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Position Paper

Date September 2016

Pages 5 (including this one)

Subject : **Communication/Navigation/Surveillance**

A harmonised Communication/Navigation/Surveillance (CNS) infrastructure

The Aviation Strategy is a welcomed and long-overdue attempt to improve the competitiveness of the European air transport industry vis-à-vis its international competitors, however it seems to be less prone at analyzing the reasons of its internal weaknesses and hence to provide much-needed fixes.

Aviation is crossing borders and oceans and therefore needs a global solution with regards to the airborne and ground technology. A harmonized Communication/Navigation/Surveillance (CNS) infrastructure is a concrete measure to ensure a proper reform of the Air Traffic Management (ATM) in Europe and hence complete the Single European Sky (SES) initiative with proportionate rules regarding:

- Communication: Set sufficient frequency capacity suitable for Data link
- Navigation: Take due consideration of all PBN functionalities
- Surveillance: Extend ADS-B Out to all airspace users

1. Communication: Set sufficient frequency capacity suitable for Data link

While data link represents the future in terms of communication, the current mandate must be reviewed to suit all airspace users' needs, including both commercial operators with an Aeronautical Operational Communication (AOC) and others, including non-commercial ones that are without. A technical solution suitable to all must be identified for the successful deployment of data link before defining new deadlines.

There are many parameters to take account of, including *inter alia* the setting of sufficient frequency capacity, the time necessary for the aircraft manufacturers to deliver the avionics systems and the time required by ANSPs to provide the adequate service.

Business Aviation operators don't usually have a heavy AOC activity. They equipped with datalink solely to comply with the ATC mandate, while airlines use it also for AOC messages. Even though the failure of the datalink service delivery impacts the whole airspace community, Business Aviation certainly bears the brunt of it.

➤ Investigation outcome

The study carried out under the leadership of the SESAR JU identified a couple of problems and solutions. In particular, it proposes a very promising (long-term) ground infrastructure:

- Taking due account of all airspace users' needs, including operators without any AOC;
- Based on an optimised ground communication network.
- Requiring now a implementation roadmap and Member States' strong commitment

Multi-frequency is one of the proposed solutions but its implementation could prove to be a real challenge:

- Multi-frequency requires frequency management. Whilst frequency management could lead to a welcome separation of ATC and AOC messages and to the allocation of a frequency per message flow, it would however be delicate for airlines due to the huge retrofit costs related to the installation of second receivers.
- Multi-frequency could ensure sufficient capacity until at least 2025. However, new generations of aircraft (e.g. A350 and B787) boast more sophisticated maintenance systems emitting continuously AOC messages which will raise capacity demand to unexpected levels much before then.
- The setting-up of a specific frequency for en-route messages and another one for terminal messages might be a good solution.

The positive CBA of a few airlines took precedence over the rest, resulting in unwanted consequences such as datalink being applied for other applications than the ones foreseen by the mandate. The saturation of data link today is not due to ATN B1 requirements, but rather to AOC activities. Any solution should avoid penalizing operators with no (or little) AOC activity. The Commission is invited to take the following into account:

- While multi-frequency and the attribution of a specific frequency for en-route messages and one for terminal messages are potentially good options, they should nonetheless go through proper validation trials involving all airspace users. To our knowledge, no flight tests with business jets were ever carried out during the study, a major flaw considering their number (around 3,500 in activity in Europe alone).
- The mandate should point to solutions for users without datalink agreement (with SITA or ARINC). The ground architecture proposed in the study takes this requirement into account and should be implemented.
- Global cooperation is key in the quest for a successful datalink deployment. The new ATN version needs to be fully coordinated with NextGen.
- The "real" CBA of each user must be accounted for, including in the set-up of a fair funding mechanism (for incentives or compensation).
- The needs in terms of communication are constantly evolving and will require new technologies to cope with the increasing number of ATM and AOC messages.
- A set of clear technical requirements is called for, including for certification. The concept of 'Best in Class' equipment, which is used by the SESAR JU and DM, is misleading. It should be replaced by 'certified equipment'.

2. Navigation: Take due consideration of all PBN functionalities

The ICAO Performance-Based Navigation (PBN) concept moves aviation away from the traditional use of aircraft navigating by means of ground-based beacons to a system reliant on airborne technologies using Area Navigation and global navigation satellite systems. Here again, global harmonisation and consistency with the existing technology and ATM procedures are required in the PBN IR and in the Pilot Common Project (PCP) regulation.

➤ PBN IR

EASA issued an opinion which will form the basis of the Commission's proposal to the Single Sky Committee. The Commission's proposal should bring further flexibility and explanation on the following points:

- The PBN IR needs to define clear rules to transit from RNP to LPV for approaches and provide clarification on how ANSPs will handle mixed types of approaches.
- The PBN IR should make a clear distinction between LPV SBAS procedures – offering 200ft minima and angular approaches and LNAV/VNAV ones – requiring higher minima and permitting linear approaches.
- A strategic GNSS deployment in all phases of flight is essential. The PBN IR should require RNP1 (or RNAV1 at least) en-route to increase capacity. This would contribute to a proper definition of trajectories which SESAR is based on. The PBN IR should develop standard RNP1 rules applicable to ALL stakeholders so that any RNP-capable aircraft can fly any RNP route or approach.
- The Pilot Common Project (PCP) requires the implementation of RNP approaches – through LNAV-VNAV AND LPVs – at 25 European hubs. This should be properly reflected in the PBN IR (it currently states that the scope is LNAV-VNAV OR LPVs).
- Similarly, the PBN IR mandates the implementation of LNAV-VNAV or LPVs at runways where there is no precision approach. Its scope should however be aligned with the PCP and requires the implementation of LNAV-VNAV AND LPVs.

The PBN IR is one piece of an overall legislative package. It includes requirements for ANSPs and aerodrome operators. The package also includes the new regulatory approach for PBN operational approval which will come into force in November 2016. It focuses on pilot training and checking and simplifies operators' life. The common core pilot qualification requires a mandatory PBN-related training, meaning that the LPV SBAS qualification is now included in the standard PBN pilot training.

➤ PCP IR

According to the terms of the PCP IR, it should be reviewed by the Commission at a certain point in time. Whenever this takes place, the revision process should consider the following points:

- The PCP IR defines the deployment of PBN as being limited to the 25 largest European airports, while it is acknowledged that it is much easier to deploy at regional airports. More effort should be spent on the promotion of projects enabling the deployment of PBN at regional airports.
- When dealing with the review of the PCP scope, the Commission should allow a wider interpretation of the concept of 'complex TMA' in order to include satellite airports (e.g. Le Bourget, Farnborough, Luton, etc.).

- The PCP requires the implementation of RNP approaches – through LNAV-VNAV AND LPVs – at 25 European hubs. This requirement should remain unchanged. Access to hubs will be guaranteed to Business Aviation through an LPV procedure which will also be a back-up solution in case of ILS maintenance work. While GBAS is a cheaper and equally effective alternative to the existing infrastructures for CAT 2/3 operations, it should not be the only satellite-based precision approach procedure deployed there.

3. Surveillance: Extend ADS-B Out to all airspace users

There is concern among many operator groups that the current ADS-B requirements don't address fully the operational needs of all airspace users. Implementation issues have been identified. The Commission proposed a postponement of the retrofit deadlines until June 2020 eventually, while launching in parallel a thorough review of the technical requirements. The following points must be addressed:

➤ Facilitate an expanded implementation of ADS-B

The current European requirements for ADS-B only include aircraft of more than 5.700kg (or flying faster than 250kts). The airspace in which ADS-B will be deployed must be based on the benefits it delivers to *all* users, the options for deployment that exist, and the total cost of equipage. An airspace-based model for ADS-B could enable broader benefits. It would be unacceptable to side-line given airspace users by pricing them out, with poorly thought-through equipment mandates. The EASA RMT is reviewing the technical mandate and should consider the following:

- The use of an airspace-based ADS-B mandate supporting a wider deployment of ADS-B;
- The potential for a phased approach that enables new technical solutions;
- When implementation is beneficial to some segments of aviation but not to others, financial incentives should be available to address the negative business case of these airspace users;
- Additional capabilities which provide additional benefits, such as broadcast weather or flight information, should be investigated to make a more solid case for broader equipage.

➤ Clarify the ANSP obligations

The ground infrastructure must be up and running before aircraft are required to equip. To guarantee that ANSPs can meet their obligations vis-à-vis a uniform and integrated level of ADS-B ground coverage across Europe, the EASA RMT should work on a detailed review of implementation to address the surveillance responsibilities and rules within both controlled and uncontrolled airspace.

➤ Further analyse the 1090/1030 spectrum capacity

Frequency constraint is a real issue that must be tackled (as illustrated recently in the Netherlands). It is important that a series of parameters be considered so as to ensure that ADS-B functions properly on the 1090/1030MHz frequency (e.g. the airborne broadcast power levels, the density of transmissions resulting from an increased use of ADS-B and any integration of ADS-B ground infrastructure rebroadcasting traffic information; i.e. rebroadcast of UAT onto the 1090 link). It is also important to cater for alternative solutions, provided they are adapted to each user.

➤ Clarify the aircraft certification requirements

Globally harmonised requirements are necessary to ensure the maintenance of global interoperability while considering the needs of a successful ADS-B solution within European airspace. The need for new avionics (or alterations) to address future changes in certification requirements should be avoided.

4. Conclusion

The current EU legislation creates unnecessary hurdles in different ways, due to:

- Its complexity;
- A lack of global harmonisation and consistency with existing technologies and ATM procedures; and,
- A lack of consideration of small and medium-sized stakeholders' specificities.

One size does not fit all and an inclusive and innovative European policy is a prerequisite for a sustainable and competitive air transport in Europe. The review of the SPI technical requirements and of the Data Link mandate and the setting-up of the new PBN Regulation are perfect opportunities to work towards a globally harmonised CNS infrastructure.

EBAA stands ready to help whenever necessary/appropriate.