

SAT-2.203-1-TMS-01

**Reformations for Enhancing Performance Aspirations of
Air Navigation Services**

**Реформи с цел подобряване на производителността
на аеронавигационното обслужване**

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Reformations for Enhancing Performance Aspirations of Air Navigation Services: Air Navigation Services Providers (ANSPs) is the backbone of the Air Traffic Management (ATM) in terms of performance and quality of services. In Europe ANSP governance is under national or regional government and the establishment of a performance-oriented organization set-up is key issue for the effective management of a monopolistic market such as airspace. A functional analysis of the ANSP is briefly presented in this paper, highlighting some key challenges and underlining key messages for planners, managers and decision makers. The analysis is formulated based on ATM profile of Greece, mainly, selected for two reasons: the ATM week performance and the high demand for additional airspace capacity, providing essential results for similar cases.

Key words: Air Navigation Service Provider, Air Traffic Management, Performance, Air Traffic Control, Organizational Reformations.

INTRODUCTION

The principle objectives of the Air Traffic Management (ATM) are to accommodate traffic in an efficient manner on one hand; and to maintain accident risk even in congested traffic environment, such as the summer season for the high attractive holiday destinations. ATM safety standards have improved over the decades for many reasons, from better equipment to additional safety defences. While ATM safety has shown essential improvement because of equipment innovation and management techniques, the capacity constrains are key operation restriction especially for extremely demanding locations such as Greece where the leisure traffic from north and the overflights for east press authorities and operators for additional slots and flight paths.

ATM is a key driver of the air transport industry development; therefore, its performance assessment constitutes an essential part of the aviation business and regional development. Unfortunately, for southeast Mediterranean regions most of the high level reports it is mentioned that ATM performance is a key barrier upon sustainable aviation growth and a major risk upon aviation business development.

International institutions, such as Eurocontrol, highlight the need for emergency actions to re-form the ATM system to accommodate future demand. The backbone of the action plan towards efficiency is the reformation of the ATM functions promoting new organizational set-up based on a performance oriented institutional framework, where air navigation is totally in depended from the other aviation business and management functions. Thus, the organizational functions for Air Navigation Services Providers (ANSPs) is on the top of the agenda in discussions in national level but also affecting Europe under the Single European Sky concept that its strongly supported.

This paper presents the key areas and challenges to improve the ATM framework through the reorganization of ATM system, focusing on the case of Greece being a very attractive tourist destination for summer holidays. Greek ANSP is briefly presented to highlight the ATM activity framework, and the key actions need to be re-form are given based on a SWOT analysis and a task functional analysis. Finally, the key components of the roadmap action plan towards improvement of the ATM framework in Greece is presented providing key messages to decision makers and authorities on one hand and the research society on the other.

KEY PARAMETERS OF THE ATM IN GREECE

In Greece, fifty-six (56) aerodromes are available for public and military use and designated as Airports (International and National). These fifty-six (56) aerodromes are categorized according to their ownership status, services provided, type of use, organizational structure etc. Fourteen (14) of the country's largest airports are going to be managed and operated by a private company for the next thirty to forty years.

Greece is member of the following International Organizations in the field of ATM (the number in parenthesis refers to the membership year): ECAC (1955), EUROCONTROL (1988), European Union (1981), EASA (2002), ICAO (1944), NATO (1952) and ITU (1866). The area (537.000 sq. km) that is under Greek ATM authority covers ATHINAI FIR and the HELLAS UIR, which is approximately 600 NM (1.100 km) in SE - NW direction, 350 NM (650 km) in WE direction and 420 NM (780 km) in NS direction. ATHINAI FIR / HELLAS UIR is surrounded by eleven (11) FIRs/UIRs of 8 ECAC bordering States. [1]

According to existing organizational framework, the national key entities involved in ATM decision process that could be summarized to the followings:

- Ministry of Infrastructure, Transportation and Networks
- Ministry of Defense (Hellenic Air Force)
- Air Accident Investigation and Aviation Safety Board (AAIASB).
- Hellenic Air Navigation Supervisory Authority (HANSA), National Authority
- Hellenic National Meteorological Service (HNMS/MET), Meteorological Provider
- Hellenic Civil Aviation Authority (HCAA) – Civil Aviation Regulator
- Hellenic Civil Aviation Authority (HANSP) – Air Navigation Provider
- Hellenic Civil Aviation Authority – Regional Airports Operator (HCAA / REGS)
- Hellenic Civil Aviation Authority (HCAA) – Civil Aviation Training Center. Their interface is shown in the diagram below (Fig. 1). [3]

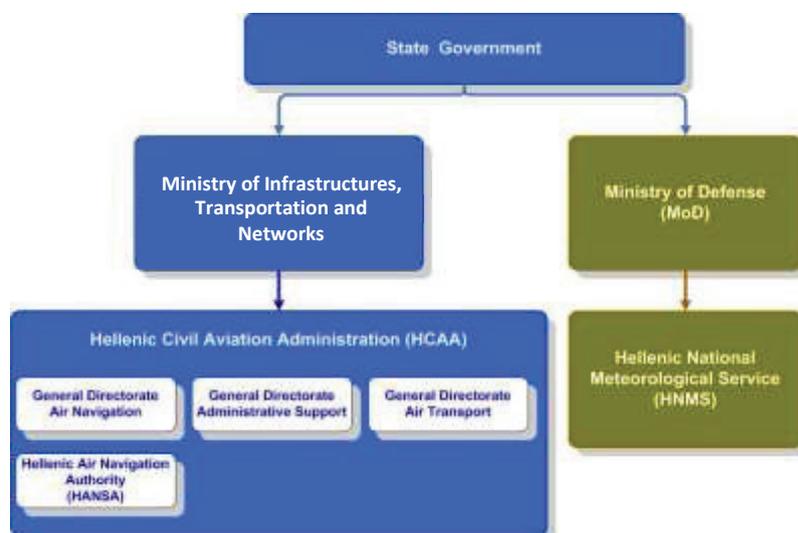


Fig. 1. Interface of Greece's ATM national stakeholders [3]

Civil aviation in Greece is under the authority of the Ministry of Infrastructure, Transportation and Networks. Military Aviation and the National Meteorological Service are under the authority of the Ministry of Defense. Hellenic Civil Aviation Authority (HCAA) is the National Regulatory Authority responsible for the regulation of all aspects of civil aviation in Greece, including air navigation. The Hellenic Air Navigation Supervisory Authority (HANSA) performs the regulatory functions as foreseen by European Regulations including certification of ANSPs. The responsibility for designation of ATS providers lies with the

Minister of Infrastructure, Transport and Networks. HANSA certified the Directorate General of Air Navigation Services Provider (HANSP) according to EU Regulations. HANSP act as ATS provider within the Athinai FIR / Hellas UIR and all civil airports in Greece. HCAA divisions under HANSP are responsible for ATM quality and safety management in line with the relevant established Quality and Safety Management Systems (QMS and SMS).

Meteorological Services for civil aviation is provided by Hellenic National Meteorological Service (HNMS / MET), which is subordinated to the Ministry of Defense. HNMS / MET, has been certified by HANSA on in 2016 as MET - ANS provider and designated by the state according to European Regulation (EC) 550/2004 (article 9).

Military activities do not fall under the responsibilities of HCAA. The Military Authorities involved in ATM in Greece are: the Hellenic Air Force (Ministry of Defense), the military department dealing with inspections of military airports offering services to GAT and the Search and Rescue (SAR) service.

SWOT ANALYSIS FOR HANSP

Traffic in Greece increased by 10.5% during summer 2014 (May to October) compared to summer 2013. For the Planning Period 2015-2019 the STATFOR/Eurocontrol report the annual traffic growth forecasts is between 1.6% and 4.4%, with a baseline of 3.1%, [1,2]. However, the delays in Greek aerospace are too high comparing with European average. Its noteworthy that for airports bellow 5 million passengers, the threshold of of 100k hours cumulative delays per year is a key performance indicator for a well performed system. In 2015 for some high congested airports in Greek islands, where the peak demand is not extended more than 4 months in summer (seasonality), the annual delays varied from 150k to 900k hours, providing strong evidence of inefficiency.

The complexity of the ATM system and the governmental bodies lack of decision in association with the weak organizational set-up are key elements have to be defending to improve efficiency. To define the HANSP existing variation of change, a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis is presented based on raw data and results from a wide number of internal quality audit reports and some evidence presented in HANSP Business Plan 2013-2017. [2,3] The main strengths of HANSP are the following:

- Highly qualified and experienced personnel.
- Very effective and efficient design of ATS routes and terminal procedures.
- High revenues from route charges.
- Extended operational and administrative data collection system.
- Excellent cooperation with Hellenic Air Force and Meteorology Service.
- The landscape and weather conditions of Greek territory.

The main weaknesses of HANSP are the following:

- The HR procedures and the availability of personnel resources, especially, the lack of Air Traffic Controllers (ATCOs), [4].
- The lack in equipment modernization and up-date, resulting serious material failures and limited maintenance, etc.
- Inability to support proper personnel training.
- Inefficiency in management and decision making because of administrative barriers and responsibility overlapping.
- There is wide geographic dispersion of HANSP operational units and the electronic or administrative system for their coordination is too weak.
- The Aeronautical Information System (AIS) not certified to quality management standard as European Regulations demand, e.g. ISO 9001: 2008

The main opportunities of HANSP could be summarized to the followings:

- The anticipated reorganization of HCAA after the privatization of more than 80% of Greek airport in terms of traffic, according to the EU legislation and best practices.
 - The growth of air traffic as a result of the forecasted growth of tourism in Greece.
 - The use of new technologies, equipment, systems and know how on ANS especially the implementation of advanced CNS / ATM systems.
 - The privatization of the 14 regional airports may result in better cooperation.
 - The available budget by European and National bodies for the financing of new software, equipment, material and personnel training.
 - The development of the BLUEMED FAB, combined with the financial strength of HCAA / ANS, may provide opportunities to extrapolate the HCAA / ANS knowhow.
- The main threats of HANSP are the following:
- The economic crisis of Greece that holds back investments, financing and staffing.
 - The lack of willingness of Greek government to support the development of an ATM system according to European Laws and International Standards.
 - The growth of traffic can be a threat if the proper reorganization of HCAA and investments on personnel and equipment are not carried out.

FUNCTIONAL ANALYSIS FOR NEW ORGANIZATION

Taking into account the SWOT results, a functional analysis is carried out to reorganize the function modules to improve operational and management performance on one hand; and reduce the organizational and management weakness.

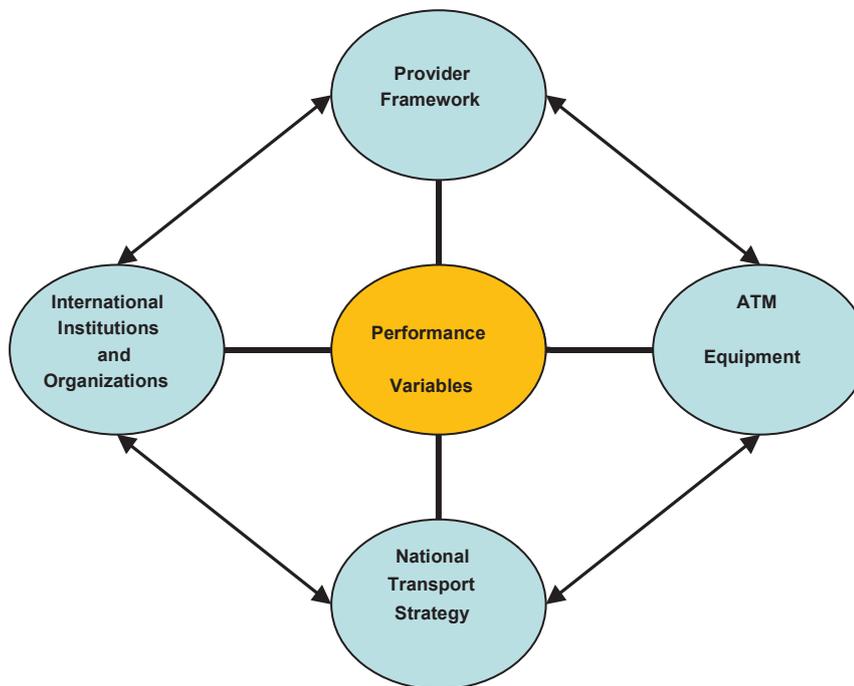


Fig. 3. Key management functions for ATM

The narrow in above ATM functions depict the input – output relationship. The key tasks for each function could be:

Table 1. Key functions, tasks and performance variables for ATM provider

Functions	Key tasks	Performance variables
Management	Administration Risk assessment Business planning	Business plan targets Risk control procedures Shareholders expectations
ATM Services pricing	Revenue management Demand control Cost control	Profit margin Dividends Unit cost benchmarking
HR - Controllers	Scheduling Safety Training	Delays Safety/Accidents Hours per year/employee
Equipment maintenance control	Procurement- Financing options Condition of contacts	Asset portfolio Equipment availability
Quality control	Management procedures Quality control standards	Audit outputs Adoptability of best practice

CONCLUDING REMARKS

SWOT and factional analysis reveal and present evidence for the critical issues that HANSP have to improve towards efficiency in management and operation. These issues provide the key steps of a roadmap for the re-formation of the ATM system for Greece (and similar cases), which could be summarized to the followings:

- The reorganization of HCAA in order to act as rule making and supervisory authority for all airports according to the provisions of the MoU between the Hellenic Republic and the Creditors.
- The establishment and organization of a state owned company for the management of the public and municipal airports as provided by Law 4146/2013.
- The establishment and organization according to European Regulations / Laws and International Standards of a new independent, flexible and efficient HANSP. This reorganization is imposed both by European Legislative Framework and from the widely accepted need to manage safely and efficiently the high levels of anticipated air traffic. In order to have the desired result decision makers can use the examples of relevant successful projects that some of them have carried out.
- The implementation of a project for the development and wide adoption of Quality and Safety Management Systems at all the above mentioned organizations.
- The establishment of a new efficient framework for recruitment and training of new personnel in order to cover all operational and administrative positions.

The consultation coordination of governmental bodies, labor unions, tourism stakeholders, airport operators and airlines is considered crucial in order to facilitate fast implementation, wide adoption and the desired economic and social growth.

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