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TECHNICAL COMMISSION

Agenda Item 28: Aviation Safety and Air Navigation Policy

CIVIL-MILITARY COOPERATION AND FLEXIBLE USE OF AIRSPACE IN INDIA

(Presented by India)

EXECUTIVE SUMMARY

This paper provides information about the progress made by India in implementing the flexible use of airspace (FUA) concept. It highlights the improvements in mutual trust, understanding and cooperation between the military and civil aviation agencies achieved through better coordination at strategic airspace management (ASM) levels and through effective communication and training. The paper also discusses the plans for establishment of airspace management cells (AMC) in a phased manner, sharing of surveillance data between military and civil air traffic services (ATS) units to improve tactical airspace management and the benefits accrued through civil-military cooperation.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objectives: Air Navigation Capacity and Efficiency.
<i>Financial implications:</i>	Nil
<i>References:</i>	Doc 9750, <i>Global Air Navigation Plan (GANP) - B0-FRTO: Improved operations through enhanced en-route trajectories, GPI-1 “Flexible Use of Airspace”</i> .

1. INTRODUCTION

1.1 The proposal for implementation of flexible use of airspace (FUA) in India was formally approved by the Government of India in March 2013. Subsequently, National High Level Airspace Policy Body (NHLAPB), with the primary responsibility of implementing FUA in India, came into existence on 24 October 2013. The National Airspace Management Advisory Committee (NAMAC) was also established to assist NHLAPB in realizing its objectives.

1.2 NHLAPB authorised an ad hoc subcommittee, comprising of members from civil as well as military, to prepare a manual on FUA. The first version of the manual on FUA was released on 28 August 2014 which was later validated through a live exercise in the presence of stakeholders. The Manual on FUA version 1.0 thus became the guidance material and reference document for the implementation of FUA in India.

1.3 The purpose of this paper is to inform the Member States about India's progress in civil-military cooperation, particularly in the area of airspace management, through effective application of the principles of flexible use of airspace.

2. DISCUSSION

2.1 Progress in strategic airspace management

2.1.1 Five NHLAPB meetings have been conducted since 2013 to take important high-level decisions pertaining to flexible use of airspace. Sixteen NAMAC meetings have been conducted so far for realizing the objectives of NHLAPB and find early solutions to airspace-related issues between military and civil units. Participation of the regulator (DGCA) in the NHLAPB and NAMAC meetings has resulted in faster decision-making.

2.1.2 39 temporary segregated areas (TSA) and temporary reserved areas (TRA) have been established for use by the military. 24 conditional routes (CDR) have also been established for use by airlines. Proposals for creation of more TRA, TSA and CDR are being processed by Airports Authority of India (AAI), the civil air navigation service provider (ANSP).

2.1.3 The process of reviewing existing danger (D) and restricted (R) areas under the military is underway. AAI is negotiating with defence authorities for de-notification of unused D/R areas and for converting D/R areas into either TRA/TSA or AMC-manageable D/R areas. It has been generally agreed that no more rigid airspace structures will be established unless particularly important for national security. De-notification or realignment of under-utilized danger and restricted areas under military is also being carried out.

2.1.4 Joint airspace review and design workshops are being conducted at regular intervals which help in bridging gaps in understanding leading to confidence building and early resolution of differences. AAI has conducted many such meetings with Indian Air Force (IAF), Indian Navy (IN) and other agencies such as Indian Space Research Organization (ISRO) and Defence Research and Development Organization (DRDO) to resolve airspace related issues.

2.2 Improvements in civil/military cooperation

2.2.1 ICAO Circ 330, *Civil/Military Cooperation in Air Traffic Management* stresses on the importance of good civil-military communication and collaboration which are key elements for efficient air traffic management (ATM) around the world. Good communication and mutual understanding enable building collaboration upon a solid foundation.

2.2.2 India has identified that mutual trust and cooperation between civil and military agencies can be significantly improved through interactions and training, with the intent of bringing about a cultural change on both sides. This will lead to better acceptance of each other's needs and create awareness about the immense potential of FUA in realising benefits such as fuel saving and reduced carbon emissions.

2.2.3 AAI has conducted many training programmes for military and civil ATS personnel and other airspace users since 2013. More than 700 military personnel and 1 000 civil ATS personnel have been trained on FUA as on date.

2.2.4 An important aspect of civil-military cooperation is the familiarization of civil and military ATS personnel with each other's working environment, procedures and the systems they use for discharging their responsibilities and their requirements and limitations. Based on the NAMAC decision to organize such familiarizations visits, AAI has effected necessary coordination for scheduling the visits of civil controllers to IAF / Indian Navy and Hindustan Aeronautics Limited (HAL) ATC units and vice versa.

2.2.5 Formal channels of communication between adjacent civil and military ATC units are being made more effective through letters of agreement (LOAs) and standard operating procedures (SOPs). Existing LOA and SOP between civil and military ATC units are being reviewed incorporating principles of FUA. LOA/SOP are being established between civil and military units which do not have any formal agreements existing. This includes LOA for making use of military airspace when not being used by military units.

2.3 Establishment of airspace management cells (AMC)

2.3.1 AMC are joint civil-military ASM focal points which have the authority to conduct pre-tactical and tactical ASM within the framework of the State's airspace structures, priority rules and negotiation procedures as laid down by the NHLAPB. India will establish four regional AMCs (R-AMC) and one national AMC (N-AMC) to manage pre-tactical and tactical ASM.

2.3.2 R-AMC will be established at the four major ATS centres at Chennai, Delhi, Kolkata and Mumbai. The RAMCs will work under the supervision of the N-AMC to be located at Delhi, which will be collocated with the central command centre (CCC) of the air traffic flow management (ATFM) system. RAMCs will work in tandem with flow management position (FMP) of ATFM established at the four ATS centres.

2.3.3 AMCs will be vested with the responsibility of pre-tactical allocation of temporary airspaces (TRA, TSA etc.) and CDR. Each R-AMC will be responsible for allocation of the FUA structures within the corresponding FIR. AMC will, in near term, also handle tactical allocation of ad hoc airspaces through dynamic airspace management (DAM).

2.3.4 India has planned establishment of RAMCs in a phased manner. Owing to the limited number of FUA structures established so far, R-AMC will be established only at Delhi initially, which will also act as the N-AMC. The R-AMC/N-AMC at Delhi will be collocated with the ATFM central command centre (CCC) near Indira Gandhi International Airport in Delhi. More R--AMCs will be established in a time bound manner based on the requirement.

2.3.5 Trial operation of Delhi AMC was conducted from 27 February to 10 March 2017 in collaboration with the representatives from IAF, Indian Navy, airline operators and airport operators. The live trials highlighted some important issues which need to be addressed before AMCs can be established on permanent basis.

2.3.6 Preparations are underway to establish at least one R-AMC along with the N-AMC on permanent basis before 31 December 2019.

2.4 Sharing of resources between civil and military agencies

2.4.1 Indian civil and military agencies have been sharing their resources for a long time. Navigation aids such as non-directional radio beacon (NDB), very high frequency (VHF) omnidirectional radio range (VOR), distance measuring equipment (DME) and instrument landing system (ILS) at most of

the joint user airports were installed and are being maintained by AAI. Further, at joint user airports, ATS is being provided by military whereas services such as apron management service of civil apron(s) and terminal management are being looked after by AAI.

2.4.2 Search and rescue is another area where civil military cooperation exists. Indian Air Force, Indian Navy and Indian Coast Guard are actively involved in search and rescue operations involving aircraft in distress.

2.4.3 AAI has shared surveillance data from many of its radars with IAF ATC and air defence units for improved situational awareness of military controllers. IAF and Indian Navy have agreed in principle to share the data from their ATC radars with civil ATC centres of AAI. AAI and the military have identified four military radar stations as pilot projects for surveillance data sharing,

2.5 Coordination for airspace closures

2.5.1 Large volumes of airspace get closed during launch of rockets and test firing of missiles. Even though the actual duration of the launch may be between 30 to 60 minutes, airspaces get blocked for up to four hours daily for many days. Even after the launch is over and the airspace released by the airspace user, timely cancellation of the airspace closure NOTAMs may not happen due to delay in receipt of the information by the concerned States or ANSPs and/or due to the delay in the aeronautical information service (AIS) process.

2.5.2 In order to reduce delayed cancellation of such NOTAM, India took early steps to address the issue of improper management of airspace closures. Since 2015, AAI had series of meetings and interactions with Indian Space Research Organization (ISRO) and Defence Research and Development Organization (DRDO) to streamline the process of airspace closures during their activities. This resulted in bringing down the airspace closure windows substantially and also improve advance notification period to ensure adherence with Annex 15 — *Aeronautical Information Services Standards and Recommended Practices*.

2.6 Benefits of flexible use of airspace

2.6.1 Airline operators save significant amount of fuel through shorter routing options on CDR passing through military airspace. Use of CDR1 and CDR2 routes will result in additional advantage of flight planning which saves the “cost to carry fuel”.

2.6.2 A direct benefit of shorter routing of aircraft on CDRs is better ATM by ATS units. Airspace capacity increases due to faster disposal of traffic along shorter routes. It will also enable more efficient performance of ATFM system, as multiple routing options will be available for better management of air delay. Shorter routing options, especially which provide flight planning advantage, also improve operational efficiency of airline operators by better fleet utilization and improved on time performance (OTP).

2.6.3 Creation of flexible airspace structures such as TSA and TRA and allocating the TSA/TRA pre-tactically through AMC will result in reduced occupation of airspace by military. Rigid airspace structures such as danger areas and restricted areas are inaccessible to non-military aircraft either on permanent basis or as when activated through NOTAM. In both these cases, actual use of danger areas and restricted areas by military may be significantly less than the published information, as the decisions to activate the airspaces are taken much before the actual day of operation and hence the projected requirement may be significantly greater than the actual requirement. In the trial operation of Delhi AMC, which was conducted in the months of February and March 2017, use of pre-tactically allocated

TSA/TRA by military was approximately 40 per cent less than the typical strategic allocation through NOTAM.

2.6.4 Cost effectiveness of FUA may not always be tangible. Besides the obvious benefit of saving fuel by aircraft operators, there are other long-term benefits such as reduction in carbon footprint and reduction in cost of flying when airline operators accrue significant savings due to shorter routing options. For the military, availability of ad hoc local flying areas nearer to the air bases, which hitherto would not have been possible due to presence of ATS routes, will reduce the cost of operations. Dynamic management of airspace under FUA will ensure availability of airspace for military flying at short notice, resulting in reduced planning and preparatory expenditure including burning of fuel on ground due ATS coordination delays.

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