



MUNICH SATELLITE NAVIGATION SUMMIT 2008

Session 9:

Chairman: Rafael Lucas Rodriguez



Opera Munich

Bryan Jenkins of ESYS plc in UK gave a report on the evolution of user requirements. The basis of this work was a study called GENESI on mid and long term user needs conducted by ESYS and funded by FDC. First of all, a quantification of user requirements was attempted leading to seven criteria: accuracy, availability, integrity alarm limit, integrity time to alarm, integrity risk per hour, continuity and time to first fix. The researchers of the study investigated relevant drivers for possible user requirement changes. These can arise due to a higher importance of the application, e.g. oil and gas market or precision agriculture or due to changes in line with developments in user domain specifications, e.g. ICAO (aviation), IMO (shipping). Others can be the introduction of demanding new applications, e.g. PRS related applications or train control, or new services, e.g. integrity or location based billing. A quantification of the individual user requirements was attempted.

Richard Peckham, Business Development Director of EADS Astrium shed a light on the future direction of European GNSS. First of all, the strategic direction has to be consolidated. In order to maintain trust into the system Peckham thinks that EU and ESA must follow a pragmatic approach to enable Galileo FOC until 2013. A major question to evolve is whether the PPP can still be an option for the operational phase in order to keep Galileo driven by user demands

and market pulls. Finally, Peckham presented an overview of likely technical evolutions. Probably digitally processed signal generators are going to lead to full flexibility with respect to the modulation schemes in the space segment without the necessity of a new satellite design. Generally, a greater autonomy in the space segment is conceivable, e.g. on-board orbit determination. Other aspects Peckham finally mentioned are new receiver developments, new and more frequencies including the S- and C-band, advanced clock technologies and a closer cooperation between Galileo and EGNOS.

Pere Durbà, Project Manager of Satellite Navigation Systems Department Indra Espacio, presented the idea of a Multi-Constellation Regional System (MRS). The MRS is conceptually similar to EGNOS in terms of its functionality of signal-in-space reception, computation of the augmentation parameters and the broadcasting. However, the novelty is the diversity that is provided by MRS with respect to infrastructural aspects. There is a diversity of augmentation processing centres depending on the different services that MRS will offer to the user. This will also require different Quality of Service reports. Moreover, there is a diversity of broadcasting facilities (SBAS and terrestrial). The available MRS products will embrace raw data, performance data dependent of short, mid or long term accuracy, ionosphere maps and timing.

Dr. Francesco Martinino, Director End to End Engineering & System IVV, Navigation & Integrated Communications, ThalesAlenia, started his speech asking two questions related to the evolution of European GNSS. "How to manage the evolution?" and "Which are the new ideas?" After finding appropriate answers to these questions a dedicated evolution process has to be initiated. A main requirement for the future is to integrate the available space-related services via a common communications backbone. Dr. Martinino proposed a Wide-Space-Infrastructure (WSI) providing communication links between dedicated GEO, MEO and LEO satellites. Main capabilities in terms of navigation functionality are the



movement of key functions from ground to space and improvements in security aspects. Appropriate developments have to fit into the timetable towards the 2nd generation of Galileo that has also been presented by Dr. Martinino.



Famous Karlsplatz/Stachus in Munich

Dr. Werner Enderle, Head of System Evolution at European GNSS Supervisory Authority (GSA) presented an overview of the four main activities within the FP 7 R&D program in the field of GNSS. The duration of the program that started in 2007 is seven years and contains a budget of 350 M€. The first activity aims to promote and expand the use of Galileo in a wide range of applications. The second activity is to provide the regulatory framework to push Galileo services and applications. The third activity is to drive the development and technology of receivers, user terminals and local elements. Finally, the fourth activity is to ensure the modernisation of Galileo to cope with the evolving user needs and market evolution. There is a dual focus of FP 7 GNSS R&D. On the one hand, mission aspects are considered to improve cost effectiveness. On the other hand, market and application development is considered in order to satisfy user needs.



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