



Balkan Regional Approach to Air Defence (BRAAD): Role of NATO

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Contents

Background	3
The Balkan Region	3
Air Defence	3
NATO's role and actors in the Balkan Region	4
NATO Air Defence Committee (ADC)	4
NATO IS	4
NC3A	4
NAMSA	5
NPC	5
What is BRAAD	6
NATO Life-cycle support	6
Air Defence and BRAAD domains	7
Air Surveillance and Radar Procurement (BRAAD Spiral 1)	8
Definition	8
Main elements of an Air Surveillance Capability	8
Driving costs down through ICB	8
Nationally-independent procurement versus BRAAD	9
NC3A and NAMSA in partnership for radar procurement	9
Air Command and Control (BRAAD Spiral 1)	10
Definition	10
Air C2 in the Balkans: current status	10
Displaying the NATO Recognised Air Picture	10
MASE	10
Air Surveillance Centre (ASC) and production of the RAP	11
Planning and Tasking of air operations with ICC	11
Integration of weapon systems and Tactical Data Links	12
Governance and Funding	12
National Funding	12
NATO Common Funding	13
C4ISR Integration Fund (CIF)	13
Management and relevant NATO Contacts	14
NC3A	14
NAMSA	14
NPC	14
NATO International Staff	14
Endnotes	15

BACKGROUND

The Balkan Region

The South Eastern European countries of the Balkan Region form an area of Nations with similar geo-political challenges. Most importantly, these countries are a connecting bridge between the rich and developed, but also aging, Western and Central Europe, and Russia, which in turn is the gateway to the young and rising Asian powers. A modern, fast, and comprehensive development of the armed forces in the Balkan countries, would give the region the capability to become self-reliant in the role of providing a secure eastern frontier to the NATO Alliance, and in fostering a true peer-to-peer cooperation with Russia, fulfilling on behalf of NATO the new task mandated by the NATO Secretary General of bringing NATO-Russia relationships into a new era of openness, integration and mutual support.



Figure 1: the wider South-Eastern European Region in a picture taken from the web site of "The South East Europe Transnational Cooperation Programme", a Programme co-funded by the EU

Air Defence

Air Defence is a strategic area for the Balkan Region and for South East Europe in general. NATO defines air defence as "all measures designed to nullify or reduce the effectiveness of hostile air action"¹. At first glance, this definition might just seem to concern the air domain; in reality, it touches all domains of the armed forces: land, maritime, and airborne. Protection against hostile air action calls for capabilities such as joint situational awareness and identification of threats, which are not necessarily military threats coming from a neighbouring country. They could simply be threats coming from renegade aircrafts or terrorist attacks; this brings into the concept of Air Defence two other dimensions: that of Civil to Military Interaction (CMI), i.e. the cooperation and integration between civilian air surveillance and military air defence capabilities; and that of airspace border control, which comes into play when such renegade aircraft transitions from one sovereign space into another. Air defence is therefore really a comprehensive capability, where the extent and quality of integration between air, maritime and land assets and cooperation between different entities (civil, military) and different nations is a key factor for a successful implementation. Last but not least, acquiring a full comprehensive and modern air defence capability is expensive in such a way that becomes difficult to afford by a nation with a relatively small defence budget. For all these reasons, Air Defence is an area where the Balkan countries can leverage their own investments to jointly create a capability which will be bigger, more modern, and economically more sustainable than the air defence capabilities that the individual countries could afford without pooling their resources and capabilities into a common, multi-nationally funded project.

NATO'S ROLE AND ACTORS IN THE BALKAN REGION

NATO has a history of involvement in South East Europe which almost dates back to the years of the Alliance's foundation, with Greece and Turkey being NATO members since 1952. However, it is especially since 1999, with the establishment of the NATO's South East Europe Initiative (SEEI) at the 1999 Washington Summit, that NATO started to promote regional cooperation and long term security and stability in the region. In 2004, Bulgaria, Romania and Slovenia joined NATO, followed by Albania and Croatia in 2009. As of April 2010, the three countries of Bosnia-Herzegovina, Montenegro and the former Yugoslav Republic of Macedoniaⁱⁱ have a Membership Action Plan (MAP), which is a roadmap for their accession to NATO.

NATO Agencies and organisations, such as the NATO C3 Agency (NC3A)ⁱⁱⁱ, NATO Maintenance and Supply Agency (NAMSA)^{iv}, NATO CIS Services Agency (NCSA)^v and the NATO Programming Centre (NPC)^{vi}, and the NATO International Staff (IS)^{vii} have provided in the recent years invaluable support to the region by leading projects and initiatives in the realms of C4ISR^{viii}, starting with the physical connections of the new NATO nations' defence headquarters to the classified NATO communication and information systems (CIS) main networks.

NATO Air Defence Committee (ADC)

The ADC is the main advisor of the North Atlantic Council (NAC) regarding all aspects of Air Defence. The ADC has a long history of working with Partners to enhance national air defence capabilities and structures and has recently launched an initiative with a number of Balkan nations on a regional approach to build and maintain core air defence capabilities.

NATO IS

NATO's International Staff (IS) is based at NATO Headquarters in Brussels (Belgium), and it is an organisation made of about 1200 civilians. An advisory and administrative body, the IS works under the authority of the Secretary General and supports the delegations of NATO members at different committee levels and helps implement their decisions. The IS has a role in facilitating political coordination and consensus building.

Over the past two decades, the NATO Analytical Air Defence Cell (NAADC) of the NATO IS/DI/AERO Directorate has performed joint Air Defence studies for the benefit of Partner nations and has recently supported NATO's South East Europe Initiative (SEEI) by engaging with the Nations of South East Europe in analysing their Air Defence capabilities and looking for regional solutions to enhance security.

NC3A

The NATO C3 Agency was established on 1 July 1996 by the amalgamation of the former SHAPE Technical Centre (STC) and the former NATO Communications and Information Systems Agency (NACISA). Both of these organisations take their roots from the origin of NATO and from the requirement to provide Consultation, Command and Control capabilities to NATO authorities.

The NC3A's core business is research, acquisition and development of advanced technology for NATO, specifically in the C4ISR. NC3A has fifty-five years of experience of providing scientific and technical advice to the operational community on matters of air defence and wider C4ISR issues. NC3A has a highly educated staff of around eight hundred, from 23 NATO nations, many boasting advanced post-graduate degrees and a wealth of international experience.



2010 CIO Conference (Sofia). C4ISR MoU between NC3A and Bulgaria

More information can be found on the NC3A Web site^{ix}.

The NATO C3 Agency (NC3A)^x has been playing an active role in the South Eastern European Region since the second half of 2009, participating to the South Eastern European Defence Ministerial (SEDM^{xi}) meeting hosted in Sofia on 21st of October and successive SEDM meetings, and jointly organising with the Bulgarian Ministry of Defence in Sofia the first C4ISR Chief Information Officers (CIO) Conference^{xii}, on February 2010, which saw the participation of NATO stakeholders and C4I leaders and heads of C4I departments from the SEDM Nations.

NC3A is currently engaged with providing a series of C4ISR capabilities, ranging from Defence Planning to training on Intelligence, Naval communications, Air Surveillance and situational awareness, document handling and network connectivity and information systems, Training and Simulation and overall contract management to countries such as Bulgaria, Romania, Albania, Slovenia, Croatia, and Hungary. Such Bi-lateral engagements enable NC3A to be best positioned within NATO to provide consultation and procurement support in the light of a multi-national interest of the region in one of the C4ISR Domains. When it comes to the specific domain of Air Defence, the NATO C3 Agency also has unique and recognised technical excellence in the area of passive sensors and has acquired multi-year experience in procuring national turn-key Air Surveillance capabilities.

NAMSA

Established in 1958, the NATO Maintenance and Supply Agency (NAMSA) is NATO's principal logistics support management agency, providing cooperative logistic support services to NATO nations and NATO bodies. NAMSA's mission is to:

- Carry out logistics support management functions which can be performed in common more effectively than by individual countries
- Provide direct logistics support solutions in operational theatres
- Act as an extension of national logistics support chains
- Maximise efficiency of logistics support to NATO military forces at minimum cost

More information can be found on NAMSA's web site^{xiii}.

The NAMSA Air Defence Programme (LE) provides logistic support to a wide range of radar systems, Air C2 systems, Tactical Data Link systems and Ground-Air-Ground radios. The services cover acquisition support, supply, maintenance and technical services like lightning protection, system performance checks, configuration management, technical documentation, as well as system and software maintenance.

In the areas of Air Defence, NAMSA is an established partner of NC3A, working side by side with NC3A on the main common funded radar procurement projects for NATO Nations as well as national procurements entrusted to the agencies. NAMSA's role on the radar procurement projects is to deliver the so-called Integrated Logistic Support (ILS). The Integrated Logistic Support is the business practice encompassing the management, definition and delivery of support elements required to maintain and support a system or equipment at its specified level of operational capability throughout its entire life cycle. In essence, NAMSA provides the continued Operation & Maintenance support to the systems delivered to the Nation by NC3A.

NPC

The NATO Programming Centre (NPC) is part of the NATO CIS Services Agency (NCSA) and has been providing for the last 39 years system and advisory support for the NATO Air Command and Control (C2) assets entrusted to the NPC. On one hand, NPC provides the continued support for the maintenance of Legacy and Interim Air C2 Systems in service within NATO and the Nations. On the other hand NPC provides expertise and manpower in support of the procurement of NATO Air Command and Control System (ACCS), and will become the System Support Centre (SSC) for the ACCS LOC1 system.

NPC covers areas of Air C2 such as system engineering, obsolescence management, commercial-off-the-shelf (COTS) software management and technical training.

NPC is actively involved with partner nations in providing Tactical Data Link services and several types of support including installation, helpdesk and maintenance for ASDE, MASE Remote Console (MRC) and Integrated Command and Control (ICC) systems.

The NACMO ACCS Software Committee (ASC) is the tasking authority for the NPC and acts as the configuration control board for the Air C2 systems entrusted to the NPC. Additionally, the ASC is the decision-making authority for all changes to in-service Air C2 systems, using the NPC's Programme of Work as the basis for performance reporting and meeting the operational requirements of SACEUR.

More information can be found on NPC's web site^{xiv}.

WHAT IS BRAAD

The Balkan Regional Approach to Air Defence (BRAAD) is a NATO Multi-National and Multi-Year, conceived by the NATO's International Staff (DI/AERO/SAD section) and supported by NC3A, NAMSA, NACMA and NPC, aimed at delivering Air Defence capabilities to the Balkan Nations by adopting a regional approach to the problem, fostering a greater interoperability among the participating nations and with NATO, and allowing significant cost reductions to the participating nations.

In July 2010, the NATO IS supported the organisation of a conference in Podgorica (Montenegro), dedicated to the theme of a "Balkan regional approach to building common air defence core capabilities", to measure the level of interest and determine where practical work might be initiated in the field of air defence. Three Partner nations (Bosnia and Herzegovina, the former Yugoslav Republic of Macedoniaⁱⁱ, and Serbia) and four NATO nations (Albania, Croatia, Hungary, and Slovenia)

were represented at the conference. Also participating were representatives from CC-Air Izmir, EUCOM and USAFE. The great interest shown by the participating stakeholders was repeated at follow-on workshops and events which have finally led to the definition of a common NATO approach called the Balkan Regional Approach to Air Defence (BRAAD), supported by NC3A, NAMSA, NACMA, NPC and the NATO IS. This approach will be presented for the first time at the 2011 US-Adriatic Charter Chiefs of Defence (CHOD) Conference (June 27-28), hosted in Garmisch (Germany).

NATO LIFE-CYCLE SUPPORT

One of strengths of BRAAD resides in the capability of the partner NATO Agencies (NC3A, NAMSA, NACMA and NPC) to really implement the NATO C4ISR Comprehensive Approach, by being able to jointly provide support across the whole life-cycle of the systems taken into consideration.

The following list summarises the different stages of the Life-Cycle support provided by the NATO Agencies working in partnership on large acquisition programmes for one or more NATO or Partner Nations:

- 1 Capturing of user requirements
Thoroughly and correctly identifying user requirements is often crucial to a successful delivery of a capability. This is often conducted through a dedicated study which identifies the existing gaps in the national capabilities.
- 2 Developing a cost estimate in the required NATO formats
For NATO Common Funded projects, the NATO-standardised Type-B Cost Estimate (TBCE) is to be elaborated, covering all cost items, and ultimately to be authorised by the respective NATO bodies. For nationally funded projects, the economical offer made to the sponsoring nations will include the Project Service Costs for the customer funded NATO Agencies and the cost of the systems to be procured from Industry.
- 3 Developing a detailed technical Statement of Work
The technical offer is developed through a detailed technical Statement of Work, covering all aspects and requirements of the systems requested by the Nations, including requirements on project management, civil works, logistics support, documentation and training.

Issuing an Invitation for Bid, and inviting Industry to submit Bids: The Invitation for Bid (IFB) and all associated documents are to be issued in an open competition in order to receive detailed technical proposals and price quotations from Industry. This ranges from organising a Bidders Conference, responding to clarification requests, receiving Bids from Industry. All these activities are conducted on behalf of the requesting nations.
- 4 Evaluating Industry proposals and selecting the best Bid:
The Industry Bids will be thoroughly evaluated from the technical and financial view-point. The final result of the proposal evaluation will identify the most attractive Bid.
- 5 Assigning the Contract, Monitoring and Control of the Work:
Upon selection of the Bid, a Contract is going to be negotiated with the selected Contractor, following the applicable NATO standards and rules. The project will be kicked-off and the work can commence. The progress will be closely controlled to ensure that all work is performed in line with the contractually agreed activities and the Statement of Work.

- 6 Testing, Acceptances and Hand-over of the final system to the Nation (Final System Acceptance)
All systems and sub-systems put into place and configured will undergo thorough testing and verification, witnessed by the Purchaser (i.e. the requesting nation). NATO will oversee phases of the Factory Acceptance Testing, all site acceptance tests, RAMT testing and the Final System Acceptance tests, reviewing, improving and approving on behalf of the nation all test plans provided by the contractor.
- 7 Contracted Logistics Support (Operation & Maintenance)
After Final System Acceptance, the installed systems have generally 1 year of warranty. After the first year of warranty is over, NATO can provide on behalf of the nation the on-going operation and maintenance (O&M) support, typically for 20 years. The entire set of services are generally managed through Contracted Logistics Support (CLS) and include technical documentation and manuals, training, spare parts management and supply, system repairs, remote support and helpdesk, on-site support for repair, configuration management, and obsolescence management. NATO can complement the portfolio of services covered by CLS to meet national requirements through industrial or organic means.

Air Defence and BRAAD domains

Air Defence can be further sub-divided into the following domains or capability areas:

- 1 Air Surveillance
- 2 Air Command & Control (Air C2)
- 3 Ground Air Ground Communications
- 4 Civil to Military Interaction (CMI)

Such capability areas can be integrated by NATO to form a Comprehensive Air Defence capability, made of sensors, reporting and decision support systems, communications between relevant air policing ground, naval and airborne assets. By acting in synergy and partnership, the NATO Agencies of NC3A, NAMSA, NACMA and NPC, are able to offer lifecycle support across the different stages of the Air Defence domains, starting with the definition of the requirement, the acquisition of the capability through competitive procurement strategies the implementation and activation of the system in field and its continuous operation and maintenance).

For the purpose of BRAAD, we consider NATO's intervention in three successive spirals or increment. The first increment or spiral is the one object of this leaflet, and will include Air Surveillance and Air C2, which are the primary and essential capabilities of Air Defence.

The second spiral or increment to be implemented following the first spiral, is the one including Ground Air Ground Communications and Civil to Military Interaction (CMI). The Ground-Air-Ground (G-A-G) communications system is to provide Nations with a solid ground-based wireless communications infrastructure, providing voice communications between tactical aircrafts and the territory above which the aircrafts are operating. This capability is required to provide secure communications by using encryption and needs to be resistant to Electronic Countermeasures (ECM)^{xv}. Recognising that a threat to the Air sovereignty of a nation can also be of "civilian" nature, with a clear example being a threat posed by a renegade aircraft, CMI will bring into BRAAD the capabilities of managing and exploiting

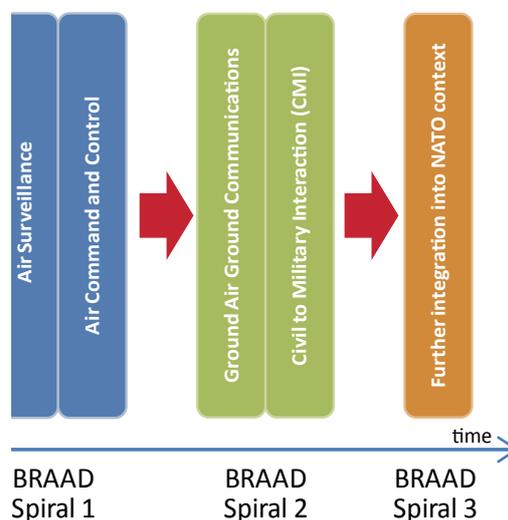


Figure 2: Successive increments or spirals of the BRAAD initiative

the integration of military and civilian tracks that the NC3A has matured through the Cooperative Airspace Initiative (CAI) project (more information can be found on the NC3A Web Site^{xxvii}).

The final increment will provide further integration of the Balkan nations into NATO context, including NATO Missile Defence capabilities and their integration into existing C2 Systems.

The following sections further detail the services that NATO Agencies can offer in the first spiral domains of BRAAD listed above, across the full life-cycle of the systems considered.

Air Surveillance and Radar Procurement (BRAAD Spiral 1)

Definition

The main purpose of an Air Surveillance system is to provide Nations with positive control of the airspace over their territory. NATO requirements are for a Nation to provide basic volumetric coverage; however a Nation will typically have requirements to control lower altitudes, as well.

Main elements of an Air Surveillance Capability

Major sub-elements that comprise a typical Air Surveillance Capability are: civil works, long-range Fixed Air Defence Radars (FADRs) including Identification Friend Foe (IFF) interrogators, mid/short range active and passive sensor systems, radio equipment, cabling, power supplies, encryption devices, networking appliances, operator workstations, test and simulation equipment, software and all related tools and procedures to operate and maintain such a capability. Connectivity and integration with National and NATO command and control systems and legacy equipment is an important factor, whilst also taking account of future upgrade plans. It is clearly recognised that proper integration produces a capability that is greater than the sum of the individual parts.

Particular attention needs to be paid to the protection of high value assets, such as power plants and to protect avenues of low-level approach. The number and locations of sensor sites need to be carefully selected to maximise coverage and minimise the number of systems required. This selection depends on terrain, accessibility of the site, types of sensors, location of other infrastructure, possible interference, as well as a wide range of operational, political, economic and environmental concerns.

Driving costs down through ICB

An Air Surveillance Capability is a large investment, probably the most expensive part of BRAAD. It is therefore important to look at important factors that can reduce costs, such as cooperation with neighbouring Nations to share air pictures and the use of alternative lower-cost sensor technologies. Full competitive bidding will result in lower acquisition costs. Experience shows that a Fixed Air Defence Radar (FADR) could cost between 15 Million Euro and 20 Million Euro without competitive bidding. Through a recent International Competitive Bidding (ICB) process for a NATO Nation, NC3A managed to lower the initial sole source quotation by nearly 45%. Competitive bidding managed by NC3A is therefore really an area where the sponsoring nations could receive great benefit from NATO's involvement.



Figure 3: Long Range Fixed Air Defence Radar (FADR)

There are other significant factors that can lead to cost reductions: a well-written specification, successful contract negotiations, careful risk management, a soundly defined, well-executed testing programme, and effective communication with all involved parties. NC3A and NAMSA have a highly-skilled, interdisciplinary team who can cover all aspects of implementing successful air surveillance capabilities^{xvii}.

Nationally-independent procurement versus BRAAD

It is important to stress the many benefits for the Balkan Nations which will decide to be part of BRAAD, versus them acquiring radars individually. If a Balkan nation is to procure FADRs individually, the number of FADRs procured will be limited (1 or 2), resulting in a high unit price for the FADR, due to the high margins applied by Industry. More Balkan nations joining together into multi-national acquisition will create sufficient demand to stimulate a greater and better offer from Industry: more FADRs will result in a much lower margin applied, inducing shared savings for the nations. The same reasoning applies to the CLS contract: an individual 20-year CLS contract is likely to have low bargaining power, while the prospect of a collective CLS contract for the same duration will strike a much better bargain and also will result in significant savings of spares pool, as these can be shared among several nations. In terms of radar coverage, a nation procuring individually will have to complement the FADRs with additional short range or passive sensors in order to obtain sufficient Basic Volumetric Coverage. With BRAAD, the studies developed by the NATO's IS show that optimal radar BVC of the Balkan Region can be achieved by carefully selecting the location of the radars in each country. Moreover, there would be redundancy for free, due to overlapping radar coverage by neighbouring nations.

A counter argument to BRAAD could be that the joining nations would not have total control over their national air-surveillance. This argument can be greatly reduced by endowing each participating nation with a sufficient Air Surveillance capability that is able to function independently. This can be achieved through careful selection of the sensor sites and ensuring that each BRAAD nation has at least one FADR on its soil.

NC3A and NAMSA in partnership for radar procurement

Air Surveillance is a highly complex capability and every implementation must be tailored to the unique operational requirements and the legacy environment into which it must be integrated. It begins with a proper requirements analysis. This analysis will examine the operational requirements, the legacy environment, and any other relevant political or economic issues. It will identify existing gaps and alternatives to fill these gaps, gather rough order of magnitude (ROM) costing figures, and present final recommendations and options to high-level decision makers.

Once a decision has been made to acquire an air surveillance capability, there is a full spectrum of activities required to conduct a successful implementation, including: preparing formal notification of intent, developing specifications for an invitation for bid (formalised with the definition of the Statement of Work and the issuing of an Invitation for Bid (IFB) to Industry, covering technical, logistical, programme management and contractual issues), preparing the bids, selecting a contractor, reviewing the detailed design documentation, preparation of the civil works and coordination of the civil works interface with the contractors, reviewing and approving the test procedures, physical installation, testing, training, documentation, to ultimately final commissioning and hand-over of the Air Surveillance capability to the Nation and handover of the logistics to NAMSA. The whole process is clearly illustrated in Figure 4.

Another aspect where NATO can provide support to Nations is in the integration of nationally-owned sensors and legacy sensors. Through the multi-year and multinational project called MAJIC (a complex acronym which stands for

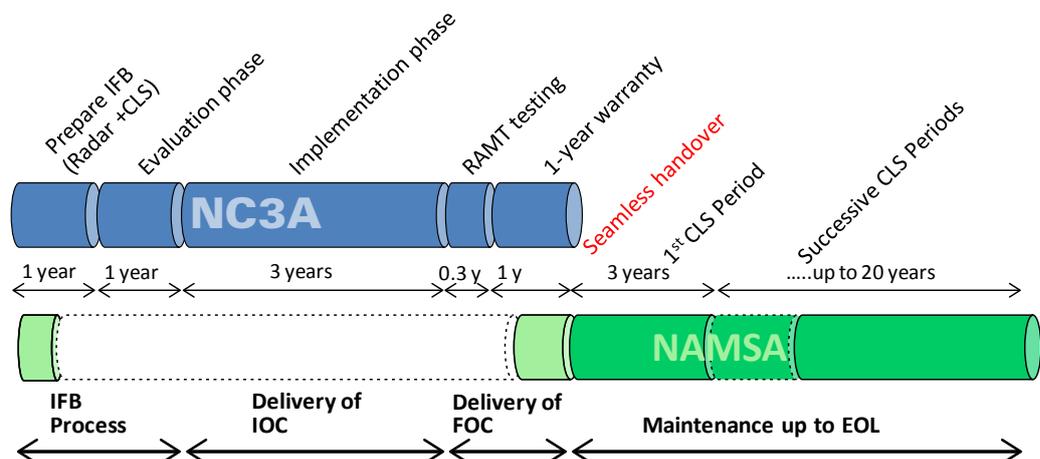


Figure 4: NC3A and NAMSA in partnership, delivering the acquisition of radars and their continued maintenance

Multi-Sensor Aerospace-Ground Joint Intelligence, Surveillance and Reconnaissance (ISR) Interoperability Coalition), the NC3A has acquired the capability to enable interoperability and integration between NATO and national ISR and C2 systems through the use of common interfaces for data formats, based on NATO standardisation agreements (STANAGs). In practice, this means that the information captured and distributed by a wide range of national sensors, such as Unmanned Aerial Vehicles (UAV) or other aerospace-borne systems, ground-based or maritime sensors, ground moving target indicator (GMTI) radars, synthetic aperture radars (SAR), electro-optical and infra-red imaging and video sensors, electronic warfare support measures (ESM) sensors, and others, can be translated into a common format – NATO compliant. These can be published into a common repository (called Coalition Shared Database) for exploitation by decision support systems (such as C2 systems) and support the commanders and high-level decision makers.

Air Command and Control (BRAAD Spiral 1)

Definition

Air Command and Control is a process and structure that aims at managing air operations, getting the air assets in the air at the correct time and place with timely information and accurate plans to provide the desired effect. With the increasing emphasis on joint operations and doctrines, Air Command and Control is no longer just 'Air' anymore. Today, both ground and naval assets are fully part of the Air C2 context, as well as Air assets become integral part of land-based and maritime operations. Moreover, command presupposes knowledge, and knowledge is a function of information and analysis. It is, therefore, no surprise that so much importance is being placed in the effective integration and use of ISTAR (Intelligence, Surveillance, Target Acquisition, and Reconnaissance) resources, and the fusion of intelligence information^{xviii}.

Air C2 in the Balkans: current status

From the NAADC Studies performed for Balkan nations, particularly Bosnia and Herzegovina, Montenegro and the former Yugoslav Republic of Macedoniaⁱⁱ it has been noted that the partner C2 chains are not fully compatible with NATO C2 structure and are not supported by appropriate C2 systems when existing. Moreover, there is no exchange of air situation data between Balkan partners and NATO. Potential needs for the Balkan nations are therefore:

- A real time capability to display NATO Unclassified (NU) Recognised Air Picture (RAP)
- A real time capability to create and display a Local Air Picture
- A planning and tasking tool to support air operations, possibly joint operations as well.

Displaying the NATO Recognised Air Picture

The generation of a Local Air Picture will be consistent when the sensors will be in place and operating. As shown by Figure 4, radar procurement takes a few years to deliver an operating capability. BRAAD will therefore first focus on connecting the Balkan Nations to NATO and deliver a Recognised Air Picture (RAP) which will be de-classified to NU for the Partner Nations. The Air Situation Data Exchange (ASDE) program provides such capability. This system manages the controlled exchange of air picture data by filtering the NATO air picture in such a way that it is releasable to partner nations. It also enables the integration of a partner nation's RAP into the NATO air picture. The initial ASDE system was developed in cooperation with the NC3A and the NPC. Since 2007, the NPC has provided full system support for the ASDE including system installations and further development.

A Nation joining BRAAD could initially establish an Air Surveillance Unit on their territory for the purpose of connecting such unit to the nearest NATO CRC. A Multi-AEGIS Site Emulator (MASE) Remote Console (MRC) installed in the Air Surveillance Unit would display the NATO NU RAP and the local air picture data if available .

MASE

The Multi-AEGIS Site Emulator (MASE) is a flexible, low cost, state-of-the-art solution developed by NPC to support the execution of air operations. MASE supports the following functions:

- Production of a real-time RAP based on input from active/passive sensors and civilian air traffic control;
- Identification and exchange of the RAP with other military units in a NATO-wide, real-time network;
- Control of Air Defence assets like fighter aircraft and SAM.

Both military and civilian radars can be connected using nearly all relevant protocols on dedicated lines or packet switched networks. The sensor data from these sources is processed using a multi sensor tracker, which provides the real-time air picture.

Flight plan data from civilian or military Air Traffic Control (ATC) centres are received, correlated with the real-time air picture and displayed to the operational user to support identification of the RAP.

Today more than 60 installations in 20 NATO countries use MASE to execute Air C2 on national territory.

Air Surveillance Centre (ASC) and production of the RAP

When the sensors are in place and operating, the Balkan nations will have two choices: the nationally-independent choice would be to implement a full mission capable national Air Surveillance Centre (ASC), manned and operating 24/7. Typically such ASC requires manning in the order of 150 skilled operators and technicians combined. The investment needed by each nation could be significantly large, in the order of 5 Million Euro, without considering the running costs of personnel. The regional approach would instead be to create a Regional full mission capable ASC for RAP production, shared by the BRAAD nations, coupled by at least one Air Surveillance Unit in each nation for LAP and RAP display, manned by a far lower number of operators and technicians. This solution would significantly reduce both investment and running costs for each nation, and would still enable each nation to retain a minimum independent capability.

Integrating the ASDE filtered NATO NU RAP can enhance the RAP in the ASC. Furthermore the ASDE enables the integration of the ASC RAP into the NATO air picture.

Planning and Tasking of air operations with ICC

BRAAD recommends that the Planning and Tasking of Air Operations are conducted at the Joint level, through the implementation of a Joint Operational Command (JOC).

The tool recommended by BRAAD to plan and conduct tasking in support of Air Operations is the Integrated Command and Control (ICC), a NATO accredited capability developed by NC3A. The ICC is currently the de-facto standard for Air and Joint C2 operations in NATO and NATO nations with usage 24 hours a day, 7 days a week in 23 countries in more than 400 locations (see Figure 5). The ICC provides capabilities for integrated planning, tasking, intelligence targeting and operations, information management and decision support to operational and tactical level air operations during peacetime, exercise, crisis and conflict. ICC is a truly comprehensive suite for Air C2, capable of displaying a Joint Common Operational Picture (COP) and to support the joint targeting cycle between the Joint Force Command (JFC) and the various Component Commands (CC)^{xix}, with interfaces to get access to ISR data from the Coalition shared Databases (CSD – MAJIC) and display Friendly Force Tracking Information. NPC delivers on-going maintenance to all the ICC installations provided by NC3A.

Used in
~ 400 sites
in 23
countries



Figure 5: The Integrated Command and Control (ICC) developed by NC3A and maintained by NPC.

With the NATO successors of ICC being worked on, i.e. Air Command and Control Information Services or Air C2IS (part of the Bi-SC AIS, whose industrialisation programme is led for NATO by the NC3A itself) and NATO ACCS (a programme led by NACMA), it is anticipated that NATO funding for ICC will be reduced in the upcoming years. For this reason the Agency, receiving clear interest from several NATO and Partner Nations (among others Belgium, Bulgaria, Czech Republic, France, Italy, The Netherlands, Poland, Portugal, Spain, the United Kingdom and the United States), has launched a Multi-national ICC Programme which will cater for the future developments and maintenance requested by the Nations who joined the Programme and are currently using ICC for their national needs.

Integration of weapon systems and Tactical Data Links

Integration, command and control of weapon systems and naval assets can be provided through the CRC System Interface (CSI) and Ship-Shore-Ship Buffer (SSSB) systems.

CSI provides the capability for weapons command and control of SAM and airborne assets as well as exchange of the recognised air picture using a wide range of NATO standardised Tactical Data Links. The CSI is being used by 20 NATO countries in more than 40 installations.

The SSSB provides exchange of air surveillance information between Air C2 and Naval units and is deployed to 7 NATO countries (CRC, NATO FORACS ranges). The system supports the use of Link 1, Link 11, Link 11B, AIS and Link 22. CSI and SSSB capabilities are managed through NAMS0 Support agreements to ensure that future developments and maintenance requests by the participating nations can be provided.

Networked Interoperable Real-time Information Services (NIRIS), a product developed by NC3A and maintained by NPC is capable of interfacing a wide range of commonly used Tactical Data Links, enabling the information to be visualised and consumed by C2 tools such as ICC. NIRIS is a middle-layer system which is also capable of translating one TDL format into the other, facilitating the dissemination and consumption of information for operational purposes. NIRIS is operationally deployed at over 220 sites throughout Europe (SHAPE, Regional Commands, Component Commands, JSRCs, CAOCs, over 150 national sites).

GOVERNANCE AND FUNDING

In order to allow the BRAAD initiative to take off and become a Programme, there needs to be official tasking by a group of the Balkan Nations. NC3A, NAMSA, and NCSA/NPC are Executive Agencies, which means that they take official action only if tasked by Nations or by a Steering Committee created by Nations as Governance mechanism for the Programme.

Different mechanisms for funding could be applied to BRAAD:

- 1 National funding (from beneficiary and/or from donor nations)
- 2 NATO Common Funding
- 3 C4ISR Integration Fund0 (CIF)

These options are not alternative to each other and actually could very well be used complementary to launch the BRAAD Programme.

National Funding

National Funding means direct funding from a nation's government, typically from its Ministry of Defence. This is the typical option chosen by NC3A and NAMSA when providing bi-lateral C4ISR support to a nation.

Usually, the nation providing the funds to run the project is the beneficiary nation. This can be in part an option also for BRAAD, i.e. one or more of the Balkan Nations contribute to BRAAD separately, each Nation pursuing specific objectives of the Programme. This should be complemented by other means of funding to cover the common parts of the Programme which benefit all joining nations at the same time.

Another case, which is often found with nations that need to close an existing gap in capability with more advanced nations, is when such funding is provided by donor nations, which are not part of the direct beneficiaries.

A concrete possibility for a donor nation could be the United States of America. The USA are greatly involved in supporting modernisation programmes in South East Europe, especially through bi-lateral programmes with SEE

nations led by the US European Command (EUCOM) and through multi-national programmes led by the Department of Defence. Other countries that could be interested in being donor nations for BRAAD would be the NATO European countries which are currently providing support to Air Surveillance and Air Policing in the Balkans.

NATO Common Funding

NATO Common Funding is the usual vehicle for investments that benefit the entire NATO community and are therefore defined "eligible" to common funding, i.e. to use funds authorised by the Investment Committee (IC) and derived from the direct contributions of NATO's members to the Alliance. In a first step, NATO Common Funding could only be used for the Air C2 part of BRAAD Spiral 1, in relation to the dissemination of the filtered unclassified NATO RAP to the Balkan countries and could be applicable for installation and support of NATO owned capabilities as ASDE and MRC. NATO Common Funding is not applicable for the Air Surveillance part of BRAAD Spiral 1.

C4ISR Integration Fund (CIF)

The C4ISR Integration Fund (CIF) is a mechanism already used by NATO in supporting the modernisation of PFP nations. The CIF is described in detail in the publication available on the NC3A Web Site^{xx}.

The CIF is designed to execute specific C4ISR projects aiming to deliver the implementation of capabilities to those NATO nations and partner nations lacking sufficient financial resources, as well as competence and specific expertise to achieve the purposes of NATO C4ISR integration.

For the CIF three entities are defined:

- The donor(s):
Are the Entities with legitimate title and interest which provide financial contribution for specific efforts to be accomplished through the CIF.
- The Fund Executive Agency:
Is the Agency responsible for the execution of the project(s), for the management/employment of the financial resources of the fund for the agreed purposes, and for the planning and administration of the CIF.
- The Beneficiaries:
Are the Entities for the benefit of which the project is conducted and ultimately the entities which will retain the project immediate business benefits.

Governance of the CIF will be retained by a Steering Committee comprised of representatives of donor nations which provide funding to a specific project or pool of projects.

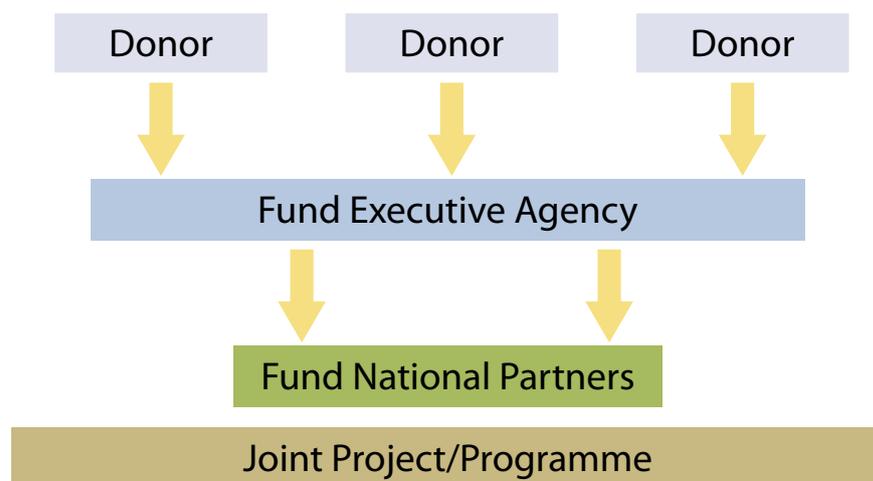


Figure 6: Schematic view of the C4ISR Integration Fund

The CIF could prove to be the ideal solution for BRAAD. It could provide an initial pool of funds coming from a coalition of the willing nations within the Balkan Region, as well as pool additional funds coming from external donor nations.

MANAGEMENT AND RELEVANT NATO CONTACTS

The BRAAD Initiative is led by the NATO's International Staff, and partnered by NC3A, NAMSA, NACMA and NPC.

When this initiative is turned into an actual Programme upon decision of the Balkan Nations, an international Programme Management Office (PMO) will be created for the purpose, led by one Programme Manager from NC3A and several project managers for the specific management of the different parts of the Programme (such as Air Surveillance Procurement, RAP production and dissemination, Air C2 planning and tasking, Air Surveillance O&M, Air C2 O&M, and others eventual). The projects will be managed according to the PRINCE2 project management framework and PMI methodologies. The PMO will comprise technical experts from the different domains which pertain to the Programme, including project managers, legal experts, contracting officers, ILS engineers and will have the possibility to incorporate technical experts from the Balkan nations, and auditors from the eventual donors.

It is anticipated that in order to establish formal cooperation activities with the Partner Nations, NC3A will require approval from the NATO Atlantic Council (NAC). NC3A recommends that the Partner Nations individually establish Memoranda of Understanding (MoU) for C4ISR cooperation with the NATO C3 Agency. The MoU can be approved by the NAC and opens up the possibility for a Partner Nation to cooperate with NC3A.

In the case of NAMSA, the NAC has authorised the NAMSOM Board of Directors to conclude MoUs with PfP states for the provision of logistic support services. Specific implementation agreements would afterwards need to be established for each project or related group of projects. In the case of FYROM^{xxi}, a MoU with the NAMSOM for logistic support cooperation is already existing, and only the implementing agreements would need to be drawn up.

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ENDNOTES

- i.* AAP-6 NATO Glossary of Terms. 2009
- ii.* Turkey recognises the Republic of Macedonia with its constitutional name
- iii.* <http://www.nc3a.nato.int/>
- iv.* <http://www.namsa.nato.int/>
- v.* <http://www.ncsa.nato.int/>
- vi.* <http://www.npc.nato.int/htm/about.htm>
- vii.* http://www.nato.int/cps/en/natolive/topics_58110.htm
- viii.* Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
- ix.* www.nc3a.nato.int
- x.* <http://www.nc3a.nato.int/>
- xi.* <http://www.mod.government.bg/bg/EXT/SEDM/index.html>
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- xvi.* <http://www.nc3a.nato.int/Opportunities/Documents/3-NATO-Russia-CAI-20101213.pdf>
- xvii.* NC3A Service Catalogue, Air Surveillance Expertise, page 14
- xviii.* Effective Air Command and Control, paper written by Air Chief Marshal Sir Glenn Torpy
- xix.* NC3A Service Catalogue, Integrated Command and Control System Support, page 24
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- xxi.* Turkey recognises the Republic of Macedonia with its constitutional name



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