



SIP/2009-WP/20
Business case

Economics of air navigation services

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for the Implementation of CNS/ATM Systems
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Outline

1. ICAO policy on air navigation services charges
2. Economic oversight of air navigation services provision
3. Cost basis for air navigation services charges
4. Outcome of the Conference on the Economics of Airports and Air Navigation Services



ICAO policy on air navigation services charges



ICAO policy on air navigation services charges

- Article 15 of the Chicago Convention
- ICAO Policies on Charges for Air Navigation Services (Doc 9082)
- Manual on Air Navigation Services Economics (Doc 9161)



Article 15 of the Chicago Convention

- Sets out the following three basic principles:
 - a) **uniform conditions** shall apply to the use of airports and air navigation services;
 - b) the **charges** imposed by a Contracting State for the use of such services **shall not be higher** for aircraft of other Contracting States than those paid by its national aircraft engaged in **similar international operations**; and
 - c) **no charge** shall be imposed by any Contracting State **solely for the right of transit over or entry into or exit** from its territory of any aircraft of a Contracting State or persons or property thereon.



Article 15 of the Chicago Convention

- States are **obliged** to **publish** all their airport and air navigation services charges and also communicate them to ICAO. This information is collected and published by ICAO in the Tariffs for Airports and Air Navigation Services (Doc 7100).
- Article 15 also provides for **ICAO**, upon representation by an interested **Contracting State**, to **review charges** imposed and make recommendations thereon to the State or States concerned.



ICAO Policies on Charges for Air Navigation Services

- Published in ICAO Document 9082 (seventh edition, 2004);
- An ICAO Contracting State **is not legally bound** to adhere to the Policies, unlike the Articles of the Chicago Convention;
- Policies, including those on charges, are based on recommendations of major international conferences;
- States are **morally committed** to follow them.



ICAO policy on air navigation services charges

- In the introduction to ICAO's Policies on Charges, **concern** is expressed over the **proliferation** of charges on air traffic and it is recommended that States:
 - a) permit the imposition of charges **only for services and functions which are provided for, directly related to, or ultimately beneficial for civil aviation operations**; and
 - b) refrain from imposing charges which **discriminate** against international civil aviation in relation to other modes of international transport (paragraphs 8 and 9 of Doc 9082).



ICAO policy on air navigation services charges

- Establishment of **autonomous entities** to operate their airports and air navigation services;
- Establishment of an **independent** mechanism for the **economic regulation** of airports and air navigation services to oversee their economic, commercial and financial practices (paragraph 15).



ICAO policy on air navigation services charges

- Application of best commercial practices for airports and air navigation services in order to promote transparency, efficiency and cost-effectiveness in the provision of an appropriate quality of services and facilities (paragraph 17);
- Balance between the respective interests of airports and providers of air navigation services on the one hand and of air carriers on the other, particularly during periods of economic difficulty;



ICAO policy on air navigation services charges

- It is recommended that States encourage **increased cooperation** between airports and providers of air navigation services and air carriers to ensure that **economic difficulties** facing them all are **shared** in a reasonable manner (paragraph 20).



ICAO policy on air navigation services charges

- Other principles cover:
 - cost basis for air navigation services charges;
 - allocation of costs among aeronautical users;
 - charging systems;
 - pre-funding of projects;
 - currency issues;
 - approach and aerodrome control charges;
 - route charges;
 - charges for services used by aircraft when not over the provider State; and
 - consultation with users.



Cost basis for air navigation services charges

➤ Basic principles:

- a) where air navigation services are provided for international use, the providers **may require** the users to pay **their share of the related costs**, but international civil aviation should not be asked to meet costs which are not properly allocable to it (paragraph 36); and
- b) the cost to be shared 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** (paragraph 38 i)).



Information on cost and transparency

- States are encouraged to maintain **accounts** for the air navigation services they provide in a manner which ensures that air navigation services charges levied on international civil aviation are properly **cost-based** (paragraph 36);
- For the purpose of **consultation**, users should be provided with **transparent** and **adequate** financial, operational and other **information** (paragraph 49 ii));



Reasonable return on investment

- Air navigation services may produce sufficient revenues to exceed all **direct** and **indirect** operating costs and so provide for a **reasonable return on assets** (before tax and cost of capital) to contribute towards necessary capital improvements (paragraph 38 iv));



Allocation of costs among users

- The **allocation** of air navigation services costs among aeronautical users should be carried out in a manner **equitable** to all users (paragraph 40);



Charging systems (1/2)

- Charging systems should be **simple, equitable** and, with regard to route air navigation services charges, **suitable for general application** at least on a regional basis;
- Administrative cost of collecting charges should not exceed a **reasonable proportion** of the charges collected (paragraph 41 i));
- Charges should not be imposed in such a way as to discourage the use of facilities and services necessary for safety or the introduction of new aids and techniques (paragraph 41 ii));



Charging systems (2/2)

- Charges should be determined on the basis of **sound accounting principles** and may reflect, as required, **other economic principles**, provided that these are in conformity with Article 15 of the Convention and other principles in the present Policies (paragraph 41 iii)); and
- The providers of air navigation services for international use may **require all users to pay** their share of the costs of providing them regardless of whether or not the utilization takes place over the territory of the provider State (paragraph 47).



Pre-funding of projects

- Pre-funding of projects through air navigation services charges **may be accepted in specific circumstances** where this is the most appropriate means of financing long-term, large scale investment, provided that strict safeguards are in place (paragraph 42);



Consultation with users

- Importance of consultation with users of air navigation services before changes to charging systems or levels of charges are introduced.
- Users or their representative organizations should also be consulted before the finalization of plans for new or expanded air navigation services.
- Equally, users, particularly air carriers, should provide advance planning data to the extent possible on a five- to ten-year forecast basis.



Economic oversight of air navigation services provision



State responsibility

- Contracting States are responsible under the Chicago Convention for securing the provision of air navigation services on a non-discriminatory basis within their national airspace.
- While Contracting States may delegate the provision of air navigation services to public or private entities, they may not delegate their basic responsibility to secure the provision of safe air navigation services.



Need for economic oversight (1/6)

- There may be a need for appropriate economic oversight of the operations of an air navigation services provider in order to compensate for **lack of competition** and to avoid **monopoly** abuse.
- As competition in the provision of air navigation services is beginning to evolve, the degree to which effective competition is feasible as well as the ownership structure of an air navigation services entity may influence the extent to which economic oversight is needed.



Need for economic oversight (2/6)

- Effective competition, or the realistic prospect of it, provides the best guarantee of users' needs being properly met;
- Similarly, an entity's ownership and governance structure may be an important factor.



Need for economic oversight (3/6)

- Currently, **limited scope** for competition in the provision of air navigation services;
- **Direct competition** between different air navigation services providers within the same airspace is not a practical possibility;
- There are nevertheless aspects of operations of providers where more limited competition “for” the market is an option which can be considered.



Need for economic oversight (4/6)

- Where competition remains absent and air navigation services continue to be provided by a statutory or natural monopoly not subject to direct or even realistic indirect competition, there is likely to be a need for appropriate economic oversight.
- Paragraph 15 of ICAO's Policies on Charges (Doc 9082) sets out a number of possible objectives reflecting areas of potential need for appropriate economic oversight.



Need for economic oversight (5/6)

➤ These areas of potential need, which apply only where competition is absent or insufficiently strong to provide users with adequate protection, may be summarized as follows:

- a) the need to protect users against **overcharging** or other potentially anti-competitive practices where they constitute abuse of a dominant position;
- b) the need for **transparency** with respect to an air navigation services provider's financial and other data required to enable users to properly assess the basis for charging proposals;



Need for economic oversight (6/6)

- c) the need to protect users against **undue discrimination** in the application of charges;
- d) the need to address **efficiency** in the provision of air navigation services;
- e) the need to address the adequacy and consistency of **service standards and quality**;
- f) the need to encourage **appropriate** and **efficient investment**;
- g) the need for **effective consultation** with users so as to ensure that their views are taken properly into account; and
- h) the need for a **dispute resolution mechanism**.



Possible forms of economic oversight

➤ The framework for economic oversight that governments might put in place in order to protect users from potential monopoly abuse, could take **different forms** depending, for example, on whether it would be applied to public or private entities and the degree of market power of those entities.



Possible forms of economic oversight

- Public statement of desired outcomes;
- Third-party advisory commission;
- Contracts between providers and users;
- Arbitration/dispute resolution;
- Economic regulation/regulatory agency



Public statement of desired outcomes

- The State in establishing the public or private autonomous air navigation services provider could, as a part of the establishment arrangement, indicate that direct regulation would be initiated (Fallback Regulation) if the provider does not ensure that its behaviour stays within “acceptable” bounds.
- For this approach to work the provider must have an understanding of what constitutes unacceptable behaviour. A difficulty might be that by defining the commercial boundaries in detail there might be a risk of creating precisely the regulatory distortions that it seeks to avoid.



Third-party advisory commission

- This more traditional approach to guard against monopoly abuse is often considered more appropriate when stakeholders do not form cohesive groups.
- A third party advisory commission could be composed of airlines, general aviation users, the military and other stakeholders to engage in meaningful dialogue with the management of the air navigation services provider on an ongoing basis and to review specific pricing, investment and service proposals.



Contracts between providers and users

- Rather than directly regulate an air navigation services provider the State could require the provider to negotiate a **service contract** with users.
- The objective of the State responsible would be to ensure that users would be able to influence the nature, quality and cost of service.
- If a contract is successfully negotiated, it could eliminate or reduce the need for direct State oversight.



Arbitration/dispute resolution

- If the State defines an acceptable standard of behaviour, or if there is a contract between an air navigation services provider and users, arbitration or a dispute resolution mechanism could come into play where the provider and the users are unable to agree about their application in practice;
- The main advantage of such arbitration is that it would pressure the parties to reach and adhere to commercial agreements;
- However, the success of arbitration is likely to depend on the monopoly power of the air navigation services provider, particularly if it is the only “regulatory” mechanism available.



Economic regulation/regulatory agency

- The most common forms of economic regulation are cost of service, or rate of return regulation, and the use of predetermined caps on prices over longer periods;
- Rate of return regulation is designed principally to address the issue of excessive profits under monopoly;
- Longer term price caps may create incentives for cost-efficiency;
- Output-based price caps.



Cost basis for air navigation services charges



Cost basis for air navigation services charges

- Inventorying the facilities and services
- Determining costs
- Allocation of costs
- Cost basis for individual charges
- Special costing considerations relating to CNS/ATM systems



Inventorying the facilities and services

➤ Air traffic management (ATM)

- ATS
 - Air traffic control
 - » Area control
 - » Approach control
 - » Aerodrome control
 - Flight information
 - Alerting
- ATFM
- ASM



Inventorying the facilities and services

- Communications, Navigation and Surveillance (CNS)
 - Communications
 - AFS
 - AMS
 - Navigation
 - Ground based systems
 - Satellite based systems
 - Surveillance
 - PSR
 - SSR
 - ADS-B



Inventorying the facilities and services

- Meteorological services
- Search and Rescue services
- Aeronautical Information Services
 - AIPs
 - NOTAMs
 - AICs



Determining costs

- It is essential that all costs be determined in accordance with generally accepted accounting and costing principles to permit the costs of service operations to be recorded and analysed in accordance with their **nature** and **origin**.
- It is recognized, of course, that practices and procedures will differ from State to State.



Determining costs

- All costs incurred should be covered;
- This includes the costs of maintenance, operation, management and administration as well as depreciation and amortization costs as well as the cost of capital (debt and equity)
- The costs for safety or economic oversight directly related to the provision of air navigation services may be included in the cost basis for charges provided that such costs are imposed on the providers of services;
- The costs of any air navigation services provided exclusively for military or other State functions should be excluded.



Determining costs

- Once the costs of all the air navigation services provided have been established, the portions attributable to **en-route** utilization and **approach** and **aerodrome control** utilization may need to be identified;
- If different route charges are involved (different charges in different FIRs) the share of the **en-route** costs attributable to each of the FIRs concerned would need to be established;
- Similarly, the total **approach** and **aerodrome control** cost portion may need to be allocated to each airport served.



Allocation of costs

- Non-aeronautical utilization
- Allocation where facilities serve both airport and en-route requirements
- Allocation of total costs to service **locations**
- Allocation of en-route costs among Flight Information Regions
- Allocation of en-route costs among categories of users



Allocation of en-route costs among categories of users

- Parameters:
 - Number of flights
 - Distance flown
 - Time in the System
 - Aircraft weight
- Allocation of approach and aerodrome control costs among categories of users



Cost basis for individual charges

- Route charges:
 - all the costs attributable to the provision of air navigation services en route, by all the entities providing such services in the State concerned, including the costs of ATM (ATS), CNS (COM), MET, SAR and AIS.
- Approach and aerodrome control charges:
 - Same as above;
 - Where an approach control office serves more than one airport its costs should be allocated among the airports concerned on the basis of the number of flights handled for each airport.



Cost basis for individual charges

- Security measures for air navigation services:
 - Costs for certain security measures of a preventive nature for the provision of air navigation services, be included in the cost basis for air navigation services charges;
 - Air navigation services security costs may include the physical protection of ATM and supporting CNS and MET facilities, remote monitoring and/or control of distant CNS facilities, protection of data and voice communications (including software and satellite signals), security staff expenses and staff security training;
 - A proper allocation of these costs among the different services performed by the air navigation services providers should be made.



Special costing considerations relating to CNS/ATM systems

- As CNS/ATM systems components are implemented, States should add the associated costs to their cost base for air navigation services charges;
- Charges for CNS/ATM systems services should not be imposed unless these services are actually being provided for and implemented under the ICAO Regional Air Navigation Plan(s) (ANP);
- Costs of CNS/ATM system trials and major research and development work may be included as part of the capital investment, the subsequent annual depreciation of which could then be included in the cost base for air navigation services charges.



Special costing considerations relating to CNS/ATM systems

- Retirement of existing ground-based facilities before the end of their economic life;
- Premature retirement or training of personnel made redundant by the implementation of the new systems;
- These factors would need to be taken into account in any related cost-benefit analysis or business case study.



Allocation of CNS/ATM systems costs

- Users should not pay for more than their fair share of the costs of GNSS provision.
- Allocation of costs for systems augmentation or other costs of GNSS service provision attributable to users other than civil aviation, as well as civil aviation, should precede any cost recovery from civil aviation.
- Costs in the form of payments made by a State to a service provider offering CNS/ATM systems services to several States will need to be allocated among the different CNS/ATM systems user States involved.
- That, in turn, would require an agreement between the parties concerned as to how such an allocation should proceed.



Allocation of CNS/ATM systems costs

- Assuming a uniform level of service, such allocation could be based on **distance flown** or the **number of flights** in the airspace for which each State has accepted responsibility. Both can be considered as being reasonable proxies for usage. Distance flown would offer more precision while using number of flights as the basis would be simpler to administer.



Outcome of the Conference on the Economics of Airports and Air Navigation Services



Purpose

- to learn from the experiences of the commercialization and privatization process;
- to further develop and refine the policies;
- to enhance and strengthen cooperation between providers and users, through more developed policies on consultation with users.



Agenda

1. Issues involving interaction between States, providers and users
2. Specific issues related to airport economics and management
3. Specific issues related to air navigation services economics and management
4. Implementation of ICAO's policies on charges



Agenda item 1

- Economic oversight
- Economic performance (and minimum reporting requirements)
- Consultation with users

CEANS Recommendations: Economic Oversight

- Responsibility of States:
 - minimize anticompetitive risk
 - ensure non-discrimination and transparency
 - ensure investments
 - protect users
 - ensure consultation and performance management
- States to select appropriate form

CEANS Recommendations: Economic Performance

- Service providers to establish performance management systems
- Key Performance Areas (KPAs)
 - Safety
 - Quality of service
 - Productivity
 - Efficiency

CEANS Recommendations:

Consultation with Users

- **Clearly defined, regular consultation process with users by airports and ANSPs**
- **Consultations on charges as well as on infrastructure development and investments**

CEANS Recommendations:

Agenda Items 2 & 3

- **Application of best practices of good corporate governance**
- **More flexibility in setting airport charges (aggregation of cost bases)**
- **Return on assets**
- **Access to infrastructure**
- **International cooperation for implementation of global ATM concept**

CEANS Recommendations:

Agenda Item 4

- **States to adhere to the policies and ensure their providers observe them**
- **ICAO to promote the policies, in cooperation with the industry**
- **Main principles (non-discrimination, cost-relatedness, transparency and consultation) included in national legislation, regulations or policies, and air services agreements**

CEANS – Actions

Four types of actions by:

- 1. Contracting States**
- 2. Council (Amendments to Doc 9082)**
- 3. Secretariat (Guidance material)**
- 4. Others**

Actions: 1

State letter drawing attention to the outcome of the Conference and highlighting actions required by States:

- **economic oversight**
- **economic performance**
- **consultation with users**
- **implementation of ICAO's policies on charges**

Actions: 2

10 recommendations concerning amendments to Doc 9082:

- **economic oversight**
- **economic performance**
- **consultation**
- **separation of regulation and provision**
- **aggregation of cost bases**
- **differential charges**

Actions: 3

Revision and expansion of guidance material:

- **governance/ownership/control**
- **rate of return**
- **categorization of services**
- **aircraft weight**
- **economic aspects of global ATM concept**

(work to be done with assistance of the two economics panels)

Actions: 4

- 1) ICAO/Regional Organizations dialogue on economic performance**
- 2) Promotion of ICAO's policies on charges, in cooperation with the industry**
- 3) ICAO Council to take appropriate action on issues related to slot allocation and night curfews**

Approval and Next Steps

- ICAO Council (14 November 2008) endorsed the recommendations of CEANS and approved the Eight Edition of Doc 9082
- Airport Economics Panel and Air Navigation Services Economics Panel to review: 1) Doc 9082 (improve structure/readability); and 2) the two economics manuals

