Intelligent Transport systems

To raise the awanress of the value of using EGNOS in this sector, the following activities were implemented in 2011:

- ✓ The **'EGNOS for Road' brochure** was revised and reprinted to reflect the current status of EGNOS in this domain as expanded to included EGNOS applications for ITS.

- ✓ A **new video** in the EGNOS application series was completed to promote 'EGNOS for the Road.' The video was distributed via internet and was shown at the following road events during this period:
- ✓ **8th Annual Road User Charging (RUC) event**, (7-8/2/2011) An 'EGNOS for RUC" stand was built in the hall, the EGNOS information was inserted into event participant packs and the EGNOS logo was displayed throughout the event as an event sponsor.
- ✓ **ASECAP Days** (European professional Association of operators of toll road infrastructures) (29-31/5/2011). The 'EGNOS for the Road' stand was built in the hall, EGNOS information was inserted into participant packs and the EGNOS logo was displayed throughout the event as an event sponsor. Also, as a sponsor, the GSA/EGNOS also had a visible role in the conference programme.
- ✓ **ITS Europe, Lyon** (6-9/6/2011) EGNOS and Galileo and their contribution to Intelligent Transport Systems were represented in the European Commission stand. Information on EGNOS was distributed and several presentations were given in the conference programme by the GSA, EC and related FP7 projects.

Precision Agriculture

In the Agriculture sector, the GSA presented the 'EGNOS for Agriculture" message for the first time at the ***Agritechnica*** event (13-19 November) in Hannover, the world's largest event for the agricultural machinery sector. The EGNOS stand was present within the CLAAS event pavilion (CLAAS is one of Europe's largest precision agriculture equipment manufacturers, selling EGNOS-enabled products and is a key partner with EGNOS). Ongoing information and presentations on EGNOS were given throughout the event.

Mapping

In the mapping sector, in 2011 the GSA presented the 'EGNOS for Mapping" message at the annual ***Intergeo*** event held this year in Nuremburg (27-29 September). The 'EGNOS for Mapping' stand was built and manned and key contacts were made.

EGNOS Portal

EGNOS was also marketed promoted significantly via the **EGNOS Portal website** was introduced. In 2011, the following main activities were implemented on the site:

- ✓ Major improvements were made to the web site including redesigned home pages and sector pages, updated information, a new faster web server and a more flexible content management system. The new version of the EGNOS Portal features the new **EGNOS Toolkit and SDK** and the new **EGNOS logo registration and download tool**
- ✓ **49 news stories** were added to site in 2011.
- ✓ the **EGNOS Portal Newsletter** was distributed three times to a list of over 3,000 subscribers
- ✓ A range of new documents and videos were added to the site.

European Satellite Navigation Compétition (ESNC)

For the 4rth year in a row the GSA was a the 'Cooperation Partner' for the Galileo Masters Competition and once again offered a Special Topic Prize for the most promising EGNOS application, this year with a focus on the Safety-of-Life service to coincide with EGNOS certification. Highlights of GSA ESNC participation this year included:

- ✓ The GSA also participated in the **kick-off event of the 2011 ESNC** in London 10-(11/5/2011)
- ✓ The **European Satellite Navigation Competition (ESNC) international experts evaluation meeting** was held at the GSA (8-9 September). The 35 experts from around the world selected this year's 'Galileo Masters' winner.

- ✓ The GSA participated in the **2011 ESNC Award ceremony** on 19 October in Munich. At this event the GSA awarded the *2011 GSA Special Topic Prize* for the 'most promising EGNOS application'. This year the winning application had to exploit EGNOS SOL. The prize was awarded to 'CATUAV', a company in Catalonia that is developing a Mini-UAV Traffic Collision Avoidance System, harnessing the power of EGNOS to bring mini-UAVs into their own in civil aviation. The GSA prize will support business incubation of the idea for up to one year.

4.3.3.2. PRS Awareness activities

Under the aegis of GSA activities in the domain of the PRS Pilot Project, in 2011 the GSA began the first communications activities meant to raise awareness and understanding of the future Galileo PRS service. These activities were meant to begin to introduce and build a dialogue with industry regarding what the service can offer and how to begin to prepare for its introduction. Initial PRS awareness raising activities included:

- The development of a logotype and information leaflet in order begin the process of creating an identity for the service and present initial information on the service to target users and related industry. The leaflet was distributed for the first time at the following event:
- TETRA World Congress, Budapest (24-27/5/2011). An exhibition stand was developed and implemented for the PRS for the fist time in order to begin a dialogue with the PMR (Professional Mobile Radio) market regarding the possible future integration of PRS into these devices. Along with the stand and information distribution, a targeted 'PRS for PMR' workshop was organised during the event in order to provide information to and start a dialogue with key players in this sector. Event participation also included a conference presentation, and a press briefing to announce the future tender to support development in this domain.

4.3.3.3. GSA Corporate Communications

Following the new regulation and name change for the GSA in late 2010, in 2011 GSA Corporate Communications activities featured activities designed to reintroduce the GSA and its new defined objectives and remit, including:

- **A new GSA information leaflet** and information folder was created and distributed throughout the year at relevant events.
- The GSA was present in a large exhibition in the European Parliament called, **'EU agencies — the way ahead'** (1 - 4/2/2011). The event was designed to raise awareness of the work and importance of the EU agencies for Europe.
- The GSA continued to expand the information provided by the **GSA website.** 51 news stories were added to the sites in 2011.

Press

In 2011, the GSA was involved in a range of activities designed to raise awareness of the Agency and its activities with the press, this included the following actions:

- ✓ 7/2/2011, Press release: *'New Executive Director for the European GNSS Agency'*
- ✓ 19/4/2011l, Press release: *'Rewarding the best innovative ideas for EGNOS'*
- ✓ 17/11/2011. Press release: *"Free software 'Toolkits' bring EGNOS accuracy and integrity to smart phones."*
- ✓ 18/11/2012. Press release: *"GSA Sat-nav Prize winner creating system for Mini-UAVs in controlled airspace."*

- ✓ The GSA supported the Czech Ministry of Transport in the organisation of a **press event in Prague** (20/10/2011) on the occasion of the Galileo IOV launch. The GSA facilitated coordination of the event between the different actors (CZ Government, EC Rep in Prague, EC DG ENT and ESA) and provided documents and other promotional materials for the event.

The 'European Space Expo'

The GSA introduced the idea and supported the Commission in finalising the proposal for the 'European Space Base' (now called the 'European Space Expo') project. Initial contracts to build and transport the travelling exhibition were signed at the end of December and 7 installations across Europe have already been confirmed for 2012.

4.3.4. Relocation to Prague, Saint-Germain-en-Laye and Swanwick

The implementation of Decision 2010/803/EU of 10 December 2010 on the location of the seat of the European GNSS Agency was coordinated by the ICT and Logistics department and was clearly the main task in the General Administration area in 2012.

The objective was to prepare the relocation of the Agency headquarters to Prague in the summer of 2012 and start preparing the infrastructure for the GSMC sites in the second half of 2012 so that the GSMC can become operational in 2013. This timing would remove the risk of these two tasks overlapping and would result in cost savings because there would be no need to establish short-term infrastructure links between the current premises in Brussels and the GSMC.

A joint taskforce was created by the Agency and the respective Czech authorities in order to work in the following areas:

- **Legal** – scope, structure and content of the host agreement, immunities granted to the Agency and staff etc.;
- **Daily life and families** – status of staff, schooling, healthcare, social security, ID cards etc.;
- **Logistics and ICT systems** – preparation of the building and all equipment, computer networks, telephones, allocation of office space, meeting rooms, architecture, renovations, parking, archives and the relocation itself etc.;
- **Security** – included physical security in the building, access control, security of ICT systems, protection of classified information, coordination with Czech security authorities, protection of the agency perimeter, counter-intelligence, etc.

This task required several coordination meetings and missions on both a working level and at a high level. The Agency Executive Director was in direct contact with the Czech Ministers and the chairman of the taskforce with the deputy ministers. The Agency highly appreciated the level of attention of the Czech authorities to this project and their support. The work was successfully completed on 15 December 2011 with a clear outcome:

- The Host Agreement on site and support, privileges and immunities between the Government of the Czech Republic and the European Global Navigation Satellite System Agency (GNSS) was finalised and initialled by the respective parties;
- The Lease Agreement for the lease of premises of the Agency in Prague was finalised and initialled by the respective parties;
- The Security Arrangement between the National Security Agency of the Czech Republic and the European GNSS Agency was finalised and initialled by the respective parties;

- The Hospitality Package for the staff of the European GNSS Agency was finalised and initialled by the Czech Government;
- The Agency finalised its GSA HQ Building Requirements document and the document was accepted by the Czech authorities;
- The Czech Government finalised the preparation of a procurement procedure for the selection of the supplier who will prepare the building located at Janovskeho 438/2, Prague 7 for the Agency;
- The budgetary resources identified by the Agency as necessary for the physical relocation will be transferred to the Agency from DG Enterprise in the first quarter of 2012;
- It was agreed that the Host Agreement, the Lease Agreement, the Security Arrangement and the Hospitality Package was formally signed on the occasion of the Galileo Application Congress in Prague on 26-27 January 2012.
- The Czech Government undertook to accomplish the handover of the Premises to the Agency by 31 May 2012.

On the basis of the above results the Agency Executive Director and the Czech Minister of Transport signed a Memorandum of Understanding with the decision to organise the physical relocation of the Agency to Prague by 31 August 2012.

5. Status of the Internal Control

New internal control standards were officially adopted by the Administrative Board of the Agency in June 2011. The Agency follows the ICS applicable to the European Commission and to EU institutions in general. The last assessment on compliance with the ICS was carried out in December 2011, showing that the Agency is fully compliant with 45 out of 58 requirements and partially compliant in areas of business continuity plans, training maps, compulsory training of staff, check on data protection provisions, Single Entry Point for invoices, yearly strategic training plan. Full compliance is expected in 2012. Financial management requirements were all compliant.

In terms of ex-post controls for grants, audits on FP6 grants were carried out during 2011. Preliminary results were available before the end of 2011, with officially final results expected in the first quarter of 2012. For FP7, a new strategy and roadmap was drawn for ex-post controls of the Agency's beneficiaries. Implementation of this strategy started with concrete actions already in 2011 and it covers ex-post activities until 2014.

An update of the Risk Register was also carried out in May 2011.

6. Annexes

6.1. Declaration of Assurance

I, the undersigned, Carlo Des Dorides,

Executive Director of the GSA,

In my capacity as authorising officer,

Declare that the information contained in this report gives a true and fair view[32].

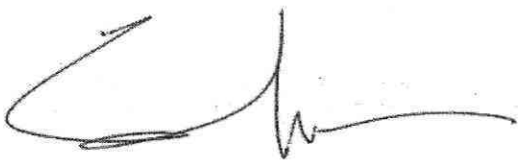
State that I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.

This reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, ex post controls, the work of the internal audit capability, the observations of the Internal Audit Service and the lessons learnt from the reports of the Court of Auditors for years prior to the year of this declaration.

Confirm that I am not aware of anything not reported here which could harm the interests of the institution.

However the following reservations should be noted: none.

Done in Brussels, 21 June 2012



Carlo des Dorides

[32] True and fair in this context means a reliable, complete and correct view on the state of affairs in the service.

6.2. Human and Financial Resources

6.2.1. Financial Resources

The Agency's executed own budget in 2011 was EUR 8,058,652, out of a maximum budget of EUR 8,200,000 (98.4% of budget execution in terms of commitments). In addition to the annual subsidy, in 2011 the Agency managed a 'delegated budget' from the European Commission of almost EUR 70,000,000 via grant and procurement projects.

Per titles, total expenditure in title 1 (HR costs) represented EUR 3,821,859; title 2 (Administrative costs) amounted to EUR 1,582,171; title 3 (operational costs) EUR 2,666,621. Details of the budget implementation during 2011 can be found in the Budget Implementation Report 2011, on the Agency's website.

The entire Agency revenue comes from the EU budget. No other sources of funding were foreseen during 2011.

6.2.2. Human Resources

At the end of 2011, the Agency consisted of 42 staff (28 temporary agents, 13 contractual agents and 1 seconded national expert). Despite the relatively high turnover of staff during 2011, all posts except four (GNSS Security Accreditation Officer, Local Security Officer, Market Innovation Officer and Component and User Segment Security Accreditation Officer) were replaced by the end of the year.

2011 GSA staff hailed from 15 Member States: Belgium, Bulgaria, the Czech Republic, Estonia, France, Germany, Hungary, Italy, Malta, Poland, Portugal, Spain, Sweden, the Netherlands and the United Kingdom. Many of the applications the Agency received for the more technical positions came from Member States with a long tradition in the aerospace industry. However, the Agency is continuously searching for new ways to spread awareness of its available positions in order to better reach qualified candidates in all Member States.

The Agency takes great care to avoid any form of discrimination in its recruitment procedures. The Agency has managed to achieve a very well balanced gender distribution, with 55% of all staff being men versus 45% being women.

Per Department and area of activity, the 2011 distribution of GSA staff was as follows:

- Office of the Executive Director: 2 (2 TAs)
- Communications: 2 (1 TA + 1 CA)
- Finance/HR/Procurement/Admin: 10 (7 TAs + 3 CAs)
- ICT & Logistics: 3 (1 TA + 2 CAs)
- Legal: 4 (3 TAs + 1 CA)
- Market Development: 9 (5 TAs + 4 CAs)
- Security Accreditation: 9.4 (7.65 TAs + 1.75 CAs)
- Galileo Security Monitoring Centres (GSMCs): 2.6 (1.35 TAs + 0.25 CA + 1 SNE)

Code ABB Activity	ABB Activity	Human Resources by ABB activity		
		Establishment Plan Posts	External Personnel	Total
	Security Accreditation	14	5	19

	Contribution to commercialization	11	7	18
	Galileo Security Monitoring Centres	3	2	5
TOTAL		28	14	42

The above data rely on the snapshot of GSA personnel actually employed in each Department as of 31 Dec 2011 and do not constitute full-time-equivalent units throughout the year.

6.3. Draft Annual Accounts and Financial Reports

Draft Annual Accounts have been prepared for the 2011 exercise and sent to the European Commission on their due date. The Budget Implementation Report 2011 has also been finalized and it is currently available on the Agency website.

The Court of Auditors is expected in May 2012 to audit the 2011 Accounts. After their final remarks, the 2011 Annual Accounts are to be submitted in June 2012 to the Administrative Board for adoption.

6.4. List of Administrative Board Decisions

The Administrative Board held five meetings in 2011 (AB27, AB28, AB29, AB30 and AB31). A summary of the main results of these meetings is provided below.

1. 27th Meeting of the Administrative Board, held on 13 January 2011
At its twenty-seventh meeting, the Administrative Board: ▪ Elected the new Executive Director of the European GNSS Agency among three candidates. Mr Carlo des Dorides was elected as the new Executive Director by over a majority of three-quarters. His mandate is for a period of 5 years and is in effect from 1st February 2011.
2. 28th Meeting of the Administrative Board, held on 24 February 2011
At its twenty-eighth meeting, the Administrative board met for a workshop on the implementation of the work programme with a focus on GNSS Applications and security activities. The Administrative Board also: ▪ adopted a revised organisation chart following the entry in service of the new Executive Director
3. 29th Meeting of the Administrative Board, held on 24 March 2011
At its twenty-ninth meeting, the Administrative Board: ▪ Adopted the minutes of AB26 held on 18 November 2010 ▪ Adopted the minutes of AB27 held on 13 January 2011 ▪ Approved the provisional work programme for 2012 ▪ Approved the multi-annual staff policy plan 2012-2014 ▪ Approved the estimate of revenues and expenditures 2012 including a draft establishment plan ▪ Extended the mandate (ending May 2011) of the Chairman and Deputy Chairman of the Administrative Board until end of June 2011 due to the lack of candidates for the takeover.
4. 30th Meeting of the Administrative Board, held on 23 June 2011

At its thirtieth meeting, the Administrative Board:

- adopted the minutes of AB29
- adopted the annual activity report 2010
- adopted the annual accounts 2010
- adopted the Agency new financial circuits
- adopted internal control standards applicable to the Agency
- adopted new reclassification rules
- adopted derogation to third language requirement for promotion of staff in 2011
- appointed the accounting officer (formal appointment)
- elected the new chairperson of the Administrative Board, Ms Sabine Dannelke with a mandate of 2.5 years until 31st December 2013
- renewed the mandate of deputy chairperson, Ms Ann Sta, until 31 December 2011

5. 31st Meeting of the Administrative Board, held on 15 November 2011

At its thirty-first meeting, the Administrative Board:

- adopted the minutes of AB30
- approved the new internal organisation of the Agency
- approved the work programme 2012 pending the formal opinion of the European Commission
- adopted the budget 2012
- elected the new deputy chairman, Mr Christian Gaisbauer, unanimously with a mandate of 2.5 years until 15 April 2014.
- appointed GSA new accounting officer, Ms Svetlana Benevska.

6. Written Procedures

In 2011, the Administrative Board decided on four occasions to take decisions by written procedure:

6.1 Written Procedure No. 17 for adoption of a decision to carry-over of appropriations from 2010 to 2011

The Administrative Board adopted on 7 February 2011 the decision to carry over unused payment appropriations in the amount of €1,262.00 on budget line 3100 Expenditure for studies from 2010 to 2011 in accordance with article 10 (1) and (2) of the GSA financial regulation.

6.2 Written Procedure No. 18 for adoption of a financing decision for €4,458,000.00 to cover commitments of the Agency towards ESA for the procurement of infrastructures from Israeli entities for the Galileo Programme under the Matimop cooperation agreement to be paid from expenditure

	appropriations, which the Agency received from the GJU and Matimop allocated under Budget line 3911
The Administrative Board adopted on 23 March 2011 the above-mentioned financing decision.	
6.3	**Written Procedure No. 19 for adoption of a measure to support of multi-lingual tuition for children of GSA Staff**
The Administrative Board adopted on 13 September 2011 the decision to support multi-lingual tuition for children of GSA Staff relocated to the new GSA headquarters.	
6.4	**Written Procedure No. 20 for adoption of the annual accounts for the year 2010**
The Administrative Board adopted on 29 September 2011 the annual accounts for the year 2010. These annual accounts were adopted in June 2011 but were resubmitted for adoption following an observation by the European Court of Auditors.	

6.5. FP7 Projects Managed by the GSA on behalf of the European Commission

Agriculture	
TITLE	**FieldCopter** : GPS-EGNOS based Precision Agriculture using unmanned aerial vehicles
DURATION	27 months
BUDGET	Total budget : 967 959 € EU Contribution : 616 979 €
WEBSITE	http://www.fieldcopter.eu
TITLE	**GEOPAL:** GNSS-based Planning system for Agricultural Logistics
DURATION	24 months
BUDGET	Total budget : 1.300.449 € EU Contribution : 768.245 €
WEBSITE	http://www.geopal-project.eu
TITLE	**UNIFARM:** GNSS User Forum on Navigation based Innovation for Farmers
DURATION	27 months
BUDGET	Total budget : € 698,970.46 EU Contribution : 679,000.00€
WEBSITE	http://www.project-unifarm.eu
Aviation	
TITLE	**ACCEPTA**: ACCelerating EGNOS adoPTion in Aviation
DURATION	48 months
BUDGET	Total budget : 4 530 345 € EU Contribution : 2 508 928 €
WEBSITE	http://accepta.ineco.es/acepta/html/main.html
TITLE	**GIANT-2:** EGNOS adoption in the aviation sector
DURATION	33 months
BUDGET	Total Cost: 1 765649 € EU Contribution: 1 070 603 €
WEBSITE	http://giant2.ineco.es/giant2/html/main.html
TITLE	**HEDGE**: Helicopter Deploys GNSS in Europe
DURATION	27 months
BUDGET	Total Cost: 1 214 760 € EU Contribution: 846 211 €
WEBSITE	http://hedge.askhelios.com/
TITLE	**CLOSE-SEARCH**: Accurate and safe EGNOS-SoL navigation for UAV-based low-cost SAR operations
DURATION	25 months

BUDGET	Total budget : 449 385 € EU Contribution : 307 878 €
WEBSITE	http://www.close-search-project.eu/
TITLE	**FilGAPP:** "Filling the gap" in GNSS Advanced Procedures and oPerations
DURATION	27 months
BUDGET	Total budget : 1 158 611€ EU Contribution : 603 150 €
TITLE	**HEDGE NEXT**: Helicopter Deploy GNSS in Europe – NEXT
DURATION	24 months
BUDGET	Total budget : 1 369 552 € EU Contribution : 790 965 €
TITLE	**LOGAM**: Low cost GNSS attitude and navigation system with inertial MEMS aiding
DURATION	27 months
BUDGET	Total budget : 667 784 € EU Contribution : 398 102 €
WEBSITE	http://www.logam-project.eu/
TITLE	**SHERPA**: Support on Pre-operational Actions in GNSS
DURATION	18 months
BUDGET	Total budget : 790 723€ EU Contribution : 515 366€
Road	
TITLE	**COVEL:** Cooperative Vehicle Localization for Safe and Sustainable Mobility
DURATION	24 months
BUDGET	Total Cost: 3 336 000 € EU Contribution: 2 118 500 €
WEBSITE	http://www.covel-project.eu/
TITLE	**GENEVA**: Galileo / EGNOS Enhanced Driver Assistance
DURATION	27 months
BUDGET	Total Cost : 2 482 496 € EU Contribution : 1 614 256 €
WEBSITE	http://www.geneva-fp7.eu/
TITLE	**GINA**: GNSS for INnovative road Applications
DURATION	28 months
BUDGET	Total Cost: 2.198.006 € EU Contribution: 1.307.363 €
WEBSITE	http://www.gina-project.eu
TITLE	**SCUTUM**: SeCUring the EU GNSS adopTion in the dangeroUs Material transport
DURATION	23 months
BUDGET	Total Cost: 2 242 437 € EU Contribution: 1 407 188 €

WEBSITE	http://www.scutumgnss.eu/
TITLE	**GSC**: GNSS-enabled Services Convergence
DURATION	24 months
BUDGET	Total Cost: 2 198 096 € EU Contribution: 1 429 655 €
WEBSITE	http://www.ertico.com/unlocking-the-potential-of-galileo-and-egnos/
TITLE	**ERSEC**: Enhanced Road Safety by integrating Egnos-Galileo data with on-board Control system
DURATION	22 months
BUDGET	Total Cost: 512 411 € EU Contribution: 390 448 €
WEBSITE	http://www.ersecproject.eu/
TITLE	**GALAPAGOS**: GALileo-bAsed seamless and robust Positioning Applications for loGistics Optimation processes
DURATION	17 months
BUDGET	Total Cost: 385 139 € EU Contribution : 299 823 €
WEBSITE	http://galapagos-project.eu/wb/
TITLE	**GNSSmeter**: GNSS-based metering for vehicle applications and value added road services
DURATION	24 months
BUDGET	Total cost : 615 225 € EU Contribution: 493 081 €
WEBSITE	http://www.gnssmeter.eu/
TITLE	**GSW**: Galileo Speed Warning
DURATION	18 months
BUDGET	Total Cost: 395 000 € EU Contribution: 299 000 €
WEBSITE	http://gsw.mapflow.com
TITLE	**PUMA:** Precise and secUre autoMative trAcking
DURATION	22 months
BUDGET	Total Cost: 358 545 €EU Contribution: 289 802 €
WEBSITE	http://www.project-puma.eu/index.html
TITLE	**SIGNATURE:** Simple GNSS Assisted and Trusted Receiver
DURATION	21 months
BUDGET	Total Cost : 389 336 € EU Contribution: 299 881 €
WEBSITE	http://www.nsl.eu.com/SIGNATURE/index.html
TITLE	**DETECTOR:** Detection, Evaluation and Characterisation of Threats to Road

	applications
DURATION	21 months
BUDGET	Total Cost: 746 400 € EU Contribution: 465 389 €
TITLE	**Easy-OBU:** Enhanced (EGNOS/EDAS) Accuracy SYstem with GNSS Outage Bridging Unit
DURATION	24 months
BUDGET	Total Cost: 987 462 € EU Contribution: 556 995 €
TITLE	**GAIN:** GAIN - Galileo for Interactive Driving
DURATION	27 months
BUDGET	Total Cost: 3 591 000€ EU Contribution: 2 018 000 €
WEBSITE	http://www.gain-project.eu
TITLE	**OCD:** OpenCarData
DURATION	18 months
BUDGET	Total Cost: 707 152€ EU Contribution: 428 872€
TITLE	**QualiSaR:** Development of a Qualification Procedure for the Usage of Galileo Satellite Receivers for Safety Relevant Applications
DURATION	27 months
BUDGET	Total Cost: 979 119 € EU Contribution: 600 911 €
TITLE	**TACOT**: Trusted Multi Application Receiver for Trucks
DURATION	24 months
BUDGET	Total Cost: 2 502 053 € EU Contribution: 1 397 603 €
TITLE	**TAXISAT**: A new TAXI application guided by SATellite
DURATION	24 months
BUDGET	Total Cost: 748 516 € EU Contribution: 480 076 €
Maritime	
TITLE	**SafePort:** Safe Port Operations using EGNOS SoL Services
DURATION	24 months
BUDGET	Total cost : 2 750 000 € EU Contribution: 1 930 000 €
WEBSITE	http://www.safeportproject.com/
TITLE	**CoSuDEC:** Coastal Surveying of Depths with EGNOS to Enhance Charts
DURATION	24 months
BUDGET	Total Cost: 458 617 € EU Contribution: 356 496 €

WEBSITE	http://www.teamsurv.eu/ , http://www.cosudec.eu/
TITLE	**MEDUSE:** Marine Park Enhanced applications baseD on Use of integrated GNSS SErvices
DURATION	20 months
BUDGET	Total Cost: 467 107 € EU Contribution: 368 775 €
WEBSITE	http://www.meduse-project.eu
Rail	
TITLE	**GRAIL-2** :GNSS-based Enhanced Odometry for Rail
DURATION	24 months
BUDGET	Total Cost: 2 052 974 € EU Contribution: 1 279 347 €
WEBSITE	http://grail2.ineco.es/Grail2/html/main.jsp
TITLE	**GaLoROI:** Galileo Localization for Railway Operation Innovation
DURATION	27 months
BUDGET	Total Cost: 1 509 102 € EU Contribution: 916 450 €
WEBSITE	http://www.galoroi.eu
TITLE	**GSP :** Galileo Signal Priority
DURATION	27 months
BUDGET	Total Cost: 738 979 € EU Contribution: 453 573 €
WEBSITE	http://www.GalileoSignalPriority.eu
TITLE	**SATLOC:** Satellite based operation and management of local low traffic lines
DURATION	28 months
BUDGET	Total Cost: 261 6435.8€ EU Contribution: 1 269 323.52 €
WEBSITE	http://satloc.uic.org
Location-Based Services	
TITLE	**ATLAS:** Autenticated Time and Location for Location Based Application and Services
DURATION	21 months
BUDGET	Total Cost: 353 176 € EU Contribution: 271 917 €
TITLE	**GalileoCast**: Innovative Forecast and Broadcast Applications with Galileo
DURATION	From 01/02/2009 to 31/10/2010 (21 months)
BUDGET	Total Cost: 393 000 € EU Contribution: 299 000 €
WEBSITE	http://www.forecaconsulting.com/galileocast/doku.php, http://dev.galileoactive.com/, https://www.sarweather.com/

TITLE	**IEGLO:** Infrastructure-based EGNOS/Galileo receiver for personal mobility
DURATION	16 months
BUDGET	Total Cost: 386 000 € EU Contribution: 300 000 €
WEBSITE	http://www.modis.at/
TITLE	**IMAGEO** ImaGeo: Accurate geotemporal coding in Photos
DURATION	21 months
BUDGET	Total Cost: 401 713 € EU Contribution: 299 891 €
WEBSITE	http://imageo.in-two.com/
TITLE	**INCLUSION:** Innovative LBS for social/public dimension
OBJECTIVE	Provide the Target Users (motor impaired people) with the possibility to experience end-to-end systems and pre-operative products able to guarantee their mobility in secure and safe conditions.
DURATION	26 months
BUDGET	Total Cost: 1 672 419 € EU Contribution: 1 034 983 €
WEBSITE	http://inclusion-fp7.org/
TITLE	**LIVELINE:** Live ICT Services Verified by EGNOS to find Lost Individuals in Emergency situations
DURATION	From 04/01/2010 to 12/07/2011 (18 months)
BUDGET	Total Cost: 464160 € EU Contribution: 362340 €
WEBSITE	http://www.liveline-project.eu/ , https://heartbeatshome.com/en/
TITLE	**LS4P:** Livesailing For Professionals
DURATION	24 months
BUDGET	Total Cost: 670 836 € EU Contribution: 484 874 €
WEBSITE	http://www.ls4p.com/
TITLE	**METAPOS**: a meta-service integrating diverse position determining technologies for LBS
DURATION	19 months
BUDGET	Total Cost: 393 480 € EU Contribution: 299 210 €
WEBSITE	http://metapos.wordpress.com/, http://metapos.positium.ee/
TITLE	**MUGGES**: Mobile User Generated GEo Services
DURATION	26 months
BUDGET	Total Cost: 1 672 636 € EU Contribution: 1 150 000 €
WEBSITE	http://www.mugges-fp7.eu/

TITLE	**OPTITRANS :** Optimised Transport System for Mobile Location Based Services
DURATION	36 months
BUDGET	Total Cost: 1 657 152 € EU Contribution: 1 139 639 €
WEBSITE	http://www.optitrans-fp7.eu/
TITLE	**PERNASVIP:** PERsonal NAvigation System for Visually disabled People
DURATION	22 months
BUDGET	Total Cost: 502 997 € EU Contribution: 370 414 €
WEBSITE	http://pernasvip.di.uoa.gr/index.php
TITLE	**SMART-WAY:** Galileo based navigation in public transport systems with passenger interaction
DURATION	26 months
BUDGET	Total Cost: 2 380 873 € EU Contribution: 1 793 501 €
WEBSITE	http://www.smart-way.mobi
TITLE	**TIGER:**Trusted GNSS Receiver
DURATION	21 months
BUDGET	Total Cost: 389.986 € EU Contribution: 301.011 €
WEBSITE	http://www.tiger-project.eu/index.htm
TITLE	**CEWITT:** Low Cost and low Energy GNSS-based WIreless Tag for asset Tracking and monitoring
DURATION	23 months
BUDGET	Total Cost: 1 013 268 € EU Contribution: 574 740 €
TITLE	**I-G0ing:** Setting the path for mass market use of Indoor Galileo Operations
DURATION	24 months
BUDGET	Total Cost: 692 492 € EU Contribution: 435 630 €
WEBSITE	http:// www.igoing.eu
TITLE	**POSSUM**: POsition-based ServiceS for Utilities Maintenance teams
DURATION	24 months
BUDGET	Total Cost: 2110370 € EU Contribution: 969561.86 €
TITLE	**STON:** Security Technologies based on lOcatioN
DURATION	24 months
BUDGET	Total Cost: 807 722 € EU Contribution: 312 996 €
TITLE	**WalkEGNOS:** WalkEGNOS: a social web 2.0 mapping solution generating and leveraging on the brand EGNOS Certification Inside

DURATION	24 months
BUDGET	Total Cost: 450 853 € EU Contribution: 296 980 €
Professional and scientific applications	
TITLE	**ASPHALT:** Advanced Galileo Navigation System for Asphalts Fleet Machines
DURATION	24 months
BUDGET	Total Cost: 1 349 681 € EU Contribution: 1 018 072 €
WEBSITE	http://www.asphalt-fp7.eu/index.html
TITLE	**GOLDEN-ICE:** ImprovinG the efficiency Of saLt-spreaDing (de-icing) sErvices and emergeNcy call managment on winter professional vehiCles using Egnos
DURATION	23 months
BUDGET	Total Cost: 694 400 € EU Contribution: 478 650 €
WEBSITE	http://www.golden-ice.eu/
TITLE	**I2GPS:** Integrated Interferometry and GNSS for Precision Survey
DURATION	23 months
BUDGET	Total Cost: 500 863 € EU Contribution: 339 203 €
WEBSITE	http://www.i2gps.eu/Home.html
TITLE	**SX5**: Scientific Service Support based on GALILEO E5 Receivers
DURATION	27 months
BUDGET	Total Cost: 882 942 € EU Contribution: 665 486 €
WEBSITE	http://ifen.bauv.unibw.de/sx5/index.html
TITLE	**MOW-BY-SAT:** MOWing the lawn BY SATelitte
DURATION	18 months
BUDGET	Total Cost: 405 380 € EU Contribution: 299 400 €
WEBSITE	http://www.mow-by-sat.eu/
TITLE	**COSMEMOS:** COoperative Satellite navigation for MEteo-marine MOdelling and Services
DURATION	24 months
BUDGET	Total Cost: 1 676 462 € EU Contribution: 942 540 €
WEBSITE	www.cosmemos.eu (proposed, to be confirmed)
TITLE	**E-TRACK:** EGNOS and EDAS Enhanced Tracking of Animal Movement and Behaviour
DURATION	24 months

BUDGET	Total Cost: 727 892 € EU Contribution: 473 991 €
TITLE	**GAL:** Galileo for Gravity
DURATION	24 months
BUDGET	Total Cost: 1 358 218.00 € EU Contribution: 864 000.00 €
WEBSITE	http://www.gal-project.eu/
TITLE	**Handheld**: Handheld device with innovative compact antenna for professional GNSS applications
DURATION	21 months
BUDGET	Total Cost: 883 526 € EU Contribution: 557 000 €
International cooperation	
TITLE	**CIGALA:** Concept for Ionospheric-Scintillation Mitigation for Professional GNSS in Latin America
DURATION	24 months
BUDGET	Total Cost: 896 591 € EU Contribution: 689 882 €
WEBSITE	http://www.fp7cigala.eu/
TITLE	**ENCORE:** Enhanced Code Galileo Receiver for Land Management in Brazil
DURATION	27 months
BUDGET	Total Cost: 952 708 € EU Contribution: 590 000 €
WEBSITE	http://www.encoreproject.org/
TITLE	**EEGS**: EGNOS Extension to Eastern Europe
DURATION	22 months
BUDGET	Total Cost: 1 365 599 € EU Contribution: 599 943 €
WEBSITE	http://www.eegs-project.eu
TITLE	**ESESA**: EGNOS Service Extension to South Africa
DURATION	20 months
BUDGET	Total Cost: 659 500 € EU Contribution: 289 969 €
WEBSITE	http://www.esesa.org/
TITLE	**GACELA :** GALILEO Centre of Excellence for Latin America
DURATION	19 months
BUDGET	Total Cost: 1 131 682 € EU Contribution: 558 638 €
WEBSITE	http://www.galileoic.org/
TITLE	**GSARSED**: GALILEO SAR Service Early Demonstration

DURATION	From 01/01/2010 to 30/06/2012 (30 months)
BUDGET	Total Cost: 1 817 100 € EU Contribution: 1 151 850 €
TITLE	**SEAGAL:** South East Asia centre on European GNSS for international cooperation And Local development
DURATION	20 months
BUDGET	Total Cost: 543 563 € EU Contribution: 458 645 €
WEBSITE	http://www.navsas.ismb.it/seagal/
TITLE	**SIRAJ**: SBAS Implementation in the regions ACAC and ASECNA
DURATION	22 months
BUDGET	Total Cost: 1 624 488 € EU Contribution: 830 000 €
WEBSITE	http://siraj.ec.pildo.com/
TITLE	**AiA:** Awareness in Africa Awareness in Africa: Disseminating Knowledge on EGNOS and Galileo in Africa to Foster Local and Regional Development
DURATION	24 months
BUDGET	Total Cost: 187 000 € EU Contribution: 187 000 €
TITLE	**EEGS2:** EGNOS extension to Eastern Europe: Applications
DURATION	22 months
BUDGET	Total Cost: 1 498 408, 20 € EU Contribution: 760 791,00 €
TITLE	**G5AsiA:** GNSS for Asia - Support on International Activities
DURATION	30 months
BUDGET	Total Cost: 1 248 701€ EU Contribution: 1 248 701 €
WEBSITE	http://www.gnss.asia
TITLE	**G-NAVIS :** Growing NAVIS
DURATION	31 months
BUDGET	Total Cost: 945 683 € EU Contribution: 756 733 €
WEBSITE	http://www.g-navis.eu
TITLE	**SATSA:** SBAS Awareness and Training for South Africa
DURATION	21 months
BUDGET	Total Cost: 763 984 € EU Contribution: 487 983 €
Education & Innovation	
TITLE	**GAINS**: Galileo Advanced INnovation Services
DURATION	32 months

BUDGET	Total Cost: 1 104 880 € EU Contribution: 877 684 €
WEBSITE	http://www.gainsproject.eu/
TITLE	**G-TRAIN**: Supporting Education and Training in GNSS
DURATION	From 18/01/2010 to 17/01/2013 (36 months)
BUDGET	Total Cost: 558 587 EU Contribution: 543 736
WEBSITE	http://www.g-train.eu/
TITLE	**PEGASE**: Provision of Expertise to GSA And Support to Enabling activities
DURATION	39 months
BUDGET	Total Cost: 1 586 329 € EU Contribution: 1 499 966 €
WEBSITE	http://www.gnss-in-eu-regions.info/
TITLE	**GENIUS:** GNSS Education Network for Universities and IndustrieS
DURATION	36 months
BUDGET	Total Cost: 1 086 547.34 € EU Contribution: 844 912.91 €
WEBSITE	http://www.gnss-education.eu or http://www.gnss-genius.eu
TITLE	**SUNRISE:** Strengthening User Networks for Requirement Investigation and Supporting Entrepreneurship
DURATION	36 months
BUDGET	Total Cost: 1 241 244 € EU Contribution: 1 048 670 €
Security	
TITLE	**PROPHET:** PRS Operations Performance Handy Evaluation Tool
DURATION	36 months
BUDGET	Total Cost: 2 750 000 € EU Contribution:
TITLE	**FORTRESS:** FORge of Tamper-RESistant Security module
DURATION	30 months
BUDGET	Total Cost: 3 998 895.91 €
TITLE	**PROTECTOR**: PRS Operational Tool to Evaluate and Counteract Threats Originating from Radio-sources
DURATION	18 months
BUDGET	Total Cost: 1 000 000.00 €.
TITLE	**PRS4PMR**: Integrated PMR (Professional Mobile Radio) and Galileo PRS receiver

	architecture
DURATION	18 months
BUDGET	Total Cost: 900 000.00 €.
TITLE	**ARMOURS:** Antenna and Front-End Modules for Public Regulates Service applications
DURATION	27 months
BUDGET	Total Cost: 1 509 784.00 C. EU Contribution: 832 968 €
WEBSITE	http://www.armours-project.eu/
TITLE	**PREMISE**: PRs receivers with EMbedded hardware Intrinsic Security Enhancements
DURATION	27 months
BUDGET	Total Cost: 2 720 758,98 €. EU Contribution: 1 461 860.13 €
WEBSITE	http://www.premise-project.eu
TITLE	**ULTRA**:Ultra Low Cost PRS Receiver
DURATION	20 months
BUDGET	Total Cost: 862 000,00 €. EU Contribution: 550 000,00 €

6.6. GSA Administrative Board

The GSA Administrative Board brings together representatives of the Member States, the European Commission, and the European Space Agency. The Administrative Board is responsible for the definition of the Agency's priorities, the establishment of the budget and for monitoring the Agency's operations.

Composition[33]

Members with voting rights	European Member States (27 representatives) and European Commission (5 representatives)
Members without voting rights	European Parliament (1 representative), Norway
Observers	European Space Agency (1 representative) and HR (1 representative)

Chair of the Administrative Board	Deputy Chair of the Administrative Board
Ms Sabine Dannelke (Germany)	Mr Christian Gaisbauer (Austria)

[33] A detailed list of GSA AB Members is available on the GSA website : http://gsa.europa.eu/go/gsa/governance/

6.7. GSA Legal Framework

Document	Ref.	Issue - Date
Council Joint Action 2004/552/CFSP of 12 July 2009 an aspects of the operation of the European satellite radio-navigation system affecting the security of the European Union	Joint Action 2004/552/CFSP	12 July 2004
Regulation (EC) No 683/2008 of the European Parliament and of the Council of 9 July 2008 on the further implementation of the European satellite navigation programmes (EGNOS and Galileo)	683/2008	9 July 2008
Regulation (EU) 912/2010 of the European Parliament and of the Council of 22 September 2010 setting up the European GNSS Agency, repealing Council Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio navigation programmes and amending Regulation (EC) No 683/2008 of the European Parliament and of the Council	912/2010	22 September 2010
Decision No 1104/2011/EU of the European Parliament and of the Council of 25 October 2011 on the rules for access to the public regulated service provided by the global navigation satellite system established under the Galileo programme	1104/2011 (enforced on 5/11/2011)	25 October 2011
Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities	1605/2002	25 June 2002
Financial Regulations of the GSA adopted by the Administrative Board on 11 October 2005 (GSA-AB-2005-042), as amended by the Administrative Board on 20 November 2008 (GSA-AB-08-11-18-02)	*GSA-AB-08-11-18-02*	*20 November 2002*
Commission Regulation (EC, EURATOM) No 2342/2002 of 23 December 2002 laying down detailed rules for the implementation of Council Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities	2342/2002	23 December 2002
Implementing rules of the financial regulations adopted by the Administrative Board on 27 October 2006 (GSA-AB-06-10-07-04)	*GSA-AB-06-10-07-04*	*27 October 2006*
Regulation No 31 (EEC), 11 (EAEC), laying down the Staff Regulations of Officials and the Conditions of Employment of Other Servants of the European Economic Community and the European Atomic Energy Community	Staff Regulations	As amended (2007)

6.8. Security Accreditation Board (SAB) Decisions

Meeting	Date	Ref	Title	Description	Notes
SAB3	24/02	D1	Adoption of agenda	The agenda was adopted with minor amendments coming from the EC.	
SAB3	24/02	D2	Adoption of the Minutes of SAB2	The minutes of the SAB2 meeting were adopted with amendments coming from the UK.	
SAB3	24/02	D3	SAB Status Update	Each time there is an update or change in such documents as the Security Accreditation Milestones (SAMs), SSRS, system configuration applicable or review plan for each accreditation milestones, the SAB secretariat should receive these documents formally from the EC and approve the revised versions.	
SAB3	24/02	D4	Election of the Chairperson and Deputy Chairperson	It was decided to hold the elections of Chairperson and Deputy Chairperson at the meeting and ask the missing Member States to vote by email or post mail after the meeting, fixing the deadline for submission of votes.	Request for votes sent to relevant MS 28/02/2011. Deadline set for COP 21/03/2011.
SAB3	24/02 /2011	D5	GSAP Report	The SAB agreed to adopt the presented ATL template.	
SAB3	24/02 /2011	D6	GSAP Recommend ations	The SAB agreed with the GSAP recommendations reported in document GSA-SAB-11-02-03-07.	

SAB4	03/05 /2011	D1	Adoption of agenda	The agenda was adopted with minor amendment coming from the EC.	As there was no quorum at the meeting all decisions were submitted for approval through a silent procedure launched on 17 May 2011 which closed without being broken on 1 June 2011.
SAB4	03/05 /2011	D2	Adoption of the Minutes of the SAB3	The minutes of SAB3 were adopted unanimously with a reservation that as there was no quorum at the meeting, the approval of the minutes as well as the other decisions taken in this meeting will have to be confirmed by the missing MSs through a silent procedure.	As there was no quorum at the meeting all decisions were submitted for approval through silence procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05 /2011	D3	SoC to SSRS 3.9 and SSRS 3.9 Flow-down	The GSAP was tasked to prepare with the support of GSA and ESA for the pre-SAB meeting in June a first draft of the ATL1 report focussing on SoC to SSRS 3.9 and SSRS 3.9 flow-down, to be further presented to the SAB in July.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and closed without being broken on 1 June 2011.
SAB4	03/05 /2011	D4	GSAP Recommend ations	The SAB meeting in July will be a 1-day meeting.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.

SAB4	03/05 /2011	D5	GSAP Recommend ations	The GSAP recommendations (RESTREINT UE) referring to a SECRET UE document presented during the meeting were adopted.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05 /2011	D6	GSA Report	The site activity report shall be referred and summarised by the GSA in the ATL1 Report (appropriate chapter) until a proper security risk *analysis at system level* integrates all the Site Accreditation outcomes.	As there was no quorum at the meeting all decisions were submitted for approval through *silent procedure* launched on 17 May 2011 and which closed without being broken on 1 June 2011
SAB4	03/05 /2011	D7	GSA Report	On GSF PDR Report Update with Close-Out Review the SAB noted the content of this report and the issues raised by the GSA during the GSF PDR review.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05	D8	GSA Report	On PRS User Segment Accreditation Strategy – the SAB accepted the high level principles with a view of developing the full security accreditation strategy by the GSAP by autumn.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.

SAB4	03/05	D9	GSA Report	The GSAP is tasked to hold a site meeting (GSAP/F2) to review the security issues related to the sites and harmonize as far as possible the local security operating procedures (LSoPs).	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05	D10	Approval of SAB Framework Documents	GSAP Terms of Reference were adopted.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05	D11	Approval of SAB Framework Documents	The Galileo Security Accreditation Strategy was adopted.	
SAB4	03/05	D12	Approval of SAB Framework Documents	The security management plan 2011 was adopted and the corresponding resource requirements by SAB were forwarded by the SAB Chair to the GSA Executive Director in order to fulfil Article 8 (k) and Article 11.10.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05	D13	Approval of SAB Framework Documents	The FKC Work Plan 2011 was adopted.	

SAB4	03/05	D14	Approval of SAB Framework Documents	Crypto Distribution Authority – Draft Terms of Reference were adopted with the reservation that it is a temporary approval, at least for the kick-off of the CDA.	As there was no quorum at the meeting all decisions were submitted for approval through *silent procedure* launched on 17 May 2011 and which closed without being broken on 1 June 2011.
SAB4	03/05	D15	Approval of SAB Framework Documents	On the transportation of the BBKME the SAB agreed that the FKC will witness the shipment under ESA responsibility of the BBKME from Europe to Kourou.	As there was no quorum at the meeting all decisions were submitted for approval through silent procedure launched on 17 May 2011 and which closed without being broken on 1 June 2011
SAB5	12/07	D1	Adoption of the agenda	The agenda was adopted with a minor change.	
SAB5	12/07	D2	Adoption of the minutes of SAB4	The updated SAB4 minutes containing the omitted decisions have to be re-submitted through an additional silent procedure.	
SAB5	12/07	D3	Status Update	The SAB tasks the GSAP to verify the implementation of the EC action plan on major open issues with regard to accreditation. *The GSAP should alert the* SAB if the implementation of this action plan is not progressing adequately.	

SAB5	12/07	D4	Status Update	The SAB formally asked the GSA to do all that was necessary in order to ensure continuous support to the accreditation activities below the requested and planned level, in observance of regulation 912. The necessary resources should be put in place this summer.	
SAB5	12/07	D5	GSAP Report	The SAB requests the conduct of penetration tests against cyber-attacks with the support of MS for checking the Galileo infrastructure. The GSA should ensure that the SAB budget covers the associated expenses.	
SAB5	12/07	D6	CDA/FKC Report	The procurement of the seed loading tool by the GSA with some support of the FKC being a programme responsibility, the SAB notifies that it does not accept any associated responsibility. In addition, the budget for procuring this tool should not be borne by the SAB budget.	
SAB5	12/07	D7	GSAP Recommendations	The GSAP recommendations have been adopted by the SAB.	As there was no quorum at the meeting all decisions were submitted for approval through a silent procedure launched on 13 July 2011 and which closed without being broken on 22 July 2011.
SAB5b	07/09	D1	Adoption of Agenda	The agenda was adopted without changes.	
SAB5b	07/09	D2	Adoption of the minutes of SAB5	The minutes of SAB5 were adopted without any amendments.	

SAB5b	07/09	D3	GSAP report	The SAB decided not to follow the GSAP recommendation to *approve the ATL1 report.*	
SAB5b	07/09	D4	GSAP report	The GSAP recommendations have been adopted by the SAB with a single reservation: that the reference document detailing treatment plans will have to be changed in these recommendations.	
SAB5b	07/09	D5	GSAP Report	The SAB confirms that full access to Security Targets of all Galileo security components is granted to the GSAP in formation F3. The release of this information shall be made by ESA to the GSAP secretariat.	
SAB5b	07/09	D6	ATL1 Report	The SAB decided not to vote on the ATL1 Report at its SAB5b meeting.	
SAB5b	07/09	D7	ATL1 Report	The SAB decided to organise an extraordinary SAB5c meeting on 7 October for voting on the ATL1 Report. The meeting should be organised in the JLS premises.	
SAB5b	07/09	D8	ATL1 Report	Those MSs that won't be able to attend SAB5c for voting on the ATL1 Report should be available to vote after the meeting either by email or fax.	
SAB5c	07/10	D1	Adoption of Agenda	The agenda was adopted after amendment.	
SAB5c	07/10	D2	Adoption of the minutes of SAB5	The SAB5(b) minutes were adopted but should be submitted for approval through a silent procedure of the missing MSs.	As there was no quorum at the meeting the minutes will be launched for silent procedure.

SAB5c	07/10	D3	Vote on ATL Statement	For the future of the programme the E-BBKME component must be certified.	The remaining votes will be gathered after the meeting and the final results will be announced on 14 October 2011.
SAB5c	07/10	D4	Vote on ATL Statement	EC commits to address all open issues and recommendations raised by the GSAP in the ATL1 final report in order to solve them before the finalisation of the next SAB accreditation statement (IOV-SE).	
SAB5c	07/10	D5	Vote on ATL Statement	The present MSs approved the ATL1 statement to launch.	
SAB6	06/12	D1	Adoption of Agenda	The agenda was adopted with minor changes.	
SAB6	06/12	D2	Any Other Business	The issue of solar panels raised by Belgium is not only a safety issue but also a security issue.	

6.9. List of Acronyms

3SC	System Safety and Security Committee
Abbreviation	Definition
ABR	Accounting Budgeting Reporting
AD	Administrator
APV	Approach for Vertical Landing
AST	Assistant
ATL	Authorization to Launch
Authority/GSA	European GNSS Supervisory Authority
CA	Commercial Aviation
CAPEX	Capital expenditure
CBA	Cost Benefit Analysis
CC	Common Criteria
CDA	Crypto-Distribution Authority
CEN-C	China-Europe GNSS Technology Training and Cooperation Center
CFSP	Common Foreign and Security Policy
CNES	Centre National d'Études Spatiales
Commission	European Commission
CONOPS	Concept of Operations
CP	Collaborative Projects
CS	Commercial Service
DCN	Document Change Notice
DG	Directorate General
DIGIT	Directorate General for Informatics
Dpt	Department
EASA	European Aviation Safety Agency
EC	European Community
EDAS	EGNOS Data Access System
EETS	European Electronic Tolling System
EGNOS	European Geostationary Navigation Overlay Service
EGNSS	European GNSS
ESA	European Space Agency
ESCCs	External Satellite Control Centres
ESOC (ESA)	European Space Operations Centre
ESSP (SAS)	European Satellite Services Provider

EU	European Union
EUROCONTROL	European Organisation for the Safety of Air Navigation
FET	Future Emerging Technology
Financial Regulation	Council Regulation (EC, Euratom) No. 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities, as amended by Council Regulation (EC, Euratom) No. 1995/2006
FKC	Flight Key Cell
FOC	Full Operational Capability
FP6	6th Framework Programme for Research and Technological Development of the European Union
FP7	7th Framework Programme for Research and Technological Development of the European Union
GA	General Aviation
GDL	Guidelines
GDP	Gross Domestic Product
GJU	Galileo Joint Undertaking
GKMF	GNSS Knowledge Management Facility
GMES	Global Monitoring for Environment and Security
GNSS	Global Navigation Satellite System
GNSS Regulation	Regulation (EC) No. 683/2008 of the European Parliament and the Council of 9 July 2008 on the further implementation of the European satellite navigation programmes (EGNOS and Galileo)
GNSS Security Board	The Security Board of the European GNSS Systems. It is composed of one representative of each Member State, selected from among the recognised experts in the field of safety and security, and a representative of the Commission.
GPS	Global Positioning System (USA)
GSA	European GNSS Agency
GSA Regulation	Regulation (EU) No 912/2010 of the European Parliament and of the Council of 22 September 2010 setting up the European GNSS Agency, repealing Council Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio navigation programmes and amending Regulation (EC) No 683/2008 of the European Parliament and of the Council
GSAP	Galileo Security Accreditation Panel
GSB	Galileo Security Board
GSC	GNSS Security Centre
GSF PDR	Galileo Security Facility Preliminary Design Review
GSMC	Galileo Security Monitoring Centre
GSS	Galileo Sensor Station

HR	Human Resources
IAA	Initiating Agent and Administration
IAS	Internal Audit Service of the European Commission
IATO	*Interim Approval to Operate*
ICD	Interface Control Document
ICS	Internal Control Standards
ICT	Information and Communications Technology
ILS	Instrument Landing System
IOT	In-Orbit Testing
IOV	In-Orbit Validation
IP	Intellectual Property
IPR	Intellectual Property Rights
IT	Information Technology
ITS	Intelligent Transport Systems
JIAC	Joint International Agricultural Conference
JIMS	Jamming and Interference Monitoring System
JMRD	Justification Mission Requirement Document
Joint Action	Council Joint Action 2004/552/CFSP of 12 July 2004 on aspects of the operation of the European satellite radio-navigation system affecting the security of the European Union
LBS	Location-Based Services
LEOP	Launch and Early Operations
LSAP	Local Site Security Accreditation Plan
LSOP	Local Security Operating Procedure
MASPP	Multi-Annual Staff Policy Plan
MATIMOP	Israeli Industry Center for R&D
Member State(s)	Member State(s) of the European Union
MPS	Minimum Performance Standards
MRD	Mission Requirements Document
MS	Member State(s)
NET	National Expert Group (working group of the GNSS Security Board)
NRSCC	National Remote Sensing Center of China
OPEX	Operational expenditure
ORR	Operational Readiness Review
OS	The Galileo Open Service
OURD	Operator User Requirements Document

PACIFIC	PRS Application Concept Involving Future Interested Customers
PDF	Preliminary Design Review
PinS	Point in Space
PKMF	PRS Key Management Facility
POC	Point of Contact
POCP	Point of Contact Platform
PP	Protection Profile
PRA	Preliminary Risk Assessment
PRAM	PRS Receivers and Security Modules
PRS	Public Regulated Service
PSI	Programme Security Instruction
PUF	Physically Unclonable Function
PxSU	Payload or Platform Security Unit
R&D	Research and Development
RNAV	Area Navigation (method for airspace navigation)
SAA	Security Accreditation Authority
SAB	Security Accreditation Board
SACP	Security Accreditation and Certification Plan
SAM	Security Accreditation Milestone
SAR	Search And Rescue
SAT PDR	Satellite Preliminary Design Review
SB	Security Board
SBAS	Satellite Based Augmentation Systems
SC	Specific Contract
SCDR	System Critical Design Review
SecOPS	Security Operations
SG	Secretariat-General
SISRS-PRS-RX	PRS Receiver System Interconnection Security Requirement Statement
SM	Security Module
SME	Small Medium Enterprise
SoC	Statement of Compliance
SoL	Safety of Life
SPCDR	System Preliminary Critical Design Review
SQR	System Qualification Review
SSP	System Security Plan

SSRS	System Specific Security Requirements Statement
SSRS-PRS-Rx	System Specific Security Requirements Statement for the PRS Receiver
SS-SKP	Space Segment Security Key Point
SVT	System Validation Test
TBC	To be confirmed
TBD	To be defined
TEN-T	Trans-European Transport Network
TIP	Tender Information Package
TMP	Technology Monitoring Process
ToR	Terms of Reference
TREN	Transport and Energy
TTC	Telemetry and Telecommand
ULS	Uplink Station
UNIDROIT	International Institute for the Unification of Private Law
US	United States (of America)
WG	Working Group
WG-CMS	Working Group Common Minimum Standards
WG-NET	Working Group National Expert Team
WG-PRS	Working Group Public Regulated Service

6.7.12 S Danielle