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ANALYSIS OF EXPECTED ATM PROCESSES CHANGES IN CENTRAL EUROPE

Summary. This paper evaluates feasibility of the new Air Traffic Management (ATM) organisation in Functional Airspace Block Central Europe (FAB CE) and specifies the implementation scenarios that are proposed by Central European Air Traffic Services Coordination Group (CEATS CG). The paper elaborates elements of required Functional Airspace Block Central Europe implementation and identifies and assesses the implementation blockers. Provision of air navigation services in European Civil Aviation Conference (ECAC) area is diversely regulated and highly fragmented.

ANALIZA SPODZIEWANYCH ZMIAN W ZARZĄDZANIU RUCHEM POWIETRZNYM W CENTRALNEJ EUROPIE

Streszczenie. Niniejsza praca ocenia możliwość realizowania nowego systemu ATM zarządzania ruchem powietrznym organizowanego w ramach Functional Airspace Block Central Europe (FAB CE) (Funkcjonalny Blok Przestrzeni Powietrznej Europy Centralnej) i określa wprowadzenie scenariuszy, które zostały zaproponowane przez Central European Air Traffic Services Coordination Group (CEATS CG) (grupę koordynacyjną obsługi ruchu lotniczego centralnej Europy). Niniejsza praca prezentuje elementy wymagane do wprowadzenia Funkcjonalnego Bloku Przestrzeni Powietrznej Europy Centralnej oraz identyfikuje i ocenia elementy blokujące jego wprowadzenie. Zapewnienie usług nawigacji powietrznej w obszarze Europejskiej Konferencji Lotnictwa Cywilnego (ECAC) jest różnorodnie regulowane i wysoce fragmentaryczne.

1. INTRODUCTION

At the end of 1990s high level of traffic growth combined with liberalisation raised concerns of the ability of ATM to meet projected capacity requirements needed to keep pace with growing demand. One of the major problems was and still is delay that has risen to unacceptable levels for airspace users. Responsibility for delays is shared among Aircraft Operators, Airport Operators and Air Navigation Service Providers (ANSPs).

Today's air traffic demand generated by 30000 flights per day in ECAC area and created by ~ 5000 aircraft between 100 major airports is straining the capacity of air transport infrastructure. Even

though liberalisation forced air carriers to reorganise their operations on the global market, ATM system in Europe remains organised and operated at national scale. Air Traffic Management is organised in a fragmented way. Even though air transport is cross border activity [1]. Every time an aircraft enters the airspace of Member State it is serviced by different ANSP, which may operate on the basis of different operational requirements and rules. Fragmentation of ATM system restrains optimal use of the capacity. The American ATM system manages double the number of flights (~18 millions controlled flights) with 20 en-route centres, while Europe with 65 en route centres controls approximately 10 million flights annually. Fragmentation in Europe is a result of historical relationship, where Air Traffic Control (ATC) has been closely associated with sovereignty which influenced on airspace configuration relationship with national borders. There are several consequences of fragmentation in Europe: area control centres operate below optimal economic size, multiplication of systems, unsynchronised adaptation of technology, high maintenance and contingency costs, high cost of training, research and administration. According to the European Commission report, fragmentation costs €1 bn annually.

European airspace strategic development programmes refer to the solving of the problem of fragmented airspace by means of ATM regionalisation, increasing airspace capacity and traffic efficiency. Thus the 2004 adaptation of the Single Sky legislation brought legal basis for range of activities in ATM system. The European Commission has mandated Eurocontrol to provide technical assistance and develop implementing rules under the Single European Sky SES framework. Technological dimension of SES is articulated by Single European Sky Research Programme (SESAR), speeding up innovations in aviation industry. The fragmentation issue will be solved through Functional Airspace Block concept, where the ATM would be based on operational requirements, regardless of existing boundaries [2].

2. REGIONALISATION OF AIR NAVIGATION SERVICE PROVDERS

Air Navigation Service Provider operates under legal and institutional requirements, following national airspace legislation. This kind of operating environment leads to diverging performance in terms of safety, capacity and cost efficiency. European Union member states appear to be global dwarfs in terms of size of controlled airspace [3]. ATM centres in Europe appear to be suboptimal, with multiplicity of technical systems and high maintenance costs. With 38 en route operating providers, fragmentation of air navigation services is a main driver for lack of performance in Europe.

Even though Europe has similar area to control as the United States, Federal Aviation Authority handles ~70% more flights than European ATM system. Also in terms of productivity the US has 17% less air traffic controllers than Europe, and handle 80% more of flight hours than the European system. When making a comparison of basic key performance indicators of two major ATM systems it is visible that fragmentation results in low productivity and high costs (Table 1).

According to Single European Sky regulations, airspace in Europe will be organised into Functional Airspace Blocks, following operational requirements and neglecting national boundaries. Airspace is divided as displayed in Fig. 1, into more than 670 sectors [4], where flying through each sector obliges the pilot to change frequency and contact next ATC sector. According to the Eurocontrol research, transit times per ANSPs vary from 7.2 minutes for Belgocontrol to 39.5 min for the Spanish Provider - AENA. Flexibility in sector management is limited to Area Control Centre (ACC) level, as sector is managed by a team of two air traffic controllers, who need two to four years to become competent in providing ATC service

The establishment of functional airspace blocks is identified as a “window of opportunity” for improvements in the European airspace [5]. SES Framework Regulation has defined the generic term “Functional Airspace Block” as: *“An airspace block based on operational requirements, reflecting the need to ensure more integrated management of the airspace regardless of existing boundaries.”*[6]

Table 1

Comparison of US/European ATM

Calendar Year 2008	*Europe*[1]	*USA*[2]	*Difference US vs. Europe*
Geographic Area (million km²)	*11.5*	*10.4*	*≈ -10%*
Number of en-route Air Navigation Service Providers	*38*	*1*	
Number of Air Traffic Controllers (ATCOs in Ops.)[3]	*16 800* [4]	*14 000* [5]	*≈ -17%*
Total staff	*56 000*	*35 000*	*≈ -40%*
Controlled flights (IFR) (million)	*10*	*17* [6]	*≈ +70%*
Flight hours controlled (million)	*14*	*25*	*≈ +80%*
Relative density (flight hours per km2)	*1.2*	*2.4*	*≈ x 2*
Average length of flight (within respective airspace)	*541 NM*	*497 NM*	*≈ -8%*
Nr. of en-route centres	*65*	*20*	*≈ - 70%*
En-route sectors at maximum configuration ≈	*679*	*955*	*+40%*

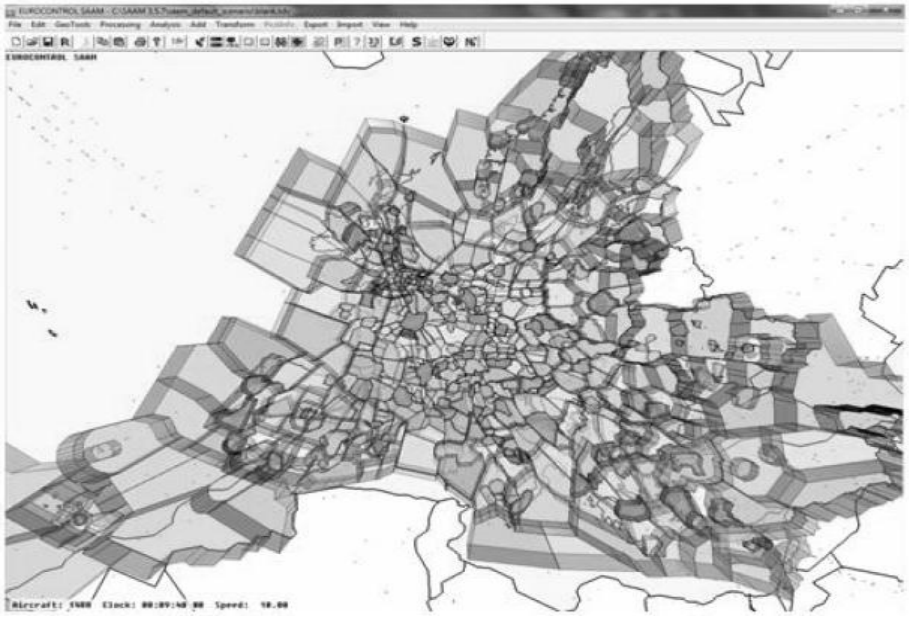

Fig. 1. Sectorisation in ECAC area
Rys. 1. Podział na sektory w obszarze ECAC

High Level Group 2000 Report identified a number of problems within the organisation and operation of European ANSPs: inconsistency in airspace design, fragmentation in service provision, lack of interoperable technology and institutional and regulatory issues. Even though the 2000 Report

[1] EUROCONTROL States plus Estonia and Latvia, excluding Oceanic areas and Canary Islands
[2] Area, flight hours and centre count refers to CONUS only. The term US CONUS refers to the 48 contiguous States located on the North American continent south of the border with Canada, plus the District of Columbia, excluding Alaska, Hawaii and Oceanic areas.
[3] Figures include supervisors and towers staffed by the respective ANSPs but exclude contracted towers.
[4] Of which 60% are allocated to en-route units and 40% to approach and tower units.
[5] FAA has approximately 60% Radar Controller, 25% Tower/TRACON, and 15% Tower. The tower figure includes only FAA managed Towers.
[6] The total number of flights controlled within the entire US airspace is approximately 18 million.

emphasised above mentioned issues it didn't specially refer to FABs, although it recommended that airspace should be managed as single continuum: *"this could be delivered through FAB but would not necessary have to be".* Reference to a structure as FAB can be found in the Service provision section: *"cooperation between service providers, in particular at regional level, either on a contractual basis or through more structural arrangements such as joint ventures, as a useful way to enhance the integrated management of airspace and to operate airspace blocks regardless of national borders"* (paragraph 87 page 29). There are four main HLG recommendations associated with FAB`s. The first one is that airspace should be managed as a single continuum to optimise performance, where the integration of airspace would start with uniform categories (U-Unknown traffic environment, K-known traffic environment, N-intended traffic environment), flexible use of airspace and sector design and route optimisation. Recommendation is that the service provision should enhance integrated management of airspace through cooperation between ANSPs, either through agreements (joint ventures) or on contractual basis. Also, there is a need for better safety regulation and independent Regulatory Authority. Technological issue should be solved with the adaptation of compatible and interoperable technology.

The first study that introduced FAB concept was conducted by Wilmer, Cutler and Pickering [7]. The study referred to FABs as a tool which would replace current upper controlled airspace operated by ANSP. Report did not define what would happen with FAB beyond this, because the recommendations of the study implied that the implementation of the FABs should take place in the second stage of SES legislation. The study evaluated the three options for implementing FABs:

- Bottom up regional cooperation model,
- Joint franchising by Member States, and
- European franchising.

The second and third model is not politically acceptable to Member States, even though they represent more effective model. The first model was identified as representative, with the several disadvantages including the different speeds of implementation by states. The second Study on ATM market organisations emphasised the need for monopoly services, such as ANSP to be regulated, in order to operate in more efficient and cost effective way [8]. According to the study one of the conclusions was that due to the sovereignty issues, mergers and consolidations are not likely to happen.

In 2001 the Commission proposed the draft regulation to implement SES. The draft Regulation on the organisation and use of airspace proposed FAB to: *support efficiently the existing and future pattern of air traffic, ensure the maximisation of the efficiency of European airspace with each airspace block, take into account human and capital investment of various ANSP, minimise transition costs of Area Control Centers, ensure coherence between configurations of upper and lower airspace* [9]. It also proposed that similar airspace blocks should be established in lower airspace. Even though the Commission had the support of the Parliament in the proposal that the FABs should be created with the decision of the whole Community *(top down approach)* the Council of Europe opposed it. The Council considered that responsibility should remain under the responsibility of Member States *(bottom up approach)* and that only Member States (Table 2) involved in a FAB should decide about the creation of FAB [10]. The existing framework is the mix of both approaches for the different aspects of the establishment.

Table 2

Bottom up and Top down concepts

	Final legislation	Draft legislation
Key objectives, scope and geographical coverage	*"Bottom up" Member States and ANSP*	*"Top down" Single Sky Committee[7] (all Member States)*
Final approval/decision to create FAB	*"Bottom up" Member States*	*"Top down" Single Sky Committee (all Member States)*
Common general principles for the establishment and modification of FABs	*"Top down"*	*"Top down"*
Guidance materials	*"Top down" Article 5 Airspace Regulation*	*"Top down"*

The Single European Sky legislation is set out in four Regulations which came into force in the 2004. The Regulations general objective was to improve current safety standards and overall efficiency of ATM in Europe, to optimise capacity, meet the requirements of all airspace users, and to minimise delays. The Regulations are:

- The Framework Regulation (549/2004), which set out the general framework;
- The Service Provision Regulation (550/2004), which set out the regulatory environment within which ANSPs would provide services;
- The Airspace Regulation (551/2004), which set out how airspace should be organised and utilised within the Single European Sky; and
- The Interoperability Regulation (552/2004), which set out how interoperability would be achieved.

Airspace regulation states that *"progressively more integrated operating airspace should be established for en-route general air traffic in the upper airspace"* and that *"the reconfiguration of airspace should be based on operational requirements regardless of existing boundaries. Common general principles for creating uniform functional airspace blocks should be developed."*. The word 'uniform' could imply that each FAB should have the same characteristics; although it could also mean that there should be uniformity within the FAB. Article 5 of the Airspace Regulation gives obligation to Member States to reconfigure their upper airspace into FAB, but it does not limit FABs to upper limit. The minimum (fundamental) requirements to define a FAB are: spatially delineated airspace, delineation in time, airspace where ANS are provided, airspace designed on the basis of operational requirements, regardless of existing boundaries. Specific requirements for FABs are described in Table 3.

Common general principles for the establishment and modification of Functional Airspace Blocks shall be developed in the light of greater experience. According to the Article 5 of Airspace Regulation there is the need for agreements establishing FABs between Member States. All difficulties within the FABs will be brought to the Single Sky Committee.

The Regulation on laying down common rules for the Flexible Use of Airspace (FUA) has a number of provisions that could affect FAB, as according to regulation: Member States are required to cooperate and ensure common set of procedures across national boundaries (Cross Border Area), and are allowed to establish joint Airspace Management Cell.

[7] The Single Sky Committee (SSC) supports the European Commission in the implementation of the SES. It is composed by two representatives of each European Union Member State (civil and military) and observers from third countries and Eurocontrol. Each Member State delegation is considered to be one committee member. The Committee is chaired by a representative from the European Commission. The Chairman may decide to invite experts to talk on particular matters, at the request of a member or on his/her own initiative

Table 3

Airspace regulation requirements

Specific requirements for the implementation of FABs
Be supported by a safety case;
Enable optimum use of airspace, taking into account air traffic flows;
Be justified by their overall added value, including optimal use of technical and human resources, on the basis of cost-benefit analyses;
Ensure a fluent and flexible transfer of responsibility for air traffic control between air traffic service units;
Ensure compatibility between the configurations of upper and lower airspace;
Comply with conditions stemming from regional agreements concluded within the ICAO
Respect regional agreements in existence on the date of entry into force of this Regulation, in particular those involving European third countries.

Common charging scheme Regulation sets charging requirements across ECAC. Article 4 of Regulation states that if charging zones are extended across the airspace of more than one Member State (e.g. FAB) there has to be consistency and uniform application of the Regulation [11]. Also it has to be noted that the concept of charging zones is disconnected from Flight Information Regions allowing greater flexibility in organisation of air navigation charges.

Civil Air Navigation Services (CANSO) together with European Transport Workers Association (ETF) in 2007 released joint statement concerning FABs. The statement confirmed that bottom up approach is the best way to achieve the enhancement of ATM services. It emphasised that improved cooperation and full involvement of staff is a key to success of FABs.

The HGL report [12] in 2007 identified six hurdles, that are slowing down the progress of FABs:

- *Definitions:* There is no consensus on the definition of a FAB and therefore different FABs may have different objectives,
- *Political and legal:* Member States perceive that FABs will result in them losing sovereignty, and there is also no agreement on how liability issues would be resolved for cross-border ATM,
- *Governance issues:* ANSPs have different governance structures and this does not facilitate cross-border co-operation,
- *Airspace and operational:* Development of new air routes within FABs is a severe process. These processes often require co-operation with the military across the states,
- *Financial and technical:* The business case is not yet strong enough.
- *Human resources:* Harmonization in the training and competence keeping in ATM safety related staff. Variation in salaries, benefits etc are highlighted by the creation of FABs.

In order to enhance overall performance of European ATM system, European Commission adopted in 2008 the Single European Sky II Regulation. It complements the SES I Regulations. Single European Sky II regulation consists of four pillars: Regulating performance, Single Safety Framework, Opening doors to new technologies, and Managing capacity on the ground. According to SES II amendments, Member States have to take all necessary measures to establish operational Functional Airspace Blocks by 2012. The establishment of FABs will be established only by mutual agreement between Member States who have responsibility for any part of the airspace included in airspace block or by declaration of one Member State if the airspace included in the block is wholly under its responsibility. The agreements must assure the modification of the airspace block and way in which one Member State can withdraw from the block. Member States have to conclude an Agreement on the supervision with regard to Air Navigation Service Providers relating to these blocks. The scope of airspace is extended to lower as well as upper airspace by using words “compatibility between different airspace configurations”, rather than “distinguish between upper and lower airspace”.

3. CHARACTERISTICS OF FUNCTIONAL AIRSPACE BLOCK CENTRAL EUROPE

Nine Functional Airspace Block initiatives which are composed of 27 States were declared to the European Commission. Each FAB varies significantly. Functional Airspace Blocks are presented as effective tool to reach SES performance objectives, since objective of Single European Sky is to improve performance of ANSPs, Legal obligation to create FABs generates opportunities for performance improvements.

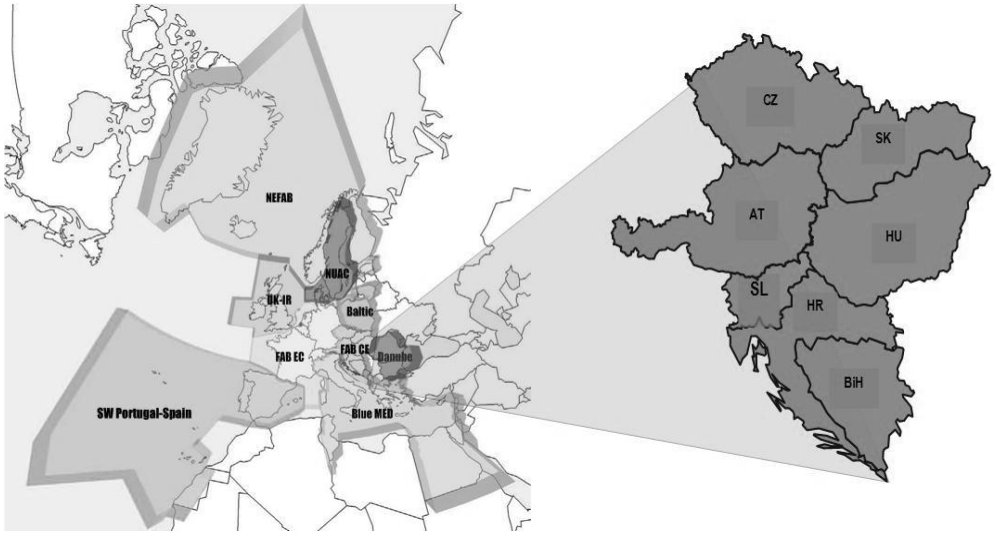

Fig. 2. FAB initiatives and FAB CE States
Rys. 2. Inicjatywy Funkcjonalnego Bloku Przestrzeni Powietrznej (FAB) oraz krajów FAB CE – Europy Centralnej

The history of FAB CE goes back in 1997, when FAB CE States together with Italy and Eurocontrol signed the Central European Air Traffic Services (CEATS) Agreement [13]. The aim was the establishment of a centralised single Area Control Centre for the upper airspace in Vienna. Part of CEATS States participated in the South East Europe FAB approach, proposed by the European Commission and the Stability Pact, in cooperation with Eurocontrol. The SEE FAB approach exists no longer; it is replaced by Implementation of the Single European Sky in South East Europe (ISIS) which will provide the support to help the transposition of SES regulations to national law. ISIS provides means to regional members of ECAA to harmonise their responsibilities within the Air Traffic Management. The most recent approach towards regional cooperation is presented through establishment of FAB Central Europe as the successor of the CEATS project.

Numerous changes in the European ATM system, lead CEATS Coordination group to agree to replace a part of the CEATS goals; one consolidated ACC centre in Vienna would be replaced with the full use of existing and planned infrastructure (distributed model where the responsibilities for service provision will be entrusted to the national ANSPs. These principles have been established through the "Common Understanding" statement published and approved in March 2008. The statement had lead to the creation of the Feasibility Study for FAB CE. In May 2008 all concerned ANSPs signed Memorandum of Cooperation which was followed by Declaration of intent in June 2008, as a part of process for developing an Implementation plan [14]. The FAB CE Memorandum of Understanding has been signed in Bratislava on 18th November 2009. According to FAB CE Member States, the purpose is to „establish a general framework of cooperation among the States, including their National Supervisory Authorities (NSA) and respective Military Authorities, aimed at the establishment of FAB CE and to create the interfaces enabling the coordination between the States and

ANSPs“. Functional Airspace Block Central Europe covers upper and lower en-route airspace (CEATS covered only upper airspace, FL 290 and above), but excludes Terminal Manoeuvring Areas.

As FAB CE initiative is successor of CEATS project, there are seven States and their Air Navigation Service Providers participating in the initiative: Czech Republic (ANS CR), Austria (Austro Control), Croatia (Croatia Control), Hungary (Hungaro Control), Slovakia (Letové Prevádzkové Služby), Slovenia (Slovenia Control), Bosnia-Herzegovina (BHDCA).

Four elements are used for a brief description of the existing operational concepts in each country, as following: *en-route civil-military arrangements:* Croatia Control and Hungaro Control provide ATC services to General Air Traffic (GAT) and Operational Air Traffic (OAT), Austro Control provides Air Traffic Control services to GAT and there are no OAT flights outside military area in Austria, ANS CR has remote location of civil and military centres, partially integrated in ATC system; *characteristics of pre-tactical Air Traffic Flow and Capacity Management/ AirSpace Management (ATFCM/ASM) services:* several ANSPs have combined Flow Management Position (FMP) and Airspace Management Cell (AMC), while Croatia Control and Slovenia Control at the moment have only FMP. Each of the ANSPs provides en-route and Terminal Manoeuvring Area (TMA) services, for en-route fights, arrivals and departures flights.
Staff management: Slovenia Control and LPA have team rostering with no overtime, Crocontrol has team rostering and overtime while Hungaro Control has team rostering and no overtime, Austrocontrol and ANS CR have individual rostering with overtime.

The institutional framework of FAB CE is established under Public law instrument – FAB Agreement (dealing with States responsibilities), and Private law – ANSP cooperation and corresponding sub-committees. Highest level of governance is FAB CE Council where integral part will form Joint Civil-Military Airspace Coordination Body (JC-MACB). Council will have representatives form States who have voting rights, while ANSPs which are also in the Council do not have voting rights.

Appointment of agreements and carrying the tasks will be under the responsibility of the National Supervisory Authority Coordination Committee which will be independent in the terms of budget. According to SES I, supervision regulation functions include inter alia certification, licensing mechanisms for inspections, audits and surveys of foreign providers operating in another State`s airspace. There are a number of possible cooperation models for NSAs:

1. National NSA supervising national territory,
2. National NSA supervising a delimited airspace (one or more sector groups),
3. National NSA supervising all ANSPs with same principal place of operation,
4. Lead National NSA nominated to supervise all ANSPs in the FAB,
5. Supranational NSA supervising FAB.

Subordinate to the Council will be ANSP Cooperation Committee which will be responsible for harmonisation, coordination and other means of cooperation among ANSPs and for the creation of its subcommittees. The national ANSPs CEOs will form top management board. There will be number of sub-committees to the ANSP Committee: *ATS Operations Sub-Committee* responsible for operational matters, sectorisation, and proposals for operational design; *Regional Technical Planning Board* responsible for tasks related to integration and/or common procurement of technical infrastructure, synchronisation of the use of technology and equipment; *Financial Sub-Committee* responsible for tasks related to financial coordination, assessment of financial impact of proposals by other subcommittees, issues of single unit rate; *Safety Steering Sub-Committee* responsible for tasks related to the harmonisation of safety management systems according to the define levels of harmonisation. In particular Safety Steering Sub-Committee will be responsible for adjusting measurement methodology and establishing a reporting scheme.

The FAB CE operational concept is based on distributed model of service provision. The first operational step of FAB CE are small scale cross border operations where limited number of technical changes are required. The second step will lead to higher level of harmonisation, enhanced data sharing and functional convergence. The third step will support the dynamic cross border activities.

Operational Working Group developed their scenarios. An *Initial scenario* includes cooperation and implementation actions, and is focused on satisfying SES regulations and establishment of legal

and institutional framework for the FAB CE. Initial Scenario represents evolution of execution of daily operations in terms of airspace infrastructure. Initial Scenario would lead to small modifications of airspace structure and/or procedures. Key elements of FAB CE Initial scenario: small scale border operations, integration of ASM/ATFCM through the establishment JC-MACB, contingency planning, FAB competence scheme, cooperation of the NSA licensed training facilities, regional technical planning board, and finally FAB agreement. Preparation for the implementation phase of the Initial scenario started in 2009, while deployment phase is not stated in Master Plan.

A *Static scenario* consists of regional provision of Air Traffic Services and full integration of ASM and ATFCM measures, which could provide cross border activity. Airspace planning is carried out by JC-MACB, taking into account the allocation of Sector groups to Air Traffic Service Units (Fig. 3). Configuration of sectors is determined through regional Network Operating Portal (NOP) coordinated with European NOP, while sector configuration management is done with an ATS units having Area of Responsibility covering all or several sectors groups. Each sector group is allocated to one Air Traffic Service Unit that provides relevant services for the duration of period of validity (not less than six months). Key elements in Static Scenario concerning ATM are: coordinated procedures around major traffic flows, common airspace design criteria, and contingency planning on FAB level. Regarding Human resources the key elements are: common minimum requirements on staff competence (FAB Competence Scheme), harmonization of the training (common) training standards, mutual recognition of licenses, common regulations and procedures applied to sector groups, NSA supervising the common requirements, and NSA licensed training facilities. Static scenario is in development, and development should finish in 2010. The implementation is expected between 2010 and 2012.

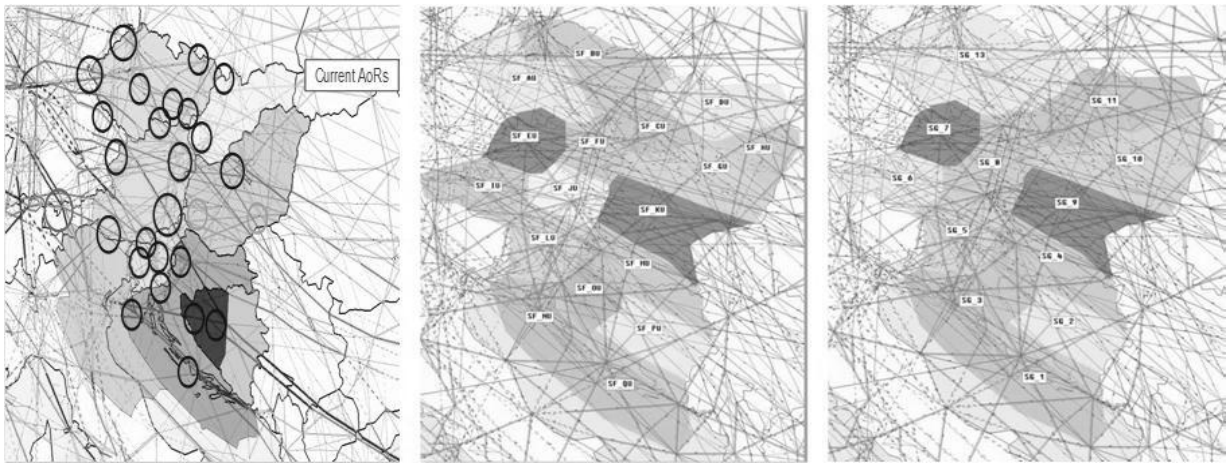

Fig. 3. Sector Families and Sector Groups in FAB CE
Rys. 3. Sektorowe rodziny i Sektorowe grupy w ramach FAB CE

A Dynamic scenario provides futuristic approach to optimise use of technical and human resources of different ATSU using dynamic changes in the Area of Responsibility. Dynamic scenario incorporates all elements of Static Scenario and it is predicted to be operational from 2015. Dynamic scenarios have pre-determined configurations (weekly or daily basis) that are potentially involving more than one adjacent ATSU with in sector group, thus more than one ATSU may be responsible for a sector group (Fig. 4). There are a lot of issues that have risen from the possibility of implementation of Dynamic scenario that have to be resolved in future years.

The performance objectives identified in Feasibility study predict that the *capacity* increase should cope with increase of around 140% in traffic in 2025 with maximum delay of 0.6 min/flight while satisfying military needs. The *safety* levels will maintain and improve where possible through establishment of a common Safety Management System. Regarding *flight efficiency* there should be a

saving of 2 million km annually by 2017 onwards, while *environment* would benefit with save of 22 thousand tons of CO_2 annually by 2017 onwards. Improved financial cost effectiveness is expected by 5% in 2017 and 10% in 2025 compared with 2006, and also a decrease in ATM induced cost for military operations.

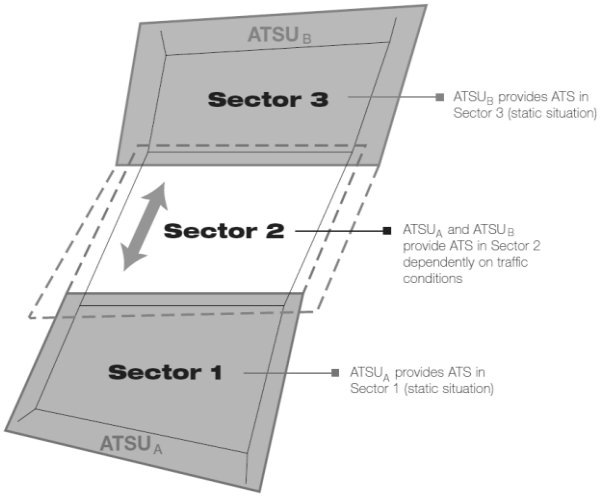

Fig. 4. Examples of Dynamic Area of Responsibility
Rys. 4. Przykłady Dynamicznego Obszaru Odpowiedzialności

4. IMPLICATIONS IN IMPLEMENTATION FAB CE

As Functional Airspace Block is conceived as continuous defragmentation of airspace, not all conditions imposed by SES Regulations can be achieved at the very beginning. The Master Plan of FAB CE represents reference document for the implementation of FAB CE, was written before the SES II regulation came into force, which brought the exact date of the implementation of FABs across ECAC. As the FAB CE Agreement identifies all conditions to be met and sets forth relevant implementation procedures, the key decision to which extent Parties agree on all relevant conditions might lead to the situation where no consensus is reached and implementation process would stop. The FAB Agreement will be in the form of memorandum of agreement between participating Member States, however most likely form of agreement will take is, signed but not ratified agreement. Therefore, it is possible that some elements of FAB Agreement to be provisionally applied (subject to limitations in each State`s legislation).

There is the absence of specific guidelines from European Commission to the process for establishing and implementing FAB. There are two interpretations: option one – only the fundamental requirements need to be met for the FAB to be established, compliance requirements are met before FAB is declared operational, option two – fundamental and compliance requirements to be met before FAB is established, and the FAB can then be declared operational almost immediately. It is still not clear what option will be put forward in the FAB CE Agreement. Central Europe FAB may be declared operational once: the FAB Agreement comes into force, the cooperation arrangements between states and supervision arrangements between NSA are concluded; the legal, governance and operational structures are in place; and it meets the requirements of Airspace regulation.

Even though according to FAB CE Feasibility study the development phase of Initial scenario had to be finished by 2009 it is foreseen that it will be finished in 2010. The Master plan didn't note the implementation date of Initial scenario and it is expected that implementation and operation would start in 2011. According to Article 8.1 and 8.4 of the Service Provision Regulation in order to carry out cross border operations it is necessary to establish joint designation of ANSPs. This will be very difficult to achieve and will mainly depend on the Member States and ANSPs willingness in determining the Area of Responsibility.

During the Preparatory phase four different job categories were identified as the key element which contributes to the implementation of FAB CE Initial Scenario: Air traffic Controllers Officer (ATCO), Air Traffic Services Electronic Personnel (ATSEP), Flow Management Position (FMP) and Airspace Management Cell (AMC) personnel. The investigations conducted during the Preparatory Phase by the HR (Human Resource) group, showed that there are few differences in the training and competence keeping for ATCO´s (there are no big differences regarding the training and competence keeping for ATCO`s), more differences have been detected and indicated as far as ATSEP and subsequently AMC and FMP personal are concerned. Recruitment (initial selection), training and certification and competence keeping of AMC and FMP personal are the responsibility of each ANSP´s so for the starting of the Initial Scenario it is important to harmonize training and certification of AMC and FMP personal. One of the ways to do that is:

- to set desired profile of personnel
- to define qualification of personnel,
- to create raw model for training and certification of AMC and FMP personnel,
- to define training requirements,
- to define certification
- to define competence keeping scheme.

There are difficulties concerning ASM/ATFCM processes, which includes the cooperation and coordination between National AMC and FMP and identification of Lead AMC, because some countries still didn't designate the AMC. There is a difficulty of educating ANSPs staff for the AMC position, because there is no formal document or manual on European level that will describe the process of the training and competence keeping the personnel (contains the competences for air traffic controllers) working on AMC position. Also the implementation of Flexible Use of Airspace is in question with the absence of AMC. With the implementation of the Static scenario the priority is to harmonize the training and competence keeping of an ATCO's concerned in the croos border activities (train and re-train significant number of air traffic controllers) to keep competence in the new Area of Responsibility and new sector configurations. Dynamic scenario will require a greater deal of cooperation that will increase pressure for harmonised working conditions, and it will raise issues in term of manpower, rostering and maintaining competence. From Human Factors point of view transition involves changing in air traffic controller mind set to be ready to operate in the FAB CE environment.

One of the key elements of the FAB CE is the implementation of single unit rate. There are some potential risks with the establishment of a single charging zone, particular in the level of cooperation between states, which may constrain the implementation of the single unit rate until after 2010. Not all states are ready to associate to a single charging zone at the same time, thus it is possible that single charging zone would be composed out of the two States and other would join later on.

The implementation of FAB CE will have long term social impact on the employees of the Member States ANSPs. The increasing functions that employees of various ANSPs must perform (providing Air Traffic Management in cross border areas, providing maintenance and support for common systems, etc), will raise social pressure.

There is a possibility that mutual acceptance of the results and information regarding Safety elements in FAB CE will not be guaranteed.

5. CONCLUSION

There is still today little guidance in legislation that describes the process that Member States have to follow in order to establish or modify Functional Airspace Block. Although the Regulations sets up common principles for the creation and modification of FABs, these have not yet been drafted. It should be emphasised that Member States want to retain maximum possible flexibility in the development of FABs. Even though the FAB CE Agreement is still not signed it is anticipated that it

will identify all the conditions to be met and to solve implications mentioned in this paper. The Single Sky studies identified that introduction of FABs was ambitious project, and would seek political commitment.

Considering the number of operational concepts currently put in place it is difficult to meet the explicative objective that FAB creates a win-win situation for each individual partner in order to survive as a group. The States must ensure that ATM can provide services in conjunction with their neighbours. A necessary condition of FAB CE becoming operational is that FAB Agreement comes into force. Air Navigation Service Providers will continue to function as independent organisations, providing Air Traffic Services in delimited airspace. Regulatory Authority will continue to function as now, with higher degree of collaboration by introducing NSA Coordination Committee.

As FAB CE is based on distributed model of ANSP provision, individual ANSPs will have to be able to operate with modified Area of Responsibility and with greater deal of cooperation. Even though the staff will experience significant change, the transition time will happen gradually. The FAB CE Master Plan predicts that there will be significant reductions in costs through increases in Air Traffic Controllers productivity, shared approach to contingency, common training, benefits of the single unit rate and future technical performances.

When talking about ANSP Staff, it has to be mentioned that employees of various ANSPs will carry out functions that overlap with those of their neighbours, where they might seek justification in seeking alignment of the terms and conditions of the employment in neighbouring State.

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