EMMA - EUROPEAN AIRPORT MOVEMENT MANAGEMENT by A-SMGCS

- A contribution to Vision 2020 -

The European Commission White Paper "*European transport policy for 2010: Time to decide*" focuses on an efficient transport system offering a high level of quality and safety, referring also to airport capacity and use. In addition the authors of "*Vision 2020*" [1] forecast that today's traffic volume will double within the next 15 years. How will airports cope with this additional traffic? Most of the existing ones will not be able to extend their infrastructure. Therefore more and more airports strive for an increase in efficiency of the surface movements by means of modern technology while maintaining a consistent high level of safety. For years, airports, ATC providers, civil aviation authorities, airlines, industry and particularly research institutes worldwide have been working on the development of technologies and processes for the optimisation of aerodrome surface movement management. **A**dvanced **S**urface **M**ovement **G**uidance and **C**ontrol **S**ystems (**A-SMGCS**) aims at satisfying these objectives and allow a more efficient use of existing infrastructure in all weather conditions. The approaches adopted by many aerodromes have resulted in isolated solutions applicable for only parts of the complex objective.

The European Commission therefore initiated research projects in the former FPs to develop concepts, prototypes and operational application variants (FP4: DEFAMM with the participation of DLR; FP5: BETA coordinated by DLR). An all-encompassing solution is being strived for, which can be applied to all airports with their different conditions. This requires A-SMGCS to provide worldwide harmonisation of technical and operational

requirements. For this purpose, 24 partners from airports, ATC providers, industrial enterprises, airlines and research institutes from ten European countries joined forces and, with support from the European Commission, officially launched in March 2004 the Integrated Project **EMMA (E**uropean Airport **M**ovement **M**anagement by **A**-**SMGCS**), coordinated by the German Aerospace Center (DLR). EMMA therefore focuses on harmonisation and consolidation, with the overall long-term objective being a worldwide ICAO standardisation [2] in accordance with the EUROCONTROL A-SMGCS activities [3]. This approach ensures that manufacturer-specific and proprietary individual solutions are to a large extent prevented. Improved efficiency can only be achieved by means of aim-oriented cooperation of all systems involved. In parallel EUROCONTROL supported this policy by the EVA-Project which was also coordinated by DLR. The Memorandum of Understanding between DFS, Hamburg Airport and DLR for installing an A-SMGCS research environment at Hamburg Airport significantly shows the acknowledged expertise of the DLR in this area.

At three sample airports (Prague Ruzyne, Toulouse Blagnac, Milano Malpensa) EMMA achieved a higher level of safety, an increase of throughput, reduced environmental impact by less fuel consumption, less pollution and less delays mainly under low visibility. This validation result was supported by Real Time Simulations (RTS), which usually offer a good opportunity to measure operational improvements in terms of objective traffic data (e.g. taxi times, R/T load, etc.). They were also used to investigate safety critical situations like low visibility conditions or conflict situations without any danger. The DLR simulation environment is an internationally accepted centre of excellence for such validation trials.

To follow this success, a new project called **EMMA2** was publically launched in March 2006 at Malpensa Airport. The objectives are to further develop the future A-SMGCS services which get more and more automated and in which the exchange of information between onboard and ground (CPDLC) becomes increasingly important. The basis for this work was laid in EMMA -demonstrated at Prague Airport Ruzyne in March 2006 to an audience of 120 guests - which has already gained a lot of attention and acknowledgement within the A-SMGCS Community. The results of EMMA [4] will support the **S**ingle **E**uropean **S**ky **A**TM **R**esearch project (**SESAR**).

Both IPs **EMMA** and **EMMA2**, with a total budget of 36 Million EUR (DLR part 6.4 Million EUR), show the significance of this area in the EC policy. They are important milestones towards a Europe-wide harmonisation of A-SMGCS in order to increase the safety, the throughput and the efficiency of airports, according to EUROCONTROL and in view of a worldwide ICAO standardisation.

References

[1] Busquin et.al. (2001), *European Aeronautics: A Vision for 2020*, Luxembourg
[2] ICAO Doc. 9830, (2004), *Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual*, First Edition, ICAO Montreal, Canada
[3] Adamson P. (2003), *Definition of A-SMGCS Implementation Levels*, EUROCONTROL Brussels, Belgium
[3] EUROPEAN AIRPORT MOVEMENT MANAGEMENT BY A-SMGCS (EMMA), D681 *Recommendations Report*, Version 1.0, J. Jakobi (DLR), et al., Braunschweig, 2006

Further information on:
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