



THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE A

Agenda Item 1: Air navigation global strategy

1.4: Air navigation business cases

COST ANALYSIS - BENEFITS, IMPLEMENTATION, MAINTENANCE AND UPDATING OF AERONAUTICAL METEOROLOGICAL INFORMATION QUALITY MANAGEMENT SYSTEMS

(Presented by Argentina)

EXECUTIVE SUMMARY

This paper presents a cost and benefits analysis scheme concerning the investments and costs that the Aeronautical Meteorological Services must incur, based on the requirement introduced in Amendment 75 to Annex 3 — *Meteorological Service for International Air Navigation*, on establishing and applying a system adequately organized to guarantee the quality of the meteorological information to be provided to the users in the field. It serves as the basis for improving the meteorological data to be supplied and is also promoted within the framework of block improvements of the aviation system (aviation system block upgrade (ASBU)). The implementation as mentioned above evidence the need to obtain funds and financing additional to those taken into account before the amendment as mentioned earlier to allocate them to the recovery of the costs not only of the implementation but also to the maintenance and updating thereof.

Action: The Conference is invited to agree to the recommendation in paragraph 3.2.

1. INTRODUCTION

1.1 One of the main aspects that must be analysed when selecting a resource for its implementation so that it contributes with operational improvements to the air navigation system is the relationship between the benefits that this resource provides to the aviation community and its related costs for the corresponding interested parties.

1.2 In general, this analysis includes the collection of data and the hypothesis to estimate the benefits that, concerning efficiency, are obtained from the implementation of a resource.

1.3 This paper presents, for States and other interested parties that do not yet have a cost and benefit analysis process (CBA), an analysis of costs and benefits concerning, which the aeronautical meteorological services must incur to contribute improvements on safety and in the decision making

¹ English and Spanish versions provided by Argentina.

process in the aeronautical field. This analysis serves to consider the necessary recovery of costs associated to the requirement of the adoption of quality management systems, as well as their maintenance and updating. The prospective analysis is described in the Appendix to this working paper.

2. ANALYSIS

2.1 Through the analysis of Doc 9082, *ICAO's Policies on Charges for Airports and Air Navigation Services*, Ninth Edition, in Section III, it is mentioned, "An equitable cost-recovery system could comprise charges based on the allocation of total air navigation services costs incurred on behalf of users." (Paragraph 2 refers). Additionally, in the Appendix, it presents a list that should be considered for the inventory of facilities and services that should be accounted for.

2.2 Likewise, in the same document it is added that "The establishment of the cost basis for air navigation services should observe the following principles:

- i) The cost to be allocated is the full cost of providing the air navigation services, including appropriate amounts for cost of capital and depreciation of assets, as well as the costs of maintenance, operation, management and administration.

...

- iv) The costs of supporting services such as aeronautical meteorological services (MET), aeronautical information services (AIS) and other ancillary services should also be identified separately" (Section III, Paragraph 3 refers).

2.3 Depending on the background mentioned in the preceding paragraph, the costs incurred from the requirement introduced in Annex 3 — *Meteorological Service for International Air Navigation* on the establishment and application of a duly organized quality system should be taken into account. It must include procedures, processes, and resources required to provide meteorological information to users. Likewise, it is necessary to demonstrate, through audits, compliance with the applied quality system, as well as if it is observed that the system does not comply, measures must be initiated to determine and correct the causes and observations revealed in them.

2.4 Therefore, the proposed analysis reflects the benefits and costs of the implementation project of the aeronautical meteorological information quality management systems. They must be adjusted to the economic objective of maximizing profits. These include the positive repercussions of the investments made, among which we can highlight, for example, improvements in safety issues, in the decision-making process of the different aeronautical users, whether operational or planning, etc.

2.5 Every important decision made by States, airports or air navigation service providers (ANSP) should be supported by analyses that demonstrate the costs and benefits derived from investments in the aeronautical information quality management system. Aviation service providers, users of such services and, outside of the aviation sector, the broader global community would benefit significantly from these analyses.

2.6 In the *Manual on Air Navigation Services Economics* (Doc 9161) and in the *Airport Economics Manual* (Doc 9562) there are guidelines on profitability studies, CBA and economic impact Analysis (EIA).

3. CONCLUSION

3.1 All organizations have to make decisions about the best way to achieve their objectives. To address their investment decisions, the organizations use evaluation techniques that allow them to examine options and select the solution that optimizes the benefits. Every critical decision regarding investment in quality management systems should be supported by analyses that show the costs and benefits that are foreseen for the interested parties and, where appropriate, for the whole community.

3.2 To provide analytical support to interested parties to take into account investments in implementations, maintenance, and updates of aeronautical meteorological information quality management systems in cost recovery of air navigation services as discriminated in Doc 9082, using the ASBU framework, as well as to obtain funds and financing to get resources, the Conference is invited to agree to the following recommendation:

Recommendation 1.4/x – Incorporate investments in implementations, maintenance, and updates of aeronautical meteorological information quality management systems within the cost recovery framework of aeronautical meteorological services

That the Conference:

- a) urge States and ANSPs to take into account the proposed analysis;
- b) encourage States and ANSPs that derive budget for investment projects to maintain and update the aeronautical meteorological information quality management systems to the MET provider, to support the improvements described in the ASBU framework; and
- c) ask ICAO to support this initiative.

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APPENDIX

COST-BENEFIT ANALYSIS FOR INVESTMENT PROJECTS IN AERONAUTICAL METEOROLOGY

1. OBJECTIVE

Investment for the establishment and application of a duly organized quality system to provide aeronautical meteorological information to the users of the sector, this investment allows the production and distribution of meteorological information to be controlled so that it becomes more and more beneficial and useful to the aeronautical user, be it in making operational decisions, as well as in planning their activities. The implementation of the system as mentioned earlier ensures that the user is taken into account in all stages of the aeronautical meteorology processes and their integration into the rest of the aeronautical field, and also allows to:

- a) generate a virtuous circle that allows installing the culture of continuous improvement of information and mutually beneficial relationships between the stakeholders of the aeronautical field;
- b) measure the uncertainty about the accuracy of the data and forecasts so that the user knows them and bases their decision-making on concise, accurate and controlled quality data; and
- c) demonstrate progress as well as recognize and control the risk and the impacts of aeronautical meteorological information.

2. SCOPE

The geographic and temporal scope is already defined in different ICAO documents, such as Annex 3.

- a) It attains all meteorological information for international air navigation supplied through OPMET banks.
- b) Intimately related not only with the projects and activities of the users of the airlines but also with the aeronautical information and air traffic control services.

Note. — The integral project and implementation may vary according to sovereign criteria of the countries, therefore, the implementation times, associated costs and benefits would be very variable if the countries do not receive help to improve their capacities from the related organizations and competition in the field: ICAO, World Meteorological Organization (WMO), Civil Air Navigation Services Organization (CANSO), etc.

3. ASSUMPTIONS

The project would allow to keep under control and improve the information, helping to make operative and planning decisions contributing differentially, concerning:

- a) level of aircraft activity;
- b) equipment lifetime;
- c) costs of fatalities/injuries; and/or
- d) cost of delays due to aircraft and/or passengers.

4. ALTERNATIVES TO THE PROPOSED CASE

4.1 The only possible alternative project to a regulatory requirement that seeks to keep operational safety under control, as well as the risks derived from aeronautical meteorological activity, would be different implementation plans, with different timelines.

4.2 The cost of not implementing an aeronautical meteorology data quality management system would be the lack of knowledge of the uncertainty, of the risks, as well as of the effectiveness and efficiency that the information as mentioned above provides, not only regarding operational safety in the aeronautical system but concerning economic and social benefits. For example, to be able to better individualize operating hours of a given fleet in a given airport, how to save the time of delay of aircraft and passengers, avoid different types of risks of accidents and operational incidents, etc.

5. HORIZON / TIMELINE

It is determined from its introduction in Annex 3, but as will be mentioned above, the timeline is undoubtedly affected by the fact that each country has different capacities, both for the internal normative part and for budgetary reasons.

6. COSTS AND BENEFITS (IDENTIFICATION)

6.1 The investment that aeronautical meteorological services should make when implementing, maintaining and improving/updating their quality management systems should be considered.

6.2 Even investments in technology and human resources that the adoption of these systems entails should be taken into account:

6.3 Cost categories to include:

- a) necessary infrastructure;
- b) equipment information technology (IT) essential;
- c) software necessary;

- d) personnel costs, either for increases in work in the operating personnel, such as the costs involved in the entry of personnel dedicated exclusively to the implementation and maintenance of the system, as well as the certification, support, and recertification audits. In addition to the personnel of the service affected to the specific tasks of quality management that may fall on a staff of plant or new income; and
- e) some of the training, initial and ongoing not only on the system to be implemented or implemented but the necessary updates of the training material and teaching staff.

6.4 Categories of benefits to include:

- a) access and fairness to quality aeronautical meteorological information by different stakeholders;
- b) improvements in the capabilities of the provider body;
- c) cost-effectiveness control;
- d) flexibility to take into account in decision-making;
- e) global interoperability by unifying standards based on the same quality management system (ISO 9001: 2015);
- f) participation of the air traffic management (ATM) community and all interested parties in the aeronautical field;
- g) prediction with controlled and/or known uncertainties;
- h) improvements in safety; and
- i) relevant economic and social benefits as mentioned in examples with the benefit provided for making decisions on the use of aircraft, delay times in aircraft and passengers, improvements in ramp safety, platform, etc.

7. COSTS AND BENEFITS (COMPARISON)

Once the costs and benefits are in a comparable format, different indicators and criteria may be available to establish if the benefits exceed the costs, or not. They should work with the various stakeholders.

8. ANALYSIS OF THE DISTRIBUTION OF COSTS AND BENEFITS

8.1 Everything varies according to individual assumptions or if the variables used are changed. Identification of who bears the cost of the investments and who benefits.

8.2 The investment in the cases that meteorological services are public is supported by the budgetary item or the cost recovery instrument determined by the State and the policy adopted, which mainly depends on the national and international normative commitments assumed.

8.3 The beneficiaries are not only the different subsectors of the aeronautical system but also the citizen who uses the airplane as a means of transport (business, tourism, health, etc.), as well as the company/organization that uses air transport for cargo. Other non-commercial sectors benefit, since the improvement in MET information benefits general aviation, search and rescue services, etc. in short of the whole society.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 Bearing in mind that Doc 9082 in its ninth edition, in Section III “ICAO’s Policies on Charges for Air Navigation Services”, in paragraph 2 of “The cost basis for air navigation services charges” mentions that “An equitable cost-recovery system could comprise charges based on the allocation of total air navigation services costs incurred on behalf of users.”

9.2 The same document adds that in establishing the cost basis for the imposition of fees for air navigation services, several should be applied, among them the cost of maintenance, exploitation, management and administration expenses, adding that the costs of support services such as meteorological services (MET) for aviation, should be identified separately.

9.3 As well as taking into account the requirement of Annex 3, it is necessary to take into account the recovery of the “cost” that MET suppliers assume about the investments they make for the implementation, maintenance, and updating of quality management systems of aeronautical meteorological information.

9.4 Among other things taking into account that the quality as mentioned above information provided, provides an incremental improvement of the benefits of the users of the sector and other interested parties.

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