Aerospace Ground Surveillance and Reconnaissance (AGS&R)

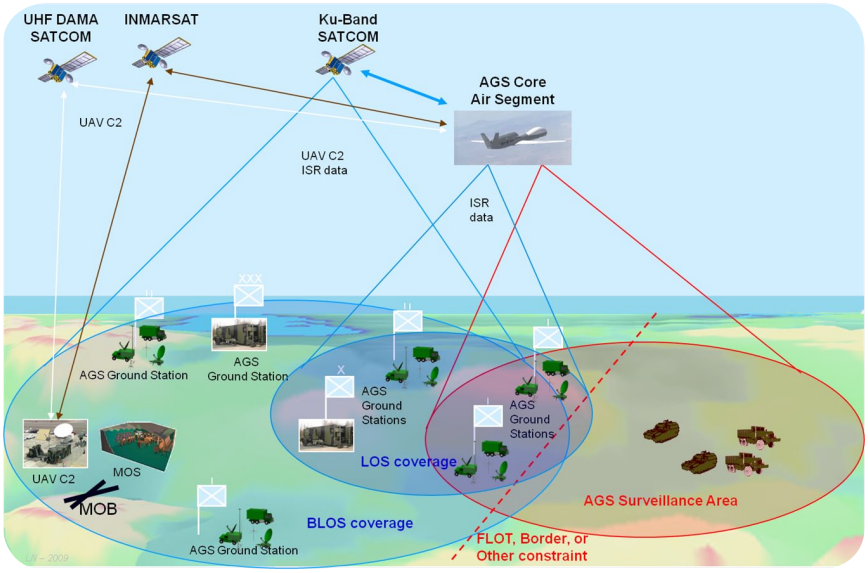
NATO C3 AGENCY

What is NC3A?

The mission of the NATO Consultation, Command and Control Agency (NC3A) is to enable NATO's success through the unbiased provision of comprehensive Consultation, Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities.

What is Aerospace Ground Surveillance and Reconnaissance?

Aerospace Ground Surveillance and Reconnaissance (AGS&R) refers to a class of military airborne sensor systems used for long, medium, and short range theatre and tactical reconnaissance, surveillance, and target acquisition, and are capable of detecting moving, fixed, and static targets in all weather conditions, night and day. These systems, connected to associated ground stations through a secure local and wide area network, transmit both near real time and archived data, imagery, and information to the NATO and coalition supported commanders in order to provide enhanced situational awareness to military decision making. AGS&R is conducted in order to develop an understanding of adversary, neutral, and friendly force dispositions (e.g. defensive and offensive positions, order of battle, etc); to survey status of adversary and friendly infrastructure (e.g. port facilities, lines of communication, railways, etc); to support operations and targeting, contributing to the delay, disruption, and destruction of adversary forces; and for protection, warning, and direction of friendly forces. Airborne AGS&R systems include manned air platforms and unmanned platforms supporting commanders at all levels of command.



The figure above offers a high-level example of how such systems would interact with other systems in a network-oriented environment based on interoperable standards and procedures to provide the users with the best overall capabilities possible:

Examples of AGS&R systems include the US Air Force E-8C Joint Surveillance Target Attack Radar System (Joint STARS); the UK Royal Air Force Airborne Stand-Off Radar (ASTOR); the USAF RQ-9 Reaper medium-altitude long-endurance (MALE) unmanned aerial vehicle (UAV); the USAF RQ-4 Global Hawk high-altitude, long-endurance (HALE) UAV; and the recently agreed NATO RQ-4 based Alliance Ground Surveillance (AGS) system.

The NATO-owned and -operated AGS Core capability will enable the Alliance to perform its own persistent surveillance. The AGS Core will be an integrated system consisting of an air segment and a ground segment.

The air segment will be based on the Block 40 version of the US RQ-4B Global Hawk UAV. The AGS system primary sensor will be the state-of-the-art multi-platform radar technology insertion program (MP-RTIP) ground surveillance radar sensor. The AGS sensor package will provide Ground Moving Target Indicator (GMTI) data, Synthetic Aperture Radar (SAR) imagery and Electronic Surveillance Measures (ESM) data. The system will also be equipped with an extensive suite of line-of-sight and beyond-line-of-sight long-range, wideband data links. The ground segment will provide an interface between the AGS Core system and a wide range of C2ISR systems to interconnect with and provide data to multiple deployed and fixed operational users, including reach-back facilities, remote from the surveillance area.

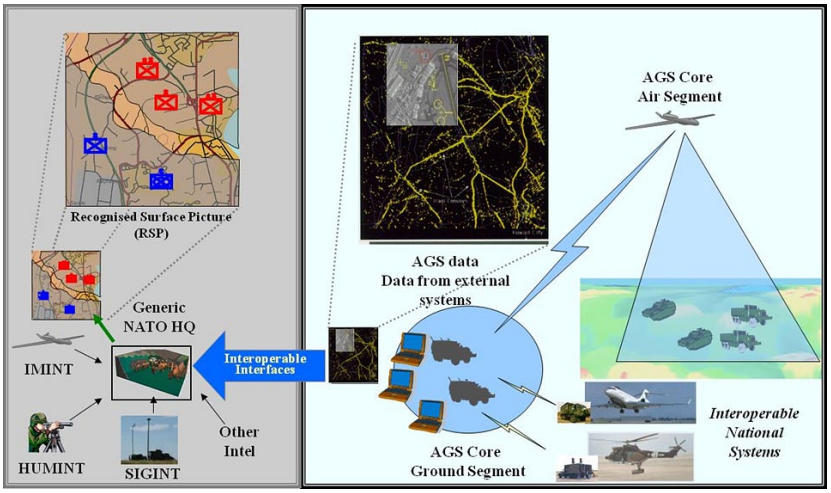
Expertise Description

NC3A is a world-recognised leader in the fields of C2ISR and sensor technology and has done both theoretical and practical work in these fields. NC3A also has extensive experience in integrating legacy sensors with new sensors and with command and control systems.

For several years the NC3A has provided valuable support in the acquisition and implementation processes of the new AGS capability, including development of a concept of employment (CONEMP) for the AGS and helping NATO to explore and evaluate both manned and unmanned options. The CONEMP proposes that the NATO AGS core system be interoperable within an architecture composed of NATO and national intelligence surveillance target acquisition and reconnaissance (ISTAR) systems operating within defined NATO areas of operations. It provided a basis for NATO use of GMTI data and SAR imagery.

NC3A currently provides: legal assistance and advice in NATO AGS System contract; assistance in the establishment of the NATO AGS Management Organization / Agency (NAGSMO/NAGSMA); AGS configuration management; future capability studies for the integration of NAEW&C and AGS; system and operational architecture development for the NATO AGS capability in support of NATO Joint ISR Operations; and development of operational processes and concepts of employment through support to Joint ISR projects and programs

Recently, NC3A has been in the forefront of an effort to transform the NAEW&C E-3A force from an air surveillance system to a multi-mission capability. These efforts have included the development and testing of an on-board internet protocol based communications system and integration of the E-3A into Joint ISR and AGS&R experiments and exercises. Further, NC3A has researched and published studies pertaining to Joint ISR: one details harmonization options for the NAEW&C Force and AGS as a single NATO owned and operated C2ISR capability, the other is a technical and operational assessment of the



The essential elements of the AGS architecture:

AGS UAV only program. Both studies explore areas of cooperation which will provide NATO commanders with a highly capable C2ISR system, enabling out of area alliance operations in support of crisis world-wide.

What is the Scope of a typical AGS&R Project?

The effective integration of national and NATO ISR capabilities into the wider NATO Joint ISR architecture covers a very wide range of activities. The acquisition and implementation for a AGS&R capability encompasses the full spectrum of activities, from capturing particular system requirements, detailed requirements specification, acquisition and procurement, provisioning, physical installation, validation and testing, training, documentation, to ultimately the final commissioning and hand-over of the AGS&R capability to the final customer (ISAF, Nations).

Predominantly, these projects focus on interoperability, an area that includes operational as well as technical aspects and is typically performed in cooperation with many of the wide range of C4ISR capabilities. Operationally, the projects may include supporting the development of joint Concepts of Operation (CONOPS), Concepts of Employment (CONEMP) and Tactics, Techniques and Procedures (TTP), issues that are essential for efficient employment and use of ISR systems from multiple nations in a multinational or coalition environment. Conversely, the technical aspects include capturing and defining interface requirements based on common standards and methods (for NATO typically based on Standardisation Agreements (STANAGs), providing technical advice support to national and NATO contracting authorities, and organising and executing test and verification activities.

Other project activities can include general technical support to ISR system-level requirements capture, analysis of specifications and proposed solutions, and support to NATO as well as national contract development and execution. Furthermore, research and development activities in this area, as well as analysis, feasibility studies and field tests of promising technology in order to validate its potentials, are key to keeping up with the rapid evolution of available capabilities.

What can NC3A offer to Nations?

NC3A can provide unique and valuable support in the acquisition and implementation processes, as well as, continuing evolution and integration of advanced AGS&R capabilities into the wider NATO JISR environment. The Agency offers unique expertise to help develop requirements for bi- and multi-lateral interoperability within the NATO domain, as well as the facilities for testing and demonstrating the developed capabilities in a secure and non-biased environment. This environment includes the use of various interconnected laboratories at NC3A to support developmental testing activities, but also support during live-fly tests, exercises or demonstrations aimed at verifying the developed capabilities.

NC3A is also in a unique position to offer operational expertise to support coordination and development of operational concepts, doctrine and procedures for effective operations within the NATO environment, efforts that are undertaken in conjunction with various national and NATO operational authorities to ensure that the results are relevant and receive operational acceptance.

NC3A is also able to conduct in-depth analysis of actual and proposed ISR systems and updates thereof to assess their technical and operational performance, not only as a standalone capability but also as an integral part of the NATO JISR environment. Such analyses can be performed in support of a range of purposes, including NATO and national activities to plan for future defence capabilities, requirements capture and definition, contract development, cost-performance based prioritisation of requirements and capabilities, and system security accreditation within NATO operations.

In case of common NATO funding the NATO Security Investment Programme (NSIP) requires sound justifications in support of a new capability. This typically demands the compilation of a cost estimate in the format of a NATO-standardised Type-B Cost Estimate (TBCE). The TBCE is the 'Business Case' for authorisation by the NATO Infrastructure Committee (IC). The TBCE shall prove that the NATO Minimum Military Requirements (MMR) are met, but not exceeded, identify risks and propose mitigation actions, and include implementation as well as Operations and Maintenance cost estimates.

Based on its record of delivering integrated AGS&R capability well ahead of schedule, NC3A offers the necessary technical expertise to support not only the detailed technical requirements specification and acquisition processes, formalised with the definition of the Statement of Work (SoW) and the issuing of an Invitation for Bid (IFB) to Industry, but also to provide the required technical consultancy in the best technology available to conduct AGS&R.

NC3A has an extensive track record on the evaluation of industry proposals in order to identify the most attractive bid from the technical point of view as well as from the financial aspect. Evaluation processes are executed following standardised and proven procedures and involving multi-national subject matter experts in determining the best offers. Evaluation can be done in a Best Value Evaluation methodology (BV), or alternatively by selecting the Lowest Compliant Bid (LCB). NC3A has successfully implemented and optimised both evaluation methodologies with great success. NC3A possesses the project management capabilities and technical expertise to follow-up such acquisition projects during the execution of the work by the Contractor up to the final commissioning of the system.

What are the services provided by NC3A?

NC3A has a highly-skilled, interdisciplinary team which can cover all aspects of implementing successful airborne ground surveillance capabilities. In particular, NC3A can provide the following services:

1. **AGS&R Operational and Technical Concept Development and Experimentation (CD&E)**
   NC3A provides a broad range of state of the art CD&E capabilities, using this proven best practice process to develop and evaluate new concepts before commitment of extensive resources. This includes enabling repetitive or continuous testing of bi- and multilateral interoperability in a non-biased and secure environment, including laboratory and live-fly activities, as well as, supporting final test and verification of interoperability.
2. **Capture of operational and technical user requirements**
   Capture and coordinate operational and technical requirements for system enhancements in the area of interoperability. Capture and analyse the operational requirements for and capabilities of AGS&R systems to enable their characterisation from an operational coordination approach.
3. **Operational Integration**
   Support and coordinate the development or refinement of operational doctrine for the integrated operation of the systems within the NATO domain, including items such as CONOPS, CONEMP and TTPs. Enable demonstration, test and verification of concepts and procedures in a laboratory and live-fly environment in close cooperation with the technical activities
4. **Development of a cost estimate in the required NATO formats**
   Elaborating a NATO-standardised Type-B Cost Estimate (TBCE), covering all cost items, and ultimately obtaining authorision by the respective NATO bodies.
5. **Development of detailed technical Statements of Work**
   Developing a detailed technical Statement of Work (SoW), covering all aspects and requirements on the AGS&R system, incl. requirements on project management, logistics support, documentation, and training.
6. **Issuance of an Invitations For Bid, and inviting Industry to submit Bids**
   Issuing an invitation for Bid (IFB) with all associated documents necessary for 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, up to including the IFB closure by receiving Bids from Industry.
7. **Evaluation of industry proposals and selection of best Bid**
   Thoroughly evaluating Industry Bids from the technical and financial viewpoint. The final result of the proposal evaluation will identify the most attractive Bid.
8. **Establishment of contract, monitoring and control work**
   Upon selection of the Bid, negotiating a Contract with the selected Contractor, following the applicable NATO standards and rules. The project will be kicked off and the work can commence. The progress is closely controlled to ensure that all work is performed in line with the contractually agreed activities and the SoW.
9. **Acceptance and hand-over of the final airborne ground surveillance system to the Nation.**
   Thorough test, evaluation, and verification of all configured systems and sub-systems put into place and configured will undergo thorough testing and verification, witnessed by the Purchaser. Once all verification has been successfully concluded, the AGS&R capability is formally accepted and will be commissioned, as well as all user documentation, manuals and training is going to be delivered to the Purchaser and respectively handed over to the Nation.

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