



MUNICH SATELLITE NAVIGATION SUMMIT 2008

Session 2:

Chairman: Dr. Martin Haunschild

Dr. Oliver Juckenhöfel, responsible of the Business Division on Navigation of EADS Astrium, presented some flashlights on GIOVE B. That is the second experimental Galileo satellite and is expected to be launched on April 26, 2008. He gave information on the tests carried out in Munich, ESTEC and Baikonur, showing in particular the radiation, acoustic, and solar array deployment tests. GIOVE B follows GIOVE A, which was launched on 28th December 2005, sending the first Galileo signals in orbit. A look on the Galileo roadmap shows that the Galileo Signal in Space compliance was reached 2007 and the system is planned to be operational in 2013. Before that, 2010 the In Orbit Validation (IOV) phase is expected to start. Dr. Juckenhöfel concluded his presentation commenting on the recent Agreement on MBOC reached between EU and USA in July 2007. In spite of the little time that was available to implement the necessary changes, GIOVE B will be compatible with the Signal In Space ICD, providing thus the pursued compatibility and interoperability between GPS and Galileo from the very beginning. Finally some alternative/opportunities scenarios from the industrial point of view were underlined. Indeed, the GATE upgrade to full SIS ICD compliance is planned for mid 2008 as well as the full integration of GIOVE B data in GATE and BayNavTech.

Dr. Stefan Bedrich, Head of the Navigation Department of Kayser-Threde, presented the activities and prospects of his company regarding satellite navigation. Kayser-Threde is a medium sized high-tech company (space systems engineering, high-speed measurement systems) active in satellite navigation since the end of the 1980's. Indeed, Kayser-Threde is one of the few companies in Europe providing infrastructure for Galileo system operations as well as applications for early test and use. Regarding system operations, the company is the prime contractor for the Galileo time reference system. The Precise Timing Facility (PTF) is currently under component procurement

and it shall be installed in DLR's new Galileo Control Centre (GCC) by end of 2008. In addition, Kayser-Threde is also the prime contractor for the Galileo satellite harness. The delivery of all four harness sets is planned for 2008. On the side of the applications, Kayser-Threde provided the six transmitter installations of the GATE test bed in Berchtesgaden in 2007. Furthermore, Kayser-Threde is also involved in ongoing studies and projects focusing on early applications with Galileo such as safety and security, multi-modal transport and synchronization of telecom networks.



Exhibition Area Theatinerang

Dr. Günter Heinrichs, responsible of the Business Division of IFEN GmbH, showed the first test results of the German Galileo Test and Development Environment (GATE). After giving a brief overview of the GATE Project Status and Planning, the GATE Transmit Segment and Monitoring Station were shown providing technical information. In order to show the real applications of the whole infrastructure to the audience, static and dynamic positioning samples were provided at various locations using the GATE User Terminal software. This computes the GATE position (combined L1/E5) against the GPS position for all the GATE transmitters in view. According to Dr. Heinrichs, the operational readiness will be achieved soon. Unfortunately, the necessary requirements have not been achieved yet with respect to E5b and E6 frequency bands due to military interferences coming from terrestrial sources in Austria. However, he assesses the interferences as a good opportunity that GATE is providing to cope as early as possible with these type of problems.



The GATE Routine Operational Phase is under the responsibility of DLR / GSOC. The test area should be utilizable for industry customers and for research facilities soon. In the same manner, DLR / GSOC will also provide technical service for all customers of the infrastructure.

Prof. Dr. Bernd Eissfeller, from the Institute of Geodesy and Navigation of the University FAF Munich, gave a presentation on the next generation GNSS software receiver for precise navigation, indoor navigation and Signal Quality Monitoring. Such a software receiver is being developed at the University FAF Munich. The experimental software receiver of the institute is basically a multi-frequency high-end receiver (L1/L2/L5) that can work as GNSS reference station and is particularly appropriate for indoor positioning and ultra-tight coupling. Precise navigation with the L2 civil signal using the software receiver has been demonstrated and a real-time assessment of the software receiver signal monitor was shown by Prof. Eissfeller. Finally, he briefly discussed different ultra-tight coupling applications for integrated position solutions, reliable positioning and accurate feedback to GNSS receiver for predicting carrier phases.



Rudolph, Juckenhoefel, Bedrich, Haunschild, Eissfeller, Meurer, Heinrichs (left to right)

Dr. Michael Meurer, from the Institute of Communications and Navigation of the German Aerospace Centre (DLR), presented the views of his institute regarding Galileo. He showed the roadmap of Galileo focusing on the chronological flow from the system build-up and operations to the GNSS verification and validation, passing through the GNSS applications and concluding with the GNSS evolution. DLR plays a

fundamental role in Galileo, being the prime of the Galileo IOV operations segment. The Galileo Control Centre (GCC) is also located in Oberpfaffenhofen, close to Munich, where DLR is situated. The construction started in November 2006 and the hand-over is expected in April 2008. Then, the verification and analysis of GNSS signals coming from GIOVE A / B will be possible using the DLR high-gain antenna. To conclude, Michael Meurer has provided some additional information on safety of life applications for landing and taxiing using Galileo/GPS as well as on a GNSS receiver demonstrator with adaptive antennas.

Thorsten Rudolph, managing director of the Applications Centre in Oberpfaffenhofen, Germany, gave a short overview of the satellite navigation competition. As he mentioned, the competition counts this year for the first time with the support of GSA. The competition activities are not only concentrated in Europe, but also participants from other regions such as Taipei and Queensland take part actively. As described in the presentation, the international competition in satellite navigation is a success story that started 2004. Since last year, the number of European partner regions has grown from three to eleven, while the number of participants has increased from 80 to 258 in the same timeframe. Also the number of experts increased from 15 to 77. The spectrum of the experts is very wide, ranging from aerospace agencies, research institutes, aerospace industry, ICT industry, agencies to politics, among many others. Last year the award ceremony in the Munich Residenz was given to acknowledge the participants for their contributions in the ideas competition. The main objective of the European satellite navigation competition is to explore new commercially viable GNSS applications and is looking for totally new ideas as well as applications for the general topics. To conclude, Thorsten Rudolph referred to the special topic awards for 2008. Four special prizes will be given, sponsored by GSA, T Systems and DHL, Industrial technology research institute (ITRI) and ESA.