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6.1: Implementation plans and methodologies

ATM PERFORMANCE AND THE "BEST EFFICIENCY BEST SERVED" (BEBS) PRINCIPLE

(Presented by the Presidency of the European Union on behalf of the European Union and its Member States[1]; by the other Member States of the European Civil Aviation Conference[2]; and by the Member States of EUROCONTROL)

SUMMARY

This paper introduces the notion of "Best Efficiency Best Served", as a global operational performance incentivization strategy to allow early benefits to be secured in those operational environments in which not all stakeholders have reached the higher capabilities provided by new technologies and procedures, but for which a critical mass of higher capabilities is reached locally.

Action: The Conference is invited to agree to the recommendation in paragraph 4.

1. INTRODUCTION

1.1 The notion of "First Come First Served" (FCFS) is generally applied to manage air traffic flows. It is not a principle as such, but results from the interpretation of the provisions in Annexes and PANS regarding the relative priorities of different flights. It means that different airspace users are in normal circumstances handled without discrimination and that priority is given to the aircraft that is first using a certain resource (runway, airspace). Strictly applied, this does not promote the most efficient use of ATM "capabilities" (hereunder to be understood as both ground and airborne ATM systems and procedures). This is already recognized in the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), which specifies for example that "the approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least average delay".

1.2 In the *Global Air Traffic Management Operational Concept* (Doc 9854), the description of the expectation on access and equity specifically indicates that *"Generally, the first aircraft ready to use the ATM resources will receive priority, except where significant overall safety or system operational efficiency would accrue or national defence considerations or interests dictate that priority be determined on a different basis*".

[1] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and United Kingdom. All these 27 States are also Members of ECAC.

[2] Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Croatia, Georgia, Iceland, Moldova, Monaco, Montenegro, Norway, San Marino, Serbia, Switzerland, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

1.3 There are also a number of examples where access to aerodromes and services is differentiated depending on aircraft equipment and/or operators/crew capability, such as minimum navigation performance specification (MNPS) airspace over the North-Atlantic, the access to reduced vertical separation minimum (RVSM) airspace, or the ability to land under precision approach conditions, not to mention airspace categories. These examples are however defining broad categories and generally do not imply a different individual treatment.

1.4 The implementation of the ongoing ATM modernization initiatives (such as SESAR, Next Gen or CARATS, all in line with the ASBU approach) will require synchronized modifications to both ground and airborne capabilities. In this new context, the "First Come First Served" notion alone might not always guarantee the most efficient and effective handling of mixed capabilities, since it might imply that all flights are handled as if none was able to use the new capabilities. As a consequence, it is proposed that a paradigm shift be made towards "Best Efficiency Best Served" (BEBS).

1.5 This principle will allow the delivery of tangible performance benefits even if not everyone has reached higher capability levels in a concrete airspace portion, as might happen in particular during the transition period – in which development and deployment phase activities will coexist. The BEBS principle allows benefits to be obtained in those cases where a critical mass of higher capabilities is reached locally. In practical terms, with BEBS, stakeholders that have reached higher capability levels would benefit from a more efficient operational environment. The capability levels of each category of stakeholder will be defined taking into account the specifics of their activity and the operational environment concerned.

2. THE BEBS PRINCIPLE

2.1 The implementation of BEBS principle will be a responsibility of Contracting States. BEBS supporting measures would be applied only after the concerned States had enforced those following neutral, transparent and non-discriminatory processes. The competent authorities should validate the supporting measures.

2.2 To that end, Contracting States would draw up written procedures to be applied in application of the supporting measures. These procedures might include the sorts of aircraft equipment corresponding to the supporting measures and the rules of application of these supporting measures together with relevant operational procedures.

2.3 These measures, acting mainly on the flight planning phase, should allow airspace users, air navigation service providers and airports to execute higher efficiency operations in defined volumes of airspace during certain periods of time, or even permanently where so decided. In order to preserve the non-discriminatory principle for the access to the high efficiency operational environments, the definition of these ATM environments would be decided on the basis of the achievement of the societal benefits they would enable (e.g. reduction of environmental impact, increase of capacity, equitable access and time related savings). The need for operators to have available higher capability levels in order to have access to these ATM environments will be derived from the need to maintaining the overall safety and efficiency of operations.

2.4 These measures taken in the planning phase will require consistent procedures to be applied in the execution phase (e.g. flight, procedures, ATM procedures, airport operation procedures, slot allocation). The initial definition of these measures will involve all concerned stakeholders, such as entities involved in airspace management, air traffic flow management (ATFM) units, airports and entities involved in the financial planning of ATM activities, in particular the establishment of air navigation

charges schemes and financial incentives schemes. They should include supporting performance case analyses to show the potential benefits for airspace users, air navigation service providers, and airports.

2.5 The implementation of these "operational" supporting measures would be without prejudice to the capacity of the Contracting States, at the national or local level, to establish other incentive schemes, for instance ones of a financial nature. Those incentives may apply to air navigation service providers, airports, or airspace users.

2.6 These measures should also provide guarantees to those ATM stakeholders who have lower capability levels for access to airspace and facilities, but under different conditions. In particular, in those environments where the conditions for application of the BEBS principle are not met (e.g. in situation of crisis), it is understood that FCFS principle will continue to be applied, generally, until the full deployment of SESAR and other similar ATM initiatives worldwide in line with the ASBUs allows the use of BEBS principle in more environments.

2.7 The principles necessary to guide Contracting States in the elaboration of procedures to apply these measures should take the form of ATM performance recommendations, under the umbrella of ICAO. These would specify, in greater detail than in the Standards and Recommended Practices, the principles to be applied by the competent bodies in applying measures supporting and motivating airspace users to equip aircrafts with the new on-board devices and systems improving aircraft capabilities allowing in consequence the achievement of the performance targets.

3. SOME EXAMPLES OF POSSIBLE APPLICATIONS OF BEBS

3.1 Airspace design could take BEBS into account in the development and design of SIDs and STARs in TMA In close dialogue with airspace users, air navigation service providers could implement fuel efficient RNP SID and STAR procedures at all airports where at least 50 per cent of the aircraft movements are performed with RNP capable aircraft. The RNP status would be identified in the flight plan information in order to enable this to be taken properly into account in the planning of operations.

3.2 For en-route/departure: Implementation in congested areas CPDLC and implementation of short term ATFCM measures. Given that a data link aircraft can represent less workload for a controller and hence be beneficial for sector capacity, a situation can be foreseen where the data link equipage status of the aircraft was taken into account in the application of short-term ATFCM measures. De-facto, the data link aircraft would get the benefits of a preferential service, and could be released first from gate holds.

3.3 For en-route/remote operations: the fact that aircraft are automatic dependent surveillance — broadcast (ADS-B) equipped would be considered in the planning and execution phases, producing a reduction of separation which would lead to a capacity increase. Climb to optimum cruising levels through occupied levels would be possible in a non-radar environment having a considerable impact on cost savings and the environment.

4. ACTION BY THE CONFERENCE

4.1 Considering the need for global operational performance incentives to obtain early benefits in those operational environments where not all stakeholders have reached the higher capabilities

provided by new technologies and procedures, but for which a critical mass of higher capabilities is reached locally, the Conference is invited to:

a) note the information contained in this paper;

b) request ICAO to study and develop as appropriate incentive principles under ATM performance recommendations complementary to the Standards and Recommended Practices contained in Annex 11 and supplementary to the PANS-ATM (Doc 4444), with a view to facilitating interoperable implementations and operational use of advanced functionalities for improving the overall ATM performance; and

c) recommend that these performance recommendations are complemented with an ATM performance approach to the application of incentives in areas where return on investment differs significantly between different ATM partners and the need for interoperability is high.

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