International Civil Aviation Organization

CEANS-WP/32
14/8/08

WORKING PAPER

CONFERENCE ON THE ECONOMICS OF AIRPORTS AND AIR NAVIGATION SERVICES

Montréal, 15 to 20 September 2008

Agenda Item 3: Specific issues related to air navigation services economics and management
Agenda Item 3.4: Economic and organizational aspects related to implementation of the global air traffic management (ATM) concept

OWNERSHIP AND CONTROL OF AIR NAVIGATION SERVICES INFRASTRUCTURE

(Presented by Denmark, Iceland, Ireland, France, Norway, Portugal, United Kingdom and United States in the context of NAT SPG)

SUMMARY

This working paper presents issues being confronted in the North Atlantic (NAT) Region with regard to ensuring the availability and sustainability of the necessary infrastructure required for the provision and improvement of air navigation services in the Region. The paper supports ICAO Strategic Objectives A, D and E.

Action by the Conference is in paragraph 5.

1. INTRODUCTION

1.1 Air navigation services (ANS) in the ICAO North Atlantic (NAT) Region are provided by nine States, members of the North Atlantic Systems Planning Group (NAT SPG). In 2006 the overall NAT traffic averaged more than 1,150 flights per day, and the most recent forecasts estimate an average growth in traffic of 7 per cent per year between 2007 and 2010.

1.2 The communication and surveillance infrastructure used to provide ANS over continental areas does not have sufficient range to serve the oceanic areas of the NAT Region, and ANS provision has relied upon HF voice communications where messages are relayed by third party operators. In 1997 it was decided to implement data link communications in the NAT Region, mainly via satellite due to the geographic constraints.

1.3 The current satellite communications infrastructure in the NAT Region consists of satellites owned by Inmarsat, two Ground Earth Stations (GESs) owned by Vizada and a ground-to-ground telecommunications network that is owned by numerous entities. Aircraft operators and ANS Providers (ANSPs) have contracts with one of two communications service providers (CSPs), i.e. ARINC or SITA.

1.4 There have been significant changes in the ownership and control of the satellite communications infrastructure since the decision to implement data link in the NAT Region. In the late 1990's, Inmarsat had established the initial satellite constellation and more than 20 supporting GESs. Since then, the GESs passed into the hands of commercial enterprises who rationalized their number, and today only four aeronautical capable GESs remain. Critical parts of the satellite communications infrastructure are currently owned by a few commercial enterprises that do not have a direct aviation interest. It should also be noted that new market entrants are constrained by a very lengthy certification process.

1.5 Neither of the two GESs serving the NAT Region has the capacity to carry all of the current NAT data link traffic. If one of them failed, a significant number of aircraft normally using data link would need to revert to HF voice communications, or switch to the remaining GES. If a critical number of aircraft switched to the remaining GES, the performance would degrade; this could lead to delays or corruption of messages – a significant safety concern. In the worst case, the remaining GES might also fail.

1.6 The past yearly average increase in traffic in the NAT Region of more than 5 per cent has been absorbed without augmenting the HF voice infrastructure, mainly due to the success of the data link programme. However, there are concerns that HF voice capacity will become saturated in the event of a data link failure or in any case by 2010.

1.7 Plans to increase NAT airspace capacity and flexibility in order to improve efficiency and reduce emissions depend upon the use of data link as a required component for the intended separation reductions. Due to its surveillance capability, data link is also an enabler for safety improvements; furthermore, satellite voice communications is used as an alternative to HF voice and is considered a potential back-up communications method when data link becomes a primary means of communication. Due to the uncertainty about ownership and control and thereby about the sustainability of the infrastructures supporting the service provision, it is not possible to fully commit to such initiatives.

2. DISCUSSION

2.1 The essential challenge is to ensure the availability of the necessary infrastructure to support the safety and efficiency of current and future operations. As ANSPs are becoming commercialized or at least separated from their Civil Aviation Authorities, they become less able to exert regulatory-type control over those entities that provide part of the infrastructure. Some influence can be exerted through level of service agreements, but it must be accepted that only financial and regulatory imperatives guide the behaviour of a completely commercial enterprise. In addition, the highly specialized nature of aeronautical communications means that there are, and will likely continue to be, very few service providers. This situation introduces risk and uncertainty and in some cases may make it extremely difficult to develop the necessary business and safety cases to justify future system developments.

2.2 In the Consolidated Statement of Continuing ICAO Policies in the Air Transport Field, Assembly Resolution A36-15, Appendix F - Airports and air navigation services, Section II - Economics and management, Resolving Clause 1, the Assembly has reminded Contracting States that "with regard to airports and air navigation services they alone remain responsible for the commitments they have assumed under Article 28 of the Convention regardless of what entity or entities operate the airports or air navigation services concerned." This Resolution recognized that Contracting States are increasingly assigning the operation of airports and ANS to commercialized and privatized entities, which may have less awareness and knowledge of States' obligations, and that the States increasingly use multinational facilities and services to meet their commitments. The fundamental challenge is to ensure that commercialised service providers perform in line with recognised safety and performance requirements.

2.3 An approach similar to the one taken to ensure the availability of the Global Navigation Satellite System (GNSS) has been suggested. Two essential elements of that system, the Global Positioning System (GPS) and the Global Orbiting Navigation Satellite System (GLONASS), have been offered to aviation through ICAO by means of Letters of Commitment in which the service provider States declared their intent to provide a Standards and Recommended Practices (SARPs) compatible satellite navigation service to aviation worldwide, meeting certain integrity, reliability and availability requirements, and providing at least six years notice prior to termination of service. This commitment to service provision by States formed the basis on which the ICAO GNSS SARPs have been developed and successfully implemented worldwide. A fundamental difference lays in the fact that the providers of GPS and GLONASS are ICAO Contracting States, while provision of satellite communication services is a commercial activity that involves a myriad of commercial entities in addition to the satellite operator (Inmarsat), the GES operators (Stratos and Vizada) and the aeronautical CSPs (ARINC and SITA).

2.4 A regulatory approach could follow the example of European Union Regulation (EC) No 550/2004, which regulates ANS provision and sets standards for the certification of ANSPs. The Regulation addresses the necessity to ensure that minimum public-interest requirements are met in an environment where ANSPs are operating with an increased level of autonomy. The Regulation recognizes that the service provision should be organized under market conditions while taking into account the requirement to maintain a high level of safety.

2.5 Another possibility is a joint venture by the North Atlantic ANSPs, similar to the arrangement that was used to finance the Height Monitoring Units and monitoring mechanism put in place to support the implementation of reduced vertical separation minima (RVSM). Such a venture might be used to operate a GES or otherwise ensure ongoing availability of satellite communication services.

3. NAT SPG CONSIDERATIONS

3.1 Technically speaking, compliance with the data link communications safety and performance requirements of the NAT Region is feasible in the present environment. The costs associated with meeting those requirements are not known. If substantial investments are required, it may not be financially viable for the airspace users who will have to bear the costs. Even if the airspace users would agree to invest, the uncertainty around the current and future ownership and control of the entire data link infrastructure may not guarantee continuity in the availability of the required level of service and would therefore not safeguard the investments in the long run.

3.2 Various technical solutions are being suggested to allow for diversification of data link communications to avoid the reliance on a single system. The realisation of any such proposal may take a long time whereas the safety and performance requirements of aeronautical applications need to be satisfied in the short term. Otherwise, the evolution of a safe and efficient air navigation system will be substantially curtailed.

3.3 The NAT SPG, when examining the issues during a special meeting on 15-16 November 2007, considered the forecasted increase in traffic in the NAT Region and the requirement to use data link technology to improve efficiency and reduce the impact on the environment through reductions of separation minima. The NAT SPG also considered the need to improve surveillance and intervention capabilities in order to safely achieve a more flexible air traffic control system as well as the need to prove the reliability of the service provision to the supervisory authorities of the States. The NAT SPG resolved that these issues need to be sorted out in order to ensure that future planning and implementation activities are not severely curtailed.

3.4 Furthermore, during its 44th meeting, the NAT SPG addressed the issue of the appropriate involvement of the supervisory authorities of the States in the working arrangements of the Group, in particular for safety related issues.

4. CONCLUSIONS

4.1 In the absence of any measures to influence third party service providers through the promotion of market competition, an increased level of the State governance and control over commercialised entities seems to be the only solution. It is evident that this is a very complex issue and no immediate solution can be suggested at this point in time. It is necessary to consider the likelihood that supporting services will be outsourced or sub-contracted to multinational, regional and/or national commercial entities that might be monopolies or near monopolies. In such cases, standard market regulation and balancing measures through the promotion of competition might not be achievable. Further studies seem to be required to address this issue and, possibly, the scope of the Assembly Resolution 36/15 may need to be expanded to include subcontracted service providers.

4.2 It is therefore suggested that ICAO develop a draft level of service agreement that could be used by ANSPs to demonstrate that adequate provisions have been made to ensure that all elements of performance requirements will be met when services, such as satellite communication services, have been sub-contracted. In the meantime, unless some arrangement can be found to accommodate the shortcomings and liabilities of the current satellite based communications infrastructure, the development plans for the NAT Region, and possibly other ICAO Regions, may be jeopardised. The inability of ANSPs to safely increase capacity to accommodate increasing demand may result in economic and environmental penalties. Accordingly, the following draft Conclusion is proposed:

That ICAO, as a matter of urgency, in order to ensure the necessary framework for air navigation service providers to have the appropriate level of control over the infrastructure on which they depend for safe, efficient and reliable provision of air navigation services, study issues related to the ownership and control of air navigation services infrastructure and develop a draft service level agreement for use by ANSPs to:

i) demonstrate that adequate provisions have been made to ensure that all elements of performance requirements will be met when services, such as satellite communication services, have been sub-contracted;

ii) explain how those requirements would be met; and

iii) make provisions for appropriate notification of system changes.

5. ACTION BY THE CONFERENCE

5.1 The Conference is invited to:

a) note the vulnerability of ANS when neither the Contracting States nor the designated ANSPs have control over the infrastructure; and

b) adopt the draft Conclusion in paragraph 4.2 above.

— END —