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COMMITTEE A

Agenda Item 3: Enhancing the global air navigation system 3.4: Civil/military cooperation

A TOTAL SYSTEMS APPROACH TO CIVIL-MILITARY COOPERATION

(Presented by the United States)

EXECUTIVE SUMMARY

This paper presents that the value to the efficiency of the total aviation system is maximized if civil-military cooperation is enhanced at global levels.

The effectiveness of civil-military cooperation is multiplied if a civil-military approach is applied to cover as many items of common interests as possible to facilitate the implementation of mutually beneficial solutions, to enable exchange of know-how on aeronautical technologies, and to maximize the use of available resources. In particular, this approach should not be limited to the concept of just airspace utilization, but could also cover a variety of air traffic management (ATM) and communication, navigation, and surveillance initiatives (CNS) such as performance-based navigation (PBN), automatic dependent surveillance-broadcast (ADS-B), controller pilot data link communications (CPDLC) or to the challenges linked to cyber, the integration of remotely piloted aircraft (RPAS), counter unmanned aircraft systems (UAS) and emerging technologies above flight level 600. One way in which the United States is achieving the required level of cooperation is through North Atlantic Treaty Organization (NATO) and its Aviation Committee.

Action: The Conference is invited to agree to the recommendations in paragraph 3.4.

1. INTRODUCTION

1.1 In October 2009, ICAO hosted the Global Air Traffic Management Forum on Civil/Military Cooperation, which was attended by more than four hundred senior-level civil and military officials from sixty seven Member States, six air navigation service providers (ANSPs) and forty six industry organizations. Given the widespread realization that there was no existing international framework to bring civil and military authorities together, the Forum recommended not only that ICAO play a pivotal role in improving the level of cooperation and coordination between the respective civil and military authorities, but that it should also serve as one of the primary international facilitating platforms. The Forum also recommended that civil and military experts should jointly develop advice and guidance on the best practices for civil-military cooperation.

1.2 Civil and military experts, including North Atlantic Treaty Organization (NATO) members, prepared the ICAO Circular *Civil/Military Cooperation in Air Traffic Management* (Circ 330) which provides guidance on and examples of successful practices for civil-military cooperation. In December 2017 in Montreal, the Second Global Air Navigation Industry Symposium (GANIS/2) and the First Safety and Air Navigation Implementation Symposium (SANIS/1) both underlined the need to consider the military dimension in both the Global Air Navigation Plan (GANP) and the aviation system block upgrade (ASBU) frameworks.

1.3 Regardless of the new and increasing numbers of new entrants into the aviation domain and their related impacts on the balance between civil-military cooperation or the global aviation system, the system continues to operate best when all stakeholders work together in a cooperative manner and the respective civil-military balance is maintained. In this dynamic environment, civil and military authorities seek cooperation with various partners and stakeholders to help promote global stability - one way in which the United States works cooperatively with its partners is through NATO and its Aviation Committee. (NATO AVC)

2. DISCUSSION

2.1 Airspace is a shared resource in which civil and military interoperability requirements need accommodation. As a new landscape emerges with new institutional settings, technologies and approaches to regulation, there is an increasing risk to shift away from civil-military cooperative efforts – or introducing the potential for more intense competition between civil and military operations and airspace requirements that could potentially put military requirements at risk.

2.2 The air traffic management (ATM) landscape is a complex environment in terms of technology, regulations, standards and institutional setting, where both civil and military operations and services must cooperate. Increasing reliance on inter-connected ATM systems, new services, and the increased use of digital technologies creates cyber vulnerabilities in the ATM ecosystem, which is also a key consideration when cooperating with the military. Greater cooperation is required in all domains.

2.3 However, cooperation is more than just equipping aircraft or releasing military airspace; it must also include holistic strategic planning which critically includes full military engagement and decision-making. This will only be achieved if all actors are willing to involve the military at all levels, from strategic decisions, which may involve significant institutional changes to technical discussions regarding standards development. The military needs to be formally consulted with at national, regional and global levels in addition to joint consultations with their respective civil aviation authorities and ANSPs. Current mechanisms should not only be respected whatever evolution takes place on the civil side (institutional and technological), but they should also be improved to ensure effective cooperation.

2.4 Cooperation at the global level is mainly channeled through ICAO. More specific cooperation in modernization-related programs such as the United States' NextGen and the European SESAR (Single European Sky ATM Research) is achieved through the Federal Aviation Administration (FAA) and SESAR Joint Undertaking (SJU). The FAA and SJU have committed to a most extensive harmonization program, primarily focused around five main issue areas; Remotely piloted aircraft systems (RPAS) and cybersecurity; information management; trajectory management; communication, navigation and surveillance (CNS) and airborne interoperability; and collaboration projects. Military involvement in these areas is essential and collaboration across the spectrum of national, regional and global initiatives must also be fostered on both civil and military sides. In this context, NATO serves as a bridge between SJU and the FAA to better enable the involvement of the military in a global context. It is

essential that the two cross-Atlantic initiatives are harmonized and interoperable to support the global goal as articulated in the ICAO GANP and ASBUs.

2.5 The NATO AVC is committed to enhancing cooperation with all aviation partners and respond effectively in crisis situations as a global partner. It is a global platform of Member States that not only serves as a conduit, but offers a structure for collaboration amongst allies and partners to address global aviation-related challenges and find solutions. As an example, the NATO AVC has hosted international organizations such as ICAO and the International Air Transport Association (IATA), as well as non-NATO Member State partners such as Japan, Australia and New Zealand. The NATO AVC was organized to support the implementation of NATO's Total System Approach to Aviation, which addresses policies, procedures and standards for air activities, aircraft and personnel.

2.6 In addition, NATO, due to its seventy years' of experience in regional and global affairs, has become adept at developing policies and guidance through consultation and consensus, particularly when it comes to global security implications. NATO policies and positions, based on consensus are an important baseline for cooperation between allies and civil partners.

2.7 **A total system aviation approach**

2.7.1 The United States follows and supports NATO's implementation of a Total System Approach to Aviation (TSAA), which ensures holistic consideration of all technical, organizational, procedural and human factors. TSAA contributes to the mitigation of hazards and risks to the safety and security of air activities conducted by both manned and unmanned aircraft.

2.7.2 NATO TSAA consists of a structured process with gradual, linked and spiral developments aimed at global air mobility and interoperability of military aviation during both peacetime, contingency and crisis, with a focus on the following main capability areas:

- a) policies, procedures and standards for air activities of military aircraft, in the domains of ATM, aeronautical CNS, airfields, airspace integration, security and civil-military cooperation;
- b) policies, procedures and standards for the safety and integrity of aircraft operations, ensuring recognition of national airworthiness authorities and consideration of cyber threats to aviation; and
- c) policies and standards for personnel employed in NATO missions and operations in the accomplishment of aviation-related tasks, including pilots, controllers and other operators.

2.8 **Military and performance-based/operations-based regulations**

2.8.1 New technologies frequently beget new investments; and, unfortunately, no positive cost benefit analysis exists for military investments in ATM system efficiency improvements. For this key reason, it is important for the military to demonstrate that the performance of their systems is equivalent to those on the civil side. Therefore, when the acquisition of new equipment is not possible, "performance equivalence" (PE) solidly justifies such investments considering a concept, which also supports an alternative certification process when possible (i.e. performance equivalence).

2.8.2 For military aircraft, PE is "the ability to meet the required functional attributes of ATM/CNS systems against the performance, safety, security and interoperability requirements of

regulated airspace. This includes the measurable (e.g. metrics from regulations and standards) and non-measurable functional requirements (e.g. procedures or technical architecture), demonstrated through the evaluation of accuracy, integrity, continuity of function and availability.”

2.8.3 NATO is currently conducting a study on performance equivalence which, among others, outlines key elements of a strategic approach for the military towards compliance with civil ATM/CNS requirements with due regard to safety, while also highlighting the main goals of civil-military and military-military interoperability. As an outcome of the study, NATO is hoping to recommend standardized, non-binding, guidance and processes, based on best practices and industry standards, which could facilitate harmonized national approaches to the validation and operational approvals of the equivalent levels of performance and safety of military aircraft, where applicable.

2.8.4 The new performance based regulatory process is a window of opportunity for the military to examine new processes in this field. The United States is exploring ways and means to ensure civil-military interoperability through the processes of PE for State aircraft. However, even this solution may not always be feasible and the possibility for military to have exemptions should always be respected.

3. CONCLUSION

3.1 Military requirements for civil-military cooperation are very specific, with national and NATO missions and operations aiming to ensure a secure global environment that necessitates mobility, interoperability and security of information and data.

3.2 Civil-military cooperation across a wide array of issue areas – from research to operational implementation -- is therefore essential. Military requirements should be considered in all decision-making initiatives with regard to procedures, regulation, technologies and organizations, at local, regional and global levels.

3.3 Currently, military are formally consulted at national, regional and global levels. Current mechanisms should not only be respected whatever evolution (institutional and technological) takes place on the civil side, but improved to ensure effective cooperation and increased safety in the aviation.

3.4 The Conference is invited to agree to the following recommendations:

- a) encourage ICAO and States to consider the military as a key partner, and foster civil-military cooperation and collaboration through the use of existing platforms or new collaboration mechanisms (e.g. utilizing a similar framework to the NATO Total System Aviation Approach) that allow for global exchange;
- b) request ICAO and States to achieve civil-military cooperation through collaboration with other international organizations at local, regional and network levels in order to find balance between civil predictability and military flexibility utilizing further development of appropriate performance equivalence (PE) solutions;
- c) urge ICAO to continue collaboration with the military in the development of the *Manual on Civil-Military Cooperation in Air Traffic Management* (Doc 10088); and
- d) request ICAO to include civil military cooperation and collaboration in the *Global Air Navigation Plan* (Doc 9750) and consider military interests in the updated aviation system block upgrades (ASBUs).