

MODULE –IV

ICAO, AIR SPACE AND AIR TRAFFIC MANAGEMENT

PART -1

WING COMMANDER K VENUGOPAL (RETD)

ICAO INSTITUTIONAL AND REGULATORY FRAMEWORK

INSTITUTIONAL FRAMEWORK

- ▶ AIMS AND OBJECTIVES IN ACCORDANCE WITH ARTICLE 44 OF THE CONVENTION ON INTERNATIONAL CIVIL AVIATION (DOC 7300) ARE
 - ▶ TO DEVELOP THE PRINCIPLES AND TECHNIQUES OF INTERNATIONAL AIR NAVIGATION
 - ▶ FOSTER THE PLANNING AND DEVELOPMENT OF INTERNATIONAL AIR TRANSPORT TO, INTER ALIA, ENSURE SAFE AND ORDERLY GROWTH
- ▶ ESTABLISHES PRIVILEGES AND RESTRICTIONS OF ALL MEMBER STATES AND PROVIDES FOR ADOPTION OF INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES (SARPS) REGULATING INTERNATIONAL AIR TRANSPORT
- ▶ RECOGNIZES AND ACCEPTS THE PRINCIPLE THAT EVERY STATE HAS COMPLETE AND EXCLUSIVE SOVEREIGNTY OVER THE AIRSPACE ABOVE ITS TERRITORY.
- ▶ ICAO ASSEMBLY AND COUNCIL AND THEIR SUBSIDIARY BODIES SET CONTINUING DIRECTION OF THE ORGANIZATION
- ▶ ONE OF THE MAJOR DUTIES OF THE COUNCIL IS TO ADOPT SARPS, WHICH ARE DESIGNATED AS ANNEXES TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION.
- ▶ ALTHOUGH COUNCIL IS RESPONSIBLE FOR ADOPTION OF SARPS AND APPROVAL OF PROCEDURES FOR AIR NAVIGATION SERVICES (PANS), THE PRINCIPAL BODY CONCERNED WITH THEIR DEVELOPMENT IS THE ICAO AIR NAVIGATION COMMISSION
- ▶ COMMISSION IS COMPOSED OF QUALIFIED AND EXPERIENCED INDIVIDUALS IN THE SCIENCE AND PRACTICE OF AERONAUTICS, NOMINATED BY ICAO MEMBER STATES AND APPOINTED BY THE COUNCIL
- ▶ DUE TO INCREASED DIALOGUE AND A CHANGING CULTURE, CIVIL/MILITARY COOPERATION IS BECOMING A GLOBAL TOPIC BECAUSE OF THE ENORMOUS POSITIVE EFFECTS FOR BOTH CIVIL AND MILITARY AIR TRAFFIC MANAGEMENT (ATM) SYSTEMS AND RELATED AVIATION OPERATIONS

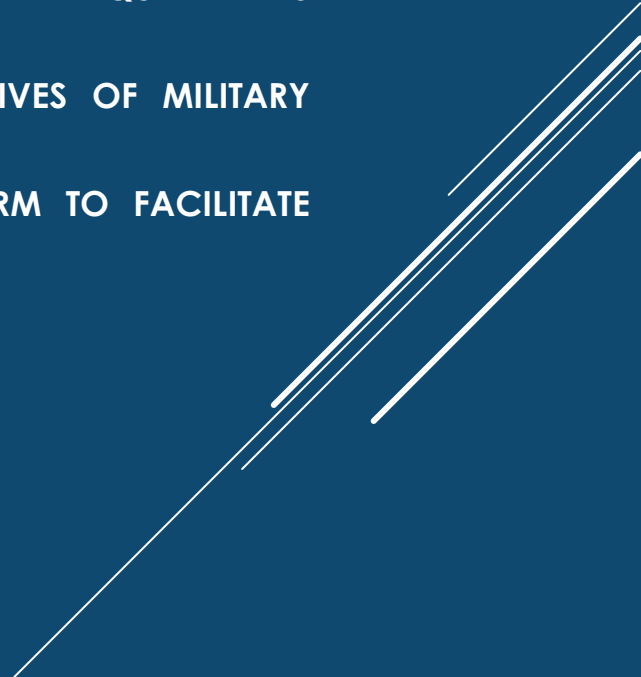
ICAO INSTITUTIONAL AND REGULATORY FRAMEWORK

ARTICLE 3 OF THE CONVENTION

- ▶ ARTICLE 3 (A) EXPRESSLY EXCLUDES STATE AIRCRAFT FROM ITS SCOPE OF APPLICABILITY
- ▶ ARTICLES 3 (B), (C) AND (D) FURTHER CLARIFY THE DEFINITION AND SCOPE OF APPLICATION OF THE ARTICLES OF THE CONVENTION:
 - ▶ CONVENTION APPLICABLE ONLY TO CIVIL AIRCRAFT, AND NOT APPLICABLE TO STATE AIRCRAFT
 - ▶ AIRCRAFT USED IN MILITARY, CUSTOMS AND POLICE SERVICES DEEMED TO BE STATE AIRCRAFT
 - ▶ NO STATE AIRCRAFT OF A CONTRACTING STATE SHALL FLY OVER THE TERRITORY OF ANOTHER STATE OR LAND THEREON WITHOUT AUTHORIZATION BY SPECIAL AGREEMENT OR OTHERWISE, AND IN ACCORDANCE WITH THE TERMS THEREOF
 - ▶ ICAO CONTRACTING STATES UNDERTAKE, WHEN ISSUING REGULATIONS FOR THEIR STATE AIRCRAFT, THAT THEY WILL HAVE DUE REGARD FOR THE SAFETY OF NAVIGATION OF CIVIL AIRCRAFT
- ▶ NOTWITHSTANDING, REFERENCES TO CIVIL/MILITARY COORDINATION AND COOPERATION MATTERS INCLUDED, RESOLUTIONS OF ICAO GENERAL ASSEMBLIES, ICAO ANNEXES, PANS, AND A VARIETY OF DOCUMENTS AND MANUALS
- ▶ ARTICLE 3(D)- STATES REQUIRED TO SAFEGUARD NAVIGATION OF CIVIL AIRCRAFT WHEN SETTING RULES FOR THEIR STATE AIRCRAFT. INDIVIDUAL STATE TO REGULATE THESE OPERATIONS AND SERVICES, GENERATING A WIDE DIVERSITY OF MILITARY REGULATIONS. IN CONGESTED AIRSPACE, HARMONIZED REGULATION IS A PRECONDITION FOR A SAFE, EFFICIENT AND ECOLOGICALLY SUSTAINABLE AVIATION SYSTEM
- ▶ STATES AWARE OF LIMITATIONS OF ICAO SARPS AND DESIGNATED ANNEXES TO CONVENTION, INCLUDING PANS AND REGIONAL SUPPLEMENTARY PROCEDURES (SUPPS), AS THEY RELATE TO STATE/MILITARY AIRCRAFT AND THEIR SERVICES. ARTICLE 3 OF CONVENTION SPECIFICALLY EXEMPTS STATE AIRCRAFT FROM COMPLIANCE WITH ARTICLES OF THE CONVENTION
- ▶ ANNEX 11 — AIR TRAFFIC SERVICES ALLOWS STATES TO DELEGATE RESPONSIBILITY FOR PROVISION OF ATS TO ANOTHER STATE., STATES RETAIN SOVEREIGNTY OVER THE AIRSPACE SO DELEGATED, AS CONFIRMED BY THEIR ADHERENCE TO THE CONVENTION. REQUIRE ADDITIONAL EFFORT OR COORDINATION IN RELATION TO CIVIL/MILITARY COOPERATION AND APPROPRIATE CONSIDERATION IN BI OR MULTILATERAL AGREEMENTS
- ▶ MULTINATIONAL MILITARY OPERATIONS THAT CROSS INTL BOUNDARIES REQUIRE COMPLEX COORDINATION AND PLANNING TO AVOID UNNECESSARY SEGREGATION OR RESTRICTIONS AND TO ACHIEVE THE REQUIRED LEVEL OF SAFETY.
- ▶ IN LIGHT OF ARTICLE 3 (D) IT SHOULD BE THE ROLE OF ICAO TO SUPPORT STATES IN HARMONIZING THEIR STATE AIRCRAFT OPERATIONS AND THE RESPECTIVE SERVICES IN A REGIONAL AND, IDEALLY, A GLOBAL CONTEXT.

ICAO INSTITUTIONAL AND REGULATORY FRAMEWORK

ASSEMBLY RESOLUTIONS

- ▶ THE TOPIC OF CIVIL/MILITARY COORDINATION HAS BEEN DISCUSSED OVER THE YEARS IN THE ICAO ASSEMBLY, AND MANY RESOLUTIONS REFERRING TO CIVIL/MILITARY COORDINATION HAVE BEEN FORMULATED
 - ▶ AT THE 37TH SESSION OF THE ASSEMBLY, 28 SEPTEMBER TO 8 OCTOBER 2010, RESOLUTION A37-15, APPENDIX O, "COORDINATION AND COOPERATION OF CIVIL AND MILITARY AIR TRAFFIC" WAS FURTHER ARTICULATED.
 - ▶ RECOGNIZED THAT AIRSPACE IS A RESOURCE COMMON TO BOTH CIVIL AND MILITARY AVIATION AND THAT MANY AIR NAVIGATION FACILITIES AND SERVICES ARE PROVIDED FOR AND USED BY BOTH CIVIL AND MILITARY AVIATION
 - ▶ SHARED USE OF AIRSPACE AND CERTAIN FACILITIES AND SERVICES BY CIVIL AND MILITARY AVIATION SHALL BE ARRANGED TO ENSURE THE SAFETY, REGULARITY AND EFFICIENCY OF INTERNATIONAL CIVIL AVIATION AS WELL AS THE REQUIREMENTS OF MILITARY AIR TRAFFIC
 - ▶ AS A CONSEQUENCE, ICAO MEMBER STATES MAY INCLUDE, WHEN APPROPRIATE, REPRESENTATIVES OF MILITARY AUTHORITIES IN THEIR DELEGATIONS TO ICAO MEETINGS
 - ▶ 37TH ASSEMBLY ALSO CONCLUDED THAT ICAO SHOULD SERVE AS AN INTERNATIONAL PLATFORM TO FACILITATE IMPROVED CIVIL/MILITARY COOPERATION, COLLABORATION AND THE SHARING OF BEST PRACTICES
- 
- A series of three parallel white diagonal lines extending from the bottom right corner towards the center of the slide.

EXISTING REGULATORY FRAMEWORK

ASSEMBLY RESOLUTIONS

- ▶ THE TOPIC OF CIVIL/MILITARY COORDINATION HAS BEEN DISCUSSED OVER THE YEARS IN THE ICAO ASSEMBLY, AND MANY RESOLUTIONS REFERRING TO CIVIL/MILITARY COORDINATION HAVE BEEN FORMULATED
- ▶ AT THE 37TH SESSION OF THE ASSEMBLY, 28 SEPTEMBER TO 8 OCTOBER 2010, RESOLUTION A37-15, APPENDIX O, "COORDINATION AND COOPERATION OF CIVIL AND MILITARY AIR TRAFFIC" WAS FURTHER ARTICULATED.
- ▶ RECOGNIZED THAT AIRSPACE IS A RESOURCE COMMON TO BOTH CIVIL AND MILITARY AVIATION AND THAT MANY AIR NAVIGATION FACILITIES AND SERVICES ARE PROVIDED FOR AND USED BY BOTH CIVIL AND MILITARY AVIATION
- ▶ SHARED USE OF AIRSPACE AND CERTAIN FACILITIES AND SERVICES BY CIVIL AND MILITARY AVIATION SHALL BE ARRANGED TO ENSURE THE SAFETY, REGULARITY AND EFFICIENCY OF INTERNATIONAL CIVIL AVIATION AS WELL AS THE REQUIREMENTS OF MILITARY AIR TRAFFIC
- ▶ AS A CONSEQUENCE, ICAO MEMBER STATES MAY INCLUDE, WHEN APPROPRIATE, REPRESENTATIVES OF MILITARY AUTHORITIES IN THEIR DELEGATIONS TO ICAO MEETINGS
- ▶ 37TH ASSEMBLY ALSO CONCLUDED THAT ICAO SHOULD SERVE AS AN INTERNATIONAL PLATFORM TO FACILITATE IMPROVED CIVIL/MILITARY COOPERATION, COLLABORATION AND THE SHARING OF BEST PRACTICES

EXISTING REGULATORY FRAMEWORK

- ▶ OBLIGATIONS OF ICAO MEMBER STATES UNDER THE CHICAGO CONVENTION TO CIVIL/MILITARY ISSUES INCLUDE:
 - ▶ RULE-MAKING AS REGARDS AVIATION SAFETY RULES IN COMPLIANCE WITH ICAO SARPS CONTAINED IN THE ANNEXES TO THE CONVENTION (ARTICLE 37); AND
 - ▶ CARRYING OUT TASKS WHICH PERTAIN TO, FOR INSTANCE, ATM AND WHICH ARE LAID DOWN IN THE ANNEXES TO THE CONVENTION, SUCH AS THE CLASSIFICATION OF AIRSPACE AND COORDINATION BETWEEN CIVIL AND MILITARY AIR TRAFFIC.

ANNEX 2 — RULES OF THE AIR CONTAINS RULES RELATING TO THE FLIGHT AND MANOEUVRE OF AIRCRAFT WITHIN THE MEANING OF ARTICLE 12 OF THE CONVENTION

- ▶ IT INCLUDES PROVISIONS ON THE COORDINATION WITH MILITARY AUTHORITIES FOR REASON OF A STATE'S TERRITORIAL INTEGRITY AND SOVEREIGNTY, NAMELY FOR AIR DEFENCE REASONS
- ▶ TO FACILITATE COORDINATION WITH APPROPRIATE MILITARY UNITS, A FLIGHT PLAN HAS TO BE SUBMITTED FOR ANY FLIGHT WITHIN OR INTO DESIGNATED AREAS OR ALONG DESIGNATED ROUTES
- ▶ IN THOSE INSTANCES A FLIGHT PLAN IS SUBMITTED TO FACILITATE COORDINATION AND CONTROL OF FLIGHTS WITH TRANSPARENT AND REAL-TIME DATA EXCHANGE.

ANNEX 11 CONTAINS THE SARPS THAT STATES USE AS REFERENCE FOR THE PROVISION OF AIR TRAFFIC SERVICES (ATS)

- ▶ CURRENTLY, THE ANNEX ADDRESSES ONLY THE NEED FOR COORDINATION WITH MILITARY AUTHORITIES OR UNITS, MAINLY THE DEGREE AND LEVEL TO WHICH STATE AIRCRAFT ACTIVITIES MAY AFFECT CIVILIAN OPERATIONS OR VICE VERSA
- ▶ TOPICS COVERED INCLUDE ACTIVITIES THAT MAY DIRECTLY AFFECT FLIGHT SAFETY, BE POTENTIALLY HAZARDOUS TO CIVIL AIRCRAFT, OR REQUIRE INTERCEPTION OF CIVIL AIRCRAFT OR COORDINATION DUE TO UNLAWFUL INTERFERENCE OF AIR TRAFFIC.

EXISTING REGULATORY FRAMEWORK

- ▶ THE PROCEDURES FOR AIR NAVIGATION SERVICES — AIR TRAFFIC MANAGEMENT (PANS-ATM, DOC 4444), TOGETHER WITH STANDARDS IN ANNEX 2 AND THE REGIONAL SUPPS, GOVERN APPLICATION OF RULES OF THE AIR AND ATS
- ▶ PANS-ATM CONTAINS PROCEDURES APPLICABLE TO OTHER IN-FLIGHT CONTINGENCIES, SUCH AS STRAYED OR UNIDENTIFIED AIRCRAFT, THAT INVOLVE COORDINATION WITH MILITARY AUTHORITIES
- ▶ SOME MISCELLANEOUS PROCEDURES ARE DETAILED FOR THE CONDUCT OF SPECIAL MILITARY OPERATIONS.

MANUAL CONCERNING SAFETY MEASURES RELATING TO MILITARY ACTIVITIES POTENTIALLY HAZARDOUS TO CIVIL AIRCRAFT OPERATIONS (DOC 9554) DESCRIBES COORDINATION THAT SHOULD TAKE PLACE BETWEEN MILITARY UNITS AND ATS UNITS. DETAILS REQUIREMENTS TO ESTABLISH AND MAINTAIN CLOSE COOPERATION WITH MILITARY AUTHORITIES RESPONSIBLE FOR ACTIVITIES THAT MAY AFFECT FLIGHTS OF CIVIL AIRCRAFT

AIR TRAFFIC SERVICES PLANNING MANUAL (DOC 9426), PUBLISHED IN 1984, WAS ONE OF THE FIRST MANUALS TO PROVIDE ICAO GUIDANCE MATERIAL ON CIVIL/MILITARY COORDINATION AND COOPERATION. MOST OF THAT GUIDANCE MATERIAL REMAINS VALID TODAY

GLOBAL AIR NAVIGATION PLAN (DOC 9750) HAS AS A FINAL GOAL THE ACHIEVEMENT OF AN INTEGRATED, HARMONIZED AND GLOBALLY INTEROPERABLE ATM SYSTEM

- ▶ A GLOBAL SYSTEM CAN BE DESCRIBED AS A WORLDWIDE SYSTEM THAT, ON A GLOBAL BASIS, ACHIEVES INTEROPERABILITY AND SEAMLESSNESS ACROSS REGIONS FOR ALL USERS DURING ALL PHASES OF FLIGHT
- ▶ THE GLOBAL PLAN INCLUDES TECHNICAL, OPERATIONAL, ECONOMIC, ENVIRONMENTAL, FINANCIAL, LEGAL AND INSTITUTIONAL ELEMENTS AND ALSO OFFERS STATES PRACTICAL GUIDANCE ON IMPLEMENTATION AND FUNDING STRATEGIES
- ▶ IN ACCORDANCE WITH THE PLAN, STATES AND REGIONS WILL CHOOSE OBJECTIVES AND DRAFT THEIR GUIDANCE IN SUPPORT OF THE PARTICULAR NEEDS OF A HOMOGENOUS ATM SYSTEM.

EXISTING REGULATORY FRAMEWORK

DOC 9750 AIMS TO PROVIDE INITIAL GUIDANCE ON, AND FACILITATE IMPLEMENTATION OF CIVIL/MILITARY COORDINATION MEASURES AND COOPERATION CONCEPTS EMBEDDED IN GLOBAL AIR TRAFFIC MANAGEMENT OPERATIONAL CONCEPT (DOC 9854)

ACHIEVEMENTS IN INTEGRATION OF SPECIFIED GLOBAL PLAN INITIATIVES (GPI) REQUIRE IMPLEMENTATION OF COLLABORATIVE AIRSPACE DESIGN AND MANAGEMENT, PERFORMANCE-BASED NAVIGATION (PBN), THE INTEGRATION OF GROUND AND AIRBORNE SYSTEMS OR DATA LINK OR COMMUNICATIONS. IT IS SIGNIFICANT TO NOTE THAT THE FIRST OF THE TWENTY-THREE DETAILED GPIs OF THE GLOBAL AIR NAVIGATION PLAN IS GPI-1, "FLEXIBLE USE OF AIRSPACE"

DOC 9854 A RELATIVELY NEW DOCUMENT THAT DESCRIBES SERVICES THAT WILL BE REQUIRED TO OPERATE GLOBAL AIR TRAFFIC SYSTEM IN NEAR FUTURE AND BEYOND

- ▶ OPERATIONAL CONCEPT HIGHLIGHTS ELEMENTS NEEDED TO INCREASE USER FLEXIBILITY, MAXIMIZE EFFICIENCIES AND INCREASE SYSTEM CAPACITY WHILE AT SAME TIME IMPROVING SAFETY
- ▶ CONSIDERATION OF INTEROPERABILITY AND OPERATIONS OF MILITARY SYSTEMS IS AN INTEGRAL PART OF THESE ELEMENTS

CIVIL/MILITARY INTEROPERABILITY AND FLEXI-USE OF AIR SPACE

INTRODUCTION

- ▶ VISION OF AN INTEGRATED, HARMONIZED AND GLOBALLY INTEROPERABLE ATM SYSTEM —MEETS AGREED LEVELS OF SAFETY, PROVIDES FOR OPTIMUM ECONOMIC OPERATIONS, ENVIRONMENTALLY SUSTAINABLE AND MEETS NATIONAL SECURITY REQUIREMENTS FOR ALL USERS DURING ALL PHASES OF FLIGHT, VISION DOES NOT DISCRIMINATE OR MAKE ANY EXCEPTIONS ABOUT TYPE OF TRAFFIC IT IS DESIGNED TO SERVE
- ▶ COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS) SYSTEMS, AND ADVANCED INFORMATION MANAGEMENT TECHNOLOGY ARE TO BE USED TO FUNCTIONALLY COMBINE THE GROUND-BASED AND AIRBORNE SYSTEM ELEMENTS INTO A FULLY INTEGRATED, INTEROPERABLE ATM SYSTEM OPEN TO ALL USERS.
- ▶ INTEROPERABILITY - ABILITY OF “SYSTEMS” (NOT EXCLUSIVELY TECHNICAL SYSTEMS) TO PROVIDE INFORMATION AND SERVICES TO, AND ACCEPT INFORMATION AND SERVICES FROM, OTHER SYSTEMS AND TO USE INFORMATION AND SERVICES SO EXCHANGED. INTEROPERABILITY CONSTITUTES DRIVER OF STANDARDIZATION, INTEGRATION AND COOPERATION.
- ▶ GLOBAL STANDARDS, UNIFORM PRINCIPLES AND AGREEMENTS ARE NEEDED TO ENSURE TECHNICAL AND OPERATIONAL INTEROPERABILITY OF ATM SYSTEM. HOWEVER, ATM SYSTEM INTEROPERABILITY NEEDS TO BE CONSIDERED IN THE BROADER CONTEXT OF GOVERNANCE, NOT JUST TECHNOLOGY AND PROCEDURES, WHILE BEARING IN MIND THE REQUIREMENTS USERS PLACE ON THE SYSTEM. AFTER ALL, ATM AIMS TO ENABLE ALL AIRSPACE USERS, INCLUDING THE MILITARY, TO OPERATE THEIR PREFERRED FLIGHT/MISSION PROFILES, COST-EFFICIENTLY AND EFFECTIVELY, WITHOUT COMPROMISING FLIGHT SAFETY OR NATIONAL SECURITY.
- ▶ INTEROPERABILITY SPECIFICS, HOWEVER, ARE NOT ALWAYS WELL-DEFINED WHEN CONSIDERED IN RELATION TO THE CNS/ATM FIELD. THEY ARE OFTEN SITUATION-DEPENDENT, COME IN VARIOUS FORMS AND DEGREES AND CAN OCCUR AT VARIOUS LEVELS, I.E. STRATEGIC, OPERATIONAL AND TECHNICAL.
- ▶ FROM THE AFOREMENTIONED, IT CAN BE CONCLUDED THAT CIVIL/MILITARY COORDINATION AND INTEROPERABILITY ARE VERY SIMILAR. INTEROPERABILITY CAN BE IDENTIFIED AS STRATEGIC/POLITICAL OR OPERATIONAL/TECHNICAL AS DESCRIBED LATER.

CIVIL/MILITARY INTEROPERABILITY AND FLEXI-USE OF AIR SPACE

STRATEGIC AND/OR POLITICAL INTEROPERABILITY

- ▶ AT THE STRATEGIC/POLITICAL LEVEL, THE CONCEPT OF INTEROPERABILITY CAN BE CONSIDERED AS AN ENABLER FOR COALITION BUILDING. IT FACILITATES MEANINGFUL CONTRIBUTIONS BY AVIATION COALITION PARTNERS, BOTH CIVIL AND MILITARY. AT THE HIGHEST LEVEL, INTEROPERABILITY OF AVIATION ISSUES CENTRES ON HARMONIZING GLOBAL (E.G. ICAO) OR REGIONAL (E.G. EUROPEAN UNION) VIEWS, DOCTRINES AND, FOREMOST, A REGULATORY FRAMEWORK. ONE MAIN ELEMENT AT THIS LEVEL IS THE POLITICAL WILLINGNESS TO COOPERATE AND COORDINATE OVER THE LONG TERM, TO ACHIEVE AND MAINTAIN SHARED INTERESTS IN AVIATION SAFETY, ENVIRONMENT, EFFICIENCY AND CAPACITY. THE PRICE OF STRATEGIC AND/OR POLITICAL INTEROPERABILITY AT NATIONAL AS WELL AS INTERNATIONAL LEVELS CAN BE HIGH AND FINDING A COMMON GROUND CAN BE DIFFICULT TO ACHIEVE. NATIONAL CONSIDERATIONS AND CULTURE ARE POTENTIAL DISABLERS OF AFFORDABLE INTEROPERABILITY. NEVERTHELESS ONE CAN ASSUME THAT THE AVIATION CHAIN IS AS STRONG AS ITS WEAKEST LINK AND THAT IT IS THEREFORE IN EVERYONE'S INTEREST TO COOPERATE AND INVEST IN ORDER TO ACHIEVE THE HIGHEST LEVEL OF INTEROPERABILITY.

OPERATIONAL AND TECHNICAL INTEROPERABILITY

- ▶ INTEROPERABILITY AT THE OPERATIONAL LEVEL OCCURS WHEN STRATEGIC, POLITICAL AND TECHNICAL INTEROPERABILITY COME TOGETHER, NOT ONLY TO HELP ALL AVIATION PARTNERS TO SHAPE THE ENVIRONMENT AND MANAGE CRISIS, BUT ALSO TO SUPPORT ANY ANTICIPATED AVIATION GROWTH AND ITS ASSOCIATED IMPACT ON AVIATION SAFETY, ENVIRONMENT, EFFICIENCY AND CAPACITY.
- ▶ THE BENEFITS OF INTEROPERABILITY AT THE OPERATIONAL AND TECHNICAL LEVEL GENERALLY DERIVE FROM THE INTER-CHANGEABILITY OF SYSTEM ELEMENTS OR OPERATIONAL PROCEDURES. AN EXAMPLE IS THE SYSTEM-WIDE INFORMATION MANAGEMENT (SWIM) CONCEPT WHICH IS OR WILL BE USED IN A CIVIL (SESAR/NEXTGEN) AS WELL AS IN A MILITARY (NETWORK CENTRIC WARFARE) ENVIRONMENT. THESE CONCEPTS ENABLE USERS TO RANDOMLY USE THAT PORTION OF INFORMATION VIABLE FOR THEIR RESPECTIVE OPERATION AND CAN BE ACHIEVED ONLY THROUGH THE INTEROPERABLE TECHNICAL FEEDERS OF THE NETWORK. FOR THIS REASON STATES AND MILITARY ORGANIZATIONS SHOULD ENDEAVOUR TO DEFINE MUTUALLY INTEROPERABLE SYSTEMS EARLY IN THEIR DESIGN PHASE.

CIVIL/MILITARY INTEROPERABILITY AND FLEXI-USE OF AIR SPACE

- ▶ ANOTHER BENEFIT OF INTEROPERABILITY IS MODULARITY, WHICH ALLOWS FOR THE POSSIBILITY OF COLLECTING ONLY THOSE TECHNICAL FACILITATORS THAT ARE NECESSARY TO CONDUCT ONE'S OPERATION. AN EXAMPLE OF THIS IS THE ALL-PURPOSE STRUCTURED EURO CONTROL SURVEILLANCE INFORMATION, KNOWN AS THE ASTERIX PROTOCOL, USED FOR RADAR DATA EXCHANGE. THIS EXCHANGE PROTOCOL, IN COMBINATION WITH A MULTI-RADAR TRACKER, CAN ENABLE A CIVIL AIR NAVIGATION SERVICE PROVIDER (ANSP) TO USE EXTERNALLY PROVIDED RADAR DATA, WITHOUT NECESSARILY PROCURING ITS OWN RADAR SYSTEM, BY USING RADAR DATA PROVIDED BY MILITARY SENSORS. STATES AND MILITARY ORGANIZATIONS SHOULD ENSURE A LEVEL OF MODULARITY IN THEIR RESPECTIVE SYSTEMS TO ALLOW THOSE SYSTEMS ACCESS TO A FREE EXCHANGE OF INFORMATION AS REQUIRED.
- ▶ COSTS ASSOCIATED WITH INTEROPERABILITY AT THE OPERATIONAL AND TACTICAL LEVEL VERY OFTEN DERIVE FROM INEFFICIENCIES CAUSED BY A NUMBER OF FACTORS OUTSIDE THE DIRECT CONTROL OF THE INVOLVED PARTIES, SUCH AS STRATEGIC OBJECTIVES, SYSTEM IMPOSSIBILITIES AND INSTITUTIONAL OR GOVERNMENTAL CHANGES. STATES AND MILITARY ORGANIZATIONS SHOULD CONSIDER INTEROPERABILITY FROM THE EARLY STAGES OF SYSTEM DESIGN TO ENSURE THAT COSTS ARE KEPT LOW AND TO ENSURE SYSTEM COMPATIBILITY.
- ▶ REGULATION AND STANDARDIZATION
- ▶ CNS/ATM REGULATIONS IN ANY FORM CAN HAVE AN IMPACT ON THE MILITARY EITHER WHEN MILITARY GROUND SYSTEMS ARE INTEGRATED INTO A CNS/ATM NETWORK, WHEN MILITARY UNITS PROVIDE AIR NAVIGATION SERVICES TO CIVIL AVIATION OR WHEN CARRIAGE REQUIREMENTS ARE IMPOSED ON AIRSPACE USERS. THEREFORE, STATES AND SERVICE PROVIDERS IMPLEMENTING REGULATIONS OR DESIGNING PROCEDURES SHOULD CONSIDER AND MINIMIZE THE IMPACT OF SUCH ACTIONS ON MILITARY USERS AND SYSTEMS (GROUND OR AIRBORNE).
- ▶ EXISTING CIVIL STANDARDS AND SPECIFICATIONS ARE ADEQUATE TO SUPPORT TECHNICAL COMPLIANCE OF CIVIL CNS/ATM SYSTEMS BUT TEND TO OVERLOOK THE SPECIFIC CHARACTERISTICS OF AVAILABLE MILITARY CNS/ATM SYSTEMS. TO ENABLE SOLUTIONS THAT WOULD PROMOTE CIVIL/MILITARY INTEROPERABILITY, STATES SHOULD ENSURE THAT SUCH SPECIFICATIONS RESPOND TO THE FULFILMENT OF DEFINED PERFORMANCE LEVELS, USING MULTIPLE MEANS OF COMPLIANCE, RATHER THAN MANDATING PARTICULAR EQUIPAGE FITS.

CIVIL/MILITARY INTEROPERABILITY AND FLEXI-USE OF AIR SPACE

- ▶ HISTORICALLY, THE SUPPORTING TECHNICAL INFRASTRUCTURE ENABLING MILITARY OPERATIONS, COMPRISING MULTIPLE GROUND-BASED AND AIRBORNE CNS/ATM SYSTEMS, HAS BEEN PROCURED WITH THE PRIMARY OBJECTIVE OF SATISFYING THE VERY DEMANDING WARTIME REQUIREMENTS OF MILITARY COMMAND AND CONTROL.
 - ▶ THE RESULTING LACK OF INTEROPERABILITY BETWEEN THE UNDERLYING CIVIL ATM INFRASTRUCTURE AND MANY MILITARY GROUND SYSTEMS AND TACTICAL AIRCRAFT AVIONICS IS DIFFICULT TO OVERCOME DUE TO:
 - ▶ LENGTHY MILITARY PROCUREMENT CYCLES;
 - ▶ PUBLIC BUDGET CONSTRAINTS;
 - ▶ LACK OF SPACE IN THE COCKPIT FOR EXTRA AVIONICS;
 - ▶ ABSENCE OF SUPPORTING MILITARY REQUIREMENTS;
 - ▶ LACK OF RECOGNIZED CERTIFICATION PROCESSES;
 - ▶ SECURITY AND INSTITUTIONAL ASPECTS; AND
 - ▶ DIFFICULTY MONITORING CIVIL CNS/ATM DEVELOPMENTS.
- 
- Several white lines of varying lengths and slopes are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

CIVIL/MILITARY INTEROPERABILITY AND FLEXI-USE OF AIR SPACE

- ▶ ONE OF THE MOST SIGNIFICANT CONSEQUENCES OF THIS SITUATION IS EVIDENCED WHENEVER A MILITARY AIRCRAFT THAT INTENDS TO USE CIVIL ROUTE STRUCTURES HAS TO BE ACCOMMODATED USING SPECIAL HANDLING OR BY APPLYING EXEMPTION POLICIES OR DEROGATIONS FOR THE AIRBORNE EQUIPAGE
- ▶ IT NEEDS TO BE REALIZED THAT THE NEED FOR AN EXEMPTION FOR STATE AIRCRAFT SHOULD BE BASED ON COMPELLING TECHNICAL OR MILITARY REASONS AND USED ONLY AS A MEASURE OF LAST RESORT.
- ▶ WITH THE FUTURE PREDOMINANCE OF STRATEGIC ATM CAPABILITIES, REDUCTION OF TACTICAL INTERVENTIONS AND CONSEQUENT AUTOMATION OF THE ASSOCIATED ATC TOOLS AND INFORMATION FLOWS IN A NETWORK-CENTRIC ENVIRONMENT (SESAR/NEXTGEN), MILITARY PLATFORMS MAY FACE SERIOUS DIFFICULTIES WHEN ATTEMPTING TO FREELY ACCESS THE AIRSPACE DESIGNATED FOR CIVIL AVIATION IF THEY LACK THE REQUIRED LEVELS OF CONNECTIVITY WITH THE UNDERLYING CIVIL ATM SYSTEM.
- ▶ THIS POSSIBLE SITUATION ENTAILS THE URGENT NEED TO IDENTIFY VALID SOLUTIONS FOR INTEROPERABILITY BETWEEN CIVIL AND MILITARY CNS/ATM SYSTEMS AT AN EARLY STAGE IN THEIR DEVELOPMENT AND TO DEFINE A MIGRATION PATH TOWARDS LONG-TERM AVIONICS CONVERGENCE AND INTEGRATION.
- ▶ STATES AND SERVICE PROVIDERS SHOULD ESTABLISH A FORMAL PROCESS OF CONSULTATION WITH MILITARY USERS AT AN EARLY STAGE OF FUTURE AVIONICS DEVELOPMENT WITH THE AIM OF ACHIEVING MAXIMUM SYSTEM INTEROPERABILITY BETWEEN CIVIL SYSTEMS AND MILITARY UNITS.
- ▶ AIRSPACE IS CONSIDERED A NATIONAL ASSET TO BE EXPLOITED OPTIMALLY BY THE CIVIL AVIATION WHILE LEAVING TACTICAL AND STRATEGIC FLEXIBILITY TO THE MILITARY AVIATION.
- ▶ UNUSED PORTION OF AIRSPACES NEED BE DYNAMICALLY ALLOCATED IN FURTHERING THE INDIVIDUAL OPERATIONAL REQUIREMENT. CODIFICATION OF PROCEDURES FOR FLEXI-USE OF AIRSPACE GOES A LONG WAY IN BETTER UTILIZATION OF THE NATIONAL AIRSPACE.
- ▶ INDIA HAS A VERY WELL STRUCTURED MECHANISM FOR FLEXI-USE OF AIRSPACE AND IS FUNCTIONING SATISFACTORILY.

AIRSPACE ORGANIZATION AND MANAGEMENT

GENERAL PRINCIPLES

- ▶ WITH REFERENCE TO THE ATM OPERATIONAL CONCEPT, AIRSPACE MANAGEMENT (ASM) IS THE PROCESS BY WHICH AIRSPACE OPTIONS ARE SELECTED AND APPLIED TO MEET THE NEEDS OF AIRSPACE USERS. COMPETING INTERESTS FOR THE USE OF AIRSPACE MAKE ASM A HIGHLY COMPLEX EXERCISE, NECESSITATING A PROCESS THAT EQUITABLY BALANCES THOSE INTERESTS. THE ULTIMATE GOAL OF ASM IS TO ACHIEVE THE MOST EFFICIENT USE OF THE AIRSPACE BASED ON ACTUAL NEEDS AND, WHEN POSSIBLE, AVOID PERMANENT AIRSPACE SEGREGATION.
- ▶ THE MANAGEMENT OF AIRSPACE SHOULD FOLLOW THESE GUIDING PRINCIPLES AND STRATEGIES:
- ▶ ALL AVAILABLE AIRSPACE SHOULD BE MANAGED FLEXIBLY;
- ▶ AIRSPACE MANAGEMENT PROCESSES SHOULD ACCOMMODATE DYNAMIC FLIGHT TRAJECTORIES AND PROVIDE OPTIMUM OPERATIONAL SOLUTIONS;
- ▶ WHEN CONDITIONS REQUIRE DIFFERENT TYPES OF TRAFFIC TO BE SEGREGATED BY AIRSPACE ORGANIZATION, THE SIZE, SHAPE, AND TIME REGULATION OF THAT AIRSPACE SHOULD BE SET SO AS TO MINIMIZE THE IMPACT ON OPERATIONS;
- ▶ AIRSPACE USE SHOULD BE COORDINATED AND MONITORED IN ORDER TO ACCOMMODATE THE CONFLICTING REQUIREMENTS OF ALL USERS AND TO MINIMIZE ANY CONSTRAINTS ON OPERATIONS;
- ▶ AIRSPACE RESERVATIONS SHOULD BE PLANNED IN ADVANCE WITH CHANGES MADE DYNAMICALLY WHENEVER POSSIBLE. THE SYSTEM ALSO NEEDS TO ACCOMMODATE SHORT-NOTICE UNPLANNED REQUIREMENTS; AND
- ▶ COMPLEXITY OF OPERATIONS MAY LIMIT THE DEGREE OF FLEXIBILITY.
- ▶ THE EFFECTIVE IMPLEMENTATION OF AN ASM PROCESS DEMANDS COMMITMENT FROM ALL STAKEHOLDERS INVOLVED. A FIRST STEP TOWARDS AN EFFECTIVE IMPLEMENTATION OF THE FLEXIBLE USE OF AIRSPACE (FUA) CONCEPT WOULD BE TO ALLOW CIVILIAN USERS TEMPORARY ACCESS TO MILITARY RESTRICTED AND RESERVED AIRSPACE FOR OPTIMUM USE OF THE AIRSPACE. ANOTHER STEP WOULD BE TO ALLOW MILITARY USERS TEMPORARY ACCESS TO CIVILIAN RESTRICTED AND RESERVED AIRSPACE.

AIRSPACE ORGANIZATION AND MANAGEMENT

THE FLEXIBLE USE OF AIRSPACE CONCEPT

- ▶ FLEXIBLE USE OF AIRSPACE (FUA) IS AN AIRSPACE MGT CONCEPT BASED ON THE PRINCIPLE THAT AIRSPACE SHOULD NOT BE DESIGNATED AS PURELY CIVIL OR MILITARY, BUT RATHER AS A CONTINUUM IN WHICH ALL USER REQUIREMENTS ARE ACCOMMODATED TO THE GREATEST POSSIBLE EXTENT
- ▶ CONCEPT INCLUDES CONSIDERATION OF EFFECTIVE COMMUNICATION, COOPERATION AND COORDINATION NECESSARY TO ENSURE A SAFE, EFFICIENT AND PREDICTABLE USE OF AIRSPACE
- ▶ ESTABLISHMENT OF JOINT CIVIL/MILITARY COORDINATION ENTITIES FOR AIRSPACE ORGANIZATION AND MANAGEMENT IS ESSENTIAL TO THE REALIZATION OF CURRENT AND FUTURE CNS/ATM INITIATIVES.
- ▶ MEETING FUTURE AIR TRAFFIC REQUIREMENTS FOR INCREASED SAFETY, SECURITY, CAPACITY, EFFICIENCY, ENVIRONMENTAL SUSTAINABILITY, AND SOVEREIGNTY DEPENDS ON EFFECTIVE CIVIL/MILITARY COORDINATION
- ▶ THE CIVIL AVIATION AUTHORITIES OF SOME STATES ARE ALREADY WORKING WITH MILITARY AUTHORITIES, USING COORDINATED PROCESSES TO MANAGE CIVILIAN USE OF ACTIVE MILITARY AIRSPACE
- ▶ JOINTLY, CIVIL AND MILITARY AUTHORITIES HAVE PUT IN PLACE PROCEDURES TO APPLY AIRSPACE RESERVATIONS OR RESTRICTIONS ONLY DURING LIMITED PERIODS OF TIME, BASED ON ACTUAL USE
- ▶ ON COMPLETION OF THE ACTIVATION REQUIRING SEGREGATION, CAPACITY IS MADE AVAILABLE AGAIN TO CIVIL TRAFFIC. EXAMPLES OF THE COORDINATION PROCESS IN SEVERAL STATES BETWEEN CIVIL AND MILITARY SECTORS ARE CONTAINED IN APPENDICES A, B AND C.
- ▶ EVEN WHEN STATES HAVE AGREEMENTS, THERE CONTINUES TO BE NUMEROUS OCCASIONS WHEN RESTRICTED OR RESERVED AIRSPACE, WITH NO PLANNED MILITARY MISSIONS, HAS GONE UNUSED
- ▶ TEMPORARILY SEGREGATING AIRSPACE BASED ON ACTUAL MILITARY REQUIREMENTS, THROUGH AN EFFECTIVE COLLABORATIVE CIVIL/MILITARY PROCESS, SHOULD BE PURSUED TO RECAPTURE THIS UNUSED CAPACITY AND RELEASE IT FOR EFFECTIVE USE BY CIVIL AVIATION

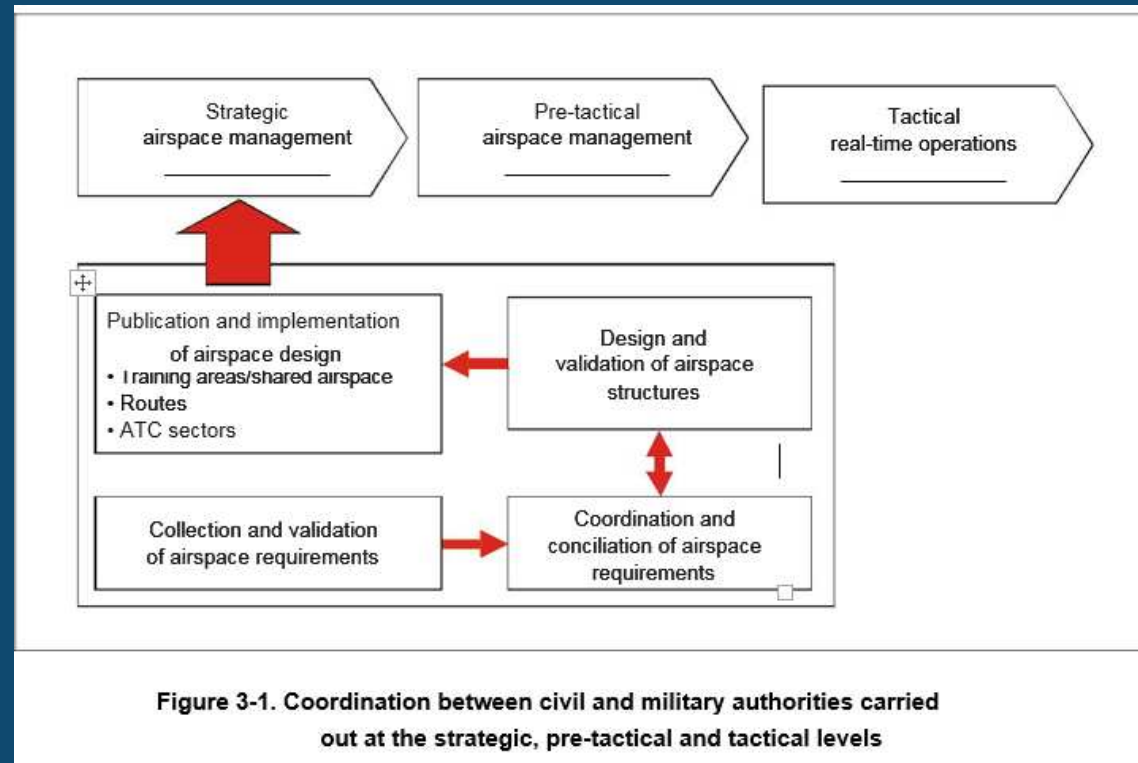
AIRSPACE ORGANIZATION AND MANAGEMENT

- ▶ IN ORDER TO ENABLE EFFECTIVE FLEXIBLE USE OF AIRSPACE, SOME BASIC PREREQUISITES SHOULD BE OBSERVED BY STATES:
 - ▶ ESTABLISHMENT OF A NATIONAL, HIGH-LEVEL CIVIL/MILITARY COORDINATION BODY;
 - ▶ DEVELOPMENT OF A CONSISTENT, COLLABORATIVE NATIONAL AIRSPACE PLANNING PROCESS TAKING INTO CONSIDERATION THE NEEDS OF ALL AIRSPACE USERS AND NATIONAL SECURITY, DEFENCE AND LAW ENFORCEMENT REQUIREMENTS;
 - ▶ ESTABLISHMENT OF COMMUNICATION, NEGOTIATION AND PRIORITY RULES AND PROCEDURES FOR CIVIL/MILITARY COORDINATION;
 - ▶ ESTABLISHMENT AND PUBLICATION OF PROCEDURES FOR ACTIVITIES WHICH REQUIRE AIRSPACE RESERVATION OR RESTRICTION. AIRSPACE RESERVATIONS OR RESTRICTIONS SHOULD BE APPLIED ONLY FOR LIMITED PERIODS OF TIME AND BASED ON ACTUAL USE;
 - ▶ DEVELOPMENT OF FRAMEWORK AGREEMENTS BETWEEN CIVIL AND MILITARY AUTHORITIES TO FACILITATE COORDINATION;
 - ▶ ESTABLISHMENT OF A SYSTEM TO PERIODICALLY REVIEW AIRSPACE NEEDS, ORGANIZATION AND MANAGEMENT
 - ▶ PREDICTIVE AND TIMELY ACCESS TO RESTRICTED OR RESERVED AIRSPACE WHENEVER POSSIBLE IN ORDER TO MAXIMIZE BENEFITS AND FLEXIBILITY FOR ALL USERS.
- ▶ TODAY AIRCRAFT ARE MORE CAPABLE OF ACCURATE NAVIGATION THAN IN THE PAST
- ▶ USING GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) AND PERFORMANCE-BASED NAVIGATION (PBN), AIRCRAFT CAN FLY BETWEEN TERMINALS AND EN-ROUTE PHASES OF FLIGHT WITH NEGLIGIBLE DEVIATIONS
- ▶ HOWEVER, LACK OF CIVIL/MILITARY COORDINATION OF AIRSPACE MANAGEMENT HAS RESULTED IN INEFFICIENT AIRSPACE USE AND LIMITED USE OF AIRCRAFT CAPABILITIES
- ▶ SAFE AND EFFICIENT JOINT USE OF AIRSPACE BY CIVIL AND MILITARY OPERATIONS RESTS ON UNDERSTANDING AND ACCOMMODATING THE AIRSPACE REQUIREMENTS OF ALL USERS ON A FAIR AND EQUITABLE BASIS, WHILE RESPECTING STATE SOVEREIGNTY AND NATIONAL/INTERNATIONAL SECURITY, DEFENCE AND LAW ENFORCEMENT OBLIGATIONS

FUA PRINCIPLES

AN FUA CONCEPT SHOULD EMBRACE THE FOLLOWING PRINCIPLES:

- ▶ COORDINATION BETWEEN CIVIL AND MILITARY AUTHORITIES SHOULD BE CARRIED OUT AT THE STRATEGIC, PRE-TACTICAL AND TACTICAL LEVELS IN ORDER TO INCREASE SAFETY AND AIRSPACE CAPACITY AND TO IMPROVE THE EFFICIENCY OF AIRCRAFT OPERATIONS.
- ▶ CONSISTENCY BETWEEN ASM, AIR TRAFFIC FLOW MANAGEMENT (ATFM) AND ATS SHOULD BE ESTABLISHED AND MAINTAINED AT THE THREE LEVELS OF ASM.
- ▶ AIRSPACE RESERVATIONS SHOULD BE OF A TEMPORARY NATURE, APPLIED ONLY FOR LIMITED PERIODS OF TIME AND BASED ON ACTUAL USE OF AIRSPACE.
- ▶ THE FUA CONCEPT SHOULD, WHENEVER POSSIBLE, BE APPLIED ACROSS NATIONAL BORDERS AND/OR THE BOUNDARIES OF FLIGHT INFORMATION REGIONS (FIRS).



FUA PRINCIPLES

STRATEGIC AIRSPACE MANAGEMENT

- ▶ ESTABLISH AIRSPACE STRUCTURES;
- ▶ DEVELOP COORDINATION PROCEDURES AND AIRSPACE MANAGEMENT PROCEDURES
- ▶ DEVELOP CROSS-BORDER COORDINATION AND SEPARATION STANDARDS BETWEEN CIVIL AND MILITARY FLIGHTS.

PRE-TACTICAL AIRSPACE MANAGEMENT

- ▶ ESTABLISH AN ENTITY TO ALLOCATE AIRSPACE IN ACCORDANCE WITH CONDITIONS AND PROCEDURES AGREED UPON AT STRATEGIC LEVEL
- ▶ FORM OF A JOINT CIVIL-MILITARY CELL, IF BOTH CIVIL AND MILITARY ARE RESPONSIBLE FOR AIRSPACE MANAGEMENT IN A GIVEN STATE, CAN ALSO BE JOINT CELL OF TWO OR MORE STATES
- ▶ PROVIDE ADEQUATE SUPPORTING SYSTEMS TO ENSURE TIMELY AND EFFICIENT PROCESS.

TACTICAL AIRSPACE MANAGEMENT

- ▶ CARRIED OUT AT THE LEVEL OF ATS UNITS AND CONTROLLING MILITARY UNITS
- ▶ DEDICATED COORD PROCEDURES AND COMM FACILITIES TO ENABLE MUTUAL PROVISION OF AIRSPACE DATA IN TIMELY MANNER TO ALLOW EFFECTIVE REAL-TIME ACTIVATION, DEACTIVATION OR REALLOCATION OF THE AIRSPACE ALLOCATED AT PRE-TACTICAL LEVEL
- ▶ AFFECTED USERS TO BE NOTIFIED OF CURRENT STATUS OF AIRSPACE
- ▶ DIRECT COMM BETWEEN CIVIL AND MILITARY ATS UNITS AVLB WITH HIGH DEGREE OF RELIABILITY TO RESOLVE SPECIFIC TRAFFIC SITUATIONS IF AND WHERE CIVIL AND MILITARY CONTROLLERS ARE PROVIDING SERVICES IN THE SAME AIRSPACE
- ▶ IF REQD TO MEET MINIMUM SAFETY LEVELS, EXCHANGE OF FLIGHT DATA, INCLUDING THE POSITION AND FLIGHT INTENTION OF THE AIRCRAFT, SHOULD BE AVAILABLE BETWEEN CIVIL ATC UNITS AND CONTROLLING MILITARY UNITS.

FLEXIBLE AND ADAPTABLE AIRSPACE STRUCTURES AND PROCEDURES

- ▶ FUA CONCEPT CAN BE BASED ON POTENTIAL OFFERED BY FLEXIBLE AND ADAPTABLE AIRSPACE STRUCTURES AND PROCEDURES THAT ARE ESPECIALLY SUITED TO TEMPORARY ALLOCATION AND UTILIZATION

CONDITIONAL ROUTE

- ▶ NON-PERMANENT ATS ROUTE OR PORTION PLANNED AND USED UNDER SPECIFIED CONDITIONS
- ▶ FORESEEN AVAILABILITY, SO FLIGHT PLANNING AND EXPECTED LEVEL OF ACTIVITY POSSIBLE FOR ASSOCIATED TSA
 - ▶ CATEGORY ONE: PERMANENTLY PLANNABLE;
 - ▶ CATEGORY TWO: NON-PERMANENTLY PLANNABLE; AND
 - ▶ CATEGORY THREE: NOT PLANNABLE

TEMPORARY RESERVED AREA (TRA)

- ▶ RESERVED AND ALLOCATED FOR THE SPECIFIC USE OF PARTICULAR USER FOR A DETERMINED PERIOD OF TIME AND THROUGH WHICH OTHER TRAFFIC MAY BE ALLOWED TO TRANSIT UNDER ATC CLEARANCE

TEMPORARY SEGREGATED AIRSPACE (TSA)

- ▶ ALLOCATED FOR THE EXCLUSIVE USE OF A PARTICULAR USER DURING A DETERMINED PERIOD OF TIME AND THROUGH WHICH OTHER TRAFFIC WILL NOT BE ALLOWED TO TRANSIT

CROSS-BORDER AREAS (CBA)

- ▶ ESTABLISHED FOR SPECIFIC OP REQD OVER INTL BOUNDARIES
- ▶ TO ALLOW MIL TRAINING AND OP FLIGHTS ON BOTH SIDES OF BORDER
- ▶ NOT CONSTRAINED BY NATIONAL BOUNDARIES, LOCATED TO BENEFIT BOTH CIV AND MIL AVIATION
- ▶ COMBINED WITH USE OF CONDITIONAL ROUTES, PERMIT IMPROVEMENT OF THE AIRSPACE STRUCTURE IN BORDER AREAS AND ASSIST IN IMPROVEMENT OF ROUTE NETWORK
- ▶ POLITICAL, LEGAL, TECHNICAL AND OPERATIONAL AGREEMENTS BETWEEN STATES ARE REQD
- ▶ FORMAL AGREEMENTS FOR ESTABLISHMENT AND USE TO ADDRESS ISSUES OF SOVEREIGNTY, DEFENCE, LEGALITY, OPERATIONS, ENVIRONMENT AND SAR

SECURITY REFERENCES IN ATM OP CONCEPT (DOC 9854)

- ▶ VISION - ACHIEVE INTEROPERABLE GLOBAL ATM SYSTEM, DURING ALL PHASES OF FLIGHT, AGREED LEVELS OF SAFETY, OPTIMUM ECONOMIC OPERATIONS, ENVIRONMENTALLY SUSTAINABLE AND NATIONAL SECURITY REQTS
- ▶ GUIDING PRINCIPLE — CONTINUITY -REQUIRES CONTINGENCY MEASURES TO PROVIDE MAXIMUM CONTINUITY OF SERVICE DURING MAJOR OUTAGES, NATURAL DISASTERS, CIVIL UNREST, SECURITY THREATS OR UNUSUAL CIRCUMSTANCES.
- ▶ AD AND MIL CONTROL SYSTEMS - TIMELY AND ACCURATE INFORMATION ON FLTS AND ATM SYSTEM INTENTIONS
- ▶ INVOLVED IN AIRSPACE RESERVATIONS, NOTIFICATION OF AIR ACTIVITIES AND ENFORCING MEASURES RELATED TO SECURITY.
- ▶ LAW ENFORCEMENT (INCL CUSTOMS & POLICE) NEED FLT IDENT AND FLT TRAJ DATA & INFO ABT TFC AT AERODROMES
- ▶ ADDRESS AND RESOLVE ISSUES SUCH AS AIRSPACE SOVEREIGNTY, DIPLOMATIC CLEARANCE AND NATIONAL SECURITY (AD) REQ
- ▶ SECURITY - PROTECTION AGAINST THREATS THAT STEM FROM INTENTIONAL ACTS (E.G. TERRORISM) OR UNINTENTIONAL ACTS (E.G. HUMAN ERROR, NATURAL DISASTER) AFFECTING ACFT, PEOPLE OR INSTALLATIONS ON THE GROUND
- ▶ ADEQUATE SECURITY A MAJOR EXPECTATION OF THE ATM COMMUNITY
- ▶ ATM SYSTEM SHOULD CONTRIBUTE TO SECURITY & ATM SYSTEM AND INFO PROTECTED AGAINST SECURITY THREAT
- ▶ SECURITY RISK MANAGEMENT TO BALANCE NEEDS OF ATM COMMUNITY THAT REQUIRE ACCESS & PROTECT ATM SYSTEM
- ▶ IF ANY THREAT TO ACFT OR USING ACFT, ATM TO PROVIDE AUTHORITIES RESPONSIBLE WITH APPROPRIATE ASSISTANCE & INFO
- ▶ SAFEGUARDING OF SYSTEM FROM SECURITY THREATS AND VULNERABILITIES AND CONTRIBUTION OF THE ATM SYSTEM TO CIVIL AVIATION SECURITY, NATIONAL SECURITY AND DEFENCE, AND LAW ENFORCEMENT
- ▶ PROVIDE COLLABORATIVE SUPPORT TO SECURITY OF AIRSPACE AND ATC ASSISTANCE TO AIRLINES, MILITARY, AND LAW ENFORCEMENT IN RESPONDING TO NON-COMPLIANT ACFT AND DISRUPTIVE PASSENGERS ON BOARD
- ▶ PROTECT ATM ASSETS FROM SERVICE DEGRADATION; PHYSICAL ATTACK (TERRORIST/CRIMINALS); INSIDER ILL-DOING; CYBER ATTACK ON INFORMATION OR DATA PROCESSING (HACKER OR COMPUTER MALWARE); ELECTROMAGNETIC ATTACK (CAUSING INTERFERENCE WITH CNS EQPT).
- ▶ ENABLE EFFECTIVE RESPONSE TO SECURITY INCIDENTS AFFECTING ATM INFRA OR AIRSPACE AND ENABLE PLANNING FOR SERVICE/BUSINESS CONTINUITY AND RECOVERY
- ▶ SERVICE CONTINUITY AND RECOVERY - PROVISION OF ATS. BUSINESS CONTINUITY AND RECOVERY -INTEGRITY OF CONTINUED BUSINESS

ATM SECURITY MANAGEMENT FOR PROTECTION OF THE ATM SYSTEM

- ▶ PROVIDE A COMPREHENSIVE FRAMEWORK FOR ATM SERVICE PROVIDER TO MANAGE SECURITY OF THE ORG
- ▶ ENABLE AN ORG TO DEVELOP AND IMPLEMENT SECURITY POLICY AND PROGRAMME ACCOUNTING FOR VARIOUS REGULATORY REQTS AND OTHER GOALS AND OBJECTIVES TO WHICH ORG SUBSCRIBES
- ▶ APPLIES TO SECURITY ASPECTS THE ORG IDENTIFIES AS THOSE WHICH IT CAN CONTROL OR INFLUENCE AND PROVIDES MECHANISM TO ASSURE ITSELF OF MEETING STATED SECURITY OBJECTIVES.
- ▶ ATM SECURITY MANAGEMENT SHOULD CONSIST OF FIVE KEY ACTIVITIES:
 - ▶ POLICY-MAKING. AN ORGANIZATION'S COMMITMENT TO MEETING CUSTOMERS' AND STAKEHOLDERS' EXPECTATIONS THROUGH ACTIVE PARTICIPATION AND LEADERSHIP FROM SENIOR MANAGEMENT. THIS COMMITMENT AND LEADERSHIP SHOULD MANIFEST ITSELF IN THE ORGANIZATION'S SECURITY POLICY AND PROVIDE THE RESOURCES FOR THE SECURITY MANAGEMENT PROGRAMMES. AN ESSENTIAL FOUNDATION OF COOPERATION IS A COLLABORATIVE REGULATORY FRAMEWORK TO ENSURE THAT COMPATIBLE STANDARDS AND SECURITY MANAGEMENT PRACTICES ARE SYSTEMATICALLY APPLIED AND THE LEGAL FRAMEWORK IS ADAPTED TO THE REQUIREMENTS OF ATM SECURITY.
 - ▶ SECURITY RISK ASSESSMENT AND PLANNING. A SYSTEMATIC ASSESSMENT OF THE ORGANIZATION'S SECURITY RISKS AGAINST POTENTIAL THREATS. THIS ACTION SHOULD COLLECT AND ANALYSE DATA TO IDENTIFY THE ORGANIZATION'S RISK POSTURE. THE RESULTS OF THESE ANALYSES SHOULD IDENTIFY GAPS AND PRIORITIES WHICH WOULD FORM THE BASIS FOR THE DEVELOPMENT OF AN IMPLEMENTATION PLAN TO MANAGE SECURITY RISK.
 - ▶ IMPLEMENTATION AND OPERATION. THE SECURITY MANAGEMENT PLAN BECOMES A REALITY ONLY WITH A FORMAL ORGANIZATIONAL STRUCTURE, THE BUILDING OF COMPETENCE, AND A CLEAR, CONSISTENT COMMUNICATION OF THE OPERATIONAL REQUIREMENTS. THE MEASURES THAT ARE INTRODUCED TO ENHANCE ATM SECURITY MUST BE A REASONABLE RESPONSE TO THE THREATS THAT ARE POSED AND AFFORDABLE BY THE VARIOUS STAKEHOLDERS. SYNERGIES WITH OTHER SECURITY INITIATIVES, IN RELATION TO THE RESPONSE OF ATM TO SECURITY THREATS, SHOULD BE MAXIMIZED TO ENSURE COST-EFFECTIVENESS.
 - ▶ AUDITING AND CORRECTIVE ACTION. A QUALITY ASSURANCE PROGRAMME OF CHECKS AND BALANCES TO PROVIDE THE OBJECTIVE REVIEW AND FEEDBACK NEEDED FOR CONTINUING IMPROVEMENTS.
 - ▶ MANAGEMENT REVIEW. THE OVERALL SECURITY MANAGEMENT SYSTEM AND PROGRAMME SHOULD BE PERIODICALLY REVIEWED BY SENIOR MANAGEMENT TO ENSURE CONTINUING RELEVANCE, ADEQUACY AND EFFECTIVENESS OF THE SYSTEM AND PROGRAMME.
- ▶ PROVIDE STRUCTURE ALLOWING ORG AND OTHERS TO EVALUATE PERFORMANCE AGAINST SECURITY OBJECTIVES
- ▶ CONSISTENT AND CONTINUING USE LEADS TO CONTINUOUS IMPROVEMENT OF THE ORG SECURITY PERFORMANCE RESULTING IN PROGRESSIVE IMPROVEMENT OF PROTECTION FOR ATM SYSTEM
- ▶ FURTHER GUIDANCE ON PROTECTION OF AIR NAV FACILITIES AND SYSTEMS IN AVIATION SECURITY MANUAL

ATM SECURITY MANAGEMENT FOR PROTECTION OF THE ATM SYSTEM

- ▶ ATM SECURITY —CONTRIBUTION OF ATM SYSTEM TO NATIONAL SECURITY, AVIATION SECURITY AND LAW ENFORCEMENT
- ▶ GENERAL OBJECTIVE - DETERMINE EFFECTIVE MECHANISMS AND PROCEDURES TO ENHANCE RESPONSE OF ATM TO SECURITY THREATS THAT AFFECT FLTS (ACFT, PAX, CREW) OR ATM SYSTEM ITSELF
- ▶ PURPOSE OF AIRSPACE SECURITY - SAFEGUARDING OF AIRSPACE FROM UNAUTHORIZED USE, INTRUSION, ILLEGAL ACTIVITIES OR ANY OTHER VIOLATION
- ▶ SAFEGUARDING OF AIRSPACE AND PROTECTION OF ATM SYSTEM REQUIRE TO PROVIDE ATM SECURITY SERVICES- ENABLE MILITARY, LAW ENFORCEMENT AND AV SEC AUTHORITIES TO CARRY OUT ROLES AND RESPONSIBILITIES WITHIN SYSTEM
- ▶ GOVTS AND PUBLIC HAVE CONFIDENCE THAT AIRSPACE AND ALL OTHER ASPECTS OF ATM SYSTEM (PEOPLE, INFRASTRUCTURE AND DATA) ARE SECURE AND WELL-PROTECTED FROM UNLAWFUL ACTIVITIES THAT COULD POTENTIALLY CAUSE DISRUPTION TO CIVIL AIR TRANSPORT
- ▶ TO ADEQUATELY PROVIDE FOR NATIONAL SECURITY AND DEFENCE, AV SEC AND LAW ENFORCEMENT, FOLLOWING LEVELS OF SECURITY OBJECTIVES BE CONSIDERED:
 - ▶ TACTICAL OPS SECURITY PROVIDE DAILY ATM SECURITY OVERSIGHT AND COORDINATION TO MAXIMIZE AWARENESS OF SECURITY SITUATIONS WITHIN ATM SYSTEM VIA LAYERED SECURITY PROCESSES
 - ▶ STRATEGIC OPS SECURITY ENSURE CONTINUITY OF ATM SYSTEM VIA LONG-RANGE PLANNING, CRISIS MANAGEMENT, ANALYSIS AND SUPPORT FUNCTION
 - ▶ SPECIAL INTEROPS SECURITY FEATURES ENHANCED ATM SECURITY COOPERATION AND USE LIAISONS FOR CIVIL/MILITARY/LAW ENFORCEMENT OPS
- ▶ COMBINATION OF ORG, MEANS AND DOCTRINES (REGULATIONS, PROCEDURES) ESTABLISHED TO PROTECT ATM SYSTEM, BE ABLE TO ASSIST RESPONSIBLE AUTHORITIES BY PROVIDING PROTECTIVE MEASURES AS EARLY AS POSSIBLE AGAINST THREATS, ATTACKS AND ACTS OF UNLAWFUL INTERFERENCE, WHEN AND WHERE NECESSARY AND POSSIBLE

ATM SECURITY MANAGEMENT FOR PROTECTION OF THE ATM SYSTEM

- ▶ ENHANCING SECURITY MEASURES OF ATM SYSTEM WILL HAVE POSITIVE EFFECT ON PREVENTION OF INCIDENTS AND ABILITY TO RESPOND TO ACTS OF UNLAWFUL INTERFERENCE
 - ▶ INCLUDES SECURITY MEASURES ADOPTED BY ALL PARTS OF ATM SYSTEM, BOTH TECHNICAL AND OPERATIONAL
 - ▶ IN PARTICULAR, INCLUDES
 - ▶ FOSTERING OF SECURITY AWARENESS
 - ▶ IMPROVING DISSEMINATION OF INFORMATION
 - ▶ DEVELOPING ATM SECURITY STANDARDS & COORDINATION PROCEDURES
 - ▶ ADDRESSING ALL SECURITY REQUIREMENTS IN THE CNS DOMAINS AND ATM INFRASTRUCTURE
 - ▶ MORE EFFECTIVE COOPERATION BETWEEN CIVIL AND MILITARY AUTHORITIES BE ACHIEVED BY ENHANCEMENT OF COORDINATION AND COMMUNICATIONS PROCEDURES AND APPLICATION OF IMPROVED COMMUNICATIONS TECHNOLOGY
- 
- A series of four parallel white lines of varying lengths, slanted diagonally upwards from left to right, located in the bottom right corner of the slide.

ATM IN CRISIS SITUATIONS

- ▶ DURING CRISIS SITUATION REQUIRES FOR INCREASED COORDINATION BETWEEN CIVIL AND MILITARY ATM AUTHORITIES
 - ▶ ALLOW CIVIL AIR TRAFFIC TO CONTINUE OPS TO MAXIMUM EXTENT POSSIBLE,
 - ▶ FACILITATING OPERATIONAL FREEDOM FOR MILITARY AIR OPERATIONS
- ▶ EXTENT OF ANY CHANGES TO NORMAL PEACETIME ATM SYSTEM DEPENDS ON DECISIONS MADE AT PREVAILING SITUATION
- ▶ CHANGES INTRODUCED PROGRESSIVELY BUT UNDER CERTAIN CIRCUMSTANCES EFFECTED IMMEDIATELY DEPENDING ON NATURE OF CRISIS
- ▶ CRISIS MAY CAUSE UNUSUAL MILITARY TRAFFIC FLOWS IN AIRSPACE OF NATIONS WHETHER DIRECTLY INVOLVED
- ▶ REGIONAL VARIATIONS ALSO BE APPLICABLE DEPENDING ON WHERE CRISIS SITUATION CENTRED
- ▶ WHATEVER CIRCUMSTANCES, REQUIREMENT FOR INCREASED CIVIL/MILITARY COORDINATION GREATLY ENHANCED BY DEVELOPMENT OF CONTINGENCY PLANS
- ▶ SUCH PLANS TO ADDRESS REQ FOR EXPEDITIOUS HANDLING OF INCREASED AIR TRAFFIC IN SUPPORT OF ANY FUTURE CRISIS WITHIN THEIR FIRS/UPPER UIRS AND ANY CROSS-BORDER AREA SHARED WITH NEIGHBOURING NATIONS
- ▶ PROCEDURES COVERING REQTS FOR DIPLOMATIC CLEARANCES FOR OVERFLYING AIRCRAFT ALSO INCLUDED
- ▶ INITIALLY, NEED FOR AUGMENTATION OF TACTICAL AIR UNITS AND AIRLIFTS BY MIL AND CIV TPT ACFT WHICH, TOGETHER WITH ASSOCIATED AIR-TO-AIR RE-FUELING OPS, TO BE ACCOMMODATED WITHIN ROUTINE AIR TFC ENVIRONMENT
- ▶ ALSO COMPRISE NUMBER OF REPATRIATION FLIGHTS OR VIP FLIGHTS REQUIRING HIGH PRIORITY
- ▶ CIVIL HUMANITARIAN AID OPERATIONS ALSO BE TAKEN INTO ACCOUNT
- ▶ THOUGH NORMAL PEACETIME ATM MEASURES APPLIED INITIALLY TO DEAL WITH CHANGES IN PATTERN AND DENSITY OF TRAFFIC, EXPECTED THAT MEASURES MAY BE INSUFFICIENT
- ▶ CONSEQUENTLY, NATIONAL CONTINGENCY PLANS BE ABLE TO RESPOND TO INCREASED COMPLEXITY OF AIRSPACE REQUIREMENTS AND ANY SUBSEQUENT CHANGES CONSIDER ESTABLISHMENT AND MANNING OF A NATIONAL ATS CRISIS ENTITY, RESPONSIBLE FOR CLOSE COORDINATION BETWEEN NATIONAL AND RELEVANT INTL AVIATION ORG

ATM IN CRISIS SITUATIONS

- ▶ PARAMOUNT IMPORTANCE FROM EARLY STAGE IMM FOLLOWING POLITICAL DECISION TO TAKE ACTION, CIV AND/OR MIL ACFT EMPLOYED IN SUPPORT OF MIL OPS BE AFFORDED MAX PRIORITY IN USE OF AIRSPACE AND ATM RESOURCES OF ALL NATIONS
 - ▶ INTERRELATIONSHIP AND SAFE AND BALANCED COEXISTENCE OF CIV AND MIL ACTIVITIES ARE CRUCIAL
 - ▶ MIL OP REQTS AND CONSEQUENT PLANNING NEED TO CONSIDER AT THE EARLIEST, ASSESSMENT OF IMPACT PLANNED ACTION HAVE ON CIVIL OPS, AND PRIORITIES ALLOCATED ACCORDINGLY
 - ▶ CONTINUAL REASSESSMENT OF IMPACT NECESSARY AS SITUATION AND MIL REQTS DEVELOP
 - ▶ GUIDANCE MATERIAL - AVIATION SECURITY MANUAL
- 

STATE AIRCRAFT OPERATIONS

- ▶ CHICAGO CONVENTION, ARTICLE 3 (B)- “ACFT USED IN MILITARY, CUSTOMS AND POLICE SERVICES SHALL BE DEEMED TO BE STATE AIRCRAFT”
- ▶ RIGHT TO ACCESS ALL AIRSPACE, WITHIN LIMITS OF OPERATIONAL NEEDS, IS CRUCIAL REQ TO ENABLE MILITARY, CUSTOMS AND POLICE TO PERFORM SECURITY, DEFENCE AND LAW ENFORCEMENT MISSIONS MANDATED BY THEIR STATES AND BY INTL AGREEMENT
- ▶ FUNDAMENTAL REQUIREMENT -EACH STATE BE ABLE TO TRAIN AND OPERATE STATE AIRCRAFT EFFECTIVELY
- ▶ VITAL FOR STATE AIRCRAFT TO BE PROVIDED ACCESS TO SUFFICIENT SPACE, ENABLING ADEQUATE OPPORTUNITIES FOR TRAINING AND EXECUTION OF SECURITY, DEFENCE AND LAW ENFORCEMENT
- ▶ OPERATORS OF STATE AIRCRAFT SHOULD, WHERE PRACTICABLE, RESPECT INTERNATIONAL, REGIONAL AND STATE CIVIL AVIATION LEGISLATION AND AIM FOR COMPLIANCY
- ▶ NATURE OF DEFENCE AND SECURITY TASKS CREATE UNIQUE SITUATIONS THAT NEED SPECIAL HANDLING

STATE AIRCRAFT ROLES

- ▶ CRUCIAL TO RE-EMPHASIZE THAT STATE AIRCRAFT CONSIST OF MILITARY AND NON-MILITARY AIR ASSETS, NATURE OF ACTUAL TASKS FRAME CHARACTER OF DEFINITION
- ▶ 3 (B) DOES NOT PRECLUDE ICAO MEMBER STATES FROM DEFINING STATE AIRCRAFT
- ▶ AIRCRAFT TYPES CONSIDERED VARY CONSIDERABLY, RANGING FROM AD FIGHTER ACFT TO FISHERIES PROTECTION TWIN-ENGINED TURBOPROP

ROLES CONSIDERED

- ▶ AIRLIFT
- ▶ COUNTER-AIR
- ▶ SPACE OPERATIONS

STATE AIRCRAFT OPERATIONS

- ▶ MARITIME OPERATIONS. AIRBORNE OPERATIONS.
 - ▶ AEROMEDICAL EVACUATION
 - ▶ INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE
 - ▶ SPECIAL AIR OPERATIONS
 - ▶ AIR-TO-AIR REFUELING. SEARCH AND RESCUE. ICAO MEMBER STATES, FUNDAMENTAL OBLIGATION UNDER THE CONVENTION ON INTERNATIONAL CIVIL AVIATION
 - ▶ POLICE/CUSTOMS.METEOROLOGICAL SUPPORT
 - ▶ GEOGRAPHIC AND HYDROGRAPHIC SUPPORT
 - ▶ AERIAL FIRE FIGHTING
 - ▶ EXPERIMENTAL/TRIAL AIRCRAFT
 - ▶ VIP AIRCRAFT
 - ▶ UNMANNED AIRCRAFT SYSTEMS
- 

STATE NON-AVIATION AIRSPACE REQUIREMENTS

- ▶ STATE NON-AVIATION OPERATIONS IN SOME CIRCUMSTANCES REQUIRE ACCESS TO NATIONAL AIRSPACE
- ▶ OFTEN THESE OPERATIONS WILL NOT BE COMPATIBLE WITH OTHER CONCURRENT AVIATION ACTIVITY AND WILL RENDER AIRSPACE NON-COMPLIANT WITH FUA PRINCIPLES
- ▶ OPERATIONS INCLUDING SURFACE/NAVAL WEAPONS FIRING, RESEARCH, DEVELOPMENT AND EXERCISING OF NON-KINETIC WEAPONRY, JAMMING, AND WEAPONS STORAGE WILL NORMALLY REQUIRE THE USE OF SEGREGATED AIRSPACE IN ORDER TO ENSURE THE SAFETY OF NON-PARTICIPANTS

STATE AIRCRAFT CONSTRAINTS

- ▶ ASSOCIATED CONSTRAINTS THAT STATE AIRCRAFT HAVE ARE-
- ▶ INSTITUTIONAL CONSTRAINTS - STATE ACFT OPS ARE NOT PROFIT-MAKING BUT MORE ATTUNED TO SERVING A FUNCTION OR CARRYING OUT A REQUIREMENT

MANDATED TO MEET SECURITY AND DEFENCE INTERESTS AS DEMANDED BY GOVTS, STATE ACFT OPS REQUIRE COST-EFFECTIVE ACCESS TO TRG AREAS THAT NEED TO BE ECONOMICALLY VIABLE FROM HOME BASES WHILE ALSO OPERATIONALLY ACHIEVABLE.

AGING FLEETS, CONSTRAINTS ON DEFENCE BUDGET SPENDING, CREATE FINANCIAL CHALLENGE OF FITTING STATE ACFT WITH NEW EQPT TO SATISFY GLOBAL DEVELOPMENTS IN NEW ATM PROGRAMMES.

- ▶ OPERATIONAL CONSTRAINTS. PREPARED FOR DEFENCE AND SECURITY THREATS AND ABLE TO CONDUCT EFFECTIVELY UNIQUE SITUATIONS THAT NEED SPECIAL HANDLING AND CONSIDERATIONS, PLACE OP CONSTRAINTS O BE CONSIDERED IN TERMS OF ATM MEASURES

ATM DELAYS OR DENIED ACCESS TO RELEVANT AIRSPACE SHOULD NOT OCCUR DURING AS SAR, AIR POLICING/PATROL, AERIAL FIRE FIGHTING AND SPECIAL AIR OPS

- ▶ TECHNICAL CONSTRAINTS. EQUIPAGE OF STATE ACFT FOCUSED ON OUTPUT AND NATURE OF TASK EXPECTED TO DELIVER
PROVISION OF ATM AND CNS EQUIPMENT ON BOARD HAVE CERTAIN CONSTRAINTS DUE TO LIMITED SPACE

STATE NON-AVIATION AIRSPACE REQUIREMENTS

FULLY-COMPLIANT OPERATIONS

AIRLIFT

VIP AIRCRAFT

PARTIALLY-COMPLIANT OPERATIONS

COUNTER-AIR MISSIONS

AEROMEDICAL EVACUATION

ISR

UNMANNED AIRCRAFT SYSTEMS

SEARCH AND RESCUE (SAR)

LARGE-SCALE EXERCISES

POLICE/CUSTOM

Several white lines of varying lengths and angles are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

CIVIL/MILITARY COLLABORATION — A NEW GLOBAL CHALLENGE

- ▶ STATE AGREEMENTS BETWEEN MILITARY AVIATION UNITS AND FOCUSED ON NEEDS OF STATE DEFENCE, SECURITY AND EMERGENCY PROCEDURES AND MILITARY READINESS, RESPONSE REQTS.
- ▶ NEED TO ESTABLISH PROCEDURES THAT SUPPORT EFFICIENT INTEGRATION OF MILITARY AND CIVIL AVIATION IN DAY-TO-DAY OPS.
- ▶ COLLABORATION BEGINS WITH GOOD COMMUNICATION - MEET REGULARLY TO BETTER UNDERSTAND NEEDS, CONSTRAINTS, CHALLENGES WITHIN STATE AIRSPACE
- ▶ GOOD COMMUNICATION AND MUTUAL UNDERSTANDING HELP BUILDING COLLABORATION
- ▶ GOOD CIVIL/MILITARY COMMUNICATION AND COLLABORATION -KEY TO SUCCESS FOR ATM AROUND THE WORLD.
- ▶ ATM STAKEHOLDERS SHOULD APPROACH AND DECIDE ON EACH CHANGE-PROCESS ON A COLLABORATIVE BASIS
- ▶ OPTIMIZED DECISION-MAKING WHEN INTERESTS OF ALL ATM STAKEHOLDERS ARE REPRESENTED AND IMPACT OF REQD CHANGES WEIGHED AND BALANCED AGAINST NEEDS AND ISSUES OF MILITARY, CIVIL AND STATE AVIATION.
- ▶ AVIATION OPS CONTRIBUTE SIGNIFICANTLY TO ECONOMY AND GROWTH NEEDS TO BE PROTECTED AND ENCOURAGED, EACH STATE BENEFIT FROM STRONG COMMITMENT TO CIVIL/MILITARY COLLABORATION
- ▶ COLLABORATION ON THE DESIGN AND MANAGEMENT OF STATE AIRSPACE, TECHNICAL REQUIREMENTS, AND DATA AND INFORMATION COLLECTION AND DISSEMINATION ALLOW CIVIL AVIATION TO FLOURISH AND MILITARY AVIATION TO PERFORM REQUIRED MISSIONS
- ▶ AVIATION GLOBAL BUSINESS WITH ECONOMIC IMPACT THAT CROSSES STATE BORDERS
- ▶ STRONG COMMITMENTS TO CIVIL/MILITARY COLLABORATION CONDUCIVE TO INTERNATIONAL HARMONIZED APPROACHES TO AVIATION AND BUILDING AGREEMENTS THAT BENEFIT STATE AND INTERNATIONAL CIVIL AVIATION STAKEHOLDERS ALIKE.

CIVIL/MILITARY COLLABORATION — A NEW GLOBAL CHALLENGE

▶ SUCCESSFUL STATE CIVIL/MILITARY COLLABORATION RESULTS IN BENEFITS TO AIRSPACE MANAGEMENT AND ATM SYSTEM OPERATIONS:

ATTAINS HIGHER LEVELS OF SAFETY

INCREASES AIRSPACE CAPACITY

ENHANCES NATIONAL SECURITY

INCREASES OPERATIONAL EFFICIENCIES THROUGH

INTEROPERABILITY OF CIVIL AND MILITARY AIRCRAFT

REDUCTION IN DISTANCES FLOWN

ESTABLISHMENT OF OPTIMAL FLIGHT PROFILES

REDUCTION IN FUEL CONSUMPTION AND CARBON EMISSIONS

▶ NOT ONLY DOES COLLABORATION HAVE A POSITIVE IMPACT ON DAY-TO-DAY AIRSPACE MANAGEMENT BUT IT ALSO ALLOWS FOR IMPROVED PLANNING AND EXECUTION OF FUTURE TECHNICAL AND OPERATIONAL CONCEPTS

▶ COLLABORATIVE ASSESSMENTS OF COSTS AND BENEFITS WILL ALLOW TO MEET THE FUTURE DEMANDS OF CIVIL AND MILITARY AVIATION WITH MUCH GREATER CERTAINTY

▶ STATES WILL BE ENCOURAGED TO CONSIDER COMMON REQUIREMENTS FOR TECHNOLOGY, CAPABILITIES, PERFORMANCE AND PROCEDURES TO MEET FUTURE ATM DEMANDS

▶ THIS GUIDANCE SHOULD BE CONSIDERED AS THE FIRST ATTEMPT TO SHOW A PATH FORWARD. IT NOT ONLY INDICATES THE STRATEGIC DIRECTION OF ICAO, BUT ALSO ATTESTS TO THE READINESS OF NUMEROUS GLOBAL AND REGIONAL PARTNERS IN THE AVIATION INDUSTRY, MILITARY ENTITIES, ATM, AND AVIATION SERVICE PROVISION TO ENGAGE IN A MUTUALLY REWARDING COLLABORATIVE EFFORT.

▶ THE AVIATION ENVIRONMENT IN INDIAN CONTEXT HAS WITNESSED MANY IMPORTANT POLICY INTERVENTIONS TOWARDS BRINGING CIVIL MILITARY COLLABORATION INTO A REALITY. THERE ARE DEFINITE DEFERRING REQUIREMENT; HOWEVER, COLLABORATION EFFORT HAS FRUCTIFIED INTO MUTUAL UNDERSTANDING AND SUPPORT. WHILE EFFORTS ARE GIVING POSITIVE OUTCOME THERE NEED BE MORE INITIATIVES TO ENHANCE THE COLLABORATION.

LEGAL ISSUES CONCERNING COMMUNICATION/NAVIGATION AND SURVEILLANCE SYSTEMS

- ▶ GENERALLY AGREED THAT NO LEGAL OBSTACLE TO IMPLEMENTATION OF CNS/ATM SYSTEMS AND NOTHING INHERENT IN CNS/ATM SYSTEMS THAT IS INCONSISTENT WITH THE CHICAGO CONVENTION. ALSO CONSENSUS THAT GNSS SHALL BE COMPATIBLE WITH CHICAGO CONVENTION, ITS ANNEXES AND OTHER PRINCIPLES OF INTERNATIONAL LAW
- ▶ PRESENTLY, LEGAL ASPECTS OF CNS/ATM SYSTEMS ADDRESS ISSUES MAINLY RELATED TO GNSS, WHICH A KEY ELEMENT OF ICAO CNS/ATM SYSTEMS
- ▶ COUNCIL HAS BEEN CONSIDERING QUESTION OF A LEGAL FRAMEWORK FOR GNSS, IN THE FORM OF A NEW LEGAL INSTRUMENT, OR SEVERAL INSTRUMENTS OF DIFFERENT TYPES, FOR SOME TIME, WITH THE ASSISTANCE OF THE LEGAL COMMITTEE, A PANEL OF LEGAL AND TECHNICAL EXPERTS AND A SECRETARIAT STUDY GROUP. EVEN THOUGH THERE IS NO CONSENSUS ON THE FORM OF ANY NEW INSTRUMENT, THERE HAS BEEN MUCH DISCUSSION ON WHAT FEATURES IT MIGHT CONTAIN. THE PRIMARY LEGAL ISSUE CONSIDERED TO REQUIRE NEW LAW IS HOW TO SECURE ACCESSIBILITY AND CONTINUITY OF GNSS SERVICES. CORRESPONDING TO THIS ISSUE, THE INSTITUTIONAL ASPECTS MAINLY RELATE TO THE FUTURE OPERATING STRUCTURES FOR GNSS. ATTENTION HAS BEEN DEVOTED TO BOTH THE LEGAL CONSIDERATIONS IN RESPECT OF THE EXISTING SYSTEMS AND TO THE ELABORATION OF A MORE COMPLETE AND LASTING LEGAL FRAMEWORK FOR THE LONG-TERM FUTURE.
- ▶ TRANSITIONAL ARRANGEMENTS WITH RESPECT TO THE EXISTING SATELLITE NAVIGATION SYSTEMS ARE GOVERNED BY THE CHICAGO CONVENTION AND RELEVANT SARPS. IN ADDITION, ASPECTS RELATING TO THE PROVISION OF THE GNSS SIGNAL-IN SPACE WERE THE SUBJECT OF THE EXCHANGE OF LETTERS BETWEEN ICAO AND THE UNITED STATES, DATED 14 AND 27 OCTOBER 1994, AND ICAO AND THE RUSSIAN FEDERATION, DATED 4 JUNE AND 29 JULY 1996.
- ▶ PANEL OF LEGAL AND TECHNICAL EXPERTS ON THE ESTABLISHMENT OF A LEGAL FRAMEWORK WITH REGARD TO GNSS (LTEP), WHICH WAS ESTABLISHED BY THE ICAO COUNCIL ON 6 DECEMBER 1995, HAS BEEN GIVEN THE MANDATE, INTER ALIA, TO CONSIDER THE DIFFERENT TYPES AND FORMS OF THE LONG-TERM LEGAL FRAMEWORK FOR GNSS AND TO ELABORATE THE LEGAL FRAMEWORK THAT WOULD RESPOND TO CERTAIN FUNDAMENTAL PRINCIPLES. THE CONSIDERATION OF THE LEGAL FRAMEWORK HAS RESULTED IN CONSENSUS ON THE TEXT OF A DRAFT CHARTER ON THE RIGHTS AND OBLIGATIONS OF STATES RELATING TO GNSS SERVICES, WHICH WAS ADOPTED BY THE 32ND SESSION OF THE ASSEMBLY (22 SEPTEMBER TO 2 OCTOBER 1998) IN THE FORM OF RESOLUTION A32-19. (THE "CHARTER", APPENDIX A TO THIS CHAPTER REFERS).

LEGAL ISSUES CONCERNING COMMUNICATION/NAVIGATION AND SURVEILLANCE SYSTEMS

- ▶ FUNDAMENTAL PRINCIPLES OF THE GNSS LEGAL FRAMEWORK
 - ▶ THE SAFETY OF INTERNATIONAL CIVIL AVIATION
 - ▶ UNIVERSAL ACCESSIBILITY WITHOUT DISCRIMINATION
 - ▶ CONTINUITY OF SERVICES
 - ▶ RESPECT OF STATE SOVEREIGNTY
 - ▶ COMPATIBILITY OF REGIONAL ARRANGEMENTS WITH THE GLOBAL PLANNING AND IMPLEMENTATION
 - ▶ COOPERATION AND MUTUAL ASSISTANCE
- 

LEGAL ISSUES CONCERNING COMMUNICATION/NAVIGATION AND SURVEILLANCE SYSTEMS

- ▶ OTHER LEGAL ISSUES
- ▶ IN ADDITION TO THE FUNDAMENTAL PRINCIPLES INCORPORATED INTO THE CHARTER, THERE ARE OTHER LEGAL ISSUES UNDER CONSIDERATION, SUCH AS:
 - ▶ CERTIFICATION;
 - ▶ LIABILITY;
 - ▶ ADMINISTRATION, FINANCING AND COST-RECOVERY; AND
 - ▶ FUTURE OPERATING STRUCTURES.
- ▶ IN CONSIDERING THESE ISSUES, LTP PUT FORWARD 16 RECOMMENDATIONS (APPENDIX B TO THIS CHAPTER REFERS) WHICH, ALONG WITH THE REPORT ON THE WORK OF THE PANEL, WERE SUBMITTED TO THE 32ND SESSION OF THE ASSEMBLY OF ICAO, THROUGH THE LEGAL COMMISSION, FOR FURTHER GUIDANCE. IN THIS RESPECT, THE 32ND SESSION OF THE ASSEMBLY ADOPTED RESOLUTION A32-20 (APPENDIX C TO THIS CHAPTER REFERS).
- ▶ CERTIFICATION
- ▶ LIABILITY
- ▶ FUTURE OPERATING STRUCTURES FOR GNSS

THANK YOU

Several thin, white, parallel diagonal lines are located in the bottom right corner of the image, extending from the right edge towards the center.