

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 3: Air traffic management (ATM) performance targets for safety, efficiency and regularity and the role of required total system performance (RTSP) in this respect

3.2 The concept of RTSP

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PERFORMANCE: WHERE TO NOW?

(Presented by Australia)

SUMMARY

This paper advocates that the work on performance be continued, and makes a number of recommendations that are pre-requisite to the preliminary endorsement of what has been achieved so far and also to any future work on the subject.

1. INTRODUCTION

1.1 The description of this agenda item indicates that it is foreseen that recommendations of the conference could facilitate the endorsement of RTSP.

1.2 This paper proposes a list of such recommendations that relate to the preliminary endorsement of what has been achieved so far, and also to any future work on this subject.

2. DISCUSSION

2.1 The performance work assigned by the terms of reference to ATMCP was only of an initial nature (i.e. "... define and study the feasibility of ...").

2.2 The report of the first meeting of the ATMCP clearly indicates that there is further and substantial work to be done beyond that presented at the time (March 2002).

2.3 Deliberations in the ATMCP reveal the following principles:

- a) that performance is not a simple subject and there is no quick, “just-throw-money-at-it” solution;
- b) that **performance** and **user expectations** must be strongly linked;
- c) that while safety is **the** overriding independent variable, it is also one of several expectations;
- d) that **expectations** are not independent — trade-offs may be necessary — and **expectations** are useful so long as there is an agreement on their utility and commitment not to breach them;
- e) that the framework must be useful to various types of users: e.g. airspace designers, regulators, day-to-day operations, service-providers, etc.;
- f) that while measuring performance should be relatively simple, it should first of all be meaningful;
- g) that there should be no measuring without a specific purpose;
- h) that a set of related models¹:
 - 1) must link **causes, effects** and ways of measuring both;
 - 2) must be accurate, detailed, reliable and timely in its predictive capacity only to the extent needed by the margin of error acceptable in the decision (e.g. it need not necessarily contain complex equations/functions); and
 - 3) must also be implementation independent to resist the test of time;

¹ The referred set of related models is absolutely necessary to achieve the consistently excellent decision making imposed by current limited resources. Such a set would provide an understanding of ATM much, much deeper than we have today; much in the same way, but not necessarily to the same extent, that medicine understands the interplay of causes and effects in the functioning of a human body and its parts; or engineering does the same for cars, rockets, etc.

Why this set of interrelated models? Because excellent decision making has never been achieved consistently without excellent knowledge of reality; because the law of diminishing return applies and real benefits will have to pay for investments; because this is not about installing as many computers as possible putting our blind faith in a technological fix. This is about focusing on spending as few resources as possible – be them computers or whatever – to obtain the maximum benefit for the overall industry. This is about the 80/20 rule and being smart, as epitomized by this hypothetical example: were it possible to halve wake vortex effects, capacity could be doubled. Also, where useful, attempts must be made to incorporate previous modelling work by ICAO (e.g. accident models, etc.).

- i) that **performance** is not only a multidisciplinary subject — i.e. various professions — but also one with multiple viewpoints, i.e. various actors (e.g. users, providers, regulators, etc.);
- j) that there is no point in making quick decisions: R&D is probably required to test the feasibility and soundness of some aspects of any framework;
- k) that this work cannot be done by isolated panels each having in its mandate to address individual performance elements (e.g. RCP, RSP, etc.);
- l) that performance measures should faithfully reflect users expectations, must at least be simple, measurable, accurate, reliable and timely (SMART), and must be applied uniformly across the total system. That other attributes against which to judge candidate measures should include: systemic vs. one-off; multiple cause vs. single cause; lead vs. lag; private vs. public; object vs. process; organisation vs. individual; local vs. universal; brand vs. type; logically² support mathematical operations (e.g. addition, etc.); and
- m) that ATM is a multi-variable process that attempts to match capacity with demand at various time stages and where strategic decisions generally constrain later ones. That (thus) the notion of conflict can be extended to include variables other than safety. That (thus) outcomes vary with the choice of optimisation variables, and optimisation is de facto a strategic matter.

2.4 The success of any future work on this subject depends heavily on the preservation of the valuable work and assumptions made so far. Thus the recommendations.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) request ICAO to advance the work currently being done on performance while ensuring that it is undertaken under a central coordinating authority (e.g. similar to the one exercised so far by the ATMCP);
- b) request ICAO to establish a formal and continuing link between groups working in the areas of performance and safety; and

² For example, does the result of adding geographically independent values of the same performance measures produce a result that is logical for the aggregate geographical areas?

- c) request ICAO that, to help gain the acceptability of the States today and in the future, any further work on performance — including the work process itself — accepts and incorporates the principles in the above paragraphs 2.3 a) to 2.3 m) in a verifiable manner.

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