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THE PRINCIPLES OF SINGLE EUROPEAN SKY PROGRAM IMPLEMENTATION IN UKRAINE

The principles of Single European Sky programme implementation process, contents of European Master Plan, deployment process of the Single European Sky target concept and Single European Sky performance targets are considered.

Розглянуто принципи впровадження програми єдиного європейського неба, складові європейського мастер-плану, процес розгортання концепції єдиного європейського неба та експлуатаційні цілі єдиного європейського неба.

Aeronautical system development, Air Traffic Management, Air Traffic Services, European Air Traffic Management, Joint undertake Master Plan, Single European Sky, Target concept

Introduction

The Single European Sky SESAR is the European Air Traffic Management (ATM) modernisation programme [1]. It will combine technological, economic and regulatory aspects and will use the SESAR legislation to synchronise the plans and actions of the different stakeholders and federate resources for the development and implementation of the required improvements throughout Europe, in both airborne and ground systems (fig. 1).

The first phase of SESAR, the Definition Phase, is co-funded by EUROCONTROL and the European Commission under Trans European networks. The products of this Definition Phase will be the result of a 2-year study awarded to an industry wide consortium supplemented by EUROCONTROL's expertise. It will ultimately deliver a European ATM

Master Plan covering the period up to 2020 and the accompanying Programme of Work for the first 6 years of the subsequent Development Phase.

The SESAR Definition Phase will produce 6 main Milestone Deliverables over the 2 years covering all aspects of the future European ATM System, including its supporting institutional framework:

D1: Air Transport Framework – the Current Situation [1];

D2: Air Transport Framework – the Performance Target [2];

D3: The Definition of the future ATM Target Concept [3];

D4: Selection of the “Best” Deployment Scenario [4];

D5: Production of the ATM Master Plan [5];

D6: Work Programme for 2008 –2013 [6].

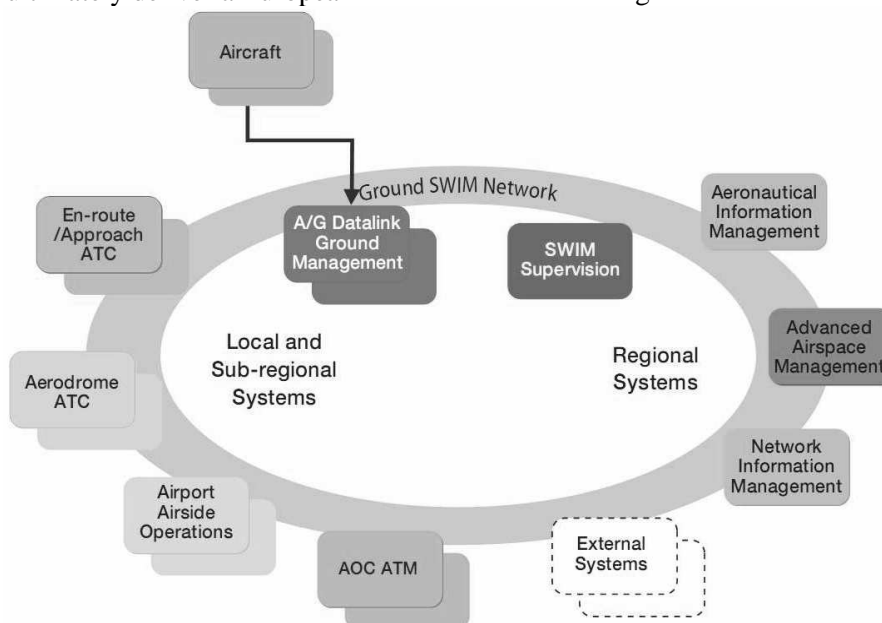


Fig. 1. SESAR Technical Architecture

The SESAR Consortium has been selected to carry out the Definition Phase study, which for the first time in European ATM history has brought together the major stakeholders in European aviation to build the ATM Master Plan.

The SESAR Consortium draws upon the expertise of the major organisations within the aviation industry.

This includes:

- Airspace Users;
- Air Navigation Service Providers;
- Airport Operators;
- Supply Industry (European and non-European), plus a number of Associated Partners, including safety regulators, military organisations, staff associations (including pilots, controllers and engineers) and research centres who work together with the significant expertise of EUROCONTROL.

The European Air Traffic Management Master Plan

The SESAR Definition Phase lead to the European ATM Master Plan (fig. 2), which will structure the future of ATM in Europe over the next decades.

The European ATM Master Plan [5; 7–9] addresses the future of ATM in Europe over the next decades and forms the basis for the work programme of SESAR. It is a “rolling” plan that will be regularly updated in accordance with the results from the R&D activities starting under the responsibility of the SESAR JU.

The Implementation of the European ATM Master Plan together with the SES II package will lead to a better performing ATM system in Europe.

The European ATM Master Plan establishes the R&D and deployment roadmaps for Operational Evolution, Enabler Development & Deployment and Supporting Changes (e.g. safety, environment, etc.) with the common goal to implement the ATM Target Concept.

It is important that the core components of the ATM Target Concept are implemented timely and consistently at European network level to enable full benefits.

The concept of ATM Service and Capability Levels is used as the top-level, system-wide basis to identify the performance characteristics by which all components of the future European ATM system will be linked.

A level of performance is provided at each ATM Service Level with higher performance provided at each successive Service Level.

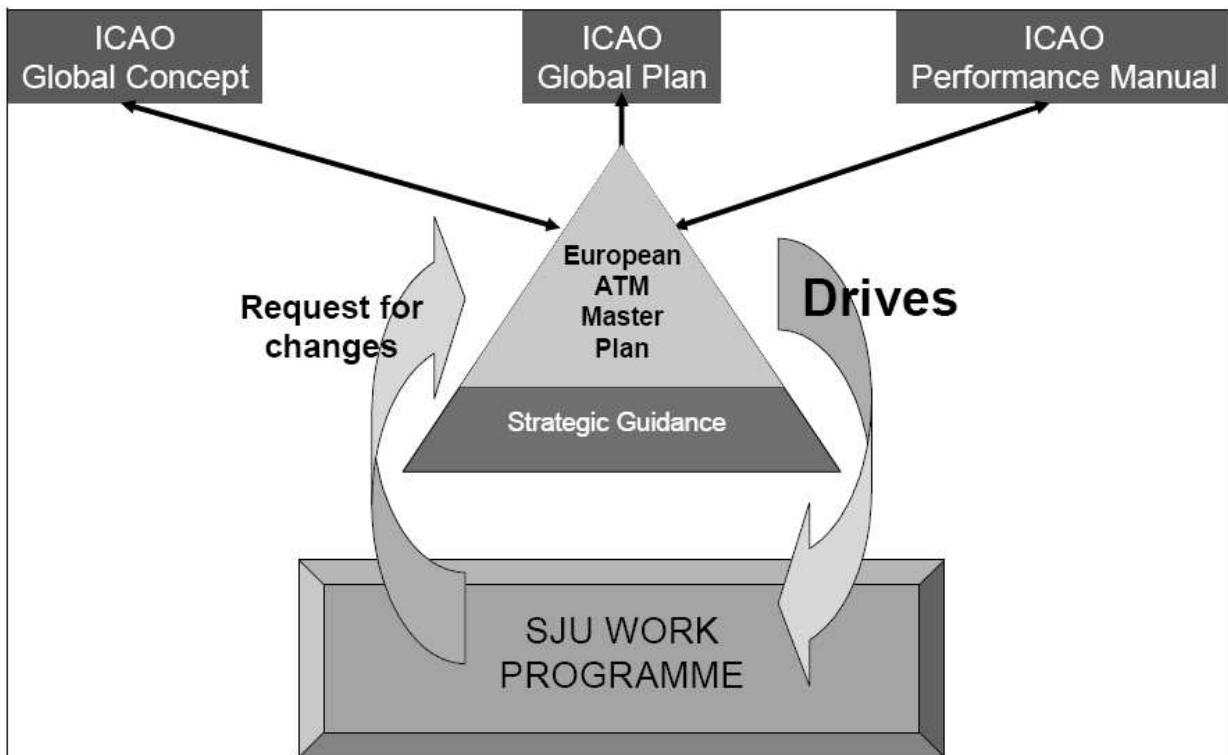


Fig. 2. The European ATM Master Plan

The Deployment of the SESAR Target Concept

The SESAR Consortium is committed to the implementation steps proposed for the shorter term and recommends the launch of the development and validation activities according to the proposed transition sequence.

This will allow the modernisation of the ATM System and enable the safe growth of the European air transport industry and thereby the European economy. In addition, a number of the proposed operational ATM enhancements will reduce the environmental effects of aviation. Without SESAR, the increasing system-wide congestion would provoke an intrinsic deterioration in efficiency and environmental impact per flight.

The objective of defining the deployment sequence is to detail the Implementation Packages needed to transition towards the long term target based upon their feasibility which has been analysed in terms of system enhancement – both at the operations, architecture and Communication Navigation Surveillance technology level; the deployment sequence also considers and encompasses the systematic management of all relevant aspects of the ATM network: legal, institutional, safety, human performance, security, environment etc. and provides roadmaps for them.

All on-going initiatives which are considered to fit within the scope to reach the 2020 ATM Target Concept and beyond are taken on board and aligned within the deployment sequence.

The specific and detailed changes required to transition from today’s system have been structured in a series of Operational Improvement (OI) Steps, defined along the LoCs.

The OI Steps have been allocated to one of the three Implementation Packages (IPs), depending upon their start of operation (fig. 3):

- IP1 from 2008 – up to 2013 – “Creating the Foundations” by building on the current ongoing European ATM initiatives contributing to capacity improvements which are building the basis for and leading to the ATM Target Concept;
- IP2 from 2013 – up to 2020 – “Accelerating ATM to implement the 2020 ATM Target Concept”, by timely implementation of all the activities needed to achieve the 2020 targets;
- IP3 from 2020 – onwards – “Achieving the SESAR goals in the long-term” targeting the activities necessary for further performance enhancement of the overall ATM System beyond 2020 to fully realise the ATM Target Concept.

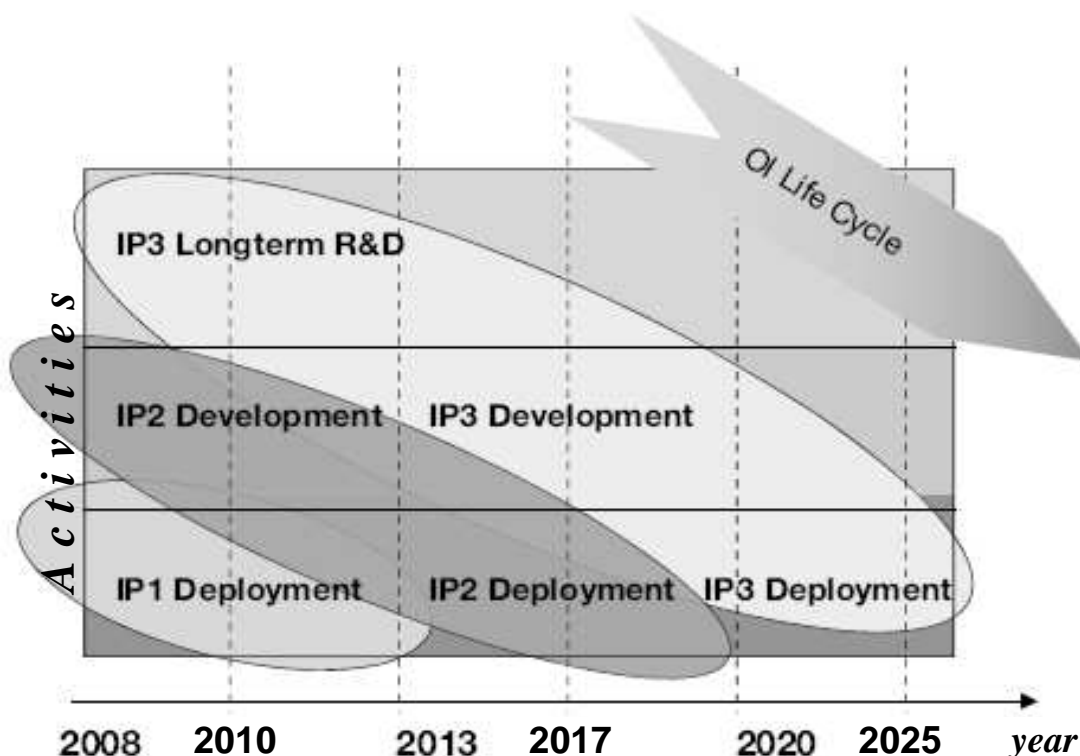


Fig. 3. Implementation package time-view

Towards SESAR Performance Targets

The Implementation Package 2 will deliver a wider information sharing environment which will be the driver for improved efficiency of the ATM network as a whole. It has the following main aspects:

- Network cost-effectiveness & efficiency gains through further improved Trajectory Management process;
- Availability of more precise meteorological data (delivered automatically by individual aircraft) will assist in better planning and management of the business trajectories;
- Operational flexibility for both civil and military users through dynamic information sharing which enables a far better response to military airspace requirements (time and space).

Table provides a synthesis of the different performance assessments for each IP.

SESAR performance assessment synthesis

Benefit Component		2007	2012 IP1	2020 IP1+IP2
Flight/Traffic	MFI*. Per y.			
Demand Accommodated	MFI*. Per y.	10	12,6	15,8
QoS - Delays				
Total delays	Min. per fl**	2	1,3	1,2
En Route delays	Min. per fl**	1,1	0,9	0,7
Airport delays	Min. per fl**	0,9	0,4	0,5
QoS - Fuel				
Fuel In-efficiency	% total fuel***	11,7%	10,6%	8,8 %

An assessment trade-off was conducted between the accommodated traffic and the acceptable delay. As a consequence in 2020, with IP1 and IP2 implemented, the ATM system will be able to accommodate 15,8 Million flights with an average delay of 1,2 minutes per flight and greater fuel efficiency (corresponding to a fuel saving of 2,9 % compared to the 2007 baseline).

The results of the timely and synchronised implementation of the complementary and efficient ground ATM services and tools exploiting the airborne investments are the main factors influencing the airspace users Cost Benefit Analysis (CBA). The benefits being considered in the CBA are:

- additional accommodated demand;
- delay reduction;
- fuel efficiency;
- maintaining airport capacity in low visibility conditions;
- reduction of flight unit costs for ATM Services.

The performance assessments were expressed in monetary terms and the cost per flight evaluated; the balance of the benefits is presented in fig. 4 for IP2.

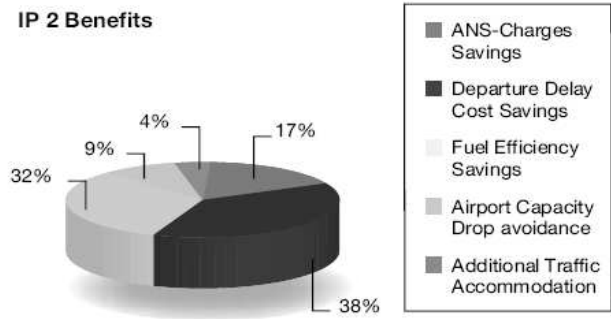


Fig. 4. IP2 benefits in 2020

Economic problems of the Ukrainian airlines and airports

The SESAR implementation requires substantial financial charges from all of aviation market subjects. Unfortunately the Ukrainian airlines and airports have a row of economic and financial problems. The basic criterion of Ukrainian aviation market attractiveness is dynamic growth of passenger, cargo and post flows during from 2000 to 2008 years.

Thus number of passengers which fulfil the trips of classic type foreign airlines considerably exceeds the international passenger commercial load of Ukrainian airlines. The substantial factor of competition level increase is going into the Ukrainian market of low-cost airlines. Successfully using the economy of scale and dumping tariff policy, these airlines actually form the new segment of Ukrainian air transportation market.

Negative impact of the world financial crisis phenomena reflected at work of all of Ukrainian airlines and airports. In 2009 passenger flows was abbreviated comparatively with previous year on a 17,5 percent, cargo and post flows - on a 35,6 percent. These tendencies complicate financial position of most Ukrainian aviation stakeholders.

Aspects of SESAR implementation process in Ukraine

Ukraine should undertake appropriate measures to participate the SESAR program activities:

- scientific researches connected with SESAR programme (operational procedures, capacity of Aeronautical system, reliability of system, human factors in new work conditions, safety of flights, efficiency and regularity of air transportations and ergonomics at workplace);

- analysis of features of Ukraine relating to phased implementation of SESAR Programme in Ukraine (transition area, separation features etc.);
- development and installation of equipment according to SESAR Programme specifications;
- creation of operational procedures for aviation personnel in new professional environment;
- development of long-term plan for the SESAR Programme implementation in Ukraine;
- elaboration of training programs and refresher training of aviation personnel according to requirements of SESAR programme;
- participate in the SESAR Joint Undertake and other regional groups to represent position of Ukraine and improve national rules and other regulations according to the SESAR programme requirements.

Conclusion

The Air navigation services and their support systems are not fully integrated and are based on technology which is already running at maximum. In order to accommodate future Air Traffic needs, a “paradigm shift”, supported by state-of-the-art and innovative technology, is required.

SESAR aims to eliminate the fragmented approach to European ATM, transform its system, synchronize all stakeholders and federate resources.

With the necessary support and regulatory measures, SESAR will re-engineer the European ATM network to achieve environmental sustainability, efficiency, full integration and cost-efficiency, resulting in maximum safety.

Over the next eight years, the development phase will work to produce technology, standards and procedures to achieve SESAR’s long term objectives:

- being able to provide three times today’s capacity while cutting ATM cost in half;
- improving safety by a factor of ten;
- reducing the environmental impact of each flight by 10 %.

At the High Level Regional meeting which took place in Kyiv on the 25th and 26th of June 2009, participants coming from Civil Aviation Authorities, Air Navigation Service Providers and Industry from EUROCONTROL

Member States identified the need to develop together a comprehensive programme towards the construction of the capability needed for the integration of the regional needs into the Single European Sky.

In the context of SESAR, the technological component of the Single European Sky, the High level Regional meeting agreed on a list of concrete actions which would enable a participation of the Region in SESAR activities.

Such an approach would contribute to the emergence of a transitional area enabling non-EU States to progressively participate to the development of the European Common Aviation Area where regional specificities are taken into account. The meeting agreed on the following operational conclusions:

- Establishing within the SESAR Work Programme an interface facilitating the participation of non-EU Member States in SESAR;
- Facilitating the non-EU Eurocontrol consultation process in order to ensure the Pan-European dimension of the SES;
- Granting equal opportunities to non-EU industrial stakeholders for participation in SJU procurement processes.

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