



NEWSLETTER

- 2 PROJECT7 BUILDS CARBON FIBER BAFFLES FOR PROBA-V
- 3 LMS: TOWARDS A WIRELESS WORLD
- 3 GIM TO PROVIDE EARTH OBSERVATION SERVICES TO UNESCO FOR MANAGEMENT OF WORLD HERITAGE SITES
- 4 QINETIQ SPACE NV: PROBA-V

Members

ANTWERP SPACE NV - EUROSENSE BELFOTOP - FLAG - GIM -
IMEC - KATHOLIEKE UNIVERSITEIT LEUVEN - NEWTEC CY -
OIP SENSOR SYSTEMS - QINETIQ SPACE - SABCA LIMBURG -
SCK•CEN - SEPTENTRIO - SPACE APPLICATIONS SERVICES -
UMICORE ELECTRO OPTIC MATERIALS - VITO

Associated Members

BRACQUENE LEGAL CONSULTING
CYPRESS SEMICONDUCTOR BELGIUM - CMOSIS - ES TOOLING
KHBO AEROSP@CE DEPARTEMENT - KONINKLIJKE MILITAIRE SCHOOL
LMS INTERNATIONAL - OMP - PROJECT7 - UNIVERSITEIT GENT -
VON KARMAN INSTITUTE - VOXDALE - XENICS

MORE ABOUT OUR MEMBERS: WWW.VRIND.BE

EDITORIAL

Continuity

Another round of federal government negotiations has started and again the de-federalization of space policy lies on the table. According to the latest information we received (August 19th) the federal space policy will in the future be determined in cooperation with the Regions.

VRI has always asked for a further involvement of the regions in the Belgian space policy even if for us this doesn't include necessarily the entire regionalization of the international aspects of the space policy (the remaining part is already under regional authority). However, if a redistribution of these competencies is going to take place, it is of the utmost importance that continuity is guaranteed.

If the new coalition parties decide to keep the international aspects of space policy no longer as a federal competence, it is necessary that some decisions be taken before this measure is implemented. It is important that the continuity of the Belgian policy, which allowed the Flemish space industries to become a small but healthy and expanding sector, is not compromised

Previous experiences with a transfer of partial competences of innovation policy taught us that this might constitute a great risk.

The reallocation of competences can only be done after having entered into an agreement with ESA and after having ensured that absolute clarity exists within Belgium on how competences are exercised. If the authority would become completely Flemish, it is necessary that within the Flemish administration a space unit is established before the transfer takes place. In case of co-competence

agreements on the control of such a unit have to be made and these need to be crystal clear.

VRI pleads to maintain the current space department as much as possible as the focal point for the space policy, possibly controlled by a board in which the Regions and Communities play an important role.

Regardless the division, the best solution for VRI to guarantee the continuity is the establishment of a (con)federal Agency. Its main competence would be to decide on the participation in ESA programmes. In the composition of the governing authorities the division of competences has to be reflected but this composition can more easily be adapted if the competencies shift.

If also the budgets are transferred to the Regions and the Communities the distribution ratio applied is crucial. Of this budget at least 55% should go to the Flemish region. If not, it will be impossible to continue to provide the Flemish space industries and the Flemish research departments with the means they have been asking for in vain for decades within the federal context.

The Flemish space industries do not want to become like the National Botanic Garden. This federal research institute was once transferred from the federal government to the communities, but after more than ten years of negotiations the transfer has not been completed yet.

Such a scenario would mean the loss of thousands jobs in Flanders.

Hans Bracquené

PROJECT7 BUILDS CARBON FIBER BAFFLES FOR PROBA-V

PROJECT7

Since mid 2009, PROJECT7 is active in the development and production of carbon fiber baffles for each of the three TMA telescopes. This was commissioned by OIP Sensor Systems (prime contractor for PROBA V).

By working closely with OIP, we can optimize development time. The original design was modified to create a lighter and more compact composite component to build.

From the release of the approved CAD models, PROJECT7 begins with designing the molds and associated tooling. All parts are milled in-house. PROJECT7 is doing this with its own CNC machines.

Then the carbon fiber parts are built and cured in one of our autoclaves. Through a combination of pressure, vacuum and temperature, extremely precise and lightweight components can be produced.

Recent investment in surface treatment technology (Vapormat process) allows PROJECT7 to prepare composites and titanium parts for secondary bondings. Titanium components are chemically etched a few hours prior to bonding.

Finally, all components are painted by PROJECT7 (EADS certified).

The pictures show the parts during various stages of the production process.

Besides the components for PROBA V, PROJECT7 also looks for a possible implementation of carbon baffles for the Solar Orbiter EUI (launch 2017), as requested by CSL.

www.project7.be



TOWARDS A WIRELESS WORLD

Mobile communications in remote areas beyond cellular and landline service take place around the world every day. Such voice calls – as well as Internet data connections – are made on mobile telephones that connect to orbiting satellites. A leader in this evolving telecommunications field is Globalstar – the world's largest provider of mobile satellite voice and data services.

The original Globalstar satellites will be replaced in late 2010. The new satellites are designed with greater reliability, power and a 15 year life expectancy. The upgraded constellation and ground network will provide more reliable service and faster data speeds to support next-generation Internet-protocol-based services.

Prime contractor for this project is Thales Alenia Space, Europe's largest satellite manufacturer. Thales Alenia Space has primary responsibility for the design, manufacture, test and delivery of 48 second-generation satellites for the Globalstar constellation.

Satellite assembly, integration and test

The multi-site capability of Thales Alenia's three Assembly, Integration and Test (AIT) Centers is well-suited for handling satellite constellation projects, with specialized capabilities for transporting sensitive hardware between facilities and delivering assembled satellites directly to launch sites. One of their critical roles is testing satellites to ensure that sensitive components can withstand the acoustics and harsh vibrations of vehicle launch. Engineers focus on parts and subsystems that must remain intact, connected and operational – structural components deploying solar arrays and antennas as well as complex on-board electronic systems with interconnected circuit boards, semiconductor chips and signal processors. All three AIT Centers perform various phases of these environmental tests: sine vibration and acoustic qualification tests, acoustic flight model tested prior to satellite assembly and delivery to the launch pad and verification testing on antennas.

Standardizing on LMS - Competitive value of proven capabilities

Tests are conducted using LMS SCADAS data acquisition hardware and LMS Test.Lab control and data-reduction software. With an expanded data acquisition system at Cannes, the 1,200+ channel



count for all three AITs ranks Thales Alenia among the most powerful distributed LMS test system worldwide. The high speed data acquisition, real time processing and versatility of this LMS system are key to the success of these satellite projects.

AITs perform tests for projects such as Globalstar and the Galileo and EGNOS navigation satellites, as well as the Herschel, Planck and Mars Express missions.

"Standardizing on LMS testing solutions is advantageous," said Jean-Charles Delambre, vibration and mechanical testing expert at Thales Alenia Space Cannes Dynamic Test Facility.

"Our test systems are compatible with those at our largest customer – ESA (European Space Agency) since they also use LMS extensively. We can ensure that our test procedures are done according to their standards. And we can exchange results data and technical information of the satellite projects we work on for them. Our engineers can work at any of our three sites thanks to the uniformity of the LMS technologies. This standardization shows its added-value when coordinating work and performing tests efficiently on large joint projects."

Clearly, there is a competitive value for Thales Alenia Space to be standardized on LMS test systems. In an industry such as satellite development where performance and reliability are critical, the trend toward LMS as the de facto standard across the industry makes sense. There is too much at stake to trust projects worth millions of Euros to anything less than the proven capabilities of LMS people and technology."

GIM TO PROVIDE EARTH OBSERVATION SERVICES TO UNESCO FOR MANAGEMENT OF WORLD HERITAGE SITES

GIM recently delivered the Calakmul 4D GIS "Information Management System" for the conservation authorities of the Biosphere Reserve and Archaeological Urban Centre of Calakmul (Mexico). This online system allows Mexican managers of Natural and Cultural Heritage to store, share, visualise and create interaction between their data, in order to coordinate various actions of conservation, management, planning, monitoring and research undertaken in the area.

To achieve a good management one needs excellent documentation. This means: data collection, analysis and evaluation. Then the administrators can add a timeline for effective conservation measures. Until now World Heritage managers didn't have the adequate tools to perform the tasks in an efficient way. Because with management many departments and people are involved, an online application is the ideal way. It provides everyone the possibility to work from his workplace.

The "Information Management System" is based on an online tool developed on the basis of open source elements and according to open standards. It enables the integration of 2D GIS layers and 3D objects, large and small scales cartography layers and the time dimension. It also includes a set of open source tools to create data, but also innovative methods and data models to manage archaeological and ecological data containing time attributes.

The name "Calakmul" refers to an ecological reserve including an ancient Maya city. The study zone lies in the South East of the Campeche State, in the middle of the Yucatan peninsula. The Calakmul Biosphere Reserve was created in 1989. It covers an area of almost 7.300 square kilometres and constitutes one of the largest protected forests of the tropical zones. This biodiversity hotspot shelters rare species of flora and fauna. It also includes many archaeological sites, Calakmul being the most important one. In this site there are 6.252 buildings to be found, from temples, palaces, homes and a ball court. This pre-Colombian city has been registered on the World Heritage List (cultural part) in 2002.

That is why Calakmul is natural and cultural heritage!



This offers opportunities to develop tools for both natural and cultural heritage.

Multidisciplinary approach

The project was carried out with a series of scientists, each with their own specialty.

- Scientists from the Department of Geography of the Ghent University did research on temporal and spatial representation of archaeological data.
- Scientists from the Centre Européen d'Archéométrie of the University of Liège were responsible for data collection and construction of the archaeological database.



- Scientists from the engineering faculty of the Catholic University of Leuven (VISICS team) further developed the Arc3D web service allowing to create three-dimensional models based on sequences of standard digital photos.
- GIM was in charge of the project coordination and was responsible for developing the "Information Management System" Calakmul 4D GIS, the analysis of satellite imagery and production of maps for the nature reserve. Our experts ensured interaction with local users and 'capacity building' (education and training).

This Consortium worked in close collaboration with UNESCO (Dr. Mario Hernandez) but also with the Mexican partners INAH (National Institute of Anthropology and History – responsible for Mexican Cultural Heritage management) and CONANP (National Commission of Protected Natural Areas – in charge of the management of the Mexican Natural Heritage). Finally, the Consortium was also supported by the University of Campeche.

Results

Calakmul 4D GIS is built on the GIM WebGIS technology. GIM WebGIS provides an open and standard product for consultancy-GIS in an intranet or Internet environment.

It is a solution for publishing a variety of geographic themes for everyone, expert GIS users and non-specialist GIS users.

Calakmul 4D GIS has a range of functions. Administrators can:

- Produce maps and export them
- Register, visualize, analyse and plan follow up actions for realized and planned interventions
- Identify and analyze threats.

The application was designed to be able to switch to other World Heritage sites with limited adaptation. Follow up projects carried out by GIM such as Silk Road CHRIS (project on the Asian Silk Road) and Heritech (Croatia project) will also be built on GIM WebGIS.



PROBA-V

In January 2009 QinetiQ Space started the PROBA-V project under an ESA GSTP contract. PROBA-V, or PROBA-Vegetation, is an Earth observation mission which will guarantee the continuation of the data products of SPOT Vegetation.

Due to the technological developments in the last 10 years, it is now possible to perform the mission using a small satellite of about 150kg, without jeopardizing the performance. Since PROBA-V is a gap-filler mission between SPOT and Sentinel-3, the planning for the mission is very critical. PROBA-V must be operational before the de-commissioning of SPOT-5, allowing both mission to be operated in parallel for a certain period.

In June 2009 the PDR (Preliminary Design Review) was held and now, just about 1 year later, the consortium is finalizing the CDR (Critical Design Review). The very short development time is a big challenge for the development team.

The main payload for PROBA-V is the Vegetation Instrument, a multi-spectral spectrometer with a swath of 2250 km, which was presented in the September edition of the VRI newsletter. On top of that, a number of technology demonstration payloads will be flown on the PROBA platform. The most important one is an experimental X-band transmitter, based on GaN technology and EPT (Energetic Particle Telescope). The latter one is developed by QinetiQ Space and will perform high resolution radiation measurements.

QinetiQ Space nv

In the next months, the production of the flight structure will be started and the first flight units will be delivered. The test team is working hard on the preparation of the functional test campaign in which the on-board software and the performance of the subsystems will be tested.

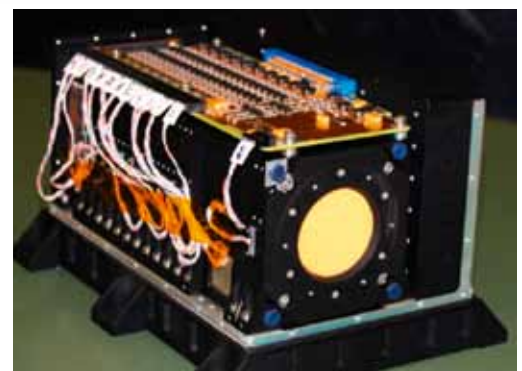


Figure 1: EPT

The complete satellite and the ground station will be ready by the end of 2011 and the launch is currently scheduled for mid 2012. The in-orbit check out and the operations for the PROBA-V mission will be performed from the ground station in Redu.



Figure 2: PROBA-V STM