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The IFATCA Office
1255 University Street, Suite 408
Montreal, Quebec, H3B 3B6
Canada

Phone: +1 514 866 7040
Fax: +1 514 866 7612
E-mail: office@ifatca.org

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58			98		
59			99		
60			100		
61			101		
62			102		
63			103		
64			104		
65			105		
66			106		
67			107		
68			108		
69			109		
70			110		
71			111		
72			112		
73			113		
74			114		
75			115		
76			116		
77			117		
78			118		
79			119		
80			120		
81			121		
82			122		
83			123		
84			124		
85			125		
86			126		
87			127		
88			128		
89			129		
90			130		

Table of Contents

1. INTRODUCTION

1.1. General

1.1.1. POLSTATS are published in the following pages of the Technical and Professional Manual.

1.1.2. Requests for information or guidance upon a technical or professional matter which has not been the subject of a working paper should be directed to the Chairman TOC or PLC who, in conjunction with, if necessary, the Executive Vice-President Technical or Professional will gather such information on the subject as is available in a reasonable timescale and provide an answer to the query.

1.2. Technical and Professional Manual

1.2.1. The permanent record of the Federation's policies and activity is contained in two volumes – the IFATCA Administrative Manual and the IFATCA Technical and Professional Manual. The Deputy President shall be responsible for ensuring the provisions of these Manuals are kept up-to-date by the regular issue amendments which shall be distributed by the Office. The Executive Board will be responsible for the appointment of (a) suitable person(s) to ensure the content and format is edited and maintained in an accurate and proper manner. These publications shall be maintained in the IFATCA Office, and each Member Association shall receive one free copy on acceptance of their affiliation plus annual amendments. (Arusha 08.A12)

1.2.2. The Technical and Professional Secretary shall maintain, amend and disseminate the Technical & Professional Manual in coordination with the Editor of the IFATCA Administrative Manual, EVPT, EVPP and Chairman PLC and TOC. (Tunis 96.A.47 amended Cancun 02.A.37, Hong Kong 04.A.41, Arusha 08.A23).

1.2.3. The Technical and Professional Manual shall only be available in Adobe Acrobat (.PDF) format on both CD and the web site (amended Melbourne 05.A.17).

1.2.4. In addition to the Technical and Professional Manual being distributed to the EB, members of TOC and PLC and the representatives, it shall be made available to other interested parties on request. (Tunis 96.A.47, amended Cancun 02.A.37)

1.3. Technical and Professional Secretary

1.3.1. Name and address:

Mr. Joy Bhattacharya
526, Dakshinayan, Plot 19, Sector 4, Dwarka, New Delhi 110019, India

Phone: +91 11 25096668 (H) +91 9873550394 (M) Fax: +91 11 24619064

E-mail: tpsec@ifatca.org

PART 2

ACRONYMS AND TERMS

List of Acronyms and Terms

1090 ES	1090 MHz Extended squitter
3D,4D	3 or 4 Dimension
AA	Approved Agency
AAC	a) Airline Administrative Control b) Aeronautical Administrative Communication
AAS	a) IFATCA Manual: Advanced Avionics System b) Technical Manual: Advanced Automated System
ABI	Advanced Boundary Information Message
Abstract Syntax Notation One - (ASN.1) ACARS	A standard definition approach that is consistent with the ISO orientation of the ATN and specific ATN Manual Guidelines. a) Aircraft Communications Addressing and Reporting System b) Aircraft Communications and Reporting System c) Aeronautical Radio Incorporation (ARINC) Communications Addressing and Reporting System.
AC	Advisory Circular
ACARE	Advisory Council for Aeronautics Research in Europe
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
Accuracy	The degree of conformance between the estimated or measured position and / or velocity and / or time of/at a platform and its true position and/or velocity and the true time. Radio navigation system accuracy is usually presented as a statistical measure of system error and is specified as: a) Predictable The accuracy of a position with respect to the geographic or geodetic coordinates of the earth. b) Repeatable The accuracy with which a user can return to a position whose coordinates have been measured at a previous time with the same navigation system. c) Relative The accuracy with which a user can determine one position relative to another position regardless of any error in their true positions. In the context of the final approach phase of operation, accuracy may be more generally defined as the ability of the total system to maintain the aircraft position within a total system error (TSE) with a 95 percent probability and to stay within a specified aircraft containment surface which defines the obstacle clearance, terrain avoidance, or aircraft separation criteria for the intended operation. The total system error is based on the 95% probability combination of aircraft and non-aircraft sensor errors, display errors and flight technical errors at each point along the specified procedure. For approach, the outer tunnel must be used as the obstacle Clearance surface.
ACE	ATM and CNS System Engineering (an EEC Centre of Expertise)
ACF	ACARS Convergence Function
ACG	ATM/CNS Consultancy Group
ACID	Aircraft Identification
ACK	Acknowledgement
Active Waypoint	A waypoint to or from which navigational guidance is being provided. For parallel offset, the active waypoint may or may not be at the same geographical position as the parent waypoint. When not in the parallel offset mode (operating on the parent route), the active and parent

	waypoints are at the same geographical position.
ACP ICAO	ICAO Aeronautical Communications Panel
AD	Application Description
ADDI	Automated Digital Data Interchange
ADEP	Airport of Departure
ADES	Airport of Destination
ADI	Aggregate Demand Indicators
ADLP	Airborne Data Link Processor. An aircraft resident processor that is specific to a particular air-ground data link (e.g. Mode S) which provides channel management, and segments and/or reassembles messages for transfer. It is connected on one side to aircraft elements common to all data link systems, and on the other side to the air/ground link itself.
ADME	Matters relating to airfield operations (ADME -> aerodrome)
ADNS	ARINC Data Network Service
ADPCM	Adaptive Differential Pulse Code Modulation
ADS	Automatic Dependent Surveillance
ADS-1	ADS capability provided by the combination of FANS 1
ADS-B	Automatic Dependent Surveillance Broadcast. ADS-B uses (Mode S) long squitter formats to broadcast aircraft position. The position is "heard" by a Ground Interrogator Receiver Unit (GIRU) on the ground and forwarded on to ATC.
ADS-B-ACC	ATC surveillance for en-route airspace
ADS-B-ADD	Aircraft derived data for ground tools
ADS-B-APT	Airport surface surveillance
ADS-B-NRA	ATC Surveillance in non-radar areas
ADS-B-TMA	ATC Surveillance in terminal areas
ADS-C	Automatic Dependence Surveillance Contract
ADSF	Automatic Dependent Surveillance Function
ADSP	ICAO Automatic Dependant Surveillance Panel
ADSU	Automatic Dependent Surveillance Unit or ADS Unit
ADT	IFATCA Airport Domain Team
Advisory	An annunciation that is generated when crew awareness is required and subsequent crew action may be required; the associated colour is unique but not red
AECMA	Association Européenne des Constructeurs de Matériel Aérospatial (European Association of Aerospace Industries)
AEEC	Airlines Electronic Engineering Committee
AES	Aircraft Earth Station
AFC	ATC Frequency Change service
AFE	Africa East
AFIS	Automated Flight Inspection System
AFL	Actual Flight Level
AFM	Africa and Middle East
AFN	a) IFATCA Manual: Africa North b) Technical Manual: ATS Facilities Notification
AFP	Air Traffic Control Flight Plan Proposal
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AFW	Africa West
AGAS	Action Group for ATM Safety

AGL	Above Ground Level
AIDC	ATC Interfacility Data Communications
AIDS	Acquired Immune Deficiency Syndrome
AIP	Aeronautical Information Publication
Aircraft Address	A unique combination of 24-bits available for assignment to an aircraft for the purpose of air-ground communications, navigation, and surveillance.
AIS	Aeronautical Information Service(s)
AKN	Acknowledgement
AL	Alerting Service
Alert	An alert is an annunciation of an operating parameter of a navigation system being out of tolerance. Alerts include warnings, cautions, advisories, and integrity alarms.
Altimetry-Aiding	The process of using altitude data to simulate a GNSS satellite directly over the receiver antenna (i.e., it reduces, by one, the number of satellites required for a given function). Barometric altimetry (calibrated pressure) is most likely to be used in civil aircraft because few, if any, have high range radio (radar) altimeters installed.
AMA	Americas
AMC	Airspace Management Cell
AMCP	ICAO Aeronautical Mobile Communications Panel
AMJ	Advisory Material-Joint
AMS	Apron Management Services,
AMSS	Aeronautical Mobile Satellite Service
AMSSP	ICAO Aeronautical Mobile-Satellite Service Panel
AMWG	Airspace Management Working Group
ANACNA	Associazione Nazionale Assistenti e Controllori della Navigazione Aerea
ANC	ICAO Air Navigation Commission
AN-Conf/11	Eleventh Air Navigation Conference
ANM	ATFM Notification Message
ANS	Air Navigation Services,
ANSP	Air Navigation Service Provider
ANSPs	Air Navigation Service Providers
ANT	Air Navigation Team
AO	Aircraft Operator
AOC	a) Aeronautical Operational Control b) Aircraft Operational Control c) Aircraft Operations Centre d) Airline Operational Communications System e) Airline Operations Centre
AOPG	Aerodrome Operations Group,
AOT	Aerodrome Operations Team
AP ICAO	ICAO Aerodrome Panel
APANPIRG	ASIA/PAC Air Navigation Planning and Implementation Regional Group
APC	a) Aeronautical Passenger Communications b) Aeronautical Public Correspondence
APDSG	ATM Procedures Development Sub-Group
APIWP	Approach Intercept Waypoint. A variable waypoint used, if needed, to link an LNAV/VNAV flight plan path with an ILS or DGNSS Instrument Approach's Final Approach Segment. (Typically used to provide such linkage inside the Final Approach Fix, e.g., on a 3-mile final from the Runway Intercept

	Waypoint).
APL	Abbreviated Flight Plan
APM	Associate Professional Membership
APP	Approach Control
Applications	Specific use of systems that address particular user requirements. For the case of GNSS, applications are defined in terms of specific operational scenarios such as the support of en-route navigation or low- visibility aircraft taxiing.
APRs	Automatic Position Reports
APT	Airport Throughput (an EEC Research Area)
APW	Area Proximity Warning
ARCW	ADS Route Conformance Warning
ARINC	Aeronautical Radio Incorporation
ARINC-429	Digital Interface
ARINC-429W	Williamsburg Protocol (ATN Committee)
ARINC-578-4	Airborne ILS-Receiver
ARINC-618	Air-Ground Character Oriented Protocol Specification
ARINC-619	ACARS Protocols for Avionic End Systems
ARINC-620	ACARS Applications
ARINC-622	ACARS ATS Applications (ACARS/ATN Gateway) (AEEC Specification 622 - standardised bit-oriented applications)
ARINC-629	Digital Interface (New)
ARINC-631	VHF Aviation Packet Communications
ARINC-635	HF Data Link Protocols
ARINC-636	Onboard Local Area Network (OLAN)
ARINC-637	Internetworking Specification
ARINC-638	ATN Upper Layer Specification
ARINC-702	FMCS, includes FMC/ACARS Data Link
ARINC-718	Mode S
ARINC-724B-3	Aircraft Communications Addressing and Reporting System (ACARS)
ARINC-741	Aviation Satellite Communication System
ARINC-744	Full-Format Printer
ARINC-745	Automatic Dependent Surveillance (ADS)
ARINC-746	Cabin Communications System
ARINC-748	Communications Management Unit
ARINC-750	VHF Data Radio
ARINC-751	Gate-Aircraft Terminal Environment Link (Gatelink) - aircraft side
ARINC-752	Airborne Radio Subsystem
ARINC-753	HF Data Link System
ARO	ATS Reporting Office
ARR	Arrival message
ARTAS	a) Air Traffic Management Surveillance Tracker and Server System b) ATC Radar Tracker and Server.
ARTCC	Air Route Traffic Control Centre
AS	Airborne Surveillance
ASA	Aircraft Surveillance Applications
ASAS	Airborne Separation Assistance System
ASAS TN	Airborne Separation Assistance System Thematic Network
ASD	Air Situation Display
ASDE-X	Airport Surface Detection Equipment Model X

ASECNA	Agency for the Security of Aerial Navigation in Africa and Madagascar
ASI	Asia
ASM	Airspace Management
A-SMGCS	Advanced Surface Movement Guidance and Control System
ASMT	Air Traffic Control Safety Monitoring Tool
ASN.1	Abstract Syntax Notation One (see there)
ASP	Asia and Pacific
ASP ICAO	ICAO Aeronautical Surveillance Panel
ASPA-S&M	Enhanced sequencing and merging operations
ASPP	ICAO Aeronautical Fixed Service (AFS) Systems Planning for Data Interchange Panel
ASTERIX	All Purpose STructured Eurocontrol suRveillance Information EXchange
ATA	Air Transport Association
ATAR	Automatic Air Reporting
ATC	Air Traffic Control, Air Traffic Control Domain
ATC Control Authority	Person responsible for separation of aircraft (controller).
ATC Data Authority	ATC ground system peer used by the ATC Control Authority.
ATC Ground System Peer	Peer end-system with ATCComm for a given connection.
ATCC	Air Traffic Control Centre
ATCComm	Air Traffic Control Communications Systems (Hardware & Software)
ATCO	Air Traffic Control Officer
ATCS	Air Traffic Control Services
ATD	Along-Track Distance. The distance along the desired track from the waypoint to the perpendicular line from the desired track to the aircraft.
ATFM	Air Traffic Flow Management
ATIS	a) Air Traffic Information Service b) Airport Terminal Information Service c) Automated Terminal Information Service
ATLAS	Australian Transition to Satellite Technology
ATM	Air Traffic Management
ATMCP	Air Traffic Management Operational Concepts Panel (ICAO) now ATMRPP
ATMRPP	Air Traffic Management Requirements and Performance Panel formerly ATMCP
ATN	Aeronautical Telecommunications Network
ATNP	ICAO ATN Panel (proposed 3/94)
ATO	Actual Time Over
ATRK	Along-Track Error. A fix error along the flight track resulting from the total error contributions.
ATS	Air Traffic Service(s)
ATSA-AIRB	Enhanced traffic situational awareness during flight operations
ATSA-S&A	Enhanced visual acquisition for see & avoid
ATSA-SURF	Enhanced traffic situational awareness on the airport surface
ATSA-SVA	Enhanced successive visual approaches
ATSA-VSA	Enhanced traffic situational awareness during visual separation
ATSAW	Airborne Traffic Situation Awareness
ATO	Actual Time Over
ATRK	Along-Track Error. A fix error along the flight track resulting from the total

	error contributions.
ATS	Air Traffic Service(s)
ATSA-AIRB	Enhanced traffic situational awareness during flight operations
ATSA-S&A	Enhanced visual acquisition for see & avoid
ATSA-SURF	Enhanced traffic situational awareness on the airport surface
ATSA-SVA	Enhanced successive visual approaches
ATSAW	Airborne Traffic Situation Awareness
ATSC	Air Traffic Services Communication
ATS-PM	Air Traffic Services Planning Manual
ATSU	Air Traffic Service Unit
AUP	Airspace Use Plan
AUSEP	Australian RNAV Standard
Availability	a) The availability of a navigation system is the ability of the system to provide the required guidance at the initiation of the intended operation. b) Availability risk is the probability that the required guidance will not be present at the initiation of the intended operation. c) Availability is an indication of the ability of the system to provide useable service within the specified coverage area. d) Signal availability is the percentage of time that navigational signals transmitted from external sources are available for use. e) Availability is a function of both the physical characteristics of the environment and the technical capabilities of the transmitter facilities.
AVPAC	Aviation VHF Packet Communications
AWOG ICAO	All Weather Operations Group
AWOP	ICAO All Weather Operations Panel
Barometric Altitude	Geopotential altitude in the earth's atmosphere above mean standard sea level pressure datum surface, measured by a pressure (barometric) altimeter.
BDS	Comm-B Data Store
BER	Basic Encoding Rules.
BRL	Bearing Range Line
B-RNAV	Basic Area Navigation
Broadcast	The protocol within the Mode S system that permits uplink messages to be sent to all aircraft in cover, and downlink messages to be made available to all interrogators that have aircraft wishing to send the message under surveillance.
C/A	Course Acquisition Code
C/I	Carrier-to-Interference Ratio
C/N	Carrier-to-Noise Ratio
CAA	a)Civil Aviation Administration b)Civil Aviation Authority
CAASD	Centre for Advanced Aviation System Development (The MITRE Corporation)
CADF	Centralised Airspace Data processing Function
CANSO	Civil Air Navigation Services Organisation
CAR	Caribbean
CASA	Civil Aviation Safety Authority
CASCADE	Co-Operative ATS through Surveillance & Communication Applications Deployed in ECAC
CAT	Data Category

CATMAC	Co-operative Air Traffic Management Concept
Caution	An annunciation that is generated when immediate crew aware subsequent crew action will be required; the associated colour is amber/yellow.
CBA	a)Cost/Benefit Analysis b)Cross-Border Area
C-Band	Approx. 5,000MHz
CBI	Computer Based Instruction
CC	Connection Confirm
CCIR	International Radio Consultative Committee
CCITT	International Telegraph and Telephone Consultative Committee
CCO	Continuous Climb Operations
CDA	Continuous Descent Approaches
CDI	Course Deviation Indicator
CDM	Collaborative Decision Making
CDO	Continuous Descent Operations
CDR	Conditional Route
CDSNs	Conflict Detection Safety Nets
CDTI	Cockpit Display of Traffic Information
CDTs	Conflict Detection Tools
CEATS	Central European Air Traffic Services
Centre of Navigation	The mathematical point, referenced to the associated with the DGNSS navigation solution. This point would typically of the GNSS antenna, but could also be an offset or translated point (e.g., might be translated vertically to the level of the wheels of a large aircraft).
CEO	Chief Executive Officer
CFMU	Central Flow Management Unit
CHI	Computer Human Interface
CIB	Controller Intervention Buffer
CIC	Controller Intervention Capability
CIDIN	Common ICAO Data Interchange Network
CIMIC	Civil/Military Interface Standing Committee
CIP	Convergence and Implementation Plan
CIS	a)Critical Incident Stress b)Co-operative Independent Surveillance
CISM	Critical Incident Stress Management
CLAM	Cleared Level Adherence Monitoring
CLNP	Connectionless Network Protocol
CM	Context Management
CMG	Controller Management Group
CMU	a) Communications Management Unit b) Context Management Unit
CNS	Communication Navigation and Surveillance
CNS/ATM	Communication, Navigation, Surveillance/Air Traffic
CoE	Centre of Expertise
COF	Continuity [of a system] a) The continuity of a system is the ability of the total system (compromising all elements necessary to maintain aircraft position within the defined airspace) to perform it's function without non- scheduled interruptions during the intended operation b) The continuity risk is the probability that the system will be unintentionally interrupted and not provides guidance information for the

	intended operation. c) More specifically, continuity is the probability that the system will be available for the duration of a phase of operation, presuming that the system was available at the beginning of that phase of operation.
COM	Communications
COM/MET/OPS	Communications/Meteorology/Operations
Comm-A	A 112-bit interrogation containing the 56-bit MA message field. This field is used by the uplink SLM and broadcast protocols.
Comm-B	A 112-bit reply containing the 56-bit MB message field. This field is used by the downlink SLM, ground-initiated, and broadcast protocols.
Comm-C	A 112-bit interrogation containing the 80-bit MC message field. This field is used by the extended length message (ELM) uplink protocol.
Comm-D	A 112-bit reply containing the 80-bit MD message field. This field is used by the extended length message (ELM) downlink protocol.
COM-T	Communications Team
Connection	Transport Layer Relationship between peer end-systems.
Connection Management	Term used to describe the management of ATCComm connections.
Context Management	An independent service that meets ATSC addressing requirements. It provides the mechanism for aircraft and ATC ground system peers to indicate availability to other ATN users and to convey the addresses to be employed. ATCComm interfaces with aircraft CM equipment to provide ATC ground system peers the addresses needed to establish communication with ATCComm.
CONTRAN	Brand name for a device to prevent aircraft from blocking each other during transmissions
CONUS	Contiguous United States
Coordinate Conversion	The act of changing the coordinate values from one system to another, e.g., from geodetic coordinates (latitude and longitude) to Universal Transverse Mercator grid coordinates.
COTS	Commercial Off-The-Shelf
Coverage	The coverage provided by a radio navigation system is that surface area or space volume in which the signals are adequate to permit the user to determine position to a specified level of accuracy. Coverage is influenced by system geometry, signal power levels, receiver sensitivity, atmospheric noise conditions and other factors which affect signal availability.
CPDLC	Controller Pilot Data Link Communications
CR	Connection Request
CRAM	Conditional Route Availability Message
CRC	Cyclic Redundancy Check
CRDA	Converging Runway Display Aid
CRDS	CEATS Research and Development Simulation Centre
CRM	a) C Reference Model b) Collision Risk Modelling c) Crew Resource Management
CROPS	Converging Runway Operations
CRT	Cathode Ray Tube
CSE	Course Setting Error. The difference between the desired course setting and the course that is actually set.
CTA	a) Control Area

	b) Calculated Time of Arrival
CTMO	Centralised Traffic Management Organisation
CTs	Controller Tools
CW	Carrier Wave
CWI	Continuous Wave Interference.
D, R, P Areas	Danger, Restricted and Prohibited Areas
DA/H	Decision Altitude (Height). A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. Note 1: Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation. Note 2: The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.
DAI	Development and Integration (an EEC Centre of Expertise
DARPS	Dynamic Air Route Planning System
D-ATIS	Digital Automatic Terminal Information Service
dBm	The dBm is the unit of absolute power related to 1 milliwatt
DCE	Data Circuit-Terminating Equipment
DCIA	Dependent Converging Instrument Approach
DCL	Departure Clearance Delivery
DCPC	Direct Controller Pilot Communication
Departure Clearance	This service provides automated assistance for requesting
Designated RNAV Route	An area navigation route based on the current high altitude or low altitude VOR/DME coverage, as designated by appropriate government agencies.
Desired Course: Magnetic	A predetermined desired course direction to be followed (measured in degrees from local magnetic north).
Desired Course: Station	A predetermined desired course direction to be followed (measured in degrees from station north).
Desired Course: True	A predetermined desired course direction to be followed (measured in degrees from true north).
DFDAU	Digital Flight Data Acquisition Unit
Dg	Degree
DGCA	Director-General Civil Aviation
DGNSS	Differential GNSS. Differential GNSS is an augmentation, the purpose of which is to determine position errors at one or more known locations and subsequently transmit derived information to other GNSS receivers in order to enhance the accuracy, integrity of the position estimate.
DGPS	Differential Global Positioning System
DIAS	Differential GNSS Instrument Approach System (see as well definitions: DIAS Integrity Alarm)
DIAS Integrity Alarm	A DIAS integrity alarm is a signal indicating an out-of-tolerance condition that might compromise the approach's containment surface.
Direct Visual Observation	Observation through direct eyesight, not supported by means other than optical aids (glasses/lenses) that correct vision
DL	Data Link
DLAC	Data Link Applications Coding.

DLORT	FAA Data Link Operational Requirements Team
DMAP	ICAO Data Link Mobile Applications Panel (proposed)
DME	Distance Measuring Equipment
DO	Document
DOP	Dilution of Precision
DOTS	Dynamic Ocean Tracking System
Downlink	A term referring to the transmission of data from an aircraft to the ground. Mode S ground-to-air signals are transmitted on the 1,090 MHz reply frequency channel.
DPF	Data Processing Function.
DPSK	Differential Phase Shift Keying.
DR	Disconnect Request
DRMS	Distance Route Mean Square. The root-mean-square value of the distance from the true location point of the position fixes in a collection of measurements. The confidence level depends on the elongation of the error ellipse. As the error ellipse collapses to a line segment, the 2 DRMS confidence level approaches 95 percent (95.4%); as the error ellipse becomes circular, the confidence level approaches 98 percent (98.2%). In navigation system analysis, a 95% confidence level is assumed, thus all error budgets are conservative with respect to the actual obtainable accuracy.
DT	Data
DTF	Data Test Facility
E. I.	Employee Involvement
EAG Eurocontrol	European ATFM Group
EANPG ICAO	European Air Navigation Planning Group
EAP	Employee Assistant Programme
EASIE	Enhanced ATM and Mode S Implementation in Europe
EATCHIP	European Air Traffic Control Harmonisation and Integration Programme
EATM	EUROCONTROL Programme for Performance Enhancement in European Air Traffic Management
EC	European Commission
ECAC	European Civil Aviation Conference
ECCG	Experimental Centre Consultation Group
EEC	a) European Economic Community b) Eurocontrol Experimental Centre
EET	Estimated Elapsed Time
EFAS	Extended Final Approach Segment. A segment collinear with the Final Approach Segment, starting at and extending beyond the Glide Path Intercept Waypoint, in the direction opposite from the landing runway.
EFIS	Electronic Flight Information System
EFR	Electronic Flight Rules
EGOA	Enhanced General Aviation Operations
EMC	Electromagnetic Compatibility.
EMI	Electromagnetic Interference.
En Route	A phase of navigation covering operations between departure and termination phases. En route phase of navigation has two subcategories: a) en route domestic / continental b) en route oceanic.
ENAV	Italian company for Air Navigation Services
ENRI	Electronic Navigation Research Institute

ER	Error
ERN	Earth Referenced Navigation. Navigation that is dependent on an external navigation source but is not dependent on a single fixed site. ERN may use either time or phase differences from hyperbolic radio navigation systems or satellite sources with earth models (datums) to determine position (normally latitude and longitude) on the surface of the earth. Omega, Loran-C, DME-DME and GNSS are different forms of ERN.
ERP	Effective Radiated Power
ESA	European Space Agency
ESARR	Eurocontrol Safety Regulatory Requirements,
ESOPS	Employee Share Option Schemes
EST	Estimate message
ETA	Estimated Time of Arrival
ETB	Estimated Time at Boundary
ETD	Estimated Time of Departure
ETN	Estimated Time of Entry
ETO	Estimated Time Over
ETODA	Estimated Time Over Deviation Aert
EU	European Union
EUC	Europe Central
EUR	Europe
EURATN	European ATN
EURET	European Transport
EUROCAE	European Organisation for Civil Aviation Equipment
EUROCONTROL	European Organisation for the Safety of Air Navigation
EUW	Europe West
EVP	Executive Vice President
EVP AFI	Executive Vice President Africa and Middle East
EVP AMA	Executive Vice President Americas
EVP ASP	Executive Vice President Asia and Pacific
EVP EUR	Executive Vice President Europe
EVP-A	Executive Vice President Administration
EVP-F	Executive Vice President Finance
EVP-P	Executive Vice President Professional
EVP-T	Executive Vice President Technical
FAA	Federal Aviation Administration
FAF	Final Approach Fix. A point in space used to indicate the position at which an aircraft on a standard approach should be stabilised with appropriate guidance being supplied for the Final Approach Segment. (Source: FAA)
FANS	ICAO Future Air Navigation Systems
FANS/II	Special Committee for the Monitoring and Co-ordination of Development and Transition Planning for the Future Air Navigation Systems
FAR	Federal Aviation Regulation
FAS	Final Approach Segment. The straight line segment which prescribes the three-dimensional geometric path in space that an aircraft is supposed to fly on final approach. This segment is defined by two points in space, the Glide Path Intercept Waypoint (GPIWP) and the Threshold Crossing Waypoint (TCWP).
FDI	Fault Detection and Isolation
FDP	Flight Data Processing.

FDPS	Flight Data Processing System
FDR	Flight Data Record
FEATS	ICAO Future European Air Traffic System
FEC	Forward Error Correction
FGCC	Federal Geodetic Control Committee.
FIFO	First In - First Out
FIIG	Federation of International Institutions of a semi-official or private nature (Geneva)
FIR	Flight Information Region
FIS	Flight Information Services
FIS-B	Flight Information Services Broadcast
FL	Flight Level, unit of altitude (expressed in 100's of feet)
FLOS	Flight Level Allocation System
FM	Frequency Modulation
FMC	Flight Management Computer
FMD	Flow Management Division (CFMU)
FMEA	Failure Mode Effects Analysis
FMP	Flow Management Position
FMS	Flight Management System
FMSG	Frequency Management Study Group.
FMU	Flow Management Unit
FOM	Figure of Merit. A system generated indication of the quality of the actual navigation performance of the aircraft. This is expressed as an indication of the aircraft position-fixing accuracy. [ICAO FANS Concept, ADSP]. Indicates aircraft position determination accuracy and navigation capability or whether accuracy is better than: FOM 0 : >30NM FOM 1 : <30NM FOM 2 : <15NM FOM 3 : <8NM FOM 4 : <4NM FOM 5 : <1NM FOM 6 : <0.24NM FOM 7 : <0.05NM
FPA	Flight Path Angle. The angle that the vertical flight path of the aircraft makes with the local horizontal.
FPD	Flight Plan Data.
FPL	Flight-Plan
FPLSG ICAO	Flight Plan Study Group
FPPS	Flight Plan Processing System
FRA	Free Route Airspace
FRAC	Free Route Airspace Concept
Frame	The basic unit of data transfer at link level. A frame can include from one to four Comm-A or Comm-B segments, or from two to sixteen Comm-C segments, or from one to sixteen Comm-D segments.
FRAP	Free Route Airspace Project
FRN	Field Reference Number
FS	Functional Statement
FSPEC	Field Specification
FTE	Flight Technical Error. The accuracy with which the aircraft is controlled as measured by the indicated aircraft position with respect to the indicated command or desired position. It does not include blunder errors.
FTI	FUA Temporary Instruction
FTS	Fast-time Simulation
FUA	Flexible Use of Airspace
FX	Field Extension Indicator

GA	General Aviation
GADS	Generic Aircraft Display Systems
GAIT	Ground-based Augmentation and Integrity Technique
GAT	General Air Traffic
GDLP	Ground Data Link Processor. A ground-resident processor that is specific to a particular air-ground data link (e.g. Mode S) which provides channel management, and segments and/or reassembles messages for transfer. It is connected on one side (by means of its DCE) to ground elements common to all data link systems, and on the other side to the air/ground link itself.
GDOP	Geometric Dilution of Position. The ratio of position error of a multilateration system. More precisely, it is the ratio of the standard deviation of the position error to the standard deviation of the measurement errors, assuming all measurement errors are statistically independent and have a zero mean and the same standard distribution. GDOP is the measure of the "goodness" of the geometry of the multilateration sources as seen by the observer; a low GDOP is desirable, a high GDOP undesirable. Applied to Loran-C, GDOP is a measure of horizontal accuracy, while with satellite navigation systems it is a measure of overall positional and temporal accuracy. (See also PDOP, HDOP and VDOP.)
GEO	Geostationary
Geocentric	Relative to the earth as a centre, measured from the centre of the earth.
Geodesy	The sciences related to the determination of the size and shape of the earth (geoid) by such direct measurements as triangulation, levelling and gravimetric observations; which determines the external gravitational field of the earth and, to a limited degree, the internal structure.
Geometric Altitude	Height above the local earth surface
Geostationary	An equatorial satellite orbit that results in a constant fixed position of the satellite over a particular earth surface reference point. (GPS and GLONASS satellites are not geostationary.) Some proposed integrity and augmentation schemes use geostationary satellites.
GES	Ground Earth Station
GIC	GNSS Integrity Channel (see there)
GICB	Ground-initiated Comm-B. The ground-initiated Comm-B protocol allows the interrogator to extract Comm-B replies from the transponder containing data from a defined source in the MB field.
GIRU	Ground Interrogator Receiver Unit.
GLONASS	Global Navigation Satellite System (Russian Federation)
GM	Guidance Material
GNSS	Global Navigation Satellite System(s)
GNSS Augmentation	GNSS augmentation is the technique of providing the system with input information, extra to that derived from the main constellation(s) in use, which provides additional range/pseudo-range inputs or corrections to, or enhancements of, existing pseudo-range inputs. This enables the system to provide a performance which is enhanced relative to that possible with the basic satellite information only.
GNSS Integrity Channel (GIC)	A system that broadcasts civil GNSS integrity information to users in a designated area, based upon measurements made by a ground-based monitor or network of monitors.
GNSS Planned Nonavailability	The proportion of time that the signals-in-space service of the GNSS is not useable taking into consideration scheduled outages only.

GNSS PSG Eurocontrol	GNSS Program Steering Group
GNSS Random Nonavailability	The proportion of time and space over the area of interest when the services of the GNSS are not useable to support the required navigation performance. Note 1: When referred to a selected point, rather than a defined area, GNSS random nonavailability is the portion of time that the services of the GNSS are not support the required navigation performance at this selected point. Note 2: GNSS random non-availability excludes planned non-availability.
GNSS Time	The overall time reference for and transmitted by the GNSS. GNSS time is precisely related to UTC but does not follow leap seconds.
GNSSP	ICAO Global Navigation Satellite Systems Panel now NSP
GOS	Grade of Service
GOSEP	Government Open Systems Interconnection Profile
GPIWP	Glide Path Intercept Waypoint. Generally located coincident with the point at which the glide slope intercept altitude meets the ILS glide slope. If no ILS glide slope exists; the point is co-located with the Final Approach Fix.
GPS	Global Positioning System. A space-based positioning, velocity and time system composed of space, control and user segments. a) The space segment, when fully operational, will be composed of 21 satellites (plus three operational spares) in six orbital planes. b) The control segment consists of five monitor stations, three ground antennas and a master control station. c) The user segment consists of antennas and receiver-processors that provide positioning, velocity, and precise timing to the user.
GPWS	Ground Proximity Warning System
GRAS	Ground-based Regional Augmentation System
GREPECAS	Caribbean/South American Planning and Implementation Regional Group
GS	Ground Speed. The speed of an aircraft measured by the distance the airplane travels over the ground, measured in nautical miles per hour (knots).
GWS	Graphic Weather Service. Provides an en route strategic weather service by way of scaleable graphics.
HALE	High Altitude Long Endurance
HARN	High Accuracy Reference Network
HAT	Height Above Touchdown
HCI	Human Computer Interface.
HDLC	High-Level Data Link Control
HDOP	Horizontal Dilution of Precision. The ratio of user-referenced horizontal position error to measurement error of a multilateration system (See GDOP for a more detailed description.)
Height Above	Specifically, the height above the Runway Intercept Waypoint.
HELI	Helicopter Operations
HEO	Highly Elliptical Orbit
HF	High Frequency
HFS	Human Factors Specialist
HIV	Human Immune-deficiency Virus, other term for à AIDS
HMI	Human Machine Interface
HPF	Horizontal Position Fix Error
HRM	Human Resource Management

HRT Eurocontrol	Human Resources Team
HRT TFG Eurocontrol	Human Resources Team Training Focus Group
HRT/HFSG Eurocontrol	Human Resources Team Human Factors Work Group
HSI	Horizontal Situation Indicator
HUPER	Human Performance
Hybrid	A navigation system relying on a combination of navigation sources.
IA5	International Alphabet #5
IACSP	International Communications Service Provider
IAF	Initial Approach Fix
IAIN	International Association of Institutes of Navigation
IANS	Institute of Air Navigation Services
IAP	Instrument Approach Procedure
IAS	Indicated Airspeed
IAS TF A /B	Implementation of Airspace Strategy Task Force A & B
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
ICCAI	International Co-ordinating Council of Aerospace Industries Associations
ICCAIA	International Coordinating Council of Aerospace Industries Associations.
ICD	Interface Control Document
ICD GPS-200B-PR	Navstar GPS Space Segment/Navigation User Interface Control
ICISF	International Critical Incident Stress Foundation
ID	a) Identifier b) Identification
IDSG	ICAO Internet Working Standards Drafting Group
IFALPA	International Federation of Airline Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IFER	In-Flight Emergency Response
IFPS	Integrated Initial Flight Plan Processing System
IFR	Instrumental Flight Rules
IFRB	International Frequency Registration Board.
IHB	Information Handbook
ILO	International Labour Organisation
ILS	Instrument Landing System
IM	Information Material
IMAWP	Initial Missed Approach Waypoint. A 3-dimensional, high-precision waypoint located in the near vicinity of the runway used to establish the Initial Missed Approach Segment.
IMC	Instrument Meteorological Conditions
IN	Information Need
Initial Missed Approach Segment	A segment extending from the Runway Intercept Waypoint to the Initial Missed Approach Waypoint. This segment is primarily used for lateral guidance during an initial missed approach until other missed approach criteria become effective.
INMARSAT	International Maritime Satellite Organisation
INO	Innovative Research (an EEC Research Area)
INS	a) Inertial Navigation System b) Insert
Instrument	Position fixes that may be used in defining RNAV approach procedures

Approach Waypoints	are the: a) Initial Approach Waypoint (IAWP) b) Intermediate Waypoint (INWP) c) Final Approach Waypoint (FAWP) d) Missed Approach Waypoint (MAWP) e) Runway Waypoint (RWY WP) f) Holding Waypoint.
Integrity	a) The integrity of a system is that quality which relates to the trust which can be placed in the correctness of the information supplied by the total system. b) Integrity risk is the probability of an undetected (latent) failure of the specified accuracy. c) Integrity includes the ability of the system to provide timely warnings to the user when the system should not be used for the intended operation
Integrity Monitoring	GNSS integrity monitoring is a GNSS subsystem which enables the timely detection and indication of malfunctions in GNSS operations to ensure the user is aware of whether or not the system is operating within its specified performance limits.
IOACG	Informal Indian Ocean Air Traffic Services Coordinating Group
IOC	Initial Operational Capability. The equipment and facilities, operational procedures, and training, on the ground and in the aircraft, required to achieve the first benefits in routine flight operations (i.e., a few aircraft operating in selected environments).
IOD	GPS Issue of Data
ION	Institute of Navigation
IP	Internetwork Protocol
IRS	Inertial Reference System
ISDN	Integrated Services Digital Network
ISO	International Standards Organisation
ISPACG	Informal South Pacific ATS Co-Ordination Group
ITU	International Telecommunication Union
ITWS	Integrated Terminal Weather Service
IWP	Interim Working Party
JCAB	Japan Civil Aviation Bureau
JPB	Joint Programme Board
KPI	Key Performance Indicator
kt	knot = NM/hour, unit of speed
LADGNSS	Local Area Differential GNSS
LAN	Local Area Network
LAT/LONG	Latitude / Longitude
Lat/Long Reference	A waypoint, defined using latitude/longitude, from which
L-Band	Approx 1,500MHz
LEN	Length Indicator
LEO	Low Earth Orbit
LO EURO	Liaison Officer EUROCONTROL
LOIG	Liaison Officer to International Organisations
LOSA	Line Operations Safety Audit
LPC	Linear Predictive Coding
LRU	Line Replaceable Unit
LSB	Least Significant Bit

LVA	Large Vertical Aperture
LVO	Low Visibility Operations
MA	Member Association
MADAP	Maastricht Automated Data Processing and Display System
MAEVA	Master ATM European Validation Plan
MALE	Medium Altitude Long Endurance
Manoeuvre Anticipation	A means, achieved either by equipment mechanisation or procedurally, by which path changes are initiated in either 2D or 3D navigation.
MAP	Missed Approach Point
MAPT	Missed Approach Point
Mask Angle	A fixed elevation angle referenced to the user's horizon below which satellites are ignored by the receiver software. Mask angles are used primarily in the analysis of GNSS performance, and are employed in some receiver designs. The mask angle is driven by the receiver antenna characteristics, the strength of the transmitted signal at low elevations, receiver sensitivity and acceptable low elevation errors.
MASPS	a) Minimum Aeronautical System Standards b) Minimum Aircraft System Performance Specification c) Minimum Aviation System Performance Specification d) Minimum Aviation System Performance Standards
Maximum Allowable Warning Rate	The maximum allowable warning rate of a system is the upper bound of total warning rate (all sources of warnings that the system can generate) with the system in normal operation.
MB	Message, Comm B
MBI	Message Block Identifier
MBS	Model Based Simulations
MCDU	Multifunction Control Display Unit
Message	Basic unit of information exchanged between ATCComm and the ATC ground system peer.
Message Element	A component of a message used to define the context of the information exchanged.
Message Header	Control information used to maintain synchronisation between ATCComm and the ATC ground system peer.
Message Identification Number	A unique number assigned to each message. This number is used to differentiate messages and is conveyed in the message header
Message Reference Number	Used to uniquely associate a response with a previously received message. The Message Identification Number of a previously received message becomes the Message Reference Number of the
MET	Meteorological
MFF	Mediterranean Free Flight Programme
MID	Middle East
MIFR	Master International Frequency Registration
Minimum Useable Elevation Angle	The minimum satellite elevation, above the user's local horizon, that the satellite can be reliably used in the calculation of a navigation solution. The minimum useable elevation angle varies depending on the environment, the antenna design and placement, aircraft altitude and attitude.
MLS	Microwave Landing System
MLT	Multilateration
MMI	Man-Machine Interface

MNC	Multi -National Corporations
MNPS	a) Minimum Navigation Performance Specification b) Minimum Navigation Performance Standards
MNT	Mach Number Technique
MOC	Mean Of Compliance
MODE S	Mode Select Transponder. Transponder that is capable of modes "A" & "C" (SSR & Data Link)
Mode S PSG	Mode S Program Steering Group
MONA	Monitoring Aids
MOPS	Minimum Operating Performance Standards
MRT	Multi-Radar Tracking
MRT-VU	Multi-Radar Tracking using Variable Update
MRVA	Minimum Radar Vector Altitude
MSB	Most Significant Bit
MSCP	Mobile Satellite Service Provider
MSE	Mean Square Error
MSK	Minimum Shift Keying
MSP	Mode S Specific Protocol. A Mode S specific protocol that provides a restricted datagram service within the Mode S subnetwork.
MSSR	Monopulse Secondary Surveillance Radar
MTBA	Mean Time Between Alarm
MTBF	Mean Time Between Failures
MTBO	Mean Time Between Outage
MTBW	Mean Time Between Warning
MTCA	Medium Term Conflict Alert
MTCD	Medium Term Conflict Detection
MTD	Moving Target Detection
MTN	MEGA Transport Network
MTSAT	Multi-Functional Transport Satellite
MTTR	Mean Time to Restore
MU	Management Unit
Multisensor Navigation	Where aircraft position is determined using data derived from two or more independent sensors (e.g., Loran-C, VOR, Omega) each of which is useable (i.e., meets required navigation performance including accuracy, availability and integrity) for each of which is useable (i.e., meets required navigation performance including accuracy, availability and integrity) for airborne navigation.
MWARA	Major World Air Route Area
NA	Not Applicable
NACK	Negative Acknowledgement
NAD	North American Datum
NADIN	National Airspace Data Interchange Network
Nanosecond	One billionth of a second
NASA	National Space Agency
NAT	North Atlantic
NAT ADSG	North Atlantic Automatic Dependent Surveillance Development Group
NAT ATS	North Atlantic Air Traffic Services
NATO	North Atlantic Treaty Organisation
NATSPG ICAO	North Atlantic Systems Planning Group
NAVAID	Radio Aid to Navigation

NAVD	North American Vertical Datum
Navigation	The means by which an aircraft is given guidance to travel from one known position to another known position. The process involves referencing the actual aircraft position to a desired course.
Navigation Guidance	The calculation of steering commands to maintain the desired track from the present aircraft position to a new position.
Navigation Information	The calculation and display of aircraft present position, velocity vector and related data, such as track angle, ground speed and drift angle.
NCA	North and Central America
NCD	Network Capacity and Demand Management (an EEC Research Area)
Next Data Authority	Next ATC Data Authority as authorised by the current ATC Data Authority.
NGRS	National Geodetic Reference System
NGS	National Geodetic Survey
NIST	National Institute of Standards and Technology
NM	Nautical Mile, unit of distance (1852 metres)
Non-Precision Approach	A standard instrument approach procedure in which no glideslope / glidepath is provided.
NOPAC	North Pacific
NOSS	Normal Operations Safety Survey
NOTAM	Notice to Airmen
NPDU	Network Protocol Data Unit
NSC	Network Service Centre
NSDU	Network Service Data Unit
NSP ICAO	Navigation Services Panel ICAO formerly GNSSP
NUAC	Nordic Upper Air Centre
NUP II	North European Update Programme Phase II
O.R.	Operational Requirement
OAS	Oceanic Automation System
OAT	Operational Air Traffic
OCA	Oceanic Control Area
OCM	Oceanic Clearance Message. This service provides automated assistance for requesting and delivering an oceanic clearance.
OCP ICAO	ICAO Obstacle Clearance Panel
OCVM	Operational Concept Validation Methodology
OCVSD	Operational Concept Validation Strategy Document
ODAPS	Oceanic Display and Planning System
ODF	Oceanic Development Facility (FAA Technical Centre)
ODIAC	Operational development of Integrated Surveillance & Air/Ground Data
ODL	Oceanic Data Link.
OFC	Off-Centre
OJT	On-The-Job-Training
OLDI	On-line Data Interchange
Op	Operational
OP SUP	Operational Supervisor
OPD	Optimized Profile Descents
OPLINK	Operational Data-Link Panel
OPMT	Operations Planning Management Team
OPS	a)Operations b)Operational Services (an EEC Centre of Expertise)

OPSP	Operations Panel
OPTUS	Name of one of Australia's Telecommunications Providers
ORI	Orientation
OSED	Operational Services and Environment Description
OSI	a) Open System Interface b) Open Systems Interconnection
OSST	FAA Oceanic Separation Standards Team
OTC	Overseas Telecommunications Company
PAC	Pacific
Packet	The basic unit of data transfer among communications devices within the network layer, (e.g. an ISO-8208 packet or a Mode S packet).
PACOTS	Pacific Organized Track System
PANS/ATM	Procedures for Air Navigation Services Air Traffic Management Rules of the Air and Air Traffic Services (ICAO DOC 4444)
PANS/RAC	Procedures for Air Navigation Services - now called the PANS/ATM
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations
Parent Waypoint	A waypoint used for route definition and/or progress reporting. The geographical position of a parent waypoint is not altered when RNAV equipment is operated in a parallel offset mode.
PBN	Performance Based Navigation
PC	Provisional Council
PCA	Prior Co-ordination Airspace
PCFL	Pre-cleared Flight Level
PCM	Pulse Code Modulation
P-Code	Precision Code
PCX	President and Chief Executive Officer
PDC	Pre-Departure Clearance
PDOP	Position Dilution of Precision. The ratio of user-referenced three-dimensional position error to measurement error of a multilateration system. PDOP is the root-sum-square of HDOP and VDOP
PEDI	Planning, Education, Demonstration, and Implementation
PER	Packed Encoding Rules
PET	Pacific Engineering Trials
PF	Position Fix Error
PFE	Path Following Error. That portion of the guidance signal error which could cause aircraft displacement from the desired course or glide path. These perturbations fall within the loop guidance bandwidth of an aircraft. The path following error is composed of the path following noise and the mean course error, in the case of azimuth functions, or the mean glide path error, in the case of elevation functions. The PFE is measured by filtering the output flight navigation error record with a second order low pass filter with a comer frequency of 0.5 radians per second lateral guidance and 1.5 radians per second for vertical guidance and a slope of 12 dB/octave for both cases.
PFL	Planned Flight Level
PHARE	Program for Harmonised ATM Research in EUROCONTROL
Phase of Operation	A phase of operation is a period of navigation with a constant required navigation performance. Note: Traditionally, the term "phase of flight" has related to periods of navigation with different procedures/criteria such as en route (continental, oceanic), terminal, approach, and landing. As the RNP

	concept is introduced, "phase of operation" will relate more to a particular RNP. For example, in the future, the continental en route phase of flight may be divided into more than one phase of operation, since several RNPs may be included as an aircraft transits a continental area.
PI	Performance Indicators
PIAC	Peak Instantaneous Aircraft Count
PM	Policy Material
POLSTATS	Policy Statements
Position Determination Error	The accuracy with which a navigation sensor can calculate and provide an output of actual location in an operational environment.
Position Fix	A derived location of an entity in a common coordinate system.
Position Fixing Error	The accuracy with which a navigation sensor in combination with a navigation computer can calculate and provide an output of actual location in relation to desired location in an operational environment.
POWG	Permanent Office Working Group
PPL	Private Pilot Licence
PPM	Provisional Policy Material
PPS	Precise Positioning Service
PRC	Performance Review Commission
Precision Approach	A standard instrument approach procedure in which a glideslope / glidepath is provided.
Predictable Accuracy	The accuracy of a position with respect to the geographic or geodetic coordinates of the Earth.
PRN	Pseudorandom Number
Propagation Delay	The time delay of a signal created as the signal travels between antennas through a propagation medium.
PRU	Performance Review Units (Eurocontrol)
Pseudolite	A pseudolite (pseudo-satellite) is a ground-based GNSS augmentation which provides, at GNSS satellite signal-in-space frequencies, an additional navigation ranging signal. The augmentation may include additionally differential GNSS corrections. (Adapted from the FANS GNSS Technical Subgroup).
Pseudo-range (PR, PRC)	The distance from the user to a satellite plus an unknown user clock offset distance. With four satellite signals it is possible to compute position and offset distance. If the user clock offset is known, three satellite signals would suffice to compute a position.
PSR	Primary Surveillance Radar
PSTN	Public Switched Telecommunications Network
PWP	Pilot Working Position
QFE	Atmospheric Pressure at Aerodrome Elevations or at Runway Threshold
QNH	Altimeter Sub-scale Setting to obtain Elevation when of the Ground
QOS	Quality-Of-Service
R&D	Research and Development
R/T	a)Radio Transmission b)Radio Telephony
RA	Resolution Advisory
RACE	Runway Safety
RAD	Material relating to the provision of radar services
Radionavigation	The determination of position, or the obtaining of information relating to

	position, for the purposes of navigation by means of the propagation properties of radio waves.
RAIM	Receiver Autonomous Integrity Monitoring. A technique whereby a civil GNSS receiver/processor determines the integrity of the GNSS navigation signals without reference to sensors or non-DoD integrity systems other than the receiver itself. This determination is achieved by a consistency check among redundant pseudo-range measurements.
RAN	Regional Air Navigation (Meeting)
RCA	Reduced Co-ordination Airspace
RCF	Radio Communication Failure
RCMS	Route Conformance Monitoring System
RDA	Route Deviation Alert
RDARA	Regional and Domestic Air Route Area.
RDE-FG	Radar Data Exchange – Focus Group
RDF	Radar Data Function
RDP	Radar Data Processing
RDPC	Radar Data Processing Chain
RDPS	Radar Data Processing System
RDT&D	Research, Development, Trials and Demonstrations
RE	Reserved Expansion Indicator
Reference VOR/DME Facility	The VOR/DME (VORTAC) (TACAN) facility with its designated latitude / longitude position used for the identification and establishment of an RNAV route or flight procedure.
Relative Accuracy	The accuracy with which a user can determine one position relative to another position, regardless of any error in their true positions.
Reliability	The probability of performing a specified function without failure under given conditions for a specified period of time.
REM	Rapid Eye Movement
REP	Field Repetition Indicator
Repeatable Accuracy	The accuracy with which a user can return to a position whose coordinates has been measured at a previous time with the same navigation system.
RFG	Requirements Focus Group
RFI	Radio Frequency Interference
RFP	Request for Proposal
RGCSP	ICAO Review of the General Concept of Separation Panel
RGS	Remote Ground Station
RHCP	Right-Hand-Circular Polarised
RLASM	Reduced Lateral Separation Minima
RLOSM	Reduced Longitudinal Separation Minima
RMM	Remote Maintenance Monitoring
RNAV	Area Navigation. Application of the navigation process providing the capability to establish and maintain a flight path on any arbitrary chosen course that remains within the coverage area of navigation sources being used. RNAV utilising capabilities in the horizontal plane only is called 2D RNAV, while RNAV which also incorporates vertical guidance is called 3D RNAV. Time navigation (TNAV) may be added to either 2D or 3D systems. TNAV added to a 3D system is called 4D.
RNAV Approach (2D)	An RNAV approach procedure utilising the lateral (2D) guidance capability of the 2D RNAV equipment to perform an approach manoeuvre.
RNAV Approach	An RNAV approach procedure utilising both the lateral (2D) and vertical

(3D)	VNAV guidance capability of the 3D RNAV equipment to perform an approach manoeuvre.
RNAV Approach (4D)	An RNAV approach procedure utilising the lateral (2D), vertical VNAV, and time guidance capability of GNSS RNAV equipment to perform an approach manoeuvre.
RNAV Route	Area Navigation Route. An en-route segment, arrival or departure route (including RNAV SIDs and STARs). It may also include en-route segments established with gaps in station coverage for use by RNAV-equipped aircraft capable of automatic dead reckoning. a. The en route phase is normally construed as operations either on RNAV routes designated as high-low altitude routes, or direct point-to-point operations between designated waypoints. b. The terminal phase is considered as the transition from the departure runway to the first en route waypoint or the transition from the en route phase of the last en route waypoint until the initial approach fix/waypoint. A nominal value for the extent of the terminal phase would be that airspace extending approximately 50 miles from the departure or arrival airport. c. The approach phase is that portion of the flight starting at the initial approach fix/waypoint and terminating at the missed approach point. Normally, the final approach fix/waypoint is located within 10 miles from the runway threshold. The missed approach area is included in the approach phase in order to define accuracy requirements.
RNDSG	Route Network Development Sub Group
RNP	Radio Navigation Performance. IFATCA Manual: A parameter describing lateral deviations from assigned or selected track as well as along track position fixing accuracy on the basis of an appropriate containment level (1, 4, 12.6, or 20NM)
RNP	Required Navigation Performance. Technical Manual: A parameter describing lateral deviations from assigned or selected track as well as along track position fixing accuracy on the basis of an appropriate containment level (1, 4, 12.6, or 20NM)
RNP GM	Guidance Material for Required Navigation Performance
Route Segment	Two subsequently related waypoints (or ATD fixes) define an RNAV route segment.
RPL	Repetitive Flight-Plan
RPV	Remotely Piloted Vehicle
RRC	Range Rate Correction
RSP	Required System Performance. Required System Performance, consists of RNP, required communication performance, and required monitoring performance.
RSS	Root-sum-square
RSSP	Radar Systems Specialist Panel
RTA	Required Time of Arrival
RTCA	RTCA Inc., Task Force 1 - GNSS Transition and Implementation Strategy. Task Force 2 - Transition to Digital Communications (formerly Requirements and Technical Concepts for Aviation formerly Radio Technical Commission for Aeronautics)
RTCM	Radio Technical Commission for Maritime
RTF	Radiotelephony
RTS	Real-time Simulation
Runway	The segment between the Runway Intercept Waypoint and the Runway End

Segment	Waypoint.
RVSM	Reduced Vertical Separation Minima
RWEWP	Runway End Waypoint. A 3-dimensional, high-precision waypoint at the landing rollout end of the runway. The RWEWP, if needed, will be used to define rollout courses, runway remaining, etc.
RWIWP	Runway Intercept Waypoint. A 3-dimensional, high precision waypoint located at the present GPIP, or at a standard "down runway" distance (e.g., 1000 foot point).
RWY	Runway
RWSL	Runway Status Lights
s	second, unit of time
SA	a) Selective Availability. A set of techniques for denying the full accuracy and selecting the level of positioning, velocity, and time accuracy of GPS available to users of the Standard Positioning Service (L1 frequency) signal. b)Situational Awareness
SAC	System Area Code
SAE	Society of Automotive Engineers
SAGE	The Safety Awareness Group at the EEC
SAM	a)Safety Assessment Methodology b)South America
SAP	ICAO Aeronautical Fixed Service (AFS) Systems Panning for Data Interchange Panel
SAR	Search and Rescue
SARPs	Standards and Recommended Practices (ICAO)
SAS	Safety, Analysis, and Scientific (an EEC Centre of Expertise)
SASP	Separation and Airspace Safety Panel
SATCOM	Satellite Communication(s)
Satellite Health	The ability of the satellite's navigation signal for unaugmented (stand alone) GNSS navigation.
SBC	Sub-Band Coding
SBU	Separate Business Units
SC	a) Special Committee b) Standing Committee
SC-142	RTCA Special Committee 142 Mode S
SC-159	RTCA Special Committee 159 Global Positioning System (GPS)
SC-162	RTCA Special Committee 162 Open Systems Interconnect (OSI)
SC-165	RTCA Special Committee 165 Aeronautical Mobile Satellite Service (AMSS)
SC-167	RTCA Special Committee 167 Software
SC-169	RTCA Special Committee 169 Data Link Communications
SC-170	RTCA Special Committee 170 ADS
SC-172	RTCA Special Committee 172 VHF Air-Ground Communication
SC-186	Special Committee 186 (for ADS-B)
SCAT-1 Approach	Special Category 1 Approach. A specially authorised DGNSS Instrument Approach using a DGNSS Instrument Approach System satisfying a specific RNP that allows operations to MLS/ILS Category 1 minima, with differential GNSS used to provide navigation guidance.
SCIA	Simultaneous Converging Instrument Approaches
SCRSP	Surveillance and Conflict Resolution Systems Panel
SDPS	Surveillance Data Processing System
Secondary	Any input from other aircraft systems that may be used to derive navigation

Sensor	information.
SEE	Society, Environment, Economics (an EEC Research Area)
Segment	A portion of a message that can be accommodated within a single MA/MB field in the case of an SLM or a single MC/MD field in the case of an ELM.
SELCAL	Selective Call
SEP	Policy on Separation Standards
Service Coverage	The coverage provided by a radio navigation system in that area or space volume in which the signals are adequate to permit the navigator to determine position to a specific level of accuracy. Coverage is influenced by system geometry, signal power levels, receiver sensitivity, atmospheric noise conditions and other factors which affect signal availability.
SES	Single European Sky
SESAR	Single European Sky ATM Research
SFM	Simulation Facility Management (an EEC Centre of Expertise)
SG	Study Group
SIC	System Identification Code
SICASP	ICAO Secondary Surveillance Radar Improvements and Collision Avoidance Panel
SID	Standard Instrument Departure
Signal-Derived Position Error	That part of the horizontal position error at the user location attributable to signal-in-space errors from the GNSS control segment, space segment and propagation effects; does not include receiver-induced errors.
Signal-Derived Range Accuracy	Measured pseudorange error on a particular satellite as observed by a ground monitor station. SRA includes the sign of the error.
SIMOPS	Simulation Operations
SIRO	Simultaneous Intersecting Runway Operations
SITA	Societe Internationale de Telecommunications Aeronautiques
SITF	Study and Implementation Task Force
Situational Awareness	An integrated understanding of factors that contribute to the operation of aircraft / vehicles under normal and abnormal conditions. Factors affecting situational awareness include spatial awareness, awareness of environment, vehicle performance awareness, aircraft/vehicle systems awareness, and operator / crew / controller awareness.
Slant Range	The actual straight line distance between an aircraft in flight and a ground location (radar, DME). This distance is greater than the geographical surface range because of the altitude.
SLM	Standard Length Message. An exchange of digital data using selectively addressed Comm-A interrogations and/or Comm-B replies.
SM	Scale Marker
SMC	System Management and Communication
SMF	Separation Monitoring Function
SMGCS	Surface Movement Guidance and Control System
SMR	Surface Movement Radar
SMS	a)Safety Management System b)Surface Movement System
SOIT	FAA Satellite Operations Implementation Team
Sole Means of Navigation	A means of navigating the aircraft where position determination is provided by a system which satisfies the required navigation performance (RNP) for a particular phase of operation.

SP	Special Purpose Indicator
SPF	Strategic Performance Framework
SPI	Special Position Identification
SPR	Safety and Performance Requirement
SPS	Standard Positioning Service. The standard specified level of positioning, velocity and timing accuracy that is available, without qualifications or restrictions, to any user on a continuous world-wide basis.
SPT	Strip Printer
SRA	Strategic Research Agenda
SRC Eurocontrol	Safety Regulation Commission
SRDP	Safety Research and Development Plan
SRE	Slant Range Error. Slant range error is the difference between the distance of an aircraft (Point A) to a DME station on the surface (Point B) and the distance from the station (Point B) to a point directly beneath the aircraft on the surface (Point C). The error magnitude is a function of aircraft altitude above the station and the distance to the station.
SSG	Safety Group
SSP	Sector Safety and Productivity (an EEC Research Area)
SSR	Secondary Surveillance Radar
SSRP	Strategic Safety Research Plan
SSWG	System Support Working Group
Stand-Alone GNSS System	An airborne GNSS configuration which may use altimeter aiding and augmented GNSS signals without reliance on any other navigation system or sensor.
STAR	a)Standard Instrument Arrival (Route) b)Standard Arrival Route
Station North	The assigned north reference for a particular station.
Station-Referenced Navigation	Position determination that is referenced to a stationary fix.
STC	Supplementary Type Certification
STCA	Short Term Conflict Alert
STFRDE	Surveillance Task Force for Radar Data Exchange (previous RDE-FG)
Subnetwork	An actual implementation of a data network which employs a homogeneous protocol and addressing plan, and is under the control of a single authority.
Supplemental Air Navigation System	An approved navigation system that can be used in controlled airspace of the National Airspace System in conjunction with a sole means navigation system.
SUR-T	Surveillance Team (EATM)
SVC	System View Cell
S-VFR	Special-VFR
TA mode	Traffic Advisory mode
TACAN	Tactical Air Navigation
TAS	True Airspeed. The actual speed of an aircraft relative to the air through which it is flying corrected for temperature and air density.
TAWS	Terrain Awareness and Warning System
TBA	To be Announced
TCAS	a) Traffic Collision Avoidance System b) Traffic Alert and Collision Avoidance System
TCH	Threshold Crossing Height. The height of the straight line extension of the glide path above the runway at the threshold.

TCP	Transport Control Protocol
TCP/IP	Transmission Control Protocol/Internetwork Protocol.
SPR	Safety and Performance Requirement
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TCP	Transport Control Protocol
TCP/IP	Transmission Control Protocol/Internetwork Protocol.
TCWP	Threshold Crossing Waypoint. A three-dimensional, high-precision waypoint typically located 50 to 55 feet above the runway threshold. This height may vary depending upon the specific airport configuration.
TDLS	Tower Data Link System
TDM	Track Definition Message
TDWR	Terminal Doppler Weather Radar
TEM	Threat and Error Management
Terminal Area	A general term used to describe airspace in which approach control service or airport traffic control service is provided.
TERPS	Terminal Instrument Procedures
TIBA	Traffic Information Broadcast (by aircraft)
Time to Alert	Time to alert is the maximum allowable time interval between system performance going outside of operational performance limits and the appropriate integrity monitoring subsystem providing an alert.
TIS	Traffic Information Service: provides a cockpit display of traffic information of all targets within 7NM of the aircraft requesting the information. TIS processes Mode S surveillance data from the ground and display the data on a TCAS I-like display.
TIS-B	Traffic Information Service Broadcast
TL	Transition Level
TLS	Target Level of Safety
TMA	a) Terminal Control Area b) Terminal Manoeuvring Area
TNAV	Time Navigation. A function of RNAV equipment that provides the capability to arrive/depart at a waypoint at a specified time. When added to a 3D system, TNAV is called 4D.
TOBT	Target Off Block Time
TO-FROM Equipment	RNAV equipment in which the desired path over the ground is defined as a specific (input quantity) course emanating either to or from a particular waypoint. In this equipment, the aircraft may fly either TO or FROM any single designated waypoint.
TO-TO Equipment	RNAV equipment in which a path is computed that connects two waypoints. In this equipment, two waypoints must always be available, and the aircraft is usually flying between the two waypoints and TO the active waypoint.
Touchdown	In using this term for airborne equipment specifications, care
TP	Turn Point. A waypoint which identifies a track change from one desired track to another along a given route.
TP4	Transport Protocol Class 4
TPC	Technical Policy Coordinator
TPDU	Transport Protocol Data Unit
TP Manual	IFATCA Technical and Professional Manual
TPS	IFATCA Technical and Professional Secretary
TQM	Total Quality Management
TRA	Temporary Reserved Area
TRKIANG	Track Angle
TRM	Team Resource Management
TRS	Transmission message
TSA	Temporary Segregated Area

TSAP-ID	Transport Service Access Point Identifier
TSE	Total System Error Generic: The root-sum-square of the navigation source error, airborne component error, display error, and flight technical error. Specific: The root-sum-square of the position fixing error, display error, course selection error, and flight technical error.
TSO	Technical Standard Order
TWDL	Two-Way Data Link Communication
TWIP	Terminal Weather Information for Pilots: provides a cockpit display to pilots of convective weather information in specific terminal areas.
TWP	Technical Work Program of the Organisation in the Air Navigation Field
TWPC	Two-Way Pilot Controller
TWR	Aerodrome Control Tower
U.S.	United States of America
UA	Unmanned Aircraft
UAC	Upper Area Control Centre
UAP	a)Upper Airspace Project b)User Application Profile
UAS	Unmanned Aircraft Systems
UAT	Universal Access Transmitter
UAV	Uniform Annual Values
UCAR	Unmanned Combat Armed Rotorcraft
UCAV	Unmanned Combat Aerial Vehicle
UDRE	User Differential Range Error
UN	United Nations
UNDP	United Nations Development Program
Uplink	A term referring to the transmission of data from the ground to an aircraft. Mode S ground-to-air signals are transmitted on the 1,030 MHz interrogation frequency channel.
URA	User Range Accuracy. The one-sigma estimate of user range errors in the navigation data for each individual satellite. It includes all errors for which the space or control segment is responsible. It does not include any errors introduced at the user set.
UTC	Co-ordinated Universal Time
UUP	Updated Airspace Use Plan
VDEV	Vertical Deviation. The deviation of the aircraft above or below the vertical profile as displayed on an indicator such that deflection is up when the aircraft is below the vertical profile.
VDL	VHF Data Link
VDOP	Vertical Dilution of Precision. The ratio of user-referenced vertical position error to measurement error of a multilateration system (see GDOP for a more detailed description).
VDR	a)VHF Data Radio b) Validation Data Repository
VDT	Video Display Terminal
VDU	Visual Display Unit
VFR	Visual Flight Rules
VGH	Validation Guideline Handbook
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation. A function of RNAV equipment which calculates displays

	and provides guidance to a vertical profile or path.
VOR	VHF Omnidirectional Radio Range
VP	Vertical Profile. A line or curve, or series of connected lines and/or curves in the vertical plane, defining an ascending or descending flight path either emanating from or terminating at a specified waypoint and altitude, or connecting two or more specified waypoints and altitudes. In this sense, a curve may be defined by performance of the airplane relative to the air mass.
VP-A	Vice President Administration
VPAE	Vertical Profile Angle Error. The difference in degrees that the current aircraft flight path angle makes with the vertical profile.
VPF	Vertical Position Fix Error
VPIP	Vertical Profile Intercept Point. The point at which the current aircraft flight path angle intercepts the vertical profile.
VP-P	Vice President Professional
VP-T	Vice President Technical
VSM	Vertical Separation Minimum
VSWR	Voltage Standing Wave Ratio
W/E	Warning/Error Condition
W/P	Waypoint
WA	Wind Angle. The direction from which the wind is blowing measured in degrees from true or magnetic north.
WADGNSS	Wide Area Differential GNSS (see there)
WAN	Wide Area Network
Warning	An annunciation that is generated when immediate recognition and corrective or compensatory action is required; the associated colour is red.
Waypoint - (W/P)	A predetermined geographical position used to define routes and / or progress reporting fixes that is defined by latitude and longitude and/or relative to a VORTAC or VOR/DME reference facility by magnetic radial bearing and range in nautical miles.
Waypoint Displacement Area	The rectangular area formed around the plotted position of the waypoint. The rectangle is oriented along the desired track with the waypoint at its centre. Its dimensions are two times the appropriate plus-or-minus along-track and cross-track displacement error values.
WCM	World Class Manufacturers
WG	Working Group
WGS	World Geodetic Survey
WGS-84	World Geodetic System 84
WHO	World Health Organisation
Wide Area Differential GNSS (WADGNSS)	Wide area differential GNSS is differential GNSS where the differential corrections are useable over an extensive geographical area for the supported phases of operation.
WIP	Working Group for Runway Incursion Prevention
WP	Working Paper
WS	Wind Speed. The speed with which the wind is blowing measured in knots.
XTK	Cross-Track Distance. The perpendicular distance that the airplane is to the left or right of the desired track.

PART 3

TECHNICAL POLICY

of

International Federation of Air Traffic Controllers' Associations (IFATCA)

Table of Contents

1. Classification of Technical Policy Statements (POLSTATS)

1.1. IFATCA POLSTATS are detailed in the following pages, grouped according to subject matter under the following headings:

AAS	Advanced Avionics Systems,
ADME	Matters relating to airfield operation,
ATS	Material relating to the provision of Air Traffic Services,
COM	Communications,
HELI	Helicopter Operations,
SUR	Surveillance,
SEP	Policy on Separation Standards

Index – Technical Policy

IFATCA Technical Policy

Table of Contents

AAS:

ADVANCED AVIONICS SYSTEMS

POLSTATS

AAS 1.1. AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS)

The continuing development of ACAS and the actions of some states individually to use ACAS technologies as a " separation" tool - contrary to the ICAO CNS/ATM Final Report, which considers ACAS as a 'last-minute device, not to be used for ATM' - make it necessary that IFATCA affirms its belief in the continuing role of the air traffic services.

IFATCA Policy is:

IFATCA recognises that the development of airborne collision avoidance systems should be encouraged. However it must be accepted that the primary means of collision avoidance within a controlled airspace environment must continue to be the air traffic control system which should be totally independent of airborne emergency devices such as ACAS. TCAS devices should not be a consideration in the provision of adequate air traffic services.

See: WP 114 - Tunis 1996
See also: WP 74 - Tel Aviv 1974 and WP 28 - Melbourne 1975;
WP 23 - Copenhagen 1978 and WP 53 - Rio de Janeiro 1988

It has become increasingly apparent that the use of ACAS is not transparent to the ATC system. This is detrimental to the effectiveness of the ATC system and potentially will lead to dangerous situations (e.g. crossing RA's) and a reduction in capacity of the ATC system. Deficiencies in ACAS systems should not result in the modification of ATC techniques.

IFATCA Policy is:

The use of automatic airborne collision avoidance systems should allow for safe operation within different types of airspace, with different ATC procedures and with different aircraft equipment capabilities - without detriment to the ATC service or to aircraft not fully equipped.

The inevitable changes in ATC procedures, techniques and phraseologies resulting from the introduction of airborne collision avoidance and traffic alert systems should be compatible, not only with a controller's responsibilities for providing positive separation, but also with a controller's ability to discharge them.

Guidelines and procedures shall be established in order to prevent incidents arising from the use of false or misleading information provided by Airborne Collision Avoidance Systems.

See: WP 159 - Dubrovnik 2009 and WP 143 - Ottawa 1994
See also: WP 138 - Jerusalem 1995 and WP 35 - Costa Rica 1986

All MA's should urge their National Administrations to assemble, disseminate, administer and maintain a comprehensive ACAS training package for ab-initio and regular refresher training

IFATCA is opposed to down linking of any advisories generated by ACAS.

If down linking of ACAS Resolution Advisories becomes mandated, then IFATCA can only accept this provided that the following criteria are met:

- **Clear and unambiguous controller legal responsibilities;**
- **Downlink without delay;**
- **ATC system to be able to receive, process and display the down link to the appropriate control positions;**
- **Compatibility with all ground based safety nets;**
- **Nuisance and false alerts must be kept to an absolute minimum.**
- **ACAS should only be considered as a 'safety net'.**

IFATCA Provisional Policy is:

After an aircraft has departed from its ATC clearance or instruction in compliance with an RA, or a pilot has reported an RA, the controller shall not resume responsibility for providing separation, until separation has been established for all affected aircraft.

See: WP 94 - Buenos Aires 2003 and WP 84 - Kaohsiung 2006 and WP 93 – Arusha 2008

See also: WP 78 - Estoril 1984, WP 79 - Christchurch 1993 and WP 88 - Jerusalem 1995

Guidance Material:

In a situation where an ACAS RA is likely to occur between aircraft under radar control, and a collision avoidance instruction need to be issued, controllers should consider horizontal movements (i.e. turns) to avoid contradictory instructions to an RA that may be issued.

See: WP 96 and WP 97 - Hong Kong 2004

AAS 1.2. AUTOMATIC DEPENDENT SURVEILLANCE (ADS)

Part of the 2006 “Surveillance Application Policy” work programme for the Technical and Operations Committee (TOC) included a review of IFATCA provisional Policy on ADS. This paper details the changes since the policy was last reviewed in Santiago-1999 and reports on the changes to ICAO documentation. This includes the introduction of the “Manual Air Traffic Services Datalink Applications Doc9694” and the changes to PANS ATM Doc 4444 and Annex 11. Part of the review is to consider that ADS policy may need to be retained or modified to include ADS-B and indeed any other form of ADS that may be used in the future.

IFATCA policy is:

Before an ADS service is introduced into operational service, the necessary system components to provide a control service and to support the control task shall be in place. Only pertinent and useful flight data should be supplied to the control team, which supports and enhances the building of human mental models and controller situation awareness.

The separation standards to be applied between ADS positions and all other surveillance targets must be subjected to an ICAO approved collision risk analysis.

ATC will require the provision of assistance tools for managing airspace where multiple separation standards apply.

The ADS system shall provide a warning to pilot and controller whenever navigation accuracy or integrity is degraded below that required to operate in the airspace, and that this will affect separation standards. Procedures must be in place to restore any loss of separation in a timely manner.

Displays of ADS information that are presented to the controller should be designed so that they meet the need of the control task and enhance the usability of the system.

ADS system design must seek to optimise the interface at the controller workstation. Control of traffic using position data derived from ADS and radar surveillance can only be used where the control system supports both types of surveillance.

Whenever a controller interface derives data from a combination of surveillance systems, the source and derivation of position data in use must be clearly and continuously evident to the controller.

Global standards and procedures must address requirements of what independent verification of position data is required before dependent position data is used for separation.

To ensure integrity of system surveillance data (not just ATC surveillance) it is essential that the automatic transmission of erroneous dependent position data can be disabled or marked as inaccurate during all stages of flight.

Definition of Automatic Dependent Surveillance (ADS):

Automatic Dependent Surveillance (ADS) is when an electromechanical device, after activation, requires no human involvement to supply dependent surveillance data.

See: WP 95 - Istanbul 2007

See also: WP 102 - Hong Kong 2004; WP 87 and 100 to 106 - Jerusalem 1995; amended by WP 94 - Santiago 1999; WP 87 (WAAS) and WP91 (ADS-B) - Tunis 1996 and WP87 - Tunis 1996.

AAS 1.3. MODE S DEVELOPMENT

Mode S has been established by ICAO as the standard for SSR surveillance due to those performance and functional limitations of the present system which are becoming increasingly significant. Whilst the initial implementation emphasis is on surveillance, Mode S also establishes the potential of SSR as an air/ground datalink.

IFATCA policy is:

The Operational implementation of Mode S must ensure that its primary role of ATC surveillance is safeguarded.

The Mode S air to ground datalink should be used exclusively for ATM purposes, and principally for routine tasks in an automated mode without direct controller intervention.

Mode S operations, for High Level Enhanced Surveillance and the Mode S sub-network and any applications, should be evaluated in a realistic operational environment with the use of operational controllers.

See: WP 92 - Ottawa 1994 and WP 81 - Jerusalem 1995
See also: WP 57 - Amsterdam 1982 and WP 93 - Tunis 1996

The use of "Conspicuity Codes" of a Mode S identified aircraft within the Mode S area must ensure that the safe operations of all other non-mode S units in that airspace e.g. military operations are not compromised.

The correlation of a departing flight using Mode S must be as safe and easy as the procedures used nowadays with SSR.

See: WP 91 - Geneva 2001

The controller HMI shall clearly distinguish correlated aircraft and aircraft only transmitting aircraft ID*
***ID is the callsign of the flight as filed in the ICAO flight plan e.g. AZA611**

See: WP 85 - Cancun 2002

ATC systems must validate the Flight ID transmitted by an aircraft's Mode S transponder and indicate to the controller any discrepancy with the ICAO aircraft identification in the flight plan.

See: Resolution B1 - WP 83 - Punta Cana 2010

Any broadcast of incorrect ATM data should be corrected or if unable then:

Switched off, or
Marked as invalid.

See: Resolution B2 - WP 83 - Punta Cana 2010

~~ATC surveillance must have priority over the interrogation signals and that the saturation of transponders must not result in the loss of data on the ground.~~

ATC surveillance systems must be able to process all data, regardless of the volume or type, necessary to provide ATC Services safely.

See: Resolution B4 - WP 90 – Kathmandu 2012

AAS 1.4. REQUIRED NAVIGATION PERFORMANCE (RNP) and AREA NAVIGATION (RNAV)

Area Navigation (RNAV) is defined as a method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self contained aids, or a combination of these. Many countries offer or are planning to offer RNAV routes as part of the ATS structure; some exploit the capabilities of Precision RNAV equipment to offer random RNAV routing.

IFATCA policy is:

Controllers should be presented with information, by any suitable means, concerning navigational capability of aircraft under their control.

In airspace where random routes are permitted, the ATS system should be capable of processing random routing flight plans and controllers should be able to amend/update such information.

Track prediction vectors should be available on situation displays used to control airspace where random routes are permitted.

Where the introduction of PBN procedures entail closely spaced parallel tracks, suitable procedures should be established for the case of loss of navigational performance, taking into account such factors as ground equipment capability and controller training.

Adequate training must be provided for controllers managing PBN operations; such items as RTF phraseology, co-ordination procedures and conflict identification need to be considered.

IFATCA should ensure that controllers' expertise is used in the deliberations taking place to provide appropriate specifications for the use of PBN.

PBN route structures must be designed to ensure that ATC workload is not increased when compared to previous conventional route structures and, where possible, it is reduced in spite of increased traffic.

RNAV and RNP standards should be harmonized throughout the world and included in the PBN Manual. Harmonisation will result in common standards, decreasing the diverse types of RNAV and RNP procedures that are currently encountered by air crews operating around the world.

See: WP 88 - Christchurch 1993 and WP 98 - Hong Kong 2004 and WP 91 – Arusha 2008

AAS 1.5 AIR-GROUND DATALINK

The use of air ground datalink systems has a significant part to play in the evolution of air Traffic Management (ATM), particularly in terms of communication and surveillance. This policy concentrates on the communication aspect; further policy is being developed for surveillance aspects, in particular Automatic Dependent Surveillance (ADS). Large quantities of information are made available by the use of datalink services therefore there are human factors considerations which must be taken into account. This policy does not cover these issues.

IFATCA policy is:

Voice communications be retained as a communications channel in all circumstances. Where datalink communications are in use, that access to the aircraft is subject to a system of priorities. The Controller who has jurisdiction for that flight shall have the highest unassailable priority subject to emergency messages.

That the necessary ground networks are in place, with satisfactory resilience to system failure and secure to resist unlawful interruption, prior to the introduction of datalink communications. The ground systems should satisfy the appropriate performance criteria for safety critical reasons.

Interface devices required for the use of datalink communication are designed such as to not add to controller workload.

Voice communications should be the preferred communications medium to be used in the event of an emergency. This shall not preclude the use of datalink communications if deemed appropriate by those involved.

An alerting device is provided to assist human operators to respond to voice communications when they are not the primary communications medium.

Future developments of datalink services in the provision of ATM services must support the cognitive needs, and be compatible with, the capabilities of the human.

The performance of aircraft on board datalink services will be such as to provide the required level of performance for safety critical system, inter alia to operate from standby power sources.

Information regarding the equipage/non-equipage of Datalink is notified to controllers at the operational position in the appropriate manner.

ATC personnel should not be required to distinguish between different levels of datalink equipage in the same airspace.

See: WP 93 - Ottawa 1994 and WP 92 - Tunis 1996
See also: WP 103 - Christchurch 1993 and WP 82 - Jerusalem 1995

IFATCA supports Datalink concepts that improve frequency management provided that they demonstrate an identical or better level of safety and efficiency compared to voice communication.

See: Punta Cana 2010 – Resolution BC5 – WP 86

AAS 1.6. DATALINK APPLICATIONS – THE USE OF LOGICAL ACKNOWLEDGEMENT (LACK)

There are situations present within the ATN CPDLC SARPs in which the use of LACKs is necessary to have the system perform in an operationally acceptable way. However the deployment of such systems as FANS 1/A does not utilise this facility.

ICAO Doc 9694-AN/955, Manual of Air Traffic Services Data Link Applications: Page IV-3-4, para. 3.29, the logical acknowledgement provides confirmation from a receiving system to the message originator that the message has been successfully received and is acceptable for display to the responsible person, if this is required. The logical acknowledgement in no way replaces any required operational response.

IFATCA Policy is:

When Air Traffic Services are provided via Aeronautical Telecommunications Network (ATN) Controller Pilot Data Link Communications (CPDLC), the use of LACKs (Logical Acknowledgments) shall be considered mandatory.

When Air Traffic Services are provided via any CPDLC other than ATN, a capability which meets the Operational Requirements for LACKs shall be considered mandatory.

See: WP 87 - Geneva 2001

AAS 1.7 DISPLAY OF GNSS STATUS TO ATC

When any failure to the GNSS occurs, it is to be expected that some aircraft will fail to meet the RNP and require special action to be taken, while others will be able to continue to meet the RNP. It is important that controllers and pilots are made aware of any degradation in a timely manner.

IFATCA policy is:

A monitoring and interpretation service should be established to monitor the status of all elements of the GNSS and interpret this information in a manner that provides relevant information to pilots and ATC. The information disseminated from the monitoring service or displayed at controller positions must be expressed in operational terms.

ATC procedures must be established for the use of GNSS and must cover the failure or degradation of the system. When ATC is informed of a change in the status of t he GNSS by the monitoring service or by display equipment, specific procedures associated with that change must be implemented. Should it not be possible to achieve the RNP in an airspace, an alternative RNP should be declared.

See: WP 86 - Tunis 1996
See also: WP 93 - Santiago 1999

AAS 1.8 INVESTIGATE 4D TRAJECTORY CONCEPTS

The combination of a standard three-dimensional route consisting of lateral, longitudinal and vertical guidance combined with time constraints is called a 4D-trajectory. 4D trajectory management is the ability to manage an aircraft's trajectory through each phase of flight ensuring that Air Traffic Management (ATM) resources are safely and efficiently used. A 4D contract is an agreement to follow a given 4D trajectory to reduce ambiguity of the aircraft position in time and space and so maximize available ATM resources for all users. Using computers and digital communication they can exchange several trajectories until both parties are satisfied. This process is called trajectory negotiation. Once the negotiation is completed, the pilot is responsible to comply with the 4D trajectory "contract". Amendments to the contract are possible on request of the pilot or controller for any part of the flight. Automated tools provide pilot and controller with a visualization of an aircraft's 4D-trajectory and allow these users to obtain more trajectories and are automatically communicated and negotiated between the ground systems and the aircraft involved via digital methods (datalink).

IFATCA Provisional Policy is:

The flight management system shall accept ATC requirements as compulsory requirements.

Airspace must be designed to support 4D trajectory management.

See: WP 86 - Arusha 2008

AAS 1.9 REMOVAL OF GROUND BASED AIDS

The implementation of GNSS is precipitating the removal of certain ground based navigation aids. IFATCA is concerned that as these GNSS systems are subject to natural temporary degradation and unserviceabilities that there should not be a reliance on a sole means navigation system.

IFATCA policy is:

Until failsafe procedures have been proven and installed, the removal of terrestrial navigation aids is neither feasible nor safe and would therefore be highly premature, and that adequate navaids should be guaranteed.

See: WP 98 - Santiago 1999

AAS 1.10 OPERATIONAL USE OF UNMANNED AIRCRAFT (UA)

ATC should not have to apply different rules or work with different criteria in order to handle UA. From the air traffic controller's perspective, the provision of ATS to an UA must be transparent. This includes all stages of the flight from pre-notification to landing. There should be no difference in RTF, landline communications or transponder data procedures nor should the controller have to apply different rules or different criteria.

IFATCA Policy is:

All Unmanned Aircraft Systems (UAS) operations in non-segregated airspace must be in full compliance with ICAO requirements.

Air Traffic Controllers must not be expected to handle an UA in a different way from any other aircraft for which they are providing service.

See: WP 90 - Melbourne 2005 and WP 91 - Dubrovnik 2009

AAS 1.11 "FLY-BY" AND "FLY-OVER" WAYPOINTS

The concept of "fly-by" and "flyover" waypoints is integral to RNAV and as such has been in existence for quite some time. As Performance Based Navigation is being increasingly used to reduce the distances between routes to a minimum, air traffic controllers have been surprised to see that aircraft do not follow consistent paths when turning from one track to another. This issue has been documented by Eurocontrol, ICAO and others. Such surprises should be prevented by changes in route structure and controller training.

More recent innovations such as the fixed radius transition for the en-route environment should allow for predictable flight paths and ensure separation where close spacing between routes or between a route and terrain or a danger area is desired.

IFATCA Policy is:

Tables, which show the maximum dimensions of fly-by transitions, should be published in ICAO PANS-ATM.

See: Resolution B10 - WP 92 - Amman 2011

Where predictability in the turn is required, PBN fixed radius path mechanisms should be implemented.

See: Resolution B11 - WP 92 - Amman 2011

AAS 1.12 AIRCRAFT FLIGHT MANAGEMENT SYSTEMS

Aircraft Flight Management Systems are in place on almost all transport aircraft in use today. These systems have been developed in order to assist the operation of the aircraft and to improve safety. ATM considerations have generally been a by-product of FMS, rather than a primary aim, however such considerations are increasing in importance as the ATM system is changed to improve efficiency and reduce the impact of aviation on the environment.

IFATCA Policy is:

The flight management system shall accept ATC requirements as compulsory requirements."

See: Resolution B12 - WP 93 - Amman 2011

FMS performance shall be harmonized with ATM system design.

See: Resolution B13 - WP 93 - Amman 2011

AAS 1.13 DETERMINING OPERATIONS READINESS OF AUTOMATED ATM SYSTEMS

Modern ATM systems are more and more complex. Safety critical tasks such as Radar Data Processing or Flight Data Processing rely on complex software packages while the increasing volume of air traffic makes the ATM system more and more dependent on such software. As a consequence, a software failure may lead to a catastrophic situation. Therefore, new ATM systems must be carefully designed, tested and validated before being considered ready for implementation.

IFATCA Policy is:

Operational controllers shall be involved in the design, development and implementation of new ATM systems. Their role should include:

- **Establish user requirements.**
- **To participate in the risk assessment process.**
- **To validate the system.**
- **To provide feedback in the further development of the system.**

See: Resolution B12 - WP 87 - Kathmandu 2012

ADME:

MATTERS RELATING TO AIRFIELD OPERATION

POLSTATS

Definitions relating to Converging Runway Operations (CROPS) and Land And Hold Short Operations (LAHSO)

Converging Runway Operations:	Converging Runway Operations (CROPS) is the use of converging, but not necessarily intersecting, runways for take-off and/or landing
Land And Hold Short Operations:	Land And Hold Short Operations (LAHSO) is an operation that has an Air Traffic Control (ATC) requirement for a landing aircraft to stop short of the full length of the runway.
Simultaneous Intersecting Runway Operations:	The simultaneous use of intersecting runways for take-off and/or landing
Dependent runway operation:	In relation to LAHSO/CROPS, a dependent runway operation is when a clearance or instruction to a landing or departing aircraft is conditional on an action of another aircraft or vehicle.
Independent runway operation:	In relation to LAHSO/CROPS, an independent runway operation is when a clearance or instruction to a landing or departing aircraft is not conditional on an action of another aircraft or vehicle.
Avoidance Procedure:	In relation to LAHSO/CROPS, an Avoidance Procedure is a designed procedure to prevent aircraft collision but does not necessarily use an air traffic control (ATC) separation standard. Note: The Avoidance Procedure must demonstrate the required safety established by safety analysis and then be formally approved for use.
Missed Approach:	A “Missed Approach” is an instrument-based procedure that a pilot has to follow after initiating a go-around at or above the Decision Height or Minimum Descent Height.
Rejected Landing:	A “Rejected” or “Baulked Landing” is a manoeuvre where the pilot, after having passed the minimum of an IFR approach, aborts the landing and initiates a go-around, or is asked by ATC to go around.

ADME 2.1 CONVERGING RUNWAY OPERATIONS (CROPS)

See Page 3 2 2 2 for Definitions

There are various types of simultaneous operations on converging/intersection runways in operation at airports all over the world. All are related to achieving maximum use of runways. It is expected that, as pressure on airport capacity grows, more and more of those procedures will be introduced. At this stage, it appears that little coherent work is being done by ICAO to harmonise converging runway operations, and it is therefore paramount for IFATCA to have concise Policy on such procedures.

IFATCA Policy is:

Simultaneous Operations of Intersecting/Converging Runways should only take place under the following conditions:

- **The ATC facilities involved have the appropriate equipment, staffing levels, and training;**
- **The appropriate risk analysis has been carried out involving pilots and controllers, which shall include simulation and real-time trials utilising data from the local airport and operators intending to operate with these procedures;**
- **Independent runway operations or Avoidance Procedures have been established;**
- **The procedures detail acceptable meteorological conditions, especially relating to wind conditions, cloud base, visibility and windshear, as well as runway conditions. If the procedure requires the participating aircraft to remain in VMC, the minimum ceiling required for CROPS shall be above the minimum radar vectoring altitude;**
- **Aircraft experiencing operational difficulties are excluded from CROPS procedures; and**
- **The responsibilities for separation are clearly defined between the aerodrome- and approach control unit**

See: WP 85 - Istanbul 2007

ADME 2.2 LAND AND HOLD SHORT OPERATIONS (LAHSO)

See Page 3 2 2 2 for Definitions

At the 2005 IFATCA Conference in Melbourne, Germany expressed concern with regard to the safe operation of Land and Hold Short Operations (LAHSO) and requested that the Technical and Operations Committee (TOC) study LAHSO. TOC has concluded that much of the criticism levelled at LAHSO are questions about airborne separation between flights operating simultaneously on multiple runways and need to be considered separately. This paper focuses solely on separation at the intersection of intersecting runways. It also proposes IFATCA definitions for various terms that are used to discuss operations on converging runways, and defines controller and pilot obligations and workload while conducting LAHSO.

IFATCA Policy is:

IFATCA opposes LAHSO unless the following concerns have been satisfactorily addressed:

- **The lack of exact requirements for what are acceptable airport and runway configurations;**
- **The “hold short point” is not always easily identifiable to the pilots.**
- **An aircraft going around after touch-down, during the rollout, or even after “floating” along the runway without the pilot managing to get it down for whatever reason could result in passing “through” rather than above the intersection.**
- **Increase in controller workload as a result of controllers having to pass LAHSO-specific information to the pilot;**
- **Controllers continually having to adjust between LAHSO and non-LAHSO operations, based on pilots’ and airline ability to participate in LAHSO operations; and**
- **Operational difficulties associated with LAHSO capable aircraft renouncing the status at a late stage.**

See: WP 86 - Istanbul 2007

ADME 2.3 VISUAL OBSERVATION & NEW AERODROME CONTROL TOWER CONCEPTS

IFATCA policy is:

Visual observation in ATM is defined as: Observation through direct eyesight of objects situated within the line of sight of the observer possibly enhanced by binoculars.

See: Resolution B10 – WP85 – Kathmandu 2012

An Aerodrome Control Tower is a unit established to provide air traffic control service to aerodrome traffic. The tower cab shall be constructed as to provide aerodrome controllers the capability to maintain a continuous watch on all flight operations on and in the vicinity of the aerodrome as well as vehicles and personnel on the manoeuvring area. Watch shall be maintained by visual observation, augmented by radar or other approved surveillance systems when available.

Before any Aerodrome Control Service Concept can be endorsed by IFATCA, the following requirements shall be met:

- **The controller shall be provided with at least the same level of surveillance as currently provided by visual observation;**
- **The introduction of Aerodrome Control Service Concepts shall be subject to a full safety analysis and relevant safety levels shall be met;**
- **Contingency procedures shall be in place;**
- **Controllers shall be involved in the development of Aerodrome Control Service Concepts.**

See: WP 87 - Istanbul 2007

ADME 2.4 SURFACE MOVEMENT GUIDANCE & CONTROL SYSTEMS

At their simplest these may consist of ground markings and stop & go lights. More sophisticated systems will incorporate taxiway centre line lighting and stopbars which can delineate the cleared route of aircraft. Where a need exists, surface movement radar or some other form of aircraft position sensing may be installed. Whatever the sophistication of the system, the essential requirement is that some means exist of ensuring the safety of aircraft while moving on the manoeuvring area.

IFATCA policy is:

The appropriate ATC authority should institute an SMGCS which includes procedures for avoidance of collision between aircraft, and between aircraft and vehicles on the ground.

Surface movement radar should be used as a monitoring device and should not be used for the provision of a control service unless procedures are available.

The boundary between apron and manoeuvring area should be clearly defined. Longitudinal separation standards to achieve the objectives of preventing collisions between aircraft and aircraft and vehicles on the ground, during push back and taxi, must not be specified.

See: WP 59 - Nairobi 1987 and WP 93 - Hong Kong 2004

ADME 2.5 PROVISION OF ATS AT AERODROMES

The Danish Air Traffic Controllers Association (DATCA) was experiencing problems defining the appropriate qualification for a particular service provided at aerodromes. Changing the level of service during the day and the incorrect use of phraseology by Aerodrome Flight Information Officers (AFISOs) in Denmark caused confusion to pilots as to the quality of service provided. The Technical and Operations Committee (TOC) was tasked to investigate this matter and to review the policy on provision of ATS at aerodromes. In the opinion of TOC the guidelines and requirements set by ICAO should be sufficient to achieve the appropriate level of ATS at aerodromes. However due to recent developments, influenced by economic reasons, TOC proposes to change IFATCA Policy.

IFATCA policy is:

Air Traffic Control service shall be provided at aerodromes that:

- **have published IFR approach, departure or holding procedures, and where control is required for the safety of air traffic.**
- **for VFR operations, where required to ensure that appropriate safety levels are met.**

At aerodromes at which Air Traffic Control is provided the appropriate grade of controlled airspace should be provided.

Where the above factors do not apply, Aerodrome Flight Information Service (AFIS) may be provided, but shall never be used as a substitute for Air Traffic Control Service. Where AFIS is in operation the limitations of the service shall be added to the station RTF callsign.

See: WP 88 - Istanbul 2007
See also: WP 39 - Athens 1985 and WP 61 - San José 1986

ADME 2.6 RESPONSIBILITY AND FUNCTIONS OF AERODROME CONTROLLERS WITH REGARD TO SURFACE MOVEMENT

The task of apron control is not solely the responsibility of ATC; therefore all staff involved in the provision of this service should be trained to the appropriate standard. It is important that the siting of control towers, the markings of taxiways, the use of visual aids and the introduction of future technology should have a minimal impact on operations. Developments in new Advanced Surface Movement Guidance Control Systems and their introduction should be an integral part of low visibility operations.

IFATCA policy is:

In Aerodrome Control Towers, the use of CCTV is not accepted to replace Visual Observation. The use of CCTV is only accepted to supplement Visual Observation where:

- **It provides the controller with at least the same level of surveillance**
- **Safety is demonstrated**
- **Contingency procedures are in place**

The layout of runways and taxiways and the provision of visual aids should be such, as to enable simple and easily understood instructions to be issued and complied with.

Where a separate apron management service is established, personnel engaged in issuing specific ground clearances, instructions and clearance delivery should be trained and licensed to exercise these functions.

Surface Movement Surveillance Systems should be installed at all airfields where low visibility operations take place and its operation should be mandatory while these operations are in progress.

Safeguards should be imposed to prohibit the development of any structure that would impede the direct visual observation from the tower.

See: Resolution B11 – WP85 – Kathmandu 2012 and Resolution B14 - WP 97 - Amman 2011
See also: WP 129 - Tunis 1996 and WP 87 - Santiago 1999

Where apron management services are established and not provided by an aerodrome ATS Unit, aerodrome controllers cannot be held liable for accidents or incidents that occur whilst aircraft are under the jurisdiction of the Unit providing such a service.

See: WP 163 - Cancun 2002
See also: WP 159 - Dubrovnik 2009

ADME 2.7 THE INTERFACE BETWEEN ATC AND AFIS

AFIS units are tasked with the provision of FIS and Alerting service within their jurisdictional airspace, without being considered an ATC unit; aerodromes identified as "AFIS aerodromes" maintain the status of "non-controlled" aerodromes. The interface between AFIS and ATC, attention is drawn to the coordination in that phase of flight when an aircraft - or more than one - is transiting from an AFIS to ATC and vice a versa. This is particularly relevant when the aerodrome is surrounded by controlled airspace where instrument procedures' profiles extend through both volumes of airspace. To enable flights to operate safely between AFIS and ATC and vice a versa.

IFATCA policy is:

At aerodromes where Aerodrome Flight Information Service is provided and are directly adjacent to controlled airspace appropriate LOAs are to be adopted defining the interface between AFIS units and the relevant ATC unit(s) in order to provide detailed operating and coordination procedures .

See: WP 84 - Taipei 1997

ADME 2.8 ADVANCED APPROACH PROCEDURES

IFATCA policy is:

Advanced approach procedures should only be introduced where there is a demonstrated benefit from using these procedures. During any transition period these operations must not overload ATC or adversely affect its ability to handle all aircraft safely and efficiently.

Advanced approach procedures should be designated under 2 categories: Basic and Advanced. The Basic procedure should be a straight in approach following the normal glidepath. An Advanced procedure is any procedure requiring a higher level of equipment.

To permit advance planning, the approach capability of the aircraft should be included on the flightplan and displayed to the controller using the appropriate data display system. The flight plan data should be limited to an indication of Basic or Advanced procedures.

The number of advanced approach procedures to any one runway should be kept to a minimum to reduce the complexity of the traffic flow in the terminal area.

ATC should have the option to limit the number of advanced approach procedures in use at any one time.

The controller should have a video map display showing the planned flight path of an aircraft on an advanced approach procedure and the track miles to touchdown.

ATC will require the provision of assistance tools for managing and integrating traffic operating on advanced approach procedures.

Advanced approach procedures should have a unique identification that is not dependent on the runway designator and should be named in accordance with ICAO Annex 11 Appendix 3, 'Principles Governing the Identification of Standard Departure and Arrival routes and Associated Procedures' .

ATC must not be responsible for checking the validity indicator of an advanced approach procedure where this is transmitted to the aircraft by datalink.

When advanced approach procedures are published, they must ensure that the aircraft is able to continue to navigate safely during an aborted approach until the aircraft has climbed to a terrain safe altitude.

When an aborted approach is made from an advanced approach procedure, radar vectors must not be considered as the primary means of navigating the aircraft.

Where advanced approach procedures are introduced, the additional staff training and equipment to integrate this traffic into the ATC system must be provided before these operations commence.

See: WP 85 - Geneva 2001

ADME 2.9 REQUIRED NAVIGATION PERFORMANCE (RNP) FOR APPROACH AND LANDING

The concept of Required Navigation Performance (RNP) is to determine the accuracy of the aircraft navigation system and has been developed for use in en-route navigation. The fundamental feature is that it only defines a standard of equipment performance therefore it is of no interest to controller how the navigation is achieved but only that the aircraft is equipped to the standard required in a particular piece of airspace. IFATCA recognises that the extension of the RNP concept to the approach and landing phases of flight appears to offer advantages to ATC.

ICAO is introducing the Performance Based Navigation concept to provide a means of achieving harmonisation of RNAV and RNP applications. The PBN Manual sets out issues associated with the identification of the advantages and limitations of choosing one or the other as the navigation requirement for an airspace concept.

IFATCA policy is:

RNP based operational procedures should be developed in parallel with new approach aids, such as GNSS.

See: WP 99 - Ottawa 1994, WP 116 - Tunis 1996, WP 91 - Arusha 2008

ADME 2.10 NEW TECHNOLOGY APPROACH & LANDING AIDS

ICAO has developed a transition plan allowing the introduction of new technology approach and landing aids (currently MLS and GNSS). IFATCA is concerned that the more complex environment created by the use of a number of new approach aids will create operational problems for controllers. These problems can be reduced by using the principles associated with RNP in the design of operational procedures, so avoiding the need for the controller to know which aircraft is using which precision approach aid and reducing RTF.

IFATCA Policy is:

Operational procedures for New Technology Approach and Landing Aids should be based on the principles associated with RNP.

Where more than one approach aid is in use the largest critical and sensitive areas must be protected;

When SMR is required in operational procedures, the SMR must be serviceable and displayed to the controller during these operations. (Note: See SMR Policy);

To permit advanced planning the approach aid capability of the aircraft should be included in the flight plan and displayed to the controller using the appropriate data display system;

Where New Technology Approach and Landing Aids are introduced, any additional staff training and equipment to integrate this traffic into the ATC system must be provided before these operations commence.

See: WP 83 - Geneva 2001
See also: WP 84 - Geneva 2001

During the last few years there has been a significant increase in the number of approach types in use. This is due in the main to the introduction of new technologies, such as Global Positioning System (GPS) and Area Navigation (RNAV). States have introduced approach types with differing terminology and differing criteria. There is a pressing need to rationalise the multitude of approach types and to introduce consistent terminology and criteria. There are plans within ICAO to try and achieve this through the Performance Based Navigation (PBN) concept. IFATCA should support such a move. In the meantime, there are several recommendations that should be accepted to assist controllers in dealing with the various approach types.

IFATCA policy is:

The variety of approach types, and the associated complexity to the controller, should be reduced.

The type of approach sub-category should be transparent to the controller in order to maintain an acceptable workload. The approach sub-category and the associated minima should be determined by the aircrew based upon equipment fit and training.

See: WP 84 - Istanbul 2007

ADME 2.11 THE APPLICATION OF COCKPIT DISPLAY OF TRAFFIC INFORMATION (CDTI) IN ADVANCED SURFACE MOVEMENT GUIDANCE SYSTEM (A-SMGCS) OPERATIONS

Many of the applications being investigated and developed, as part of the evolution of the CDTI in A-SMGCS context and the evolving use of airborne equipment and their derived data within the ground system, could have the potential for providing benefits in terms of safety, capacity and efficiency during LVO. However that development will need to address the many human factors and technical concerns that have been identified. IFATCA has identified several issues.

IFATCA policy is:

IFATCA supports development and implementation of CDTI in A-SMGCS applications to enhance safety and improve the efficiency of airport ground operations, provided that there is no adverse impact on controller or pilot workload.

Where any CDTI assurance function will be implemented, a clear and unambiguous statement of the responsibilities between pilots and controllers is required.

International standards should be established for certification and approval of complementary CDTI systems.

IFATCA considers the following to be the minimum attributes of CDTI used in A-SMGCS:

- **Positive unambiguous identification of all relevant aircraft/vehicles should be provided to the standards required for ATC systems;**
- **Sufficient information as to ground reference points, guidance and/or routings of relevant aircraft/vehicles should be provided to increase pilot's situational awareness and understanding of ATC instructions;**
- **All aircraft/vehicle should be displayed.**

See: WP 86 - Geneva 2001
See also: WP 87 - Santiago 1999

ADME 2.12 RED STOP BAR CROSSING PROCEDURES

Guidelines for aerodrome planning without taxiways crossing runways shall be the future aim to eliminate one of the main contributors to runway incursion. In particular when existing aerodromes are expanded strict guidelines to avoid construction of critical areas should become applicable.

Environment protection procedures at aerodromes must be reassessed, in order to consider the impact on runway operations and risk for runway incursion.

Wherever complex aerodrome layout, runway-crossing taxiways or known areas of danger (hot spots) exist adequate tools (e. g. SMR, A-SMGCS, stop bars, etc.) should be provided to increase controller, pilot and driver awareness.

IFATCA should support IFALPA policy and never instruct an aircraft to cross a red stop bar. The stop bar should be switched off rather than be crossed at red.

IFATCA Policy is:

Stop bars shall be switched on to indicate that all traffic shall stop. Stop bars shall be switched off to indicate that traffic may proceed, when so authorized by the aerodrome control tower.

Contingency procedures should be available for stop bar malfunction.

The ICAO provisions for stop bar related procedures should be made consistent and unambiguous in all relevant ICAO documents.

See: WP 87 Kaohsiung - 2006 and WP 88 - Dubrovnik 2009

The stop bar HMI design, location, implementation and automation should prevent an unacceptable increase of workload, distraction and head down operations.

See: Resolution BC1 - WP 82 - Punta Cana 2010

The operation of stop bars 24 hours a day is supported by IFATCA provided that the design and implementation of stop bars support operations at any traffic volumes.

See: Resolution BC2 - WP 82 - Punta Cana 2010

ADME 2.13 NUMBERING OF AIRCRAFT IN THE AERODROME TRAFFIC CIRCUIT

One of the reasons for the investigation of numbering of aircraft in the aerodrome traffic circuit was an incident in Israel, whereby the use of the term ‘number’ in radiotelephony was considered to be one of the contributory factors of this incident. After reviewing the relevant ICAO publications, IFATCA concludes that the use of ‘number’ in phraseology appears to be insufficiently supported by ICAO rules and guidelines. As a result, controllers world-wide use the term frequently, and often also refer to other phases of flight than the aerodrome traffic circuit. Besides this, ICAO does not provide the desired clarity when it comes to the ending of the aerodrome traffic circuit. For these reasons, Provisional Policy was adopted to provide the much needed clarity with the use of ‘number’.

IFATCA Provisional Policy is:

If ‘number’ is used in other than the aerodrome traffic circuit, i.e. for situational awareness, then the controller should use the phraseology

‘NUMBER … IN [approach, taxi] SEQUENCE’

See: WP 85 - Arusha 2008

ADME 2.14 RUNWAY STATUS LIGHTS (RWSL)

Runway Status Lights (RWSL) is a set of new technologies emerging in the United States to reduce runway incursions. RWSL was designed as a safety net that uses red lights to warn pilots and drivers of a runway conflict. The FAA is deploying RWSL at major US airports and other States are planning implementations as well. This paper describes system operation and discusses known and potential issues with its use.

IFATCA Policy is:

IFATCA supports RWSL provided the following criteria are met:

- **The system will be used as a safety net.**
- **It will operate automatically with no controller input required.**
- **The system specifications are globally harmonized under ICAO guidance.**
- **Potential confusion with other lighting systems is eliminated or mitigated.**
- **Clearance to proceed will still be required.**
- **All surface traffic will be required to comply with the system.**
- **Comprehensive training is provided to all pilots, drivers and controllers.**
- **False activations are kept to an absolute minimum.**

If RWSL activations are displayed to the controller, the following criteria should be met:

- **The information should be efficiently incorporated into existing surveillance displays at the appropriate control positions.**
- **Legal responsibilities are clearly and unambiguously defined.**

See: Agenda B.5.3 - WP 89 - Amman 2011

ATS:

MATTERS RELATING TO PROVISION OF ATS

POLSTATS

ATS 3.1 REPLACEMENT FLIGHT PLANS

Where owing to ATFM restrictions upon the initial flight plan route, the initial plan is cancelled and a new plan filed there is a need to ensure that the replacement flight plan can be identified as such. Procedures to achieve this have been in use in the European Region for several years but have caused difficulties to states in other regions.

IFATCA Policy is:

ICAO should review, as soon as possible, world-wide procedures and systems for amending or replacing flight plans or flight plan information, to ensure that such system and procedures exist, and that amended or replacement flight plans, or portions thereof, are easily identifiable to control personnel.

See:	WP 34 - Frankfurt 1989
See also:	WP 90 - Frankfurt 1989
Related IFATCA Policy:	Alpha-Numeric Callsigns

ATS 3.2 CLEARANCES

Downstream Clearances

One of the fundamental operational principles that have been incorporated in the draft ICAO Manual of Air Traffic Services (ATS) Data Link Applications Draft Version 0.4 from the beginning is that any ATS data link system must only allow one ATSU (ATS Unit) to be capable of communicating with a given aircraft at any one time. This requirement was felt to be necessary to ensure that there would be no confusion by the aircrew that a clearance or instruction delivered by the data link system actually came from the proper controller (or controller team). It is therefore essential that when downstream clearances delivered via datalink are in use i.e. including the current controlling authority that sufficient safeguards are in place.

IFATCA policy is:

Where Downstream Clearance capability is provided via Data Link, sufficient safeguards must be implemented in accordance with the ICAO Doc 9694 Manual of Air Traffic Services Data Link Applications, First Edition 1999.

See: WP 115 - Taipei 1997, WP 81 - Toulouse 1998 and WP 90 - Dubrovnik 2009

Route Clearances

A route clearance issued to an aircraft should be to destination.

See: Resolution B7 - WP 85 - Punta Cana 2010

If an ATC unit changes a route then that ATC unit should ensure that the new route rejoins the current flight plan route.

See: Resolution B8 - WP 85 - Punta Cana 2010

ATS 3.3 HARMONISATION OF THE AIRSPACE CLASSIFICATION

In 1991 in an attempt to harmonise the categories of airspace, ICAO re-classified the airspace offering seven different types. Since then, no review has taken place with regard to whether this re-classification has created a harmonised situation. There is now evidence to suggest, that there is a lack of harmonisation between neighbouring countries, and that there exists a degree of under and over classification..

IFATCA policy is:

ATS Authorities are urged to co-ordinate and harmonise with all neighbouring states their national airspace classification to permit safe and efficient operating conditions to all airspace users and air traffic controllers.

Airspace classification should be appropriate for the traffic operating in the airspace, to avoid over and under classification. As traffic situations change, the classification may have to change accordingly.

See: WP 83 - Tunis 1996

With regard to the ICAO classification of airspace, the definition of controlled airspace is the generic term which covers airspaces of class A, B, C and D. Classes E, F and G being uncontrolled.

Class E is a special case of uncontrolled airspace in which a limited Separation service will be provided between defined aircraft.

See: WP 85 - Taipei 1997

ATS 3.4 STANDARDISATION OF REGIONAL TRANSITION ALTITUDES

Problems can arise if Transition Altitudes vary between adjacent FIR's.

IFATCA policy is:

Standardisation of Transition Altitudes on a region wide basis be implemented where applicable.

See: WP 35 - Nairobi 1987

ATS 3.5 PROVISION OF OPERATIONAL AERONAUTICAL INFORMATION

An air navigation services system requires rapid access to correct current and conclusive data from a common source. In the air traffic control environment such data is often needed immediately in response to urgency or emergency situations. There is too much data to be efficiently memorised and therefore it is commonly available to controllers at their working positions in the form of documents, manuals etc. However, the more documents supplied the greater the problem of keeping them up to date and the more difficult finding the relevant information becomes.

There is a clear need to present such information in the instantaneously accessible form which modern display and computer technology makes possible. An upgraded AFTN system could be used to make a computerised data base available to all airspace users and providers of air navigation services.

IFATCA policy is:

States should establish a common aeronautical information database containing:

1. **Notices to Airmen (NOTAMs);**
2. **Aeronautical information Publication Data;**
3. **Meteorological data;**
4. **Operational and technical status data which could be used by air navigation services systems for the efficient handling of aeronautical information and operational flight information.**

Such systems should utilise an improved AFTN system such as the Common ICAO Data Interchange Network (CIDIN) and should be implemented as soon as possible. To enable maximum use to be mad e of the data base the AFTN should be extended into those areas of the air navigation services systems which are not at present connected to it.

See: WP 16 - Amsterdam 1982

ATS 3.6 AIR TRAFFIC FLOW MANAGEMENT - ADHERENCE

The process of Flow Management involves continual monitoring and regulation of the flow of air traffic. The timely implementation of flow management measures and the communication of restrictions to the appropriate controllers are of prime importance, as is the adherence to restrictions by aircraft operators.

IFATCA policy is:

IFATCA recognises the potentially dangerous situations that can arise when slot times are not adhered to.

In the EUR region ATFM utilises departure slot times as a means of regulating air traffic and that when a departure slot time is used, the time should be passed to the ATC unit at the departure airfield.

It is the responsibility of the aircraft operator to be ready for departure to meet the assigned ATFM departure slot.

Civil Aviation administrations pursue with the utmost vigour those operators who consistently fail to comply with ATFM measures.

See: WP 59 - Port of Spain 1991

ATS 3.7 SECTOR CAPACITY VALUES

Sector capacity measurement methods and the capacity values they produce are of great importance for an efficient ATM organisation therefore close co-operation between ATC and ATFM is required.

IFATCA policy is:

IFATCA defines:

Sector Capacity: The maximum number of flights that may enter a sector per hour averaged over a sustained period of time, to ensure a safe, orderly and efficient traffic flow.

Occupancy Counts: the number of flights occupying a sector simultaneously during a specified period of time.

See: WP 91 - Amman 2011

ATS 3.8 ATC WITHIN ICAO ASSIGNED INTERNATIONAL AIRSPACE- THE IMPACT OF TECHNOLOGY

IFATCA fears that any re-organisation of ICAO assigned international airspace would be based upon the availability of new technology in different member states, with responsibility for airspace being assigned to the state whose advanced technology enabled it to maximise the efficiency and capacity of the airspace. This would not be in the best interests of controllers whose problems must be of prime concern to IFATCA. The policy of IFATCA is based solely on the development/implementation of technology and implies no political process or decision with respect to national FIRs/UIRs.

IFATCA policy is:

The current ICAO assignment of international airspace within ICAO 'NOT' be modified / changed based solely on the development / implementation of technology by one or more States, unless agreed to by all MAs concerned.

See: WP 33 - Port of Spain 1991

ATS 3.9 RADAR MONITORING

Radar monitoring is one of the functions in the provision of an air traffic control service. For the purposes of this policy, it has been considered in two areas namely, arrival / departure phase and the en-route phase. The need to establish parameters for radar monitoring has arisen from the increasing use of self navigation.

Radar monitoring is defined as:

Radar Monitoring: A continual process of observation carried out via a radar display, to facilitate the application of regulation and control.

IFATCA Policy is:

Route spacing standards should not be reduced below those that would otherwise be required purely because of the use of radar monitoring.

Radar monitoring should not be used as the means of providing separation with obstacles (terrain clearance) where aircraft are on their own navigation and below the Minimum Radar Vector Altitude (MRVA). Any escape procedure shall provide adequate terrain clearance from the point the aircraft is below the MRVA to the lowest defined altitude at which any such procedure can be initiated. States are required to assure this.

Any introduction of Performance Based Navigation PBN routes that are closely spaced should be subjected to safety analysis. Such a safety analysis may result in hazards being identified that require automated monitoring assistance for the controller to adequately mitigate the hazard.

Any introduction of closely spaced routes should ensure that controllers can, upon identification or notification of a deviation, carry out the necessary action so that the required separation minimum is not likely to be infringed.

See: WP 92 - Istanbul 2007 and WP 91 - Arusha 2008
See also: WP 101 and 102 - Ottawa 1994

ATS 3.10 GLOBAL COMPATIBLE FLIGHT LEVEL SYSTEMS

There currently exist three systems for flight level determination which are not compatible with one another. In the interface areas safety is compromised.

IFATCA policy is:

> **That a global solution should be developed using one system of flight level determination.**
>
> **That the interface in the transition areas between FL Ft. / FL Metric CIS / FL Metric PRC be properly managed with the introduction of procedures which will prevent the selection of the incorrect flight level.**
>
> **That the introduction of compatible procedures in the interface areas be coincident with the introduction of RVSM.**
>
> **That a simplification of the R/T phraseology be introduced in the expression of Metric Flight Levels as adopted by Feet Flight Levels.**

See: WP 96 - Tunis 1996

ATS 3.11 THE USE OF NON-FLIGHT-PLANNABLE LEVELS IN THE NAT REGION FOR CONTINGENCY

There is evidence that there is an identifiable number of incidents which require an aircraft to divert or for ATC to intervene which does not require a descent out of the NAT track structure.

IFATCA Policy is:

Within the NAT region where RVSM is in operation, FL 300 would be established as a non-flight plannable level as part of the "in-flight emergency contingency" procedures as they apply to the Organised Track System.

See: WP 91 - Santiago 1999

ATS 3.12 UNITS OF MEASUREMENT IN CIVIL AVIATION

IFATCA takes the view that SI (Système International d'Unités) is not necessarily providing a single solution for Civil Aviation, and that, in order to obtain a common global standard which is necessary for safety reasons, then specific non SI elements should be retained for the measurement of Vertical Distance, Speed and Distance.

IFATCA Policy is:

For the measurement of vertical distance, speed and distance the following units of measurements should be used:

1. **for vertical distance : FEET; (Vertical distance is altitude, elevation and height)**
2. **for vertical speed : FEET PER MINUTE;**
3. **for horizontal speed : KNOTS;**
4. **for long distances* : NAUTICAL MILES.**

*** long distance used in navigation generally in excess of 4000 metres.**

Any change in use of current units of measurement should only be implemented after appropriate training of controllers.

See: WP 100 - Marrakech 2000

ATS 3.13 AVIATION RADIO FREQUENCY SPECTRUM PROTECTION

Spectrum Protection refers to the management of the radio-frequency spectrum in order to protect particular interests. The spectrum includes not only communications and datalink applications, but also navigation and other uses. Aviation is just one of the many users of the spectrum. The useable spectrum expands with technological advances however there are often competing demands for particular frequency bands. States decide on spectrum use at World Radio-communication Conferences (WRC) organised by the International Telecommunications Union (ITU).

IFATCA Policy is:

The radio-frequency spectrum must be managed in a manner that at all times ensures the safety of current aviation activity and allows for future safety-of-flight applications.

Existing spectrum allocations for exclusive aviation use must not allow other uses until it is thoroughly proven that aviation safety will not be compromised by the shared use of the spectrum allocation.

Prior to aviation use of shared spectrum allocations, it must be thoroughly proven that safety-critical aviation requirements are not compromised.

Adequate protection against harmful interference to aviation spectrum use must be ensured.

See: WP 95 - Cancun 2002

ATS 3.14 MIXED MODE OPERATIONS

The ATM system will continue to evolve through the use of technology. To permit certain categories of non-equipped flights to operate in mandatory equipage airspace, exemptions are given.

The controller is often used as the mitigation to permit these flights to operate, however there is a limit to the number of pieces of information, which can be displayed, either on the data display or the radar to indicate these exemptions, and also the cognitive function of the controller to react to numerous triggers.

Despite the use of individual safety case applications, there is an identified need to conduct a safety analysis on mixed mode operations, in all its variances.

IFATCA policy is:

Mixed mode operations are defined as ATM Operations that require different procedures due to variances in airspace users' characteristics and/or ATM design within the same area of controller responsibility.

Efforts should be undertaken to reduce existing Mixed Mode Operations by creating intrinsically safe solutions.

Introductions of new Mixed Mode Operations should be avoided by creating intrinsically safe solutions.

When safety of a Mixed Mode Operation cannot be completely managed at an intrinsic level, assessment must take place that the change in the ATM system does not increase controller workload to an unacceptable level.

See: WP 96 - Buenos Aires 2003 and WP 93 - Dubrovnik 2009

ATS 3.15 FUNCTIONAL BLOCKS OF AIRSPACE

The developments of the Central European Air Traffic Services Project from its original concept to now, fit with the European Commission's views as determined by the Single European Sky, have raised concerns with regard to the Functional Blocks of Airspace concept.

The identified issues now being raised will also occur in other developments where Functional Blocks of Airspace are to be introduced.

IFATCA provisional policy is:

The creation of Functional Blocks of Airspace should achieve the expected operational benefits.

It should also grant a clear and full evaluation and definition of all the legal implications in service provision by multinational ATCOs employed in countries with different legislations. The legal liability and under whose jurisdiction must be clearly defined.

The efficient creation and management of an FBA does not necessarily require the physical concentration of all ANS functions within a single multinational centre.

Through stable evolutionary processes the pros and cons of creating common ACCs should be compared to a continuation of the ongoing harmonization of existing ACCs especially with regard to the social implications.

All details of any plan to create an FBA have to be fully transparent to all.

As the possible implications of creating FBAs have not been thoroughly studied, the EB should be tasked to look deeper into this subject and task the appropriate SC to draft a complete policy on FBAs for next conference. The creation of "Virtual Centres" should be considered as a mean of meeting the objective of implementing FBAs.

See: WP 105 - Buenos Aires 2003

ATS 3.16 SYSTEM DEFENCES DURING PLANNED SYSTEM DEGRADATION

Planned System Degradation could be any potential reduction in the availability, reliability or integrity of any part of the ATM system, known in advance to the user of the system.

IFATCA policy is:

Risk assessment and appropriate mitigation should be carried out for every planned system degradation.

Arrangements should be made for sufficient staffing during planned system degradation.

See: WP 100 - Hong Kong 2004

ATS 3.17 (ADVANCED) STRATEGIC LATERAL OFFSET PROCEDURES

Strategic Lateral Offset Procedures (SLOP) are mitigating the risk of vertical collision and wake turbulence encounters between aircraft with high precision navigation capabilities. Provisions of SLOP are published by ICAO in Doc 4444 Air Traffic Management as special procedures for oceanic and remote continental airspace. Strategic Lateral Offset Procedures are pilot initiated and more or less transparent to controllers. After the mid-air collision in Brazil, some stakeholders in air transport industry highlighted the issue that SLOP have not been implemented by Air Traffic Services (ATS) authorities as widely as possible. ICAO has since started to investigate and develop SLOP to extend its applicability to other than oceanic and remote airspaces.

IFATCA provisional policy is:

IFATCA endorses Strategic Lateral Offset Procedures (SLOP) in oceanic or remote continental airspace where there is no ATS surveillance service provided.

IFATCA only supports an advanced strategic offset concept provided that:

- **Studies conclude that the concept enhances safety;**
- **The concept is globally harmonised;**
- **The concept is taken into account in airspace and procedures design;**
- **ATC surveillance systems accommodate the concept; and**
- **The concept is transparent to ATC, requiring no controller intervention at all.**

See: WP 90 - Arusha 2008 and WP 92 - Dubrovnik 2009

ATS 3.18 THE USE OF SAFETY NETS IN ATM

The use of safety nets within the ATM system has been established for m any years. The scope of safety nets has extended to be not only airborne based but ground based as well. There is a move to extend their application into other areas such as an ATM tool, often with a view to a reduction of separation. Also, the concept of separation protection as opposed to collision avoidance has been introduced. This implies that the controller is alerted when the separation minima are about to be infringed and action will be taken to maintain the minima. In this case, the use of the safety net is being compromised by its use as conflict detection tool.

IFATCA policy is:

A safety net is an airborne and / or ground based function, the sole purpose of which is to alert the pilot or controller of the imminence of collision of aircraft, aircraft and terrain / obstacles, as well as penetration of dangerous airspace.

See: WP 88 - Cancun 2002
See also: WP 88 - Buenos Aires 2003

ATS 3.19 CONTRO LLER TOOLS

Controller Tools have evolved as ATS systems have developed and additional functionalities have been conceived and implemented. Initially, repetitive or time consuming tasks were replaced through the introduction of tools, but technology has allowed for the development of tools that replace or enhance controller tasks.

The introduction and usage of Controller Tools (CTs) can potentially have a negative effect on a controller's workload. Often the well meaning intentions of software engineers and system designers are misguided and tools that were intended to help can sometimes hinder those asked to use them.

IFATCA policy is:

Controller Tools (CTs) are functions of an ATM system that enhance a controller's ability to meet the objectives of ATS. They provide information that assists controllers in the planning and execution of their duties, rather than dictating a course of action.

See: WP 89 - Hong Kong 2004

ATS 3.20 CONFLICT DETECTION TOOLS

Conflict Detection Tools (CDTs) are computer based Controller Tools that identify conflicts and then provide system generated conflict advice to controllers. CDTs can either provide conflict detection continually or provide one-off probes (modelling to assess the potential conflicts on an intended action such as a reroute, level change or speed adjustment). CDTs can also provide conformance monitoring to ensure that aircraft conform to instructions issued to solve a detected conflict.

IFATCA policy is:

Conflict Detection Tools (CDTs) are computer based Controller Tools that identify conflicts and then provide system generated conflict advice to controllers.

CDTs can provide conformance monitoring to ensure that aircraft comply with instructions issued to resolve a detected conflict.

Responsibility and legal implications should be fully addressed before implementation of CDTs.

During degraded modes, clearly defined operational procedures must exist. Nuisance and false alerts must be kept to an absolute minimum.

See: WP 90 - Hong Kong 2004

ATS 3.21 SHORT TERM CONFLICT ALERT

STCA is a ground based system computer program that relies on surveillance data processing to predict proximity between two or more targets. The program utilises radar information on both the vertical and horizontal planes and predicts the future position of those targets, for a time in the future, determined by a variable system parameter known as the look ahead time (generally +/- 1 min). The system then generates warnings to a controller if this prediction will result in less than a set distance (vertically or horizontally) occurring between the targets. There are no internationally accepted parameters for STCA, however in general terms STCA can operate in two different "modes": as a separation assurance function or as collision prevention function.

Definition:

Short Term Conflict Alert (STCA) is an automated system that predicts reduction of aircraft spacing to below specified parameters. An STCA function can be used as either a controller tool (STCA-T) or a safety net (STCA-N) depending upon system parameters.

IFATCA policy is:

Ground based safety nets, like STCA, can enhance overall safety in the automated ATC systems. Therefore each automated ATC radar system should be provided with a ground-based safety net system such as STCA, as a last resort, that only should be used to advise the controller of potential losses of separation.

Controllers shall be involved during the design and development phase with proper introduction and training as necessary when implementing STCA systems.

It is important that, for each individual ATC radar unit, parameters and nuisance filters in STCA systems are developed and tested that are suitable for the area involved and adjusted to the procedures, airspace layout, separation standards, radar source, traffic mix, etc. The systems' logic and parameters should be flexible.

In ATC areas where STCA will be installed, studies and real time simulations shall be carried out to ensure that possible conflicting warnings with TCAS can be kept to a minimum.

An STCA function should not be considered when developing a safety case, unless it can be demonstrated that the functionality is used in a separation assurance mode of operation.

See: WP 98 - Toulouse 1998 and WP 87 - Melbourne 2005

ATS 3.22 AREA PROXIMITY WARNINGS

In the modern world of aviation there are a variety of different types of airspace that could possibly require protection. There are danger areas, restricted areas, special use areas, prohibited areas, temporary reserved areas, military areas and other locally defined special airspace areas to name a few. All of these have different entry and operational requirements but from an ATS perspective these requirements are immaterial. The airspace will have been established for a specific purpose and there will be a requirement to either keep aircraft operations clear of such areas or at least advise a pilot of the imminent penetration of some types of airspace. For the purpose of this policy, all such airspaces referred to above shall be classified "as special use" airspace.

IFATCA policy is:

An Area Proximity Warning (APW) is an alert provided to a controller of the imminent incursion of a flight into "special-use" airspace.

Note - The response to such a warning will be dictated by the nature of the airspace in question and its specific requirements.

See: WP 92 - Hong Kong 2004

ATS 3.23 ROUTE CONFORMANCE MONITORING SYSTEM (RCMS)

A Route Conforming Monitoring System is a function of an Automated ATS System that monitors the position of an aircraft to detect when it deviates from its route. An RCMS compares aircraft trajectory data from various forms of surveillance with known points on the system route for an aircraft and then calculates if the aircraft position falls outside pre-defined parameters. When this occurs, certain processing can be suspended and an alert is often sent to the controller. This can be either a Route Deviation Alert (RDA) and/or an Estimated Time over Deviation Alert (ETODA). An RCMS is considered to be a Controller Tool.

For the purpose of the below policy, a route is considered to be a two dimensional path, i.e. lateral and longitudinal.

IFATCA policy is:

Definitions:

A ROUTE CONFORMANCE MONITORING SYSTEM (RCMS) is a function of an Automated ATS System that monitors the position of an aircraft to detect when it deviates from its route. An RCMS is considered to be a Controller Tool.

A ROUTE DEVIATION ALERT (RDA) is an alert provided to a controller to notify that an aircraft's position is displaced outside the tolerances defined within RCMS.

Note: Certain processing may be suspended.

An ESTIMATED TIME OVER DEVIATION ALERT (ETODA) is an alert provided to a controller to notify a controller that a new estimate is outside specified parameters when compared to a previous estimate.

See: WP 92 - Melbourne 2005

ATS 3.24 MINIMUM SAFE ALTITUDE WARNING SYSTEMS

There continues to be an unacceptable high level of Controlled Flight Into Terrain (CFIT) accidents. Although there are enhancements in the cockpit to prevent such incidents: Ground Proximity Warnings (GPWS), IFATCA believes that devices such as Minimum Safe Altitude Warning (MSAW) activated on the controllers screens should be employed as an additional layer of safety.

IFATCA policy is:

MSAW, as a last-ditch ground-based warning system, must be fully implemented without delay, with the necessary operational requirements and appropriate ATC procedures and training on a world-wide basis, in order to significantly reduce the number of CFIT-accidents.

See: WP 88 - Santiago 1999

ATS 3.25 ENVIRONMENTAL ISSUES IN ATM

There are several environmental issues in ATM. Aircraft noise and aircraft emissions are the issues that have the greatest impact on efficiency and safety.

The normal order of priority in air traffic control is: safety, efficiency and "finally" environmental issues. More often this order is changed in favour of the environment, although the highest priority is still given to safety. The aviation industry continues to grow and the focus on environmental issues has increased worldwide as well. Despite this, safety is still the overriding consideration in all aviation activities. While safety management is improving, the level of safety is more often balanced against efficiency and environment. This could result in a decrease of the level of safety while the target level of safety is still met.

IFATCA policy is:

In the operation, maintenance and development of the ATM system when balancing the requirements of safety, efficiency and the environment, the level of safety shall always be maintained or improved.

In case environmentally driven procedures are introduced in the ATM System, these must be introduced taking into consideration the increased complexity for the controller. This complexity must be managed at the appropriate, strategic, level. A trade-off between environment and capacity must be considered as part of this management of complexity, as safety is paramount.

Individual environmental aspects shall be considered by an ATM environmental management system and documented in an ATM environment case as part of an overall performance case.

Provisions for an ATM environment management system should comprise at least the following requirements:

- **Ensure that the level of safety shall be maintained or improved when environmentally-driven procedures are introduced;**
- **Ensure that all individual environmental factors are identified and considered while establishing procedures;**
- **The actual values (noise levels, fuel consumption and the amount of emissions) of the various individual environmental contributors of new or existing procedures should be established in detail for transparency reasons;**
- **The interrelation of the various individual environmental factors should be identified and addressed.**

Provisions for an environment case should comprise at least the following requirements:

- **An environment case is a documented body of evidence that provides argument that a certain procedure is optimized for all individual environmental factors as prioritized by the appropriate authorities;**

- **An environment case should provide a detailed overview to the appropriate authorities for the determination of priorities of the individual environmental factors on a strategic level..**

See: Resolutions B1, B2, B3 - WP 87 - Amman 2011
See also: WP 91 - Cancun 2002, WP 93 - Arusha 2008, WP 84, WP 105 - Dubrovnik 2009

ATS 3.26 SURVEILLANCE: IN-TRAIL PROCEDURES ITP

At the 2008 Conference in Arusha Tanzania, TOC presented a working paper on a new separation standard being developed through ICAO SASP which detailed the panel work that had been done so far, but was inconclusive due to the work not being finalised in SASP. This working paper provided an update on the work completed thus far and discussed the concerns that have been raised in SASP – with particular emphasis on the areas that are of concern to IFATCA.

IFATCA provisional policy is:

When using ADS-B ITP, proper mitigation must be in place to account for misidentification by the pilot due to incorrect input of FlightId.

See: WP 85 - Dubrovnik 2009

ATS 3.27 MISSED APPROACH PROCEDURES FOR VISUAL APPROACHES

The procedure that an aircraft should follow during a go-around following a Visual Approach is often not clear to the ATC or the Pilot as several options for a missed approach procedure exists. These include the missed approach procedure for the Instrument that was abbreviated, direction by ATC using the Radio etc. IFATCA policy is aimed at removing any possible misunderstanding amongst ATC and Pilot.

IFATCA policy is:

Each aerodrome at which visual approaches are undertaken shall have go-around procedures documented in the AIP.

See: Resolution B4 - WP 84 - Punta Cana 2010

Any visual approach procedure for IFR flights that is shown on a visual approach chart in the AIP shall contain a go-around procedure.

See: Resolution B5 - WP 84 - Punta Cana 2010

The inclusion of go-around procedures in the AIP should not preclude a controller from issuing alternative instructions to be used in the event of a go-around.

See: Resolution B6 - WP 84 - Punta Cana 2010

ATS 3.28 INSTRUMENT DEPARTURES AND ARRIVALS

Standard Instrument Departures (SIDs) and Standard Instrument Arrivals (STARs) are published procedures which include route information and may include tracking, level, speed and other requirements and restrictions. SIDs and STARs are becoming increasingly complex and differences in design and phraseologies are creating misunderstandings between pilots and controllers as to the intent of the controllers' instructions. A significant concern is misunderstandings whether level restrictions must be complied with or have been cancelled.

IFATCA policy is:

SID and STAR design and use should be globally harmonized.

See: Resolution B9 - WP 88 - Punta Cana 2010

Phraseology and corresponding message sets shall be developed to easily indicate whether published vertical profile is to be followed or not.

See: Resolution B9 - WP 91 - Amman 2011

For aircraft on SIDs and STARs, all level change clearances shall explicitly indicate whether the published vertical profile is to be followed or not, provided that controller workload does not increase beyond an acceptable level.

See: Resolution B8 - WP 91 - Amman 2011

ATS 3.29 EN-ROUTE RESTRICTIONS

In November 2007 ICAO introduced Amendment 5 to Doc 4444, which contained new procedures and phraseologies for aircraft following a SID or a STAR. This implementation was not as successful as expected.

IFATCA studied the operational use of these procedures and phraseology and concluded that discrepancy exists between restrictions on SIDs and STARs and restrictions in the en-route environment. The paper studied this issue to ensure compatibility and consistency between the TMA environment and en-route procedures.

IFATCA policy is:

Published level restrictions remain valid unless explicitly cancelled by ATC.

See: Resolution B6 - WP 91 - Amman 2011

Phraseology and corresponding message sets shall be developed to easily cancel published level restrictions.

See: Resolution B7 - WP 91 - Amman 2011

ATS 3.30 CONTINUOUS DESCENT OPERATIONS (CDO) AND CONTINOUS CLIMB OPERATIONS (CCO)

Recent experience has proven the potential of new arrival procedures known as Continuous Descent Arrivals (CDAs). CDAs enable aircraft to make a more continuous descent from cruise to runway, saving fuel, reducing emissions, and reducing frequency congestion. ANSPs want to expand the use of CDAs. To regulate this activity, ICAO has produced Doc 9931, "Continuous Descent Operations Manual".

IFATCA policy is:

IFATCA defines Continuous Descent Operations as: Continuous Descent Operations (CDO) are aircraft operating techniques facilitated by appropriate airspace and procedure design which meet all ATM requirements, allowing the execution of an optimized descent profile.

~~**IFATCA supports the development and implementation of Continuous Descent Operations provided that:**~~

- ~~**Controllers are involved in the design.**~~
- ~~**Airspace is suited to the design.**~~
- ~~**The design meets the desired ATM capacity.**~~
- ~~**Tactical ATC interventions are allowed.**~~
- ~~**Flight predictability is increased for both pilots and controllers.**~~
- ~~**Controller workload is not increased beyond an acceptable level.**~~

See: Resolution B9 - WP 85 – Kathmandu 2012

Doc 9931 should be amended as follows:

- **Incorporate CDA design practices learned by the pioneers of the continuous descent, including the 90% rule, the use of extensive simulation and the need for automated wind data and advanced sequencing tools.**
- **More precisely refer to those procedures it aims to regulate as either Continuous Descent Arrivals (CDAs) or Optimized Profile Descents (OPDs).**

See: Agenda B.5.9 -WP 95 - Amman 2011

Recent experience has proven the potential of new departure procedures known as Continuous Climb Operations (CCO). CCOs enable aircraft to climb in the most economical fashion, saving on emissions and costs but also providing a potential improvement in safety.

IFATCA defines Continuous Climb Operations as: Continuous Climb Operations (CCO) are aircraft operating techniques facilitated by appropriate airspace and procedure design which meet all ATM requirements, allowing the execution of an optimized climb profile.

See: Resolution B8 - WP 85 – Kathmandu 2012

IFATCA supports the development and implementation of Continuous Descent Operations and Continuous Climb Operations provided that:

- **Controllers are involved in the design.**
- **Airspace is suited to the design.**
- **The design meets the desired ATM capacity.**
- **Tactical interventions are always possible.**
- **Flight predictability is increased for both pilots and controllers.**
- **Controller workload is not increased beyond an acceptable level.**
- **It increases the overall performance of the ATM system without reducing safety.**

See: Resolution B9 - WP 85 – Kathmandu 2012

ATS 3.31 AIR TRAFFIC FLOW MANAGEMENT - IMPLEMENTATION

IFATCA identified the need for a policy by addressing the requirements of an ATFM system, present and future.

IFATCA policy is:

IFATCA encourages the implementation of ATFM processes provided that:

- **The process achieves an optimum overall performance.**
- **Air Traffic Controllers and Flow Management Controllers are involved in the design of their local procedures and the determination of capacity values and / or occupancy values.**
- **The communication between and the compatibility of regional systems is established.**
- **The tactical capacity is managed on an operational level.**
- **The process, including restrictions, is transparent to all users.**
- **Procedures should be in place to allow controllers to report occasions where they felt overloaded or sector capacity values were exceeded. Feedback should be given to the reporting controller.**

See: Agenda B.5.10 -WP 96 - Amman 2011

ATS 3.32 SID AND STAR NAMING

The use of SIDs and STARS has grown tremendously in the past decade. Unfortunately, there has been a noticeable lack of standardization and the result is pilots face a confusing mix of local practices. One of these is how the procedures are named.

IFATCA policy is:

SID and STAR designators shall be identical between the ATM system and the FMS.

See: Resolution B1 - WP 83 – Kathmandu 2012

ATS 3.33 CONTROLLED TIME OF ARRIVAL CONCEPT

The RTA function enables an aircraft to pass a waypoint at a predefined time. The CTA concept uses this capability in sequencing arriving traffic to the Terminal Area (TMA) by assigning such fix times to aircraft. CTA and RTA are considered by the industry to be the first step towards full 4 Dimension (4D) Trajectory Based Operations (TBO).

IFATCA policy is:

IFATCA supports the Controlled Time of Arrival concept provided;

- **Arrival Manager (AMAN) is available to define reliable CTA times.**
- **RTA equipage level of aircraft is sufficient to support CTA operations.**
- **Procedures and controller tools are available to integrate RTA equipped and non-equipped aircraft in the same traffic stream.**
- **Tactical ATC interventions are always possible.**
- **Accurate wind and temperature data is available.**
- **Means to communicate the CTA contract with aircraft are available (preferably data link).**

See: Resolution B2 - WP 84 – Kathmandu 2012

ATS 3.34 MERGING AND SEQUENCING CONCEPTS

Due to environmental, economical and operational reasons the need for more accurate merging and sequencing tools has arisen.

IFATCA policy is:

IFATCA encourages the development of sequencing and merging tools provided that:

- **They provide controllers with reliable and effective information.**
- **Local airspace structure, complexity and traffic density are taken into account.**
- **Integration with other systems and adjacent units is possible.**

See: Resolution B3 - WP 88 – Kathmandu 2012

ATS 3.35 TRANSPONDER MANDATORY ZONES

Transponder Mandatory Zones (TMZ), defined areas in which the carriage of an operational transponder is required, have been implemented in several states to improve safety.

IFATCA policy is:

> **All aircraft operating as IFR flights shall be equipped with a pressure-altitude reporting transponder.**

See: Resolution B5 - WP 90 – Kathmandu 2012

COM:

COMMUNICATIONS

POLSTATS

COM 4.1 ALPHA - NUMERIC CALLSIGNS

The concept of call sign confusion and particularly the use of alphanumeric call signs are investigated by IFATCA.

IFATCA Policy is:

An alpha-numeric call sign is defined as:

An alpha numeric call sign is one where the suffix consists of:

- **number(s) followed by one or more letters; or**
- **number(s) followed by a combination of letters and numbers.**

See: Resolution B16 - WP 98 - Amman 2011

To reduce the possibility of call sign confusion:

- **Call signs that correspond to the last two designators of both ICAO and IATA airport designators shall not be used.**
- **In alphanumeric call signs, aircraft operator designators shall not be chosen that will create confusion with phonetic letters.**
- **The use of tools that reduce possible call sign similarity shall be encouraged**

See: Resolution B7 - WP 92 - Kathmandu 2012
Also see: WP 98 - Amman 2011

~~**A universally applicable system for the use of alpha numeric call signs should be developed. This system should consider at least the following requirements:**~~

- ~~**full compliance with ICAO Annex 10;**~~
- ~~**call signs which correspond to the last two letters of the destinations ICAO location indicator (e.g. ABC12AM for flight bound for Amsterdam [EHAM]) or the IATA airport indicator (e.g. ABC1AMS for flight bound for Amsterdam [AMS]) shall not be used;**~~
- ~~**in alpha numeric call signs phonetic letters that can be confused with another operator designator prefix (e.g. Delta) shall not be used; and**~~
- ~~**alpha numeric call signs shall not comprise of the letters B, G, I, O, S and Z in the flight identification because of the potential visual confusion with 8, 6, 1, 0, 5 and 2.**~~

See: Resolution B7 - WP 92 - Kathmandu 2012

~~**The introduction of alpha numeric call signs in an ATM system can lead to an increase in workload for both controllers and pilots. An increase in workload shall be mitigated in order to maintain relevant safety levels.**~~

See: Resolution B7 - WP 92 - Kathmandu 2012

COM 4.2 TRAFFIC INFORMATION BROADCAST BY AIRCRAFT

IFATCA is concerned that TIBA procedures may be used to circumvent industrial disputes, or as a substitute for proper Air Traffic Services, rather than to overcome short term technical problems.

IFATCA provisional policy is:

State Authorities should be required to give adequate notification of the introduction of Traffic Information Broadcasts (TIBA) procedures, i.e. at least 3 months in advance, except where catastrophic events preclude this notification.

TIBA procedures should only be introduced where there are significant technical and/or practical deficiencies in the ATC infrastructure, subject to the Authorities providing adequate procedures and for a limited duration only, not exceeding 6 months.

See: WP 83, 84 - Port of Spain 1991 and WP 92A - Taipei 1997

COM 4.3 8.33 kHz SPACING

The introduction of 8.33 kHz will have a major impact on the European ATC system. The quality of 8.33 kHz spacing appears to be unproven. It would appear that no realistic operational trials have been done. There is the possibility of non-equipped aircraft entering 8.33 kHz, with the increased possibility of frequency blocking, and the additional workload placed on controllers both around and below the 8.33 kHz airspace. The identification and control of non-equipped aircraft relies on the flight planning arrangements working reliably and these systems need to be in place and properly tested before 8.33 kHz spacing is introduced.

All these factors may potentially have an adverse impact on the safety of the ATC system.

IFATCA policy is:

The implementation of 8.33 kHz channel spacing should not take place until the speech quality has been tested in a realistic operational environment to ensure that flight safety will not be jeopardised.

To limit controller workload, the procedures and equipment to identify non-equipped aircraft and to deal with the mixed operational environment must be in place before 8.33 kHz spacing is introduced. This applies in both the core area of Europe and also in those states that must identify and re-route non-equipped aircraft.

See: WP 87 - Taipei 1997

Although it is recognised that 100% equipage will not be achieved and in line with the Safety Validation Groups conclusions based on the assumption of an equipage rate of 95%, IFATCA believes that prior to the introduction of 8.33 kHz the following conditions must be met:

- **Appropriate “filtering / gate keeping” procedures must be in place in the ECAC area and surrounding states.**
- **Detection of 8.33 KHz carriage by IFPS and the display of non-equipped status to the controller must be in place.**
- **Education programmes for pilots and controllers must be completed. This is particularly important in states surrounding 8.33 kHz airspace which will perform the “filtering / gate keeping” procedures.**
- **Procedures which consider a controller as the principle means of mitigation are unacceptable.**
- **Last minute diversions and sub-versions of non-equipped aircraft directly affect the capacity of the sectors involved therefore such re-routings must be kept at the absolute minima in order that the safe operations of the sectors involved are not degraded.**
- **CFMU shall not re-route automatically non-equipped aircraft into 8.33 kHz sectors.**
- **121.5 cannot be considered as a contingency frequency for non equipped aircraft nor can it be used to re-route or divert aircraft that are not equipped.**

- **A 25 kHz independent contingency frequency must be available to re-route non-equipped aircraft.**
- **Non-equipped medical flights will only be accommodated in the case of an in flight emergency.**
- **The introduction and use of 8.33 kHz spacing must be proven to meet at least the current target levels of safety (As for 25 kHz spacings).**

See: WP 99 - Santiago 1999

The use of the word "channel" by ATC should not be removed from radio telephony without an independent safety review. However, in readback, the pilot may omit the word "channel".

The use of the word "decimal" should be retained in transmission of frequencies and channels.

Six digits shall only be used in transmitting an 8.33 kHz spaced channel.

See: WP 86 - Cancun 2002

COM 4.4 RTF COMMUNICATION FAILURE

Existing policies are no longer valid, are out of date and need a substantial review. A simplified approach is needed and can only be achieved through a unified global procedure.

Some radios have a sleep mode that causes communication failures without being noticed. This results in serious security and cost issues for the military.

IFATCA policy is:

There is one unified global procedure for RTF failure.

See: WP 99 - Kaohsiung 2006

COM 4.5 RTF FREQUENCY USAGE

Other means of communication are currently being developed and implemented, e.g. Controller to Pilot Datalink Communications (CPDLC). However, this technology is currently not being used in airspace with many time-critical clearances and communications. The current systems are too limited to deal with environments in which the majority of clearances are time-critical, mainly because of response times. It is therefore very likely that RTF communications will be the sole or major means of communications in many areas in the world. New requirements are listed that TOC believes all controllers should be provided with, while providing ATS.

IFATCA policy is:

If a controller is providing ATS for two or more areas, the relevant channels must be located on the Controller Working Position being used.

If more than one RTF channel is being used, then suitable 'retransmit' facilities must be provided to enable all users to receive all transmissions. The ability to enable or disable 'retransmit' facilities should be provided.

Future systems should include technology that warns the controller in the event of a crossed transmission.

Independent backup equipment should be provided.

Communications with aircraft should only be undertaken within the Designated Operational Coverage (DOC) for the frequency being used.

Voice switch systems must include facilities to:

- **mute individual frequencies (due to open microphone, etc. problems) which will also cancel the retransmit for that frequency;**
- **present equipment failure alarms and provide the ability to isolate equipment which has failed;**
- **select secondary equipment (i.e. receivers, transmitters and paths) at the Controller Working Position;**
- **indicate the frequency on which the last incoming call was made.**

See: WP 17 - Brussels 1979 and WP 88 - Melbourne 2005

IFATCA recognises the need for, and supports the reduction of voice communication workload of controllers. However simply omitting items without alternative methods of accomplishing essential checks compromises safety.

See: Resolution BC4 - WP 86 - Punta Cana 2010

COM 4.6 FREQUENCY BLOCKING

The blocking of frequencies by inadvertent transmissions is a very real operational problem. A flight deck based technical solution has now been developed but implementation is very limited.

IFATCA policy is:

Any device designed to prevent inadvertent transmissions from blocking RTF frequencies, should be installed in all stations capable of transmitting on aeronautical frequencies.

See: WP 58 - Estoril 1984 and WP 92 - Kaohsiung 2006

COM 4.7 DIRECT CONTROLLER - PILOT COMMUNICATIONS

As data link becomes an important means of delivering ATS, there are crucial questions that must be answered before this technology is used for safety-critical communications. This need is especially true where a data link communications system is the primary, or even integral, element in allowing the reduction of separation standard minima.

IFATCA policy is:

In any ATS system, where data link is considered a safety-critical element of that system, data link based ATS must be accompanied by direct two-way controller-pilot voice communications which is also safety critical. This direct voice functionality shall be rapid, continuous and static free.

Direct voice communications requires that no third human party is involved in the set-up and / or delivery of these communications. Any set-up procedures by either pilot or controller must be minimal and nearly instantaneous.

See: WP 114 - Taipei 1997 and WP 81 - Toulouse 1998

For digital air-ground datalink communications to be considered to be direct controller pilot communications, they shall have demonstrated that they support communications dialogues that provide equivalent VHF voice characteristics in terms of the transactions times, the interface which the human uses to interact with the system, and in terms of the cognitive interface between human and system.

See: WP 102 - Santiago 1999

COM 4.8 CPDLC - DATALINK COMMUNICATIONS

Many evolutions in the data link technologies and implementations required an update of the IFATCA (Controller to Pilot Data Link Communications (CPDLC) policy. Airlines growing use of VHF Data Link Mode 2 (VDL2) has offered a reliable sub network for CPDLC, Future Air Navigations System (FANS-1/A+) has removed the risk "out-of-date" messages and Aeronautical Telecommunications Network (ATN) Protected Mode CPDLC has eliminated the risk of "misdelivered" messages. But among other deficiencies to comply with ICAO ATN Standards and Recommended Practices (SARPs), FANS protocol is still vulnerable to this risk, eventually posing a safety threat in continental high density airspace when voice read-back is removed in a near future. Considering the lack of technical solutions to this FANS misdelivery risk, IFATCA opposes the use of CPDLC with FANS aircraft in continental airspace and requests ATN CPDLC only in high density airspace, and ultimately FANS replacement by ATN data link in oceanic airspace when ICAO ATN SARPs are upgraded.

IFATCA policy is:

All implementations of CPDLC must demonstrate full compliance with ICAO ATN SARPs. However, in Oceanic and Remote Regions, where it can be demonstrated that CPDLC implementation improves controller pilot communications, it is recognized that non ATN compliant technologies may be deployed during a transitional phase.

The ICAO ATN SARPs and their progressive development form the definitive basis for any future CPDLC implementation.

In high density ATN CPDLC airspace, FANS aircraft shall be handled via voice R/T for safety reasons.

See: WP 96 - Istanbul 2007
See also: WP 92 - Buenos Aires 2003, WP 82 - Toulouse 1998 and WP 92 - Santiago 1999

COM 4.9 RTF PHRASEOLOGY IN CIVIL/MILITARY INTEGRATION

In the interests of safety and knowledge that everyone can understand exactly what is being asked of them it is important for military aircrew and civil controllers to be sure of the others intentions. This is particularly true when the military pilot is operating as GAT.

IFATCA Policy is:

When military aircraft operate as General Air Traffic (GAT), civil ATC should expect the military pilot to use standard ICAO phraseology.

Where controllers are expected to handle military aircraft on a regular basis, they should be made aware of the differences between ICAO and military phraseology..

See: WP 99 - Cancun 2002

HELI:

HELICOPTER OPERATIONS, ATC ASPECTS

POLSTATS

HELI 5.1 HELICOPTER OPERATIONS

The integration of fixed wing aircraft and helicopters on an airfield can present considerable difficulties to airfield ATC.

IFATCA Policy is:

Procedures should be developed in order to integrate fixed and rotary-winged operations at airfields. In developing these procedures cognisance should be taken of the unique operating characteristics of the helicopter. To accommodate such operations local procedures should be developed to permit:

- **a) the development of discrete helicopter departure and arrival routes;**
- **b) shorter instrument or radar approach patterns;**
- **c) approaches to subsidiary runways followed by a suitable visual manoeuvre for landing on a separate heli-runway or helipad;**
- **d) reduced horizontal separation on radar approaches between helicopters following fixed-wing aircraft, subject to proper authorisation and wake turbulence;**
- **e) landing and take-off at intersections of runways, subject to wake vortex considerations.**

IFATCA would encourage the development of separate helicopter facilities on existing airfields where considered beneficial and would also approve the integration of rotary-wing and fixed-wing operations at such airfields.

See: WP 53 - Athens 1985 and WP 84 - Cancun 2002
See also: WP 29 - Cairo 1981

HELI 5.2 HELICOPTER RTF PHRASEOLOGY

It is often normal practice on airfields for helicopters to take off and land from parts of the apron area. However these areas, not being part of the manoeuvring area, are not under the control of ATC and there may be traffic to affect the take-off or landing.

IFATCA Policy is:

The phraseology 'Cleared for take-off/landing' is not appropriate for use with helicopters operating directly to or from the apron area, as it is currently defined by ICAO. Alternative phraseology should be developed which reflects the limit of ATC responsibility when dealing with such operations.

See: WP 49 - Split 1983

It is essential that controllers know whether they are dealing with helicopters or fixed wing aircraft. To ensure that no confusion can arise

IFATCA policy is:

Helicopter pilots should use the RTF callsign prefix 'HELICOPTER' on first contact with an ATSU, except when it is obvious from the callsign that the aircraft is a helicopter.

See: WP 29 - Cairo 1981 and WP 94 - Kaohsiung 2006

HELI 5.3. HELICOPTERS: DISCRETE IDENTIFICATION IN FLIGHT PLANS

There is no provision on the present flight plan form to differentiate a helicopter from a fixed wing aircraft unless the type designator gives the information. To prevent uncertainty,

IFATCA Policy is:

Procedures should be developed for Flight Plan data to provide a clear differentiation between fixed-wing and helicopter flights.

See: WP 79 - Estoril 1984

SUR:

SURVEILLANCE POLICY

POLSTATS

SUR 6.1 SURVEILLANCE DEFINITIONS

The introduction of new forms of surveillance has highlighted different understandings of surveillance. Surveillance should be used in its widest sense. It is not just position information, but any information required, for example identification, intentions, speed, etc. It is not just surveillance for ATC but also for pilots, electromechanical systems, etc.

IFATCA policy is:

Following definitions be adopted:

Definitions:

Surveillance is the acquisition and monitoring of objects' positions and/or other relevant data for the purpose of Air Traffic Management, such as identity, movement and intent.

Independent Surveillance is surveillance that does not depend on any action by object of the surveillance.

Dependent Surveillance is when surveillance data is supplied by object of the surveillance.

Automatic Dependent Surveillance (ADS) is when an electromechanical device, after activation, requires no human involvement to supply dependent surveillance data.

See: WP 84 - Melbourne 2005

SUR 6.2 ADS-B: SINGLE EMERGENCY CODE MANAGEMENT

For the 2007/08 Work program, TOC was tasked with investigating single emergency code management with ADS-B. It was documented in the 2006/2007 work program that the problem exists and that further research would be needed. The working paper describes the hardware issue, dealing with the exact problem and why. It then begins exploring ICAO for support in relevant documentation and concludes with the implementation issues in Australia.

TOC considers the issue(s) to be of concern particularly if introduced to replace radar as a sole means of surveillance in high density airspace. For these reasons, TOC has decided to propose draft recommendations, to provide guidance for when this technology is introduced.

IFATCA policy is:

If ADS-B is to replace radar then it must have the same or better functionality as SSR, and this specifically includes discrete emergency codes and a SPI function.

In non-radar airspace DO260 ADS-B is considered an acceptable interim solution provided global procedures are established for handling single emergency codes and potentially decreased SPI functionality.

That ICAO establishes a global position and recommendations on the management of ADS-B operations without separate emergency codes and isolated SPI function.

See: WP 89 - Arusha 2008

SEP:

SEPARATION STANDARDS

POLSTATS

SEP 7.1 USE OF 1000FT VERTICAL SEPARATION ABOVE FL290

When considering system changes it is necessary to assess their impact on the entire ATC operational environment, and to endorse that the introduction of such changes into one air traffic system does not adversely affect, not only that system, but also any interfacing systems where changes have not been introduced.

IFATCA policy is:

The reduction of vertical separation above FL 290 should not be implemented in any Region until the necessary procedures, staff and equipment are available to safely and expeditiously handle aircraft in the airspace experiencing the reduction and also in systems responsible for transition areas to airspace not affected by a reduction.

Only aircraft capable of meeting the Minimum Aircraft Systems Performance Specifications (MASPs) upon which reduced separation is dependent be permitted to operate in areas where reduced vertical separation is in effect.

Exceptionally, State aircraft may be accepted when appropriate procedures have been evaluated and validated, and controllers are trained in the operation of a mixed-traffic environment. If non MASPS (e.g. military) State aircraft are required to operate in RVSM airspace then, in order to preserve system safety, their number should be kept to the absolute minimum.

IFATCA is opposed to any derogation, mitigation or exemptions such as non-RVSM equipped State aircraft and aircraft not meeting ACAS II (TCAS version 7.0) requirement except in coordinated contingency emergency situations.

See: WP 50 - Acapulco 1990, WP 115 - Tunis 1996, WP 83 - Toulouse 1998 and WP 102 - Geneva 2001
See also: WP 102 - Christchurch 1993

Failing a clear operational advantage for either the single alternate or the double alternate Flight Level Orientation Scheme (FLOS), IFATCA proposes that RVSM trials utilise the single alternate FLOS in order to achieve the global application in accordance with ICAO Annex 2. In order to validate the results during this trial period, enhancements on a sub-regional level may become necessary through adequate Flight Level Allocation Schemes (FLAS).

IFATCA urges all states concerned to ensure that the appropriate infra-structure will be in place prior to the commencement of these trials, this involves staff, equipment, training, airspace and route structure, including the transition areas. All factors must be verified and validated through simulations prior to implementation.

See: WP 83 - Toulouse 1998

IFATCA endorses the investigation of the concept regarding the use of lateral offset in Oceanic RVSM airspace

See: WP 107 - Toulouse 1998
See also: WP 88 - Geneva 2001

SEP 7.2 LATERAL AND LONGITUDINAL SEPARATION

The rules governing the application of lateral and longitudinal separation which are contained in PANS-ATM Part 5 are deficient in several respects and many ATC administrations have found it necessary to amplify or extend their provisions.

IFATCA policy is:

Publications promulgating separation standards are required to include guidance material on practical methods of application and the associated phraseology.

See: WP 89 - Melbourne 2005
See also: WP 51 - Athens 1985, WP 57 - San José 1986 and WP 95 - Estoril 1984

SEP 7.3 FORMATION FLIGHTS WITHIN CONTROLLED AIRSPACE

By definition, formation flights occupy more airspace than individual flights and might therefore require greater than standard separation. Controllers need to be aware of the presence of a formation.

IFATCA policy is:

The word 'formation' shall be used in the radio callsign of a formation flight at least once, on first contact with each ATC frequency.

If conditions are such that the aircraft of the formation are unable to maintain separation within controlled airspace from each other, the formation leader will inform the controlling authority. The formation leader is responsible for separation between aircraft comprising the formation until standard separation has been achieved.

See: WP 91 - Port of Spain 1991
See Also: WP 96 - Kaohsiung 2006

SEP 7.4 AIRBORNE SEPARATION ASSISTANCE SYSTEMS (ASAS) AND COCKPIT DISPLAY OF TRAFFIC INFORMATION (CDTI)

Many changes have occurred to Airborne Separation Assistance System (ASAS) since 2003, when the provisional IFATCA policy on ASAS and Cockpit Display of Traffic Information (CDTI) was accepted in Buenos Aires (Argentina). It is therefore more than appropriate to do a full review of policy in order to make sure that the statements remain correct and are still up-to-date. The aim of this working paper is to inform the IFATCA - delegates and MAs about where we stand in the matter of ASAS. Clear and unambiguous policies must be adopted so that the Federation's representatives can fully participate in the discussions where the integration of the ASAS technology and –applications into the ICAO-process are decided.

IFATCA policy is:

Where ASAS-applications are implemented, a clear and unambiguous statement for separation responsibility is required.

ASAS-applications shall meet all appropriate safety levels.

The publication of MOPS (Minimum Operational Performance Specifications) for CDTIs by ICAO, or another internationally recognized organisation, is urgently required

New ICAO phraseology shall be developed before ASAS applications are deployed. Identification issues need to be resolved prior to implementation of ASAS applications. Procedures shall be in place to ascertain that any action taken by a crew in the use of ASAS applications will not generate additional conflicts.

See: WP 93 Istanbul 2007
See also: WP 84 – Toulouse; 1998 WP 89 - Tunis 1996; WP 93 - Buenos Aires 2003

SEP 7.5 CONTROLLER INTERVENTION BUFFER

A knowledge of the allowance made (if any) for controller intervention in the formulation of a particular separation standard logically provides the basis by which the applicability of that standard to any given airspace and ATC system may be assessed. New separation standards should specify comprehensively what performance assumptions have been made about the time required for the controller to recognise and intervene in the collision risk assessment.

IFATCA policy is:

The Controller Intervention Buffer be defined as:

The time required for the Air Traffic Controller to intervene ensuring that a collision would be averted in the event that a separation standard being applied breaks down. This will include an allowance:

- **to recognize the 'blunder ';**
- **to formulate a solution;**
- **to convey instructions to the pilot;**
- **for the pilot to react and cause the aircraft to achieve the required change of trajectory.**

A Controller Intervention Buffer should be included in the development and specification of any separation minima where controller intervention is used as a risk mitigator.

See: WP 82 - Geneva 2001

ATC systems should be developed with the capability to monitor relevant Controller Intervention Capability (CIC) parameters and warn controllers when they fall outside the values used in determining separation standards in use so that alternative standards can be applied.

See: WP 87 - Cancun 2002
See also: WP 84 - Buenos Aires 2003

SEP 7.6 INTERCEPTION OF CIVIL AIRCRAFT

Due to the potential hazard involved with the interception, meaning the interception itself, the unknown flight path that can be followed by the intercepted aircraft and the unknown actions taken by the interceptor, additional separation, above that required by standard separation is appropriate.

IFATCA policy is:

It is recommended to take additional separation, above that required by standard separation, when separating from an interceptor or intercepted aircraft.

See: WP 89 - Kaohsiung 2006

SEP 7.7 DEFINITIONS: SPACING, SEPARATION & SEGREGATION

Separation, spacing and segregation all affect one another. Separation minima define the limit for spacing while separation (and therefore spacing) may be applied with due regard to any segregation of airspace. Segregation can be applied without regards to separation and spacing or may be used directly to affect separation and spacing application levels via route or airspace design/eligibility criteria.

It is possible to view separation, spacing and segregation as having strategic and tactical applications. Strategic generally refers to the design and promulgation process while tactical refers to application by ATC of such promulgated procedures.

IFATCA policy is:

Separation be defined as:

The action within defined airspace of keeping aircraft at such displacements from defined hazards that the risk of collision is limited to an acceptable safe level.

Spacing is defined as:

The application of a displacement equal to or greater than a specific separation minimum between an aircraft and a hazard.

Segregation is defined as:

The application of procedures and design with the purpose of setting apart an exclusive subset of users of the ATM system, based on a defined operational characteristic.

See: WP 96 - Arusha 2008

SEP 7.8 VISUAL SEPARATION ON APPROACH

After a presentation on Airborne Separation Assistance System (ASAS) during the annual IFATCA Conference in Amman in 2011, it was felt necessary to investigate the concept of the ASAS application Visual Separation on Approach (ATSA-VSA). TOC has studied the subject and addressed the concept of ATSA-VSA in regard to ICAO regulations and guidelines for visual separation.

IFATCA policy is:

The description for ATSA-VSA, "Enhanced Visual Separation on Approach", shall be changed to: "Enhanced traffic situational awareness during visual separation”.

See: Resolution B6 - WP 91 – Kathmandu 2012

PART 4

PROFESSIONAL POLICY

of

International Federation of Air Traffic Controllers' Associations (IFATCA)

Table of Contents

2. Classification of Professional Policy Statements (POLSTATS)

1.2. IFATCA POLSTATS are detailed in the following pages, grouped according to subject matter under the following headings:

INFO	Collection & Dissemination of Information on Professional Matters,
LM	Legal Matters,
MED	Medical Matters,
TRNG	ATC Training,
WC	Working Conditions

Index – Professional Policy

IFATCA Professional Policy

Table of Contents

WC:

WORKING CONDITIONS

POLSTATS

WC 1.1 INDUSTRIAL RELATIONS

WC 1.1.1 IFATCA's ROLE IN THE AREA OF PROFESSIONAL AND INDUSTRIAL ISSUES

IFATCA Policy is:

IFATCA has the right to develop policy on all matters associated with the provision of air traffic services.

The terms 'industrial' and 'professional' refer to the approach to and implementation of such policies rather than the matters themselves.

IFATCA recognises the existence of other organisations that have a role to play in representing the legitimate interests of air traffic controllers.

In countries where the Member Association does not hold negotiating rights it should be encouraged to communicate IFATCA policies to the Trade Union or negotiating body and so far as practicable, to co-ordinate their implementation.

At the international level IFATCA should seek a common or coordinated approach with any other bodies representing air traffic controllers.

IFATCA should continue to act as an intermediary when so invited by Member Associations involved in disputes, either at international or national level and the Executive Board should be allowed to continue to exercise its discretion as to the appropriate scale of IFATCA involvement in any particular case.

See: WP 50 - Toulouse 1998

WC 1.1.2 ORGANISATIONS

IFATCA policy is:

Controllers should have the right to establish and join organisations including unions of their own choosing and for those organisations to affiliate with international organisations.

Those organisations should be free from interference from employers or governments. Such organisations should participate in the determination of their conditions of employment, and the conception, planning, and implementation of premises, technical equipment and procedures concerning the ATC system.

See: WP 55 - Split 1983

WC 1.1.3 DISPUTES

IFATCA policy is:

The settlement of disputes should be through negotiation followed by mediation, consultation or arbitration whichever may be appropriate to national conditions.

See: WP 55 - Split 1983

For the purpose of guaranteeing safety, ATCOs shall not be replaced by personnel who do not hold ATC licences in accordance with ICAO Annex 1, with the ratings, recency and competency appropriate to the duties that they are expected to undertake for the position and unit at which those duties are to be performed.

The functions which are contained within ICAO Annex 1, as being ATC functions shall not be added to the work responsibilities for unlicensed personnel.

See: WP 126 - Jerusalem 1996
See also: WP 163 - Kaohsiung 2006

The use of TIBA to circumvent an industrial dispute constitutes a misuse of the procedure and should not be used to circumvent an industrial dispute.

See: WP 73 - Port of Spain 1991

WC 1.1.4 CIVIL MOBILISATION OR REQUISITION MEASURES

IFATCA policy is:

IFATCA strongly condemns the actions of governments in resorting to the use of civil mobilisation or requisition measures for the purpose of preventing or ending national disputes.

Only negotiation or arbitration procedures shall be used to prevent or end disputes.

See: WP 101 - Frankfurt 1989

WC 1.1.5 MINIMUM SERVICE

IFATCA policy is:

Minimum service is defined as actions confined to operations that are strictly necessary to avoid endangering the life, personal safety or health of the whole or part of the population.

See: WP 37 - Acapulco 1990

It is recommended that Member Associations establish a policy on minimum ATC service that their individual members should provide when engaged in an industrial dispute.

It is recommended that Member Associations seek agreement with the appropriate authorities on the minimum ATC service ATCOs will provide when engaged in an industrial dispute.

The minimum ATC service agreed to should not be so great as to render any industrial action ineffective in practice because of its limited impact.

See: WP 73 - Port of Spain 1991
See also: WP 92A - Taipei 1997

WC 1.1.6 SINGLE PERSON OPERATIONS

Single Person Operations (SPO) can be defined as operations where an operational ATC unit is providing service with only one appropriately qualified ATCO on duty.

IFATCA Policy is:

Rostering Single Person Operations (SPO) shall be avoided. In the unlikely event of unavoidable SPO appropriate measurements shall be taken to ensure that the SPO-situation will be alleviated as soon as possible. Until such time measures shall be taken to mitigate all impacts of SPO such as: traffic regulation, provide breaks, informing neighbouring ATC units. Procedures shall be in place to implement such measures in an efficient way, not increasing the workload of the ATCO.

The use of single controller shifts should be strongly discouraged by MA's, both through their providers and their regulators.

When providers choose to use SPO, they must bear the responsibility for the resulting risk(s) to the system. The ATCO must not be held liable for incidents or accidents resulting from the use of SPO.

See: WP 166 - Hong Kong 2004 and WP 159 - Geneva 2001

WC 1.1.7 FOUR EYES PRINCIPLE

Another aspect of SPO is the lack of the Four Eyes Principle.

Four Eyes Principle (4EP) can be defined as the situation where an active controller is accompanied by another appropriately qualified controller whose function includes that of a safety net by monitoring the same working area as the active controller.

IFATCA policy is:

Implementation of 4EP shall be strongly encouraged by MAs, both through ANSPs and regulators.

Individual ATCOs shall not be held liable for incidents or accidents resulting solely or in part from the non-implementation of the 4EP safety net.

See: WP 162 - Melbourne 2005

WC 1.1.8 PERFORMANCE INDICATORS

IFATCA Policy is:

Performance Indicators as published and used by Air Navigation Service Providers must not be linked in any way to the pay and/or working conditions of individual ATCO's.

Global metrics for the performance of the Air Traffic Management System be developed through ICAO processes as soon as possible.

Controller expertise must be used in the establishment and settings of metrics that measure the performance of the Air Traffic Management System

Controller expertise must be used in establishing and reviewing models used for determining performance of the Air Traffic Management System to ensure that the models accurately reflect how the ATM system functions.

Controller expertise must be used in the interpretation of data used to assess the performance of the Air Traffic Management System to ensure that data is not misleading because it is incomplete or incorrectly applied.

The measurement of performance of the Air Traffic Management System shall reflect the impact of any external-to-ATM constraints, including external environmental constraints.

IFATCA urges MAs to be involved in the creation of and application of an ATM Performance Measurement System.

See: WP 165 - Hong Kong 2004
See also: WP 151 - Toulouse 1998, WP 171 - Santiago 1999, WP 84 and WP 161 – Dubrovnik 2009

WC 1.2 SOCIAL AND LABOUR ASPECTS

WC 1.2.1 METHODS OF DETERMINING COND ITIONS OF OPERATION AND SERVICE

IFATCA policy is:

Member Associations should urge their national authorities to implement regulations and/or legislation to provide:

- **a. a specifically defined personnel statute for air traffic controllers, taking into account the outstanding responsibilities, physio-/psychological demands and strains involved to match with comfortable regulations.**
- **b. participation of active air traffic controllers through their professional associations when determining conditions of operation and/or employment.**

See: WP 49 - Brussels 1979

Member Associations should make use of the ILO Conclusions in their contract negotiations with their employers, where these may be suitable.

The Executive Board should in the interest of safety use any means, within the Constitution and By-Laws of the Federation, to assist the Member Associations in such contract negotiations to get acceptance from the authorities of the ILO Conclusions.

The Executive Board should use any lawful means to achieve, through and by the ILO, an international instrument, based on the above Conclusions or improved ones, by which aviation authorities would be encouraged to become signatories.

See: WP 53 - Toronto 1980 and WP 55 - Split 1983

The Executive Board should continue to liaise with the ILO regarding conclusions numbered 12, 13, 25, 32, 41, 42 and 45 of the 1979 ILO Meeting of Aviation Experts in Air Traffic Control.

See: WP 117 - Christchurch 1993

Whenever an IFATCA Member Association wishes to appeal to the ILO for the purpose of filing a complaint, such appeal should be notified to and co-ordinated with the IFATCA Executive Board.

See: WP 55 - Split 1983

WC 1.2.2 MANAGEMENT OF ATS PROVIDERS

IFATCA Policy is:

ATC management staff directly concerned with executive air traffic control matters should have a thorough knowledge of air traffic control and be holders of an air traffic controller's licence and, to remain fully conversant with current air traffic control problems, their knowledge should be continually updated.

See: WP 49 - Brussels 1979

Where ATS providers are controlled by senior management who do not have experience as senior Air Traffic Controllers then the position of Chief Air Traffic Controller shall be created. The Chief Air Traffic Controller shall be an experienced senior air traffic controller and shall be answerable for, amongst other things, the safety of the air traffic control system. The Chief Air Traffic Controller shall report directly to the Chief Executive Officer of the ATS provider and to the head of the regulatory organisation.

See: WP 173 - Geneva 2001

WC 1.2.2.6 MONITORING PRIVATISATION / COMMERCIALISATION IN ATC

The 1993 Conference adopted the following definition of Privatisation for IFATCA use:

Privatisation of Air Traffic Control refers to the process by which the functions and/or assets of Air Traffic Control are transferred from a government department to either the private sector or to a Company or Corporation owned either partly or fully by the government, but operating independently of total government control. [Coopers & Lybrand]

IFATCA Policy is:

The safety and quality levels of the Air Traffic Services system shall not be compromised by privatisation/commercialisation.

See: WP 111 - Christchurch 1993

IFATCA should monitor the effects of privatisation/commercialisation on ATCOs working conditions in co-operation with the ILO.

See: WP 111 - Christchurch 1993 and Resolution C10 - WP 164 - Punta Cana 2010

Note: A comprehensive overview of legal aspects that should be considered the minimum requirements when ATC is to be privatised can be found in WP 94.C.137 which was accepted as Guidance material by Rec. 94.C.21.

IFATCA creates and maintain a secure database from responses to the questionnaires.

See: WP 157 - Marrakech 2000 and Resolution C11 - WP 164 - Punta Cana 2010

WC 1.2.3 WORKING ENVIRONMENTS

AND

WC 1.2.4 ATC SYSTEMS

IFATCA Policy is:

Existing knowledge of human factors should be incorporated in design for new operational rooms and new ATC working positions and in modernisation of existing facilities.

See: WP 49 - Brussels 1979

Rules of ergonomics should be respected in the design of work places and optimum microclimate conditions should be obtained or maintained.

Great attention should be paid to the lighting conditions of working positions. Indirect light, adjustable by zones, similar to daylight provoking neither reflections nor dazzling is very important. The luminosity should be adjustable at each working place and light sources be cleaned regularly and replaced if necessary.

See: WP 85 - Copenhagen 1978

Research should be carried out in each country to determine the capacity of the ATC system and the workload to be carried by each air traffic controller.

Air traffic controllers should be provided with ATC equipment commensurate with their operational requirements so as to promote an optimum level of safety.

Within each country where civil air traffic normally predominates or where civil airspace is clearly defined a civilian ATC system is preferable.

See: WP 55 - Split 1983
See also: WP 49 - Brussels 1979 and WP 117 - Christchurch 1993

The physical working environment regarding control room temperature, lighting, relative humidity, adapted rest areas and facilities for eating and drinking must be designed so as to facilitate night shift demands.

See: WP 148 - Toulouse 1998
See also: WP 159 - Taipei 1997

WC 1.2.5 AUTOMATION / HUMAN FACTORS

IFATCA Policy is:

Automation must improve and enhance the data exchange for controllers. Automated systems must be fail-safe and provide accurate and incorruptible data. These systems must be built with an integrity factor to review and crosscheck the information being received.

The Human Factors aspects of Automation must be fully considered when developing automated systems.

Automation must assist and support ATCOs in the execution of their duties.

The controller must remain the key element of the ATC system.

Total workload should not be increased without proof that the combined automated/human systems can operate safely at the levels of workload predicted, and to be able to satisfactorily manage normal and abnormal occurrences. Automated tools or systems that support the control function must enable the controller to retain complete control of the control task in such a way so as to enable the controller to support timely interventions when situations occur that are outside the normal compass of the system design, or when abnormal situations occur which require non-compliance or variation to normal procedures.

Automation should be designed to enhance controller job satisfaction.

The legal aspects of a controller's responsibilities must be clearly identified when working with automated systems.

See: WP 74 - Port of Spain 1991, WP 155 - Santiago 1999 and WP 174 - Geneva 2001
See also: WP 94A - Tunis 1996

A Controller shall not be held liable for incidents that may occur due to the use of inaccurate data if he is unable to check the integrity of the information received.

A Controller shall not be held liable for incidents in which a loss of separation occurs due to a resolution advisory issued by an automated system.

See: WP 128 - Christchurch 1993

Guidelines and procedures shall be established in order to prevent incidents occurring from the use of false or misleading information provided to the controller.

See: WP 159 - Dubrovnik 2009 and WP 155 - Marrakech 2000
See also: WP 143 - Ottawa 1994

WC 1.2.6 AIR TRAFFIC CONTROL AND PUBLIC RELATIONS

IFATCA Policy is:

IFATCA recognises that Public Relations play an important role in the promotion of ATC services. However, unsupervised public access to actual radar and radiotelephony data can lead to misuse and misinterpretation. Therefore, use of live radar and radiotelephony data for this purpose shall not be permitted.

See: WP 160 - Toulouse 1998
See also: WP 149 - Ottawa 1994

WC 1.2.7 WORKING WITH UNSERVICEABLE OR INADEQUATE EQUIPMENT

IFATCA Policy is:

ATC equipment provided should include back-up secondary equipment on hot standby for use if the primary equipment becomes degraded.

Controllers should be given initial and recurrent training in the degraded mode operations of their equipment.

ATS management must ensure that ATS equipment is regularly maintained, by properly trained and qualified technical staff, to ensure its availability and reliability.

ATS management must design adequate fault reporting procedures and publish required rectification times.

Air Traffic Controllers should not use equipment that is known to be unserviceable, unreliable or inaccurate for the provision of services to air traffic.

When designing and introducing new ATM-equipment the vulnerability and possible abuse of this equipment should be considered, and precautionary measures should be taken.

See: WP 161 - Marrakech 2000 and WP 161 - Arusha 2008

WC 1.2.8 REGULATORY APPROVAL OF ATM SYSTEMS EQUIPMENT

IFATCA Policy is:

MAs should encourage their State's Regulatory Authority to play a role in the development and certification / commissioning and oversight during the life cycle of air traffic control equipment.

See: WP 168 – Arusha 2008

WC 1.2.9 CO-OPERATIVE SEPARATION

IFATCA Policy is:

From a Human Factors aspect IFATCA has strong concerns over the transfer of control responsibility to the cockpit for the following reasons:

- **If separation functions are transferred to the cockpit the situation awareness and skills base of the ATCO will be degraded to the point when intervention will not be possible.**
- **Aircrew workload will increase by fulfilling additional tasks, which are currently carried out by ATC. This might lead to overload situations in cockpit workload when other, higher priority, tasks have to be taken care of by the crew. Responsibility for the control function cannot simply be handed back to the controller.**

Delegation of separation shall be thoroughly described and defined in ATC and Aircrew procedures.

Airspace within which Co-operative Separation is used must be so designated. Before establishing a single airspace continuum over different States, all legal issues regarding liability and protection of staff should be addressed.

ATC and Aircraft utilizing such delegated separation airspace shall be certified with minimum equipment.

Controllers and Aircrew shall be provided with special training and certification to operate in delegated separation airspace.

The "delegation of separation" clearance shall be of a temporary nature, and shall be terminated either at a fix, a specified level, a specified time, or when standard ATC separation has been re-established, or when one of the aircraft has landed.

All aircraft and controller functions in Co-operative Separation shall be synchronized to the same time reference.

Loss of separation" warning systems shall be incorporated in the application at ATC facilities and on aircraft.

Standard escape procedures shall be established for aircraft not being able to maintain separation assurance.

See: WP 154 - Santiago 1999 and WP 158 - Hong Kong 2004

States must have in place regulations detailing procedures to be followed before Separation Assurance can be transferred to the cockpit.

The Initial and final points at which Separation Assurance are transferred from ATC to the pilot must be accurately defined in all cases.

The responsibility for providing separation between the intercepting aircraft and all other aircraft must be clearly defined. ATCO's should not be held liable for incidents or accidents resulting from an interception.

See: WP 166 - Santiago 1999, WP 89 - Kaohsiung 2006 and WP 159 - Dubrovnik 2009

WC 1.2.10 SHORT TERM CONFLICT ALERT (STCA): HUMAN FACTORS / LEGAL ASPECTS

IFATCA Policy is:

The Short Term Conflict Alert (STCA) system should only alert the controllers at the specific radar sector concerned, and not at positions where controllers are not involved in the alert.

The methods and procedures for the use of STCA should be clearly defined before the introduction of the equipment.

Unless STCA provides a definitive course of action for the controller to follow, it cannot be accepted that the fitting of an STCA device will necessarily increase the controller's legal liability should an incident occur.

See: WP 168 - Santiago 1999

WC 1.2.11 THE "FREE FLIGHT CONCEPT" HUMAN FACTORS CONSIDERATIONS

IFATCA Policy is:

IFATCA and IFALPA establish a Joint Task Group to evaluate the "Free Flight Concept" with a view to determining a Concept Document on the Future of ATC.

IFATCA Provisional Policy is:

The situation awareness of the controller must be a key element to enable that controller to maintain active monitoring of flights conducted in "Free Flight Airspace" and to enable them to interact co-operatively with aircrew.

Due to the unpredictable nature of aircraft manoeuvres in "Free Flight Airspace", the responsibility for conflict detection and resolution, and the maintenance of the safe separation function, should rest with the pilot in command of that flight.

Procedures must be established to safely integrate any aircraft into a "Managed Airspace" environment when no longer able to meet the requirements of the "Free Flight Concept".

Clear guidelines and procedures must be established to resolve any differences of aircraft and ATC conflict alerting systems and the reactions that pilots and controllers will be required to take when conflict alerts are indicated.

The question of de-skilling of ATC personnel must be considered when effectively delegating conflict alert and resolution action to automated systems.

The importance of a human centred approach to the "Free Flight Concept" should be a priority and one that recognises the limitations of both human and automated systems and the interaction that results.

It cannot be assumed that ground based, human centred systems (Air Traffic Control) can simply take over the responsibility for the control and separation assurance of flights operating within Free Flight Airspace in the event of a failure of airborne systems. The limits of human-centred control must be clearly established when considering ATC as a back-up to the "Free Flight Concept". This is especially important when considering significant airspace capacity increases using the "Free Flight Concept".

Ground based conflict alert systems and ASAS must be proven in all circumstances before the "Free Flight Concept" is adopted.

The dispersion of workload from the ground to the cockpit needs to be reviewed carefully. The "Free Flight Concept" appears to accept that the transfer of responsibility for separation and associated workload can be safely accommodated by aircrew.

Consideration should be given to the establishment of suitable qualifications for aircrew operating in Free Flight airspace. The term "EFR" already seems to be accepted as a suitable acronym for "Electronic Flight Rules".

See: WP 161 - Santiago 1999

WC 1.2.12 ATM SAFETY MONITORING TOOL

IFATCA considers ASMT to denote a generic ATM Safety Monitoring Tool that extracts ATM system data to detect infringements to parameters predefined within the system itself.

IFATCA Policy is:

ASMT must be part of a Safety Management System and shall not be used by Management as a punitive tool for disciplinary action.

Except for Aerodrome Control, the introduction of ASMT shall be preceded by the introduction of STCA.

Implementation of ASMT must be preceded by a clear statement in which its goals are defined.

ATCOs shall be involved in the definition of the ASMT role.

The criteria used to set up the ASMT parameters must be carefully planned and monitored. Sufficient consideration must be given to restrict false or nuisance reports.

See: WP 158 - Cancun 2002 and WP 156 - Marrakech 2000

The system should not be used as a performance monitor for individual controllers. Analysis of any derived data should be undertaken by appropriately experienced and trained ATM safety experts.

Data obtained from the system should not be used as a capacity measurement or monitoring indicator.

See: WP 159 - Hong Kong 2004 and WP 158 - Buenos Aires 2003

WC 1.3 HOURS OF WORK

WC 1.3.1 DUTY ROSTERS

IFATCA Policy is:

The duty roster should be based on at least 2 consecutive days off in every 7 days. Duty rosters should be agreed with the air traffic controllers involved.

SPO shall be avoided.

An optimal roster should be promulgated, based on the maximum allowed number of working hours per week and per shift, a minimum number of break periods of an agreed minimum length, both during a shift and between shifts and on an optimal night/day switch number per week or per month as appropriate. This roster requires definition of personnel strength based on the number of sectors and traffic density. It must allow for attribution of a minimum number of days paid leave, sick leave, extraordinary leave and unpaid leave. It must be such that a minimum number of weekends per month and of public holidays per year can be taken as they occur and not later. Conditions for overtime and night work (e.g. rest facilities) must be defined and the regulations governing the various kinds of leave be clearly stated.

Duty rosters including night shifts should be of a rapidly rotating shift system in a morning, evening, night cycle. Consecutive night shifts are not recommended. (Toulouse 98.C.5)

Shift systems should not include night shifts that commence on the same day that a morning shift ends.

Change-over times between night shift and the following morning shift should not take place before 6 am local time, to ensure that sleep duration for the morning shift is adequate before commencement of their duty time (Toulouse 98.C.5).

Shift systems should include preferably single night duties only but where consecutive nights are required they should be restricted to the minimum.

In respect of the nature of night shift duties Member Associations pursue additional time off for night shifts worked as compensation. (Rio 1988)

After a night shift, an off-duty period of a minimum of 30 hours is recommended (Toulouse 98.C.5, amended Santiago 99.C.20).

The number of consecutive early starts (shifts starting in the period between 0600 and 0659) should be limited to a maximum of two in a period of 144 hours (6 days) (Santiago 99.C.21).

See: WP49 - Brussels 1979, WP159 - Taipei 1997, WPL003 - Rio 1988, WP155 - Santiago 1999, WP148 - Toulouse 1998 and WP 165 - Istanbul 2007

WC 1.3.2 WORK AND REST SCHEME

IFATCA Policy is:

Definition:

Operational Duty: The period which a controller is actually exercising the privileges of the controller's licence at an operational position.

Rosters should be constructed following a simple pattern, with shifts of the same or very similar lengths and adequate breaks between shifts and shift cycles.

The average time of operational duty and breaks should not exceed 32 hours per week (Jerusalem 95.C.2).

Each shift should not exceed 7 hours 30 minutes including breaks (Jerusalem 95.C.2).

A minimum rest period of 11 consecutive hours per day should be provided (Santiago 99.C.22).

The continuous operational duty for a controller should be 2 hours maximum and should be reduced to 90 minutes for controllers working with visual terminals and/or radar displays; after which a minimum 30 minutes break, away from the working environment should be given to controllers (Copenhagen 78.C.6, amended Jerusalem 95.C.2).

At least one break of a minimum of 1 hour duration, on both day and afternoon shift, shall be given to controllers for the purpose of eating at regular times and to prevent gastrointestinal dysfunctions (Santiago 99.C.23).

Extra rest hours shall be provided when requested by a pregnant controller.

By night the total operational duty time should not exceed 5 hours (Jerusalem 95.C.2).

Controllers shall not be held liable in the case of an accident or incident if the controller has previously registered a formal complaint of exaggerated working hours or lack of fatigue management and these have been determined to be a major contributing factor to the incident or accident.

See: WP155 - Santiago 1999, WP125 - Jerusalem 1995 and WP 165 - Istanbul 2007

WC 1.3.3 VACATION SCHEME

IFATCA Policy is:

The annual leave for a controller should be not less than 30 working days (this is the equivalent of 6 weeks), excluding public holidays, of which 3 weeks must be consecutive.

See: WP 49 - Brussels 1979

WC 1.3.4 RECENCY AND COMPETENCY

Controllers involved in other important tasks such as Training (classroom and / or On- the-Job), Supervising, Management and developing New Systems need a minimum amount of working hours in the OPS room to keep them current.

IFATCA Policy is:

Each Member Association should agree with the appropriate Regulatory Authority a minimum of operational working hours, per rating, for their controllers who are involved in other ATC-related duties (Ottawa 94.C.14).

The minimum operational working hours must be appropriate for the workload of each position (Ottawa 94.C.15).

The minimum working hours may be increased in the following cases:

- **at the introduction of new procedures or ATC systems;**
- **at the instigation of an individual controller (Ottawa 94.C.16).**

See: WP 148 - Ottawa 1994 and WP 165 - Istanbul 2007

WC 1.3.5 EXTRA DUTY

IFATCA Policy is:

Extra duty is defined as any operational or non-operational duty or a combination of both performed outside of the scheduled hours of work which will result in an increased total duty time for the controller.

Non-operational duties are other duties for which the controller is not required to exercise the privileges of the controller license which, from time to time, are assigned to a controller (Theoretical controller training, investigation, etc.).

Extra duty should be voluntary and used only in exceptional situations.

In the interest of aviation safety and the well being of the controller population, extra duty control should be considered as an undesirable method of staffing Air Traffic Control positions and should be avoided.

IFATCA recommends that each Member Association inform its members of the ill effects of sustained extra duty on their health and on the performance of their duties as controllers.

Member Associations should, through consultation with their respective employer, attempt to acquire adequate staffing which considers established documentation on the adverse effects of extended hours of work.

The allocation of overtime should be carried out with limitations in human performance in mind. The combination of overtime and night shifts clearly increase the risk of fatigue among controllers, because resting periods are reduced, and the possibility for sleep-loss recovery may be reduced accordingly (Toulouse 98.A.5).

Member Associations should attempt to have duty time regulated by the appropriate body. Where legislation is not achievable, hours of work and extra duty should be stipulated in their respective collective agreements. (Jerusalem 95.C.2).

See: WP 127 - Jerusalem 1995 and WP 165 - Istanbul 2007

WC 1.3.6 STAFFING

IFATCA Policy is:

IFATCA strongly recommends that MAs establish a specific task force to work with the employer to identify and achieve the required staffing targets. These minimum staffing levels should not only cater for normal operations (including proper staff relief) but also for unforeseen circumstances and/or events. (Arusha 08.C.7)

See: WP 166 – Arusha 2008

WC 1.3.7 AGEING ATCOS

IFATCA Policy is:

ANSPs should offer career development plans as medium to long term alternatives to the operational job.

See: Resolution C4 -WP 161 - Punta Cana 2010

Training courses for ATCOs regarding the issue of ageing should be made available.

See: Resolution C5 - WP 161 - Punta Cana 2010

ATCOs with an age of 50 years and older shall be entitled to abstain from nightshifts on their request.

See: Resolution C6 - WP 161 - Punta Cana 2010

Ageing ATCO's should be entitled to specific break plans, in particular additional short breaks, to assist in their performance with short term memory.

See: Resolution C7 - WP 161 - Punta Cana 2010

Ageing ATCOs should be entitled to reduce the number of their ratings and / or endorsements to a reasonable minimum. Such a reduction shall have no detrimental impact on the individual ATCO

See: Resolution C8 – WP 161 - Punta Cana 2010

WC 1.4 REMUNERATION

WC 1.4.1 GENERAL PROVISIONS

IFATCA Policy is:

Remuneration for the profession of air traffic controller is justified commensurate with the requirements and responsibilities of the profession, not limited by the practices of other organisations.

Equal remuneration for equal work is justified with relation to duties and responsibilities.

See: WP 49 - Brussels 1979

WC 1.4.2 REMUNERATION PRINCIPLE

IFATCA Policy is:

Remuneration for air traffic controllers should recognize the uniqueness of the Air Traffic Control profession and the associated responsibilities.

Remuneration of air traffic controllers should reflect their "employment status" in accordance with ILO Publication ISCO*-88, in which air traffic controllers have been put in a category that includes Aircraft pilots, ships' officers and other related "associate professionals".
***International Standard Classification of Occupations**

Remuneration should be commensurate with acquired levels of skill and experience. The remuneration of controllers should therefore reflect their skills and also have relation to the acquired amount / type of ratings.

When a controller is assigned additional tasks, such as instruction or system-development, this should also be reflected by a higher remuneration level.

See: WP 139 - Ottawa 1994 and WP 49 - Brussels 1979

WC 1.5 RETIREMENT AND PENSION

WC 1.5.1 RETIREMENT

IFATCA Policy is:

IFATCA recommends that for active air traffic controllers the age of retirement should be closer to 50 than 55.

See: WP155 - Santiago 1999

In view of the peculiarity and uniqueness of the profession of Air Traffic Control, and in the interest of air safety, air traffic controllers should be awarded retirement at an earlier age than that of the national retirement age.

The retirement age for air traffic controllers should be determined by negotiations at the national level, taking into consideration the physical and psychological demands and the occupational stress the profession involves.

Air Traffic Controller retirement legislation must be accompanied by an adequate superannuation scheme which enables the controller to receive pension benefits as if service had continued to national retirement age.

See: WP138 - Ottawa 1994, WP49 - Brussels 1979
See also: Policy on "Loss of Licence" - WP8 -1985

ANSPs must not increase retirement ages in an attempt to address ATCO staff shortage issues.

A course in order to prepare ATCOs should be made available by their employer in order to facilitate the transition between an active controlling career, and becoming a retired professional.

See: WP163 - Dubrovnik 2009

WC 1.5.2 EARLY RETIREMENT

IFATCA Policy is:

There should be a possibility to cease from active control before Controller retirement age. Air traffic controllers leaving active control, but staying in employ within the ATC environment should keep their controller retirement privilege.

See: WP 138 - Ottawa 1994
See also: WP 49 - Brussels 1979 and Policy on "Loss of Licence" - WP8 - 1985

WC 1.5.3 EXTENDED DUTY

IFATCA Policy is:

Individual air traffic controllers who wish to remain in active duty, once they have met the conditions to retire, should be allowed to do so provided they meet all medical and proficiency requirements.

See: WP 138 - Ottawa 1994
See also: WP 49 - Brussels 1979

WC 1.6 EMPLOYMENT SECURITY

WC 1.6.1 LOSS OF LICENCE

IFATCA Policy is:

Throughout their careers, air traffic controllers are exposed to the constant risk of losing their licence and/or qualifications on grounds of medical or technical incapacity.

To avoid the risk of loss of licence and/or qualifications, air traffic controllers should be provided with adequate measures at the employer's expense such as the availability of appropriate medical services, physical fitness program, training facilities and refresher training to assist the Air Traffic Controller in maintaining the required health and skill standards.

Since the number of suitable and meaningful posts for re-employing the Air Traffic Controller within the civil service is rather limited in view of their specialized backgrounds, training and experience, employers should provide loss-of-licence compensation schemes and second career programs for air traffic controllers.

Where ATC is run by a private company, such establishment is even more important since re-employment possibilities are thus even more difficult to obtain.

In the event of loss on medical grounds of a licence which includes medical standards, such measures should also include provision for income protection such as adequate disability insurance and retirement or early retirement pension.

Opportunities for re-training and re-deployment, with compensation for loss of income, should also be available to Air Traffic Controllers who lose their licence.

See: WP 8 - Athens 1985
See also: WP 49 - Brussels 1979 and WP 55 - Split 1983

The following list of minimum items should be taken into consideration when MA's are negotiating a Loss of Licence insurance. "Insurance" is a generic term which encompasses all forms of ATC loss of licence compensation programmes.

a) **Protection against Loss of Licence Insurance must be held by all ATCO's.**
b) **No extra medical examination must be required as ATCO's undergo regular medical checks according to ICAO regulations.**
c) **The insurer must not be able to impose special conditions or exclusions for any individual members.**
d) **Exclusion for already existing medical problems must not be allowed.**
e) **The meaning of bodily injury and illness must be clearly defined.**
f) **The premium must be paid by the employer.**
g) **Any payment under the policy must be in addition to any other benefits payable (i.e. pension, sick leave).**
h) **The sum payable for permanent loss of licence must be at least equal to the amount of five years of ATCO's income.**

i) **The sum must be paid even if the ATCO continues to work with the same employer in a position outside ATS.**
j) **Should the controller be re-instated with the same employer at a salary less than that of a controller, some provision must exist for this loss of income.**
k) **Claims procedure must be set out clearly in the policy.**
l) **Cancellation of Loss of Licence benefit must be payable upon provision of due written proof of loss.**
m) **The policy must have no exclusions other than self-injury and war**

See: WP 37 - Frankfurt 1989

WC 1.7 MISCELLANEOUS

WC 1.7.1 REGULATORY FRAMEWORK IN ATM

IFATCA Policy is:

Regulation of ATM must remain the responsibility of the State or of those supranational public entities mandated by the member States.

Regulatory / oversight functions must always be separated from Air Navigation Service Providers.

Regulatory / oversight functions must always include ATCOs expertise in the development of the regulatory ATM framework.

See: WP 157 - Hong Kong 2004

WC 1.7.2 NORMAL OPERATIONS SAFETY SURVEY

IFATCA Policy is:

Monitoring Safety in Normal Operations must be seen as an integral element of a Safety Management System.

A safety tool such as NOSS, shall meet following conditions:

- **Joint management/controller sponsorship;**
- **Voluntary participation;**
- **Trained observers;**
- **Set targets of safety enhancements;**
- **De-identified, confidential, and non-disciplinary data collection; and**
- **Adequate feedback of the results to the controllers.**

See: WP 161 - Melbourne 2005

WC 1.7.3 SAFETY MANAGEMENT SYSTEMS

Introduction and Training Policy

IFATCA Policy is:

Air Traffic Service Providers (ATSPs) should be encouraged from the outset to utilise the available and current operational expertise already existing within their organisations when developing SMS.

See: WP 89 Istanbul 2007
See also: WP 157 - Geneva 2001

Human Factors Case

IFATCA Policy is:

Human Factors are described as the human aspects of the working environment.

See: Resolution C1 - WP 158 - Punta Cana 2010

The Human Factor Case is a tool to provide a process to address HF issues for a project. Its function is to identify and mitigate HF issues from the beginning of any new project.

See: Resolution C2 - WP 158 - Punta Cana 2010

Human Factor issues shall be accounted for in each phase of the definition, development, and deployment of new and existing ATM systems and into operational training. Human Factors Case shall be integrated into Safety Management Systems (SMS). Controllers and human factors experts shall be involved from the beginning of any new project.

See: Resolution C3 - WP 158 - Punta Cana 2010

WC 1.7.4 INTRINSIC AND TACTICAL SAFETY

Definitions:

Intrinsic Safety is defined as:	Safety aspects inherent to the design of the system.
Tactical Safety is defined as:	Safety aspects related to the application of procedures and to the adoption of defences, where the design of the system is inadequate to achieve a given safety level.

Intrinsic Safety and Airport and Airspace Design:

IFATCA Policy is:

IFATCA recommends that all parties involved in airport and airspace design address intrinsic safety with the highest priority.

See: WP 169 - Arusha 2008

WC 1.8 ATTACHMENT

WC 1.8.1 MODEL OF EMPLOYMENT AGREEMENT

IFATCA POLICY DOCUMENT ON MODEL OF EMPLOYMENT AGREEMENT
(Established Tunis 1996)

NOTE: ***The following suggested Employment Agreement is intended as a guide to whom MAs may aspire. These guidelines suggest a lay-out, items that may be included, and reflect IFATCA policy where it applies. MAs should modify this document to reflect their own aspirations and national conditions.***

1. Validity of Agreement

This agreement is valid from *[date]* and until *[date].*

2. Dispute Settlement

a. Disputes will be settled through negotiation, or should that fail a recognised mediation, consultation or arbitration service.

b. The employer undertakes not to recommend to the Government civil mobilisation in order to resolve disputes. For its part the _________ *[Name of Organisation]* agrees to abide by the result of any recognised mediation or arbitration.

c. Air traffic controllers will not be replaced by personnel who do not hold ATC licenses in accordance with ICAO Annex 1, and with ratings, recency and competency appropriate to the duties they are expected to perform.

d. The functions which are contained within ICAO Annex 1, as being ATC functions shall not be added to the work responsibilities for unlicensed personnel.

e. The use of Traffic Information Broadcast by Aircraft (TIBA) to circumvent industrial action constitutes a misuse of the procedure and should not be used to circumvent an industrial dispute.

3. Membership of a Professional and / or Industrial Organisation

a. Controllers shall have the right to establish and join the professional and/or industrial organisation of their choice, and for that / those organisations to affiliate with national or international organisations.

b. The employer undertakes not to interfere with the members' activities in their chosen organisation.

c. The employer recognises the employee professional/industrial organisation as being an equal partner in the determination of conditions of employment and in the conception, planning, and implementation of premises technical equipment and procedures concerning the ATC system.

4. Managerial Policy

The employer undertakes to only employ managers who hold ATC licences in positions directly concerned with executive air traffic control matters.

5. Hours of Work

The duty roster should be agreed with the air traffic controllers involved.

a. Employees will be rostered for _________ hours per week, inclusive of:

i. _________ minute periods per shift required for preparation and briefing prior to the commencement of control duties.

ii. Minimum breaks of at least 30 minutes for radar controllers and _________ *for* non-radar controllers.

iii. A meal break of _________ minutes.

b. Where hours of work are scheduled on a rotating or irregular basis, employees will work _________ hours averaged over period of time not to exceed _________ days.

c. Time worked by an employee in excess of hours prescribed in paragraph (a) shall be considered as extra duty and paid as overtime. Extra Duty should be voluntary and used only in exceptional circumstances. The employer will endeavour to keep extra duty to a minimum and assign overtime equitably.

d. It is appropriate and desirable that in the interest of the employees, shift cycles within which these hours are worked be standardised. Accordingly the shift cycle shall be _________ days on followed by _________ days off.

e. An employee's days of rest shall be consecutive and not less than _________.

f. Shift rosters shall be posted at least _________ calendar days in advance in order to provide the employee with reasonable notice. The posted roster shall be the employees' scheduled hours of work, late changes should be communicated directly to the employee at the earliest possible opportunity.

g. The following principles will govern rostering:

i. The average time of work per week will not exceed _________ days.

ii. Shifts will be of not less than _________ hours duration.

iii. Shifts shall not exceed _________ hours duration.

iv. Shifts will not be split.

v. Except in an emergency, controllers will not work more than _________ hours consecutively (including breaks), or more than _________ days consecutively.

vi. Shifts will incorporate one meal break and a minimum 30 minute break every two hours for non-radar controllers and every 90 minutes for radar controllers.

vii. Night shifts will not commence on the same day that a morning shift ends.

viii. The total active duty time per night shift will not exceed _________ hours.

ix. **The minimum time off between two periods of duty should not be less than 12 hours.**

6. Recency

In order to maintain the employees' operational competency the controller is required to execute the privilege of the valid license for a period of minimum _________ hours per _________ days. In such cases where participation in administrative work, project work or other tasks results in less operational work than the required minimum, the employer is responsible for providing the necessary training to the employee to enable continued operational work.

7. Vacations and Public Holidays

a. **Controllers are entitled to enjoy all national public holidays with the following conditions:**

   i. **Where controllers are rostered to work on a public holiday either:**

      (1) **they will be granted a mutually agreed paid day off in lieu within _________ days of the holiday, or;**

      (2) **have the extra day credited to their annual leave entitlement, and or;**

      (3) **be paid at the overtime rate of hours worked on holiday.**

   ii. **Where the controller is on a normal rostered day off on the day of the public holiday the following conditions apply:**

      (1) **Either the controller will be paid an extra day's pay at normal day's rates, or;**

      (2) **be granted a mutually agreed paid day off in lieu within _________ days of the holiday, or;**

      (3) **have the extra day credited to their annual leave entitlement.**

b. **Controllers will be entitled to accrue _________ days annual vacation leave per year of employment.**

c. **Consistent with rostering requirements, the employer shall make every effort to schedule vacation leave in a manner acceptable to the employee.**

d. **Every effort shall be made to grant employees their vacational leave during the year it is earned. Where any employee has not been granted all the leave credited during a year it will be carried over until it can be taken.**

8. Remuneration

a. **Remuneration for Air Traffic Controllers should recognise the unique status of the work, the inherent responsibility for human lives and the professional responsibility required by the law.**

b. **"Associate Professionals" (ISCO-88). Included in this category are aircraft pilots, and ships' officers. Remunerations should reflect this status.**

c. **Remuneration should however be commensurate with the requirements and responsibilities of the profession, not limited by the practices of other organisations (e.g. the Civil or Public Service).**

d. **Remuneration should be commensurate with acquired levels of air traffic control skill and experience. Remunerations should therefore reflect the type and number of ratings required.**

e. **Additional tasks such as instruction or system development should be recognised by higher remuneration.**

f. **Equal remuneration for equal work is required.**

g. **Extra duty should be voluntary, defined and paid at _________ times the normal hourly rate.**

h. **Controllers shall receive an allowance of _________ per cent of their normal hourly rate for all hours worked between 1700 and 0800 local time.**

i. **Controllers should receive an allowance of _________ per cent of their normal hourly rate for all hours worked between 1700 Friday and 0800 Monday local time.**

9. Retirement and Pension

a. **The employer will contribute to a pension scheme in order to provide the employee with adequate retirement benefits.**

b. **Employees will be entitled to retire at age _________.**

c. **To recognise the unique demands of the air traffic controller profession, employees should retire earlier than the normal (for the country) retirement age, shall receive benefits at not less than the same level enjoyed by normal age retirees in other professions.**

10. Employment Security

a. **If the employee is unable to perform duties for a period of up to _________ months due to psychological stress as a result of an accident or incident, or the employee's medical licence is withdrawn temporarily by the appropriate medical authority, the employee will be transferred to non-operational duties until the medical licence is re-validated or permanently withdrawn.**

b. **During such periods of leave or transfer to non-operational duties the employee will continue to receive payment as if they were performing operational duties as an air traffic controller.**

c. **If the employee is pregnant she is entitled to paid sick leave if medical documentation from the employee's own physician indicates that the employee is unable to perform normal duties.**

d. **The above mentioned does not apply where the medical condition during pregnancy results in a temporary loss of licence and the employee is still able to**

perform other types of work than operational air traffic control. If such is the case the employee will be transferred to non-operational duties and will receive payment as if she was continuing duties as an air traffic controller.

e. **During pregnancy the employee has the right to negotiate altered shift schedules, reduced operational working time or other changes in employment as regarded necessary either by herself or her physician, to enable her to perform duties as an air traffic controller throughout the pregnancy.**

f. **After giving birth, the employee is entitled to paid leave of up to _________ months in order to recover and take care of the child.**

g. **The employer will provide Loss of Licence or Income Protection Insurance at no cost to the employee. The following conditions will apply:**

   i. **All ATCOs will be covered.**

   ii. **No medical checks other than that required to be employed as an ATCO will be required.**

   iii. **The insurance provider will not impose any special conditions or exclusions for any individual members excepting self-injury and war.**

   iv. **Pre-existing medical conditions must not be excluded.**

   v. **The meaning of "bodily injury" and "illness" shall be clearly defined.**

   vi. **Payments under the policy will be in addition to any other benefits to which the employee is entitled.**

   vii. **The sum payable for permanent loss of licence will be at least equal to five years of the ATCO's income.**

   viii. **The sum will be payable even if the employee continue to work with the employer outside air traffic services.**

   ix. **If the employee is employed at a lesser salary with the same employer or outside air traffic services, then the loss of income should be recompensed.**

   x. **The insurer must accept the written proof of Loss of Licence provided by the appropriate licensing Authority.**

   xi. **The claims procedure must be clearly set out in the policy.**

h. **The employer will provide a medical insurance scheme at no cost to the employee.**

i. **In addition to the Loss of Licence Insurance, where employees are forced to retire before reaching the normal retirement age, the employer will provide:**

   i. **a retraining programme for another career at no cost to the employee, for up to _________ years, during which the normal ATCO salary will be paid;**

   ii. **following retraining, provide the employee with employment in the field for which the retraining was provided, and maintain the remuneration at the appropriate ATCO rate until normal ATCO retirement age is reached;**

iii. where the employee is unable to undergo such retraining, or incapable of employment in any occupation, the employer shall maintain remuneration at ATCO level until the normal retirement age is reached;

iv. If the employee chooses to not undergo retraining or be employed with the employer outside the ATC area, then a sum equal to five years at the appropriate ATCO salary shall be provided as a lump sum.

11. Legal Liability

a. The employee will have the right to be exempted from operational duty after having been involved in an accident or incident. The assignment to non-operational duties is non-disciplinary and the employee can at his or her own wish return to operational duty when feeling physically and mentally fit. During such temporary exemption from operational duty, the employee will receive payment as if he or she were performing duty as an operational air traffic controller.

b. The employee has the right to be accompanied by a representative of his or her own choice during any hearing, enquiry or investigation related to an air traffic accident or incident.

c. The employer will provide a legal advisor of the employee's choice in cases where such assistance is rendered necessary by the employer or requested by the employee.

d. The employee will get access to all relevant recordings covering the time of the accident or incident. Such access will be given without delay, and will also be made available to the employee's advisors.

e. Any legal liability after an air traffic accident or incident lies with the employer, provided the employee is not proven guilty in court of a deliberate act impairing air safety or is proven guilty of criminal negligence.

12. Unlawful Interference with Civil Aviation Facilities

a. The employer is responsible for providing adequate security systems and procedures in order to safeguard the employee working within the air traffic control facility concerned.

b. The employee will not be held legally responsible for carrying out orders during unlawful interference with civil aviation facilities which deviate from or violate ICAO rules. Such orders will be given in writing to the employee's immediate superior, and the originator will in such cases be clearly identified.

c. The employee will have the right to be temporarily exempted from operational duty after having been involved in a case of unlawful interference. The assignment to non-operational duties is voluntary and the employee can at his or her own wish return to operational duty when feeling physically and mentally fit. During such temporary exemptions from operational duty, the employee will receive payment as if he or she was performing duty as an operational air traffic controller.

E N D

MED:

MEDICAL MATTERS

POLSTATS

MED 2.1 MEDICAL REQUIREMENTS

MED 2.1.1 GENERAL

IFATCA Policy is:

Local medical centres should be established for the examination of the ATC personnel. A National Medical Body should be established as the General Authority for determining questions of fitness of controllers whose fitness is questioned by the local centres.

Controllers should be afforded recourse to examination by independent medical specialists of their choice where permanent medical unfitness is indicated by earlier examination.

The cost of the examinations should be borne by the ATC authorities.

To avoid deterioration of the working conditions, all factors influencing those working conditions should be regularly and frequently inspected by the appropriate medical authorities.

Advice should be sought from competent medical authorities about any building or equipment programme. Such advice should be acted upon and applied also to existing ACC, APP and TWR units.

Competent medical authorities should be consulted as well as air traffic controllers themselves, to obtain their views on job organisation.

Member Associations are requested to act on their governments to have them establish and publish statistics on all medical problems of air traffic controllers.

See: WP 49 - Brussels 1979

Air traffic controllers should be subject to medical examination, both prior to employment in the profession and on a regular basis during their career. Such examinations should be capable of detecting any medical deficiencies prior to or during ab-initio training and provide for a thorough monitoring of the air traffic controller's health throughout his career.

Each country should carry out medical studies to determine medical standards for air traffic controllers, including the identification of the cause of stress among air traffic controllers, and investigate methods of prevention of such stress as well as diagnosing and treating its manifestations.

Air traffic controllers should be provided with adequate protection measures designed to prevent loss of licence on medical grounds. This protection should include the availability of the appropriate training facilities to assist the air traffic controllers concerned in maintaining the required health standards.

See: WP 55 - Split 1983

The medical requirements for ATC employment must be stated by the appropriate ATC authorities and should be based on the criteria laid down in Annex 1 to the ICAO Convention.

The medical system should be geared to selection, and be capable of detecting any medical deficiencies in controllers before their ab-initio training.

In the interest of safety, a system of initial and regular follow-up medical examinations specifically for controllers is essential.

The medical system should be detecting any deterioration in the controllers' health as early as possible and preventing such deterioration wherever possible.

The medical system should be providing for thorough and regular monitoring of the controllers' health throughout their careers.

The air traffic controllers should, at their request, be entitled to have their medical file forwarded to their own physician.

See: WP 8 - Athens 1985

Physical fitness programme:

a) **National administrations should consider the health of air traffic controllers by setting up a physical fitness programme open to all controllers on a voluntary basis.**
b) **No direct relationship should exist between a physical fitness programme and annual medical examination (if any).**
c) **Participation in a physical fitness programme shall have no effect whatsoever on the controller's annual leave or spare time and the costs involved shall be carried by the employer.**

See: WP 63 - Split 1983

MAs who have information relating to the medical aspects of the ATC profession, which they consider to be of interest, should forward such information to PLC.

See: WP 13 - San José 1986

IFATCA representation should participate at national and / or international aviation medical conferences or seminars whenever this is considered to be relevant to MAs, to be decided by the Executive Board, after consultation with the Chairman of PLC.

See: WP 25 - Nairobi 1987

MED 2.2 SPECIFIC MATTERS

MED 2.2.1 EFFECTS OF MEDICINE, DRUGS AND ALCOHOL

IFATCA policy is:

Member Associations should approach their respective administrations to establish guidelines about the effects of the use of medicines, drugs, alcohol and other substances available in their country.

Where possible individual substances including trade names, should be identified and listed in order to give controllers guidance concerning the use of such substances and their compatibility with ATC work.

Controllers should be allocated time off in excess of national standards in recognition of the critical nature of their health in relation to their work.

See: WP 58 - Lyon 1976 and WP 175 - Geneva 2001

An inquiry on the secondary effects of medication with respect to aerial security and the alertness of the controller should be made by the appropriate authorities.

See: WP ?? - Copenhagen 1978

MED 2.2.2 OCULAR PROBLEMS

IFATCA policy is:

Air traffic controllers should undergo an annual ophthalmic examination which takes into account real working conditions. The equipment used by controllers and the entirety of the working place should be checked by oculists so that it is conform to the requirements necessary for the safety of air traffic and health of the controllers.

See: WP 85 - Copenhagen 1978

Member Associations shall approach their national administrations in order to establish a regular ophthalmic examination scheme including a written record of the finding in an appropriate form, and shall advise PLC of results of this and any other relevant studies.

See: WP 87 - Amsterdam 1982

MED 2.2.3 STRESS AND STRESS MANAGEMENT

IFATCA policy is:

Occupational stress is now recognised as an increasingly global phenomenon, affecting all categories of workers, all work places and all countries. Several studies have revealed with scientific integrity that considerable levels of occupational stress reactions have been identified among different groups of air traffic controllers.

Occupational stress is the product of complex interaction of the task, the operational environment and the personality characteristics of the individual. Thus it is difficult to generalise to all controllers groups.

Nevertheless, some of the most common stressors have been identified as:

a) Demand

number of aircraft under control - peak traffic hours - extraneous traffic - unforeseeable events - proficiency checks / examinations;

b) Operating procedures

time pressure - having to bend the rules - feeling of loss of control - fear of consequences of errors;

c) Working time

shift and night work - unbroken duty periods;

d) Working tools

limitations and reliability of equipment - VDT, RTF and telephone quality - equipment layout;

e) Work environment

lighting / optical reflections – noise / distractors - microclimate - bad posture - rest and canteen facilities;

f) Working organisation

role ambiguity - relations with supervisors and colleagues - lack of trained staff or staff inadequately trained - lack of control over work process - lack of management support - salary - public opinion;

g) Critical Incident / Accident

A critical incident is any situation faced by Air Traffic Controllers that causes them to experience unusually strong emotional reactions which have the potential to interfere with their ability to function either at their positions or later. Critical incident stress (CIS) is the reaction a person or a group has to a critical incident.

(Adapted from Jeffrey Mitchell Ph. D)

See: WP 160 - Taipei 1997
See also: WP 93 - Bournemouth 1992

MED 2.2.4 CRITICAL INCIDENT STRESS MANAGEMENT

IFATCA policy is:

Stress prevention at the work place has proved particularly effective in combating stress, by attacking its roots and causes, rather than merely treating its effects.

The Federation recognises the importance of stress management for air traffic controllers and recommends that, at regular intervals, air traffic controllers be provided with up-to-date information on stress management techniques.

The Federation urges MAs to bring to their administration's attention the stress-inducing potential of their work environment in order that particular consideration is given to ensure that the work environment is suitable and as stress-free as possible.

The Federation endorses the use of professionally trained peers in the provision of critical incident stress management (CISM) to colleagues experiencing critical incident stress (CIS).

(Critical incident stress management (CISM) is a wide range of programmes and intervention strategies which have been designed to mitigate the impact of stress in personnel and to assist them in managing and recovering from significant stress. (Adapted from Jeffrey Mitchell Ph.D.) [San José 86.C.6-8, amended Taipei 97.C.6].

Comprehensive and confidential support services should be available at all times for air traffic controllers, support staff and their families.

Professional critical incident stress support services should be made available to air traffic controllers involved in ATC incidents / accidents and any other occurrences that have potential to create critical stress reactions influencing the ATCO's performance. It is the controllers' choice whether or not to take advantage of these support services.

See: WP 158 - Istanbul 2007
See also: WP 89 - Kaohsiung 2006, WP 160 - Taipei 1997 and WP 24 - San José 1986

MED 2.2.5 FATIGUE IN AIR TRAFFIC CONTROL

IFATCA Policy is:

MAs should draw the attention of their members to the causes of Fatigue in ATC so that they can identify those to which they are most exposed.

MAs should advise their members to seek professional psychological advice when they believe that they are subject to excessive stress-inducing agents.

See: WP L004 - Rio de Janeiro 1988

Management has the prime role for providing fatigue management and prevention of fatigue-related catastrophes. Any situation where increased fatigue, decreased sleep, or performance loss can be demonstrated, is a situation where the margin for error is reduced, albeit by some unknown amount, and should be avoided in ATC.

The provision of a satisfactory working environment appropriate rostering, rest periods, facilities, use of overtime, relief controllers and education in human factors shall be agreed with the air traffic controllers involved. Attention must be given to individual differences, age and gender.

In exercising the responsibilities of designing of duty rosters (POLSTATs elsewhere refers), management shall be responsible for providing physical arrangements (relief controllers and adapted rest area) and sufficient break periods for controllers to try to maintain their daily eating habits regardless of which shift they are working. Such physical arrangements and sufficient break periods shall be provided to allow for strategic naps during night shifts.

Management shall approve the implementation of strategic naps as an effective way of improving alertness and anchoring the circadian rhythms of controllers during night shift.

A strategic nap is defined as a short period of sleep taken at specific times during a night shift. Recommended duration of a strategic nap varies from maximum 20 minutes for a nap early in the night to maximum 50 minutes late in the night (after 4am).

Management shall in close coordination with the air traffic controllers involved, carefully consider staffing levels during night shifts. For those controllers who have very heavy traffic loads during the night shifts, additional relief should be considered as an appropriate countermeasure to sleepiness and fatigue in order to increase the safety margins, and to reduce subsequent daytime sleepiness.

Use of overtime shall generally be kept to a minimum, and a system for allocation of overtime which takes the limitations in human performance as a factor shall be established. The combination of overtime shortly before or just after night-shifts shall be avoided.

Control-rooms shall be tobacco-smoke free areas due to the negative effects on dexterity caused by smoking.

MAs should advise their members and management about the causes of fatigue and countermeasures available.

MAs should encourage their management to include theory about the physiological principles related to sleep and circadian rhythms, both in controllers retraining and basic education. Such training should include knowledge of ways to take deliberate actions (countermeasures) to better meet controllers' operational requirements.

See: WP 148 - Toulouse 1998 and WP 159 - Taipei 1997

The Regulator / Legislator should:

- **develop comprehensive hours of duty regulations for air traffic controllers, incorporating fatigue management principles;**
- **require all air traffic service providers to maintain auditable fatigue management systems and establish this as a key element of a target level of safety.**

See: WP 162 – Dubrovnik 2009

MED 2.2.6 WORK AS ATCO WHEN PREGNANT

IFATCA policy is:

Pregnancy is a normal female human condition which must not result in automatic suspension of an ATCO's licence.

When considering the design of the workplace and working conditions, employers should also take into account the requirement of pregnant ATCOs.

Pregnant ATCOs have the right to expect that the possible physiological problems associated with pregnancy will be accommodated by their employers in the form of available relief staff.

Pregnant ATCOs should have the right to transfer temporarily from shiftwork to day-time working if they so choose.

Pregnant ATCOs should have the right to transfer temporarily to non-operational positions if they so choose.

When recommended by a pregnant ATCO's own physician adequate leave with pay should be provided.

Adequate maternity leave, together with protection of the equal-opportunity-rights of pregnant ATCOs should be provided.

See: WP 131 - Jerusalem 1995

A pregnant air traffic controller should not, if she so chooses, work in front of cathode ray tube (CRT) and/or Visual Display Unit (VDU) screens during her pregnancy.

See: WP 98 - Frankfurt 1989 - Confirmed Acapulco 1990

MED 2.2.7 SUBSTANCE ABUSE IN AIR TRAFFIC CONTROL

IFATCA Policy is:

IFATCA views substance abuse with concern and cautions MAs against it.

A programme of education of substance abuse should be made available to air traffic controllers by their employer in consultation with the MA.

All appropriate safeguards and redress procedures should be established before the introduction of any mandatory drug-test scheme.

Mandatory drug tests, subject to the provisions above, are acceptable on initial recruitment of air traffic controllers to prevent any erosion of entry medical standards.

Mandatory drug tests, subject to the provisions above, of air traffic controllers in an ATC accident are acceptable in order to demonstrate positively their medical fitness at the time.

Any air traffic controller subjected to a drug test should receive a sealed identical sample in order to obtain an independent analysis paid by the employer.

A programme of rehabilitation from substance abuse should be made available to an air traffic controller where a problem is recognised. This programme should be set up and conducted in consultation with the MA in order to maintain the confidence and preserve the employment in ATC of the individual concerned..

See: WP 70 - Port of Spain 1991

MED 2.2.8 HIV AND AIDS IN AIR TRAFFIC CONTROL

IFATCA policy is:

ATCOs diagnosed HIV positive should be treated by their employer as fit for work unless declared unfit by the appropriate medical authority.

ATS personnel should be educated on HIV and AIDS.

Counselling service on HIV should be made available to all ATS personnel.

See: WP 121 - Christchurch 1993

MED 2.2.9 ATCOS WITH DISABILITIES

IFATCA did not yet have policy on controllers with either temporarily or permanent disabilities. Every day people are exposed to certain dangers or can suffer from various diseases, which could cause a loss of licence either temporarily or permanently. There are some disabilities, which are compatible with ATC work. Unfortunately others are not.

IFATCA policy is:

An ATCO who is suffering from a disability, but still meets all medical and regulatory requirements defined by the competent authority or ICAO, shall retain their full qualifications as an ATCO.

If an ATCO is suffering from any kind of disability or serious illness, a medical check should be performed in order to prove that medical requirements are met and that safety is not infringed.

If an ATCO loses their license due to a permanent disability they should where possible be offered an alternative position.

The employer should make reasonable changes for disabled ATCOs. These apply to the working arrangements or any physical aspects of the workplace. (E.g. access to buildings)

Chronic diseases should not be disqualifying, if the required treatment does not interfere with the safe exercise of license and rating privileges.

See: WP 159 - Kathmandu 2012

MED 2.3 ATTACHMENT

MED 2.3.1 CRITICAL INCIDENT STRESS MANAGEMENT (MODEL OF A SUGGESTED COURSE DESIGN)

7. INTRODUCTION

The provision of appropriate psychological assistance for air traffic controllers has been a policy of the Federation since 1986. Critical Incident Stress Management (CISM) in Air Traffic Control is a relatively new concept; and is only one, though crucial, form of psychological assistance which should be provided for air traffic controllers.

A CISM programme has its greatest chance of success when fully endorsed by the management; however, where this is not the case, ATC associations can implement and administer their own programmes.

An ATC CISM programme is a peer support programme; and the ideal situation is one in which the programme is developed by the management and controllers working together with adequately trained professionals.

Critical Incident Stress Management was developed by Dr. Jeffrey Mitchell after he observed different groups of emergency personnel suffering symptoms akin to "shell shock". Dr. Mitchell developed a successful model for treating these stress reactions. These stress reactions were termed by Dr. Mitchell as **Critical Incident Stress** and defined as **the reaction a person or a group has to a critical incident. A critical incident is any situation faced by a person or group that causes them to experience unusually strong emotional reactions which have the potential to interfere with their ability to function either on the job or later.**

Critical Incident Stress among air traffic controllers was first identified in 1988 by Anne Logie, R.N., D.O.H.N., who was then employed as the ATC Occupational Health Consultant in Vancouver, BC. Working with air traffic controllers and the Canadian Air Traffic Controllers' Association, Anne Logie developed the first programme to deal with critical incident stress among air traffic controllers.

Over the years, numerous literatures has been produced on stress in air traffic control and on Critical Incident Stress Management. The literature on stress does not recognise CIS as a separate and distinct phenomenon while that on CISM deals mainly with CIS among emergency personnel.

The experience has shown, however, that not only is critical incident stress distinct from other forms of stress but that the model for treating air traffic controllers does show some areas of divergence from that developed for emergency personnel.

Any successful CISM programme will be developed locally taking cultural concerns into consideration.

This document should, therefore, not be seen as the definitive authority on implementing a CISM programme but will focus on those areas that are crucial to any successful CISM programme.

8. MANAGEMENT SUPPORT

An ATC CISM programme has its greatest chance of success if it is endorsed and fully supported by the Management.

Though it is a peer support based programme which can be administered by the controllers themselves, the importance of support from the management can not be over emphasised, especially in cases where the resources of an ATC Association are limited. With management support, resources can be provided for training and administering the programme as well as formalising the involvement of ATC personnel dedicated to the programme.

9. THE CRITICAL INCIDENT STRESS MANAGEMENT PROGRAMME

Critical Incident Stress Management (CISM) is a wide range of programmes and intervention strategies which have been designed to mitigate the impact of stress in personnel and to assist them in managing and recovering from significant stress. - Jeffrey Mitchell, Ph.D.

A CISM programme should ideally offer the following:

Trained peer support team - Peer support is the foundation upon which CISM is based. It should be noted that a peer is effective only if perceived as such by the person seeking help. The relevant literature details the factors to be considered when choosing a team. The final composition should be reflective of the differences among the persons to be served in terms of age, sex and ATC specialty.

Appropriately trained mental health professional - A mental health professional who is trained in dealing with CIS should form part of the team. This person would conduct refresher training, lead formal debriefings, and be a referral in cases that are beyond the scope of the peer.

Established Protocols - This is a document that states clearly, in unambiguous terms, the operational procedure of the CISM programme. It states the purpose of the programme; the structure and composition of the peer support team; responsibilities and obligations of the team members; and the nature and extent of management's involvement. This document is usually the first significant advertisement of the CISM programme; it will determine the initial perception of the target group and is therefore important to the programme's success.

Education and Information - Air traffic controllers should be informed of the concept of Critical Incident Stress, its possible impact upon the individual, and the assistance available through the CISM programme.

Defusings - This refers to one-on-one interventions between a trained peer and the affected individual. This is the most used service of an ATC-CISM programme; and any programme that does not provide this service is losing the opportunity to provide significant assistance to the target group.

Debriefings - This refers to formal group sessions lead by a trained mental health professional and is mainly used in cases of major incidents and accidents.

Follow-ups - This refers to brief talks with the affected individual within a short time following an intervention.

Referral Service - A Defusing or Debriefing is not psychotherapy and frequently peers will encounter situations they are not equipped to deal with and there should be professionals available to whom referrals can be made.

Peer - Peer Consultations - These are informal talks among the peers about the incidents they have dealt with in order to provide an outlet for the peers' own cumulative stress that may be a direct result of the service they provide; this concept is also referred to as **helping the helper** or **debriefing the debriefer.**

Refresher training - Periodic refresher training should be scheduled so that peers can update their knowledge and practise their skills.

Specialty Interventions - Peer support personnel will frequently have to deal with stress reactions that result from sources other than critical incidents. The team should be prepared to deal with these issues and provide appropriate referrals. Where a CISM programme is the only psychological support service available, these specialty services will become an integral part of the programme.

Evaluation - To ensure that the programme achieves its goals, it is essential that there are ongoing evaluations. The methods of evaluations should be determined by the team and stated in the protocols. One essential method is the use of anonymous written questionnaires by the participants of interventions.

10. CISM TRAINING

ATC-CISM shows its major area of departure from CISM for emergency personnel in the relative uses of defusings and debriefings. The model developed for emergency personnel uses the formal group debriefing as the main intervention strategy with the one-on-one defusing is rarely used. The experience in air traffic control has been that because of the types of the critical incidents and the personalities of the personnel involved, the informal one-on-one defusing is the main intervention strategy used. Course content should reflect this reality.

The training must be done by certified CISM trainers. A three day course has proven to be the minimum time required for adequate training. Course material should cover the following: Stress - nature and management; CIS; CISM; CIS Interventions; Communication skills - theory and practice; CIS Debriefing and Defusing - theory and skills practice; CISM programme - design and implementation.

The experience has shown that a significant portion of the course should be dedicated to allowing participants to practise their skills. Practical demonstrations of the skills by experienced peer support personnel have proven to be very valuable in imparting confidence to trainees.

11. CISM PROGRAMME IMPLEMENTATION OVERVIEW

Initial Phase:

- **Determine the need**
- **Get Management approval**
- **Be assured of the availability of peer and mental health support**
- **Review existing CISM programmes**

Intermediate Phase

- **Establish an organisation committee**
- **Decide on a lead agency**
- **Develop a team structure**
- **Solicit applications from potential team members**
- **Schedule training**

Final Phase

- **Train**
- **Select team members**
- **Establish effective leadership**
- **Establish written protocols**
- **Maintain team operations**
- **Evaluate team performance**

(Source: Jeffrey Mitchell, Ph.D.)

12. CONCLUSION

This document has stated what recent experience has shown to be the essential features of a successful CISM programme. CISM in ATC is still a relatively new concept and is therefore still in the development phase. As new information comes to hand, this document would need to be updated. CISM has proven to be an effective tool to combat stress affecting ATC personnel. Unrelieved stress can have disastrous consequences for an individual by reducing his ability to function effectively either in his job or life. Any attempt to assist individuals in managing stress should be encouraged. This document has been provided in an attempt to assist Member Associations in successfully implementing effective **Critical Incident Stress Management Programmes**.

13. AVAILABLE CISM INFORMATION RESOURCES

“Critical Incident Stress Management in ATC” by Marc Baumgartner, 2004.

International Critical Incident Stress Foundation, Inc. Website: http://www.icisf.org

TRNG:

ATC TRAINING

POLSTATS

TRNG 3.1 SELECTION

TRNG 3.1.1 AGE

IFATCA Policy is:

Applicants without previous aviation experience should be between 18 and 25 years.

See: WP 49 - Brussels 1979

TRNG 3.1.2 SELECTION

IFATCA policy is:

Applicants will be required to possess the academic qualifications required to enter a recognized post-secondary educational institution in their country.

Applicants must pass the selection standards. (Brussels 79.C.6 edited Istanbul 07)

The ICAO medical requirements shall apply to all candidates for selection and other tests considered appropriate by respective Governments should be employed. The final selection of prospective controllers should be made by trained ATC personnel together with professional assessors.

There should be no discrimination between the sexes in the selection of air traffic controllers. (Toronto 80.C.15).

Member Associations should co-operate with those responsible for the selection of air traffic controllers in their country and obtain agreement on:

- **a) the composition of the selection board, including representation by the Member Association where appropriate;**
- **b) a definite list of criteria which would be sought by the selection board;**
- **c) the procedures of the selection process. (Toronto 80.C.16)**

Aptitude tests specifically designed for air traffic controllers shall be included in the selection process for air traffic controllers. (Amsterdam 82.C.22)

The selection board shall include a psychologist trained in, or familiar with, all aspects of ATC and a controller trained in selection methods and procedures. (Amsterdam 82.C.23)

Member Associations, in consultation with their Administrations, shall encourage the development of suitable static and dynamic aptitude tests for the selection of air traffic controllers. (Amsterdam 82.C.24)

Team Resource Management as a concept should be considered in the selection of ATCOs. (Geneva 01.C.6).

See: WP 49 - Brussels 1979, WP 38 - Toronto 1980, WP 25 - Amsterdam 1982, WP 171 - Geneva 2001 and WP 164 - Istanbul 2007

TRNG 3.1.3 TEAM RESOURCE MANAGEMENT

IFATCA policy is:

For the purposes of defining the concept of TRM, IFATCA accepts the ICAO definition of TRM in the Manual. That definition states TRM is: "To make optimal use of all available resources – people, equipment, and information – to enhance the safety and efficiency of Air Traffic Services."

See: Agenda C.6.2 - WP 156 - Amman 2011

TRNG 3.2 CURRICULUM FOR TRAINING AND GENERAL CONSIDERATIONS

TRNG 3.2.1 GENERAL SCHEDULE FOR A 3 TO 5 YEAR TRAINING

IFATCA policy is:

A general schedule for a 3 to 5 year training should consist of the following:

1. **A program of classroom instruction which should include:**
   h) **sufficient knowledge of the duties of an air traffic controller as well as pertinent information concerning related aviation fields.**
   i) **all relevant material and simulation exercises required for tower control and/or approach control and/or area control to licensing standards.**
   j) **Providing administrative background for reporting procedures, management forms, etc.**
2. **Threat and Error Management**
3. **Team Resource Management**
4. **A program of familiarisation flights; assignment for short periods of time, to commercial dispatch offices, aircraft maintenance shops, and aviation flying schools.**
5. **A program of flight training including training exercises in multi-engine aircraft simulators.**
6. **Providing the employer the opportunity to assess the suitability and capability of the students for air traffic control duties.**
7. **A practical check-out in tower, approach or area control to licensing standards.**

TRNG 3.2.2 GRADUATION

IFATCA policy is:

Students completing the complete training period would be expected to have graduated from the post secondary institution.

See: WP 164 - Istanbul 2007
See also: WP 49 - Brussels 1979 and WP 171 - Geneva 2001

TRNG 3.2.3 LINK BETWEEN ATC SCHOOL & OPERATIONAL UNITS

IFATCA policy is:

It should be brought to the attention of ATC administrations that there is a requirement for close co-operation between ATC training schools and ATC units for which training is performed. (Brussels 79.C.13)

On The Job Training Instructors (OJTI) (i.e. controllers trained to supervise trainees during on-the-job training) should assist in simulation training at the ATC School whenever possible. (Brussels 79.C.14 edited Istanbul 07)

ATC school instructors should be given the opportunity to update their knowledge regularly in operational units. (Brussels 79.C.16)

An exchange of information on the performance of students should be maintained between ATC School and ATC unit. (Brussels 79.C.15)

All controllers must be trained in accordance with ICAO requirements. (Frankfurt 89.C.24, edited Istanbul 2007)

All controllers must be licensed and must hold ATC ratings appropriate to the duties they are undertaking. (Frankfurt 89.C.24 edited Istanbul 07)

See: WP 164 - Istanbul 2007

TRNG 3.2.4 REASONS FOR FAILURE IN ATC TRAINING

IFATCA Policy is:

Training organisations should be encouraged to research the reasons for failure. (Brussels 79.C.19 edited Istanbul 07).

See: WP 164 - Istanbul 2007

TRNG 3.2.5 AUTOMATION CONTROLLER TRAINING

IFATCA Policy is:

Controllers required to operate in an automated air traffic control system should receive relevant instruction in automatic data processing for ATC. (Brussels 79.C.20)

~~Controllers should be involved in the specification, evaluation and implementation of an automated ATC system. (Brussels 79.C.21 edited Istanbul 07)~~

Formal training should be established for all ATC personnel in the theoretical and practical procedures associated with the automated ATC system. (Brussels 79.C.22)

The above training should be carefully integrated with the implementation of each stage of the automated ATC system. (Brussels 79.C.23)

Whatever the ATC environment, controllers should receive suitable, regular training on the published back-up procedures which would be put into operation in the event of a system failure. (Cairo 81.C.24 edited Istanbul 07)

The implementation of automated systems shall include sufficient training, including the Human Factors aspects of automation, prior to using new equipment. The level of training is a major factor in determining the level of traffic that can be safely handled until all controllers have gained enough hands-on experience.

See: Resolution B12 – WP87- Kathmandu 2012 and WP 164 - Istanbul 2007
See also: "Policy on Training, Introduction of new equipment and procedures" (Santiago 99.C.19)

TRNG 3.2.6 AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS) TRAINING

IFATCA policy is:

Comprehensive ACAS training should be provided for ab initio's and for refresher purposes and should consist of:

a) Definition of ACAS (TCAS);
b) Technical description and cockpit displays;
c) Pilot reactions to Traffic Advisories and Resolution Advisories;
d) Controller reactions and legal responsibilities;
e) Phraseologies;
f) Experience of simulated ACAS (TCAS) events in an aircraft simulator or on video.

(Taipei 97.C.7 edited Istanbul 07).

See: WP 164 - Istanbul 2007

TRNG 3.2.7 BASIC DOCUMENTATION FOR USE BY TRAINING OFFICERS / INSTRUCTORS

IFATCA Policy is:

Training Officers and Instructors should use the ICAO Training Manual Part D-2 in conjunction with Annex 1 and the relevant Technical Assistance Guidelines to assist them to organize the Training Courses. Variations dictated by local conditions should be borne in mind.

See: WP 37 - Toronto 1980

TRNG 3.2.8 EMERGENCY TRAINING

IFATCA policy is:

Emergency training, including In Flight Emergency Response (IFER) and coordination training, handling of Unlawful Interference situations and Hypoxia awareness should be part of ab-initio and refresher training.

See: Agenda B.5.8/C.6.12 - WP 94 - Amman 2011

TRNG 3.2.9 DEGRADED MODE OPERATIONS

IFATCA policy is:

Controllers should be given initial and recurrent training in the degraded mode operations of their equipment.

See: WP 161 – Arusha 2008

TRNG 3.2.10 E-LEARNING

IFATCA policy is:

E-learning can be defined as the delivery of training over an electronic network (technology facilitated learning) or as stand-alone distance learning with the aid of a computer terminal.

E-learning should be supported as a learning tool provided that:

- **The quality and scope of the training shall not be diminished by introducing E-learning;**
- **E-learning serves the interest and the need of the ATCO or the student ATCO;**
- **the right method is chosen with regard to the learning goal;**
- **the organisation provides sufficient duty time to meet the learning goal;**
- **the operational expertise of an active controller is used from the start;**
- **human interaction is incorporated;**
- **the feedback loop is kept short;**
- **E-learning is considered as part of the blend of training methods that is used to deliver training.**

See: WP 162 – Arusha 2008

TRNG 3.2.11 ICAO TRAINING MANUAL

Although IFATCA has comprehensive policy in the Technical and Professional Manual on many facets of training, we did not have a consolidated “Initial Training Manual” for Air Traffic Controllers. Similarly, neither did ICAO have such a manual for Air Traffic Controllers, although it does have such a document for other aviation professionals, such as engineers.

PLC undertook the task of creating an IFATCA Initial Training Manual. The intention is to offer this Manual to ICAO for adoption as the ICAO Training Manual for Air Traffic Controllers. The training manual was based upon a EuroControl document, but was made more generic.

IFATCA policy is:

The IFATCA Training Manual be accepted as the IFATCA framework for initial training of Air Traffic Controllers.

The IFATCA Training Manual be offered to ICAO for their consideration for adoption and adaption as an ICAO Training Manual for Air Traffic Controllers.

See: WP 155 – Kathmandu 2012

TRNG 3.3 ON-THE-JOB TRAINING

TRNG 3.3.1 ON-THE-JOB-TRAINING (OJT)

IFATCA policy is:

The selection of controllers as OJT instructors should not only be made on the basis of experience but also on motivation and instructional aptitude. (Copenhagen 78.C.12, amended Bournemouth 92.C.8)

All OJT instructors should attend a suitable course of training in order to increase their awareness of the techniques available in OJT and of the application of such techniques. (Copenhagen 78.C.13)

A period of consolidation should follow a check-out. The previous experience of the student must be taken into account. (Copenhagen 78.C.14 edited Istanbul 07)

Apart from being validated on the sector concerned, a controller should not be engaged in training student controllers unless he/she has at least two years' operational experience and has been validated on that sector for at least six months. (Copenhagen 78.C.15, amended Geneva 01.C.5)

ATC training shall not take place simultaneously on adjacent positions within the same sector unless the communications, surveillance and supervisory facilities are adequate for the OJTI to fulfil his/her responsibilities. (Geneva 01.C.5)

No operational duty should be carried out after simulator duty during the same shift. (Geneva 01.C.5)

To ensure OJTIs have sufficient time working on their own and are able to retain competence on each sector for which they hold validations, OJTI time should be limited to no more than 50% of duty time. This can be organised on a daily, weekly, monthly or shift pattern basis, but must limit the time gap between solo operations and take into account leave and other periods when the controller is not at work. (Geneva 01.C.5).

See: WP 164 - Istanbul 2007

TRNG 3.4 EXAMINATIONS AND VALIDITY OF CONTROLLER LICENCE

TRNG 3.4.1 A SYSTEM COMBINING ASSESSMENTS WITH EXAMINATIONS

IFATCA policy is:

During school training regular progress tests should be given on all theoretical subjects. Results should be analysed and discussed with the students.

The students should be regularly assessed and debriefed throughout the period of simulation training. A written report should be made by the instructor on a regular basis and should reflect the level attained by the student plus his overall course performance. Both the assessment and the final practical examination should contribute to the total marks.

Examination on local procedures, local area, letters of agreements etc. should be made.

During OJT regular assessments by OJT instructors should be provided. Reports on student progress should be forwarded to training section. At all times the student should be kept informed and permitted to see his report.

A student that has failed an examination should, provided he has shown some signs of success and it can be determined that he has controller potential, after a suitable period of further training, be permitted a re-examination.

No student should be given unlimited training time but neither do all students reach the required standard in the same training time. (Brussels 79 amended Istanbul 07.C).

See: WP 164 - Istanbul 2007

TRNG 3.4.2 USE OF UNQUALIFIED PERSONNEL

IFATCA policy is:

For the purpose of guaranteeing safety, controllers shall not be replaced by personnel who do not hold ATC licences in accordance with ICAO Annex 1, with the ratings, recency and competency appropriate to the duties that they are expected to undertake for the position and unit at which those duties are to be performed. (Jerusalem 95.C.3, amended Kaohsiung 06)

The functions which are contained within ICAO Annex 1, as being ATC functions shall not be added to the work responsibilities for unlicensed personnel. (Jerusalem 95.C.4)

In the event of an incident, caused totally or in part by the use of unqualified personnel, responsibility must lie with the person or authority responsible for allocating the unqualified staff to the task undertaken and any other person or authority who has materially supported or assisted to use unqualified personnel. (Taipei 97.C.12 amended Kaohsiung 06).

See: WP 164 - Istanbul 2007

TRNG 3.4.3 AIR TRAFFIC FLOW MANAGEMENT (ATFM)

IFATCA policy is:

ATFM staff not performing clerical or administrative functions, so called ATFM controllers, must be qualified controllers with recent experience on control duties on entry to ATFM services. (Port of Spain 91.C.14, amended Bournemouth 92.C.4)

The responsibility for aircraft in flight remains solely with ATC and any subsequent ATFM involvement shall be at the request of ATC only. (Port of Spain 91.C.15)

An ATFM controller must hold an ATFM rating. Such a rating will require the ATFM controller to demonstrate a comprehensive knowledge, skill and experience of all relevant ATC procedures and ATFM duties. (Port of Spain 91.C.16, amended Bournemouth 92.C.5)

ATFM controllers should be obliged to familiarise themselves with major changes in ATC procedures and maintain their acquaintance with problem areas with relation to ATFM within their region. (Port of Spain 91.C.17 amended Bournemouth 92.C.6).

See: WP 164 - Istanbul 2007

TRNG 3.4.4 PROFICIENCY CHECKING

IFATCA policy is:

The results of proficiency checks should be treated confidentially and management involvement should only be necessary in cases of negligence or on the recommendation of the appointed check controller.

The standards to be achieved and the check list of items to be evaluated should be made available to all those concerned.

Member Associations should, together with their management, draw up a "code of conduct" which to the greatest possible extent will guarantee the objectivity and confidentiality of proficiency checks.

A suitable period of evaluation should take place before a system of proficiency checks is implemented.

Before a proficiency checking system is implemented, adequate training facilities should exist to enable further training to take place where necessary. (accepted as Guidance Material, Cairo 81.C.16-20)

IFATCA is in support of a proficiency checking system for all air traffic controllers exercising the privileges of an ATC License or an equivalent Certificate of Competency for all qualified persons engaged in the duties of air traffic control.

Before any proficiency checking system is implemented the respective Member Association and employer should undergo extensive negotiations and agree to resolve internal differences in respect of their own socioeconomic situation, (which includes retraining and job security). (Cairo 81.C.22)

Member Associations should indicate to their employers that if assessments are conducted controllers must have the opportunity of sighting these assessments and discussing them with the assessing officer. Additionally a controller must have the opportunity of registering, on the assessment form, his comments regarding the assessment and the manner in which it was carried out.

Where a proficiency checking system has been implemented, a controller who is selected to act in the Check Controller role should undergo a specialist course of training that will prepare him/her for the task, and provide guidance on achieving a fair, objective, and valid assessment. This training course should achieve consistency between check controllers.

Additionally, a controller considered for the Check Controller role should have the following minimum experience:

- **4 years operational experience;**
- **1 year experience on the position being assessed;**
- **2 years OJTI experience;**

- **having a high standard of credibility and communication skills in the OJTI/coaching role, and**
- **currency on the position being assessed.**

Check Controllers should undergo the same periodic proficiency assessments as other controllers.

This Assessor qualification should be the subject of periodic refresher training, at periods not exceeding 3 years, to ensure that skills are maintained and new techniques and procedures are incorporated. (Cancun 02.C.2)

See: WP 164 - Istanbul 2007

TRNG 3.4.5 AUTOMATIC DEPENDANT SURVEILLANCE (ADS) CONTROL RATING

IFATCA policy is:

Control of aircraft via ADS and Controllers/Pilot Data Link Communication (CPDLC) is sufficiently different to other forms of ATC rating to warrant comprehensive training and a separate rating.

The training syllabus should inter alia contain instruction in:

- **Aircraft Situational Displays and Degraded Operational Modes;**
- **the CPDLC equipment and protocols including failure modes and procedures;**
- **ADS separation standards and, where applicable, ADS/Radar/Flight Data, Processor Track separation standards;**
- **aircraft emergency protocols and procedures. (Toulouse 98.C.6).**

See: WP 164 - Istanbul 2007

TRNG 3.5 TRAINING AFTER LICENSING

TRNG 3.5.1 REFRESHER COURSES

IFATCA policy is:

As a means of maintaining a world-wide air traffic control service of the highest standards, controllers should participate in a refresher course, which should not have a bearing on the test of the proficiency of the controller, (training and simulation designed to ensure a maintenance of knowledge and abilities with respect to all standards, procedures, equipment and technique currently in use) every year while actively engaged in control duties. (Dublin 1972 edited Istanbul 07)

Team Resource Management as a concept should be considered in the continuation training of ATCOs. (Geneva 01.C.8)

As well as programmed refresher courses, adequate courses of instruction should be provided prior to the introduction into the ATC system of new or modified equipment and changes to standards or procedures which may require additional skills or changes in operating techniques.

Emergency Training, including In Flight Emergency Response (IFER) and coordination training and handling of Unlawful Interference situations should be part of ab-initio and refresher training. (Geneva 01.C.9 amended Istanbul 07.C.6.8. amended Arusha 08.C6.2)

Member Associations should put forward to their administration proposals for the organisation and conduct of refresher training courses. (Cairo 1981).

See: WP 161 - Arusha 2008

TRNG 3.5.2 ENGLISH LANGUAGE TRAINING

IFATCA policy is:

Sufficient training must be available for current ATCOs of all English language abilities so as to be able to meet the required ICAO level and subsequently to retain (or improve) that competency. (Melbourne 05.C.8)

Staff who are unable to achieve and maintain the English language requirements must have their positions protected and given opportunities to reach the required ICAO level. (Melbourne 05.C.8).

See: WP 164 - Istanbul 2007

TRNG 3.5.3 SUPERVISORY AND MANAGEMENT COURSES

IFATCA policy is:

Controllers who are charged with responsibility for indoctrination or on-the-job training of ATS personnel should be provided with adequate courses of instruction in order to discharge these additional responsibilities. (Dublin 1972)

Prior to appointment to a supervisory or management position, controllers should be provided with suitable supervisory and management courses which meet the requirements of the new position. (Dublin 1972)

Team Resource Management as a concept should be considered in the training of controllers prior to an appointment as supervisor or management position. (Cancun 02.C.4)

Controllers should be provided the opportunity to take courses which will prepare them for employment on other duties, including management positions. (Dublin 1972 edited Istanbul 07).

See: WP 164 - Istanbul 2007

TRNG 3.5.4 FLIGHT EXPERIENCE FOR AIR TRAFFIC CONTROLLERS

IFATCA policy is:

The Federation recommends to all authorities responsible for the operation of Air Traffic Services:

a) To provide for familiarization flights in the cockpits of aircraft for Air Traffic Controllers, with combined facilities to visit adjacent and distant Air Traffic Control units.

b) Licensed and trainee controllers should participate in familiarization flights annually. (Dublin 1972)

c)

i. To encourage air traffic controllers with flying experience to maintain their proficiency by offering special facilities, and

ii. To encourage air traffic controllers without flying experience to gain such experience by providing facilities for pilot-training to the level of the Private Pilot Licence, and

d) To exploit the use of link trainers for the familiarization of air traffic controllers with specific in-flight problems.

Note: Familiarization flights (also known as "duty flights" or "route experience flights") are granted by national air carriers on government request in accordance with IATA Traffic Resolution No. 200. (Paris 1962, amended Jerusalem 95.A.8, edited Istanbul 07).

See: WP 164 - Istanbul 2007

TRNG 3.6 **ATTACHMENT**

TRNG 3.6.1 **IFATCA POLICY DOCUMENT ON TRAINING**

2nd Edition February 1989
Amended Geneva 01.C.10
Edited Istanbul 07
IFATCA PUBLICATIONS

Table of Contents

14. INTRODUCTION

The International Federation of Air Traffic Controllers' Associations (IFATCA) lists among its objectives - "to promote and uphold a high standard of knowledge and professional efficiency among Air Traffic Controllers". To this end IFATCA is deeply concerned about the training of Air Traffic Controllers and in particular that the training received conforms to internationally recognised standards. The quality of training will be reflected in the safety and reliability of an Air Traffic Control (ATC) system.

An efficient training system will, in the long term, justify the initially large financial investment which is required for training facilities (classrooms, simulators, teaching aids etc.) and instructional staff by producing well qualified controllers who will provide a safe and expeditious service to air traffic thus encouraging all manner of aviation and ultimately benefiting the nation.

To support this philosophy IFATCA has produced policy on training in Air Traffic Control whereby people qualified in all aspects of recruitment and training sup- ported by well designed training courses, provide the best possible education to those wishing to make a career in Air Traffic Control. The ideal is that a worldwide standardisation of training for Air Traffic Control becomes reality. IFATCA is working toward this goal.

It is not possible, nor is it intended, to go into every detail on training methods, training techniques, course design etc. Rather to observe the recruitment and training of Air Traffic Controllers and to indicate the relevant IFATCA policy (in bold).

Each aspect of the items in this paper is regarded from the training point of view and further information and explanation can be obtained from the appropriate IFATCA Working Paper or ICAO Annex or Manual (see Annex)

15. SELECTION

In looking at the training of Air Traffic Controllers it is worthwhile to review the selection process. Training is an expensive business and the return on initial capital expenditure may not be realized for some years. Some failures and dropouts during training can be considered as inevitable because of the high standard of proficiency required in the profession. Careful selection can reduce the likelihood of failure to an acceptable rate. If the selection process is unable to consistently produce candidates who possess the ability and aptitude to become good Air Traffic Controllers then it will be the ATC system and ultimately air safety which will be compromised. There is a side effect here in that the motivation of established staff can be adversely affected as they experience what they believe to be a lowering of standard. The quality of training must remain high but a craftsman cannot produce a masterpiece from poor materials.

Most countries recruit candidates from the age of 18 years who are expected to have obtained a good level of secondary education, preferably up to University entrance standard.

The training of young people for Air Traffic Control should be regarded as training for a profession. As his contemporaries may be obtaining law or medical degrees so the young controller after some years of study will obtain an Air Traffic Control License. The license attests to his proficiency and acknowledges his competency in a very responsible profession.

Applicants will be required to possess the academic qualifications required to enter a recognized post-secondary educational institution in their country.

Thus,

Applicants without previous aviation experience should be between 18 and 25 years of age.

That candidates should possess knowledge of aviation is desirable since one could reasonably expect that someone who wishes to make a career in Air Traffic Control would make aviation a basic interest. However, many candidates present themselves before a selection board knowing nothing about aviation or ATC. Do administrations make available to Schools' Career Officers sufficient information about Air Traffic Control?

Applicants for selection will be asked to complete a written application form detailing age, educational qualifications, previous experience etc. Some administrations are wary about accepting women for training as they see a risk in later "losing" these women when they wish to start families. However, there should be no reason why, as in many other professions, women cannot be re-admitted to the ATC service as controllers at a later time. A refresher course and re-validation may be necessary but the expensive training will not be totally wasted.

There should be no discrimination between the sexes in the selection of Air Traffic Controllers.

The written application can be followed by an initial interview which is held on an informal basis between the applicant and an ATC expert. This exploratory interview, particularly for school-leavers, should determine the applicant's motivation and basic suitability for the job and can serve to eliminate the obviously unsuitable.

Many administrations make use of various psychological and aptitude tests in order to further explore, on a more objective basis, the aptitude and ability of applicants for Air Traffic Control. The use of such tests specifically designed for ATC and used in the selection of Air Traffic Controllers is a relatively new practice. It is felt that the "paper and pencil" tests are, in themselves, not sufficiently adequate for effective selection in ATC. Practical exercises for determining the aptitude of people to perform tasks associated with Air Traffic Control are required and re- search is being carried out in this area.

Aptitude tests specifically designed for Air Traffic Controllers shall be included in the selection process for Air Traffic Controllers.

Member Associations, in consultation with the Administration, shall en- courage the development of suitable static and dynamic aptitude tests for the selection of Air Traffic Controllers.

The result of these tests are followed, in some administrations by an interview with the psychologist whose responsibility it is to evaluate the test scores and to integrate all the information at hand into a comprehensive personality description followed by a rating of the applicant's suitability for ATC training.

Key factors emphasized in the personality assessment are:

- Personal maturity
- Degree of personal resource utilization
- Emotional stability
- Communication abilities
- Goal directedness
- Interests, motivation and level of aspiration
- Social skills and interaction patterns
- Stress resistance

The concluding appraisal operates with a continuous spectrum of suitability degrees (not just a pass/fail category) and the eventual "go/no go" decision is left to the Air Traffic Control administration.

It is worth noting that where aptitude tests are employed, the correct criteria for ATC must be described. To do this requires a detailed description of the performance one expects of an applicant after training, i.e. the theoretical knowledge he needs to know and the practical skills he needs to perform.

Obviously the psychologist involved in selection for Air Traffic Control must have a thorough understanding of the criteria required to perform the task of the Air Traffic Controller. These job criteria have to be carefully and objectively determined if the psychologist is to successfully design suitable tests and correctly analyze the responses of the applicants for Air Traffic Control.

In practice it has been observed that some of those selected, whilst able to perform the tasks of the Air Traffic Controller, fail in other areas (e. g. attitude toward colleagues and authority) or leave the service of their own accord because the job does not offer them the challenge which they expected. Other factors include social conditions of employment, remuneration etc.

Thus the selection process, taking into due consideration the criteria required for the job of Air Traffic Control in terms of tasks to be performed and the social skills of communicating, co-coordinating and integrating with other specialists, should also study carefully the attitudes of people toward the above criteria and their motivation for the job.

Well motivated applicants who demonstrate an interest in aviation and more especially toward Air Traffic Control will more readily accept the challenge of an arduous and demanding period of training for a job which may be partly routine yet which requires accurate decisions to be made within a very limited period of time with frequently insufficient information available and subject to technical and environmental constraints. Social skills are equally important as the controller is part of a closely knit team. There is no place for ambiguity and misunderstanding to this exacting profession.

Applicants must pass the selection standards.

The members of the selection board should undergo training in interview and assessment techniques if the best in terms of suitable applicants are to go forward for ATC training. A qualified and experienced selection board can only contribute benefit to the training system.

The selection board will, as has been mentioned above, look at motivation, adaptability, flexibility, decisiveness, sound judgment, social skills, aptitude and attitude. The last, attitude, is important in determining how the controller will accept the restraints of the job, first during training and later with shift-work and working unsociable hours.

The Selection Board shall include a psychologist trained in, or familiar with, all aspects to Air Traffic Control, and a controller trained in selection methods and procedures.

It must be emphasized that only selection by qualified people who have received suitable training in interview and assessment skills, assisted by experts, will ensure that the candidates thus selected stand the best chance to successfully complete the training programme and substantially contribute to the maintenance of the high standards of the Air Traffic Control Service and air safety.

The final selection of prospective controllers should be made by trained ATC personnel together with professional assessors.

Member Associations should cooperate with those responsible for the selection of air traffic controllers in their country and obtain agreement on:

- **a) the composition of the selection board, including representation by the M. A. where appropriate;**
- **b) on a definite list of criteria which would be sought by the selection board;**
- **c) the procedures of the selection process.**

To do his task effectively the Air Traffic Controller must be in good physical and mental health with no obvious speech or serious sight and hearing defects.

Generally the final stage of the selection process is for the so far successful candidate to pass the medical examination. Nearly all countries accept the ICAO recommendations as detailed in ICAO Annex 1 "Personnel Licensing and Training".

The ICAO medical requirements shall apply to all candidates for selection and other tests considered appropriate by respective Governments should be employed.

The selection process should be designed so as to consistently produce suitable candidates who possess the ability, aptitude and motivation to become good Air Traffic Controllers. The failure or drop-out rate during training has to be reduced without lowering the standards of proficiency.

16. FAMILIARIZATION

Before commencing the formal training at an ATC college we might perhaps consider the merit of giving some familiarization training to students.

A period of familiarization can give both student and training staff the chance to make an initial assessment of the student's aptitude for ATC in the light of practical experience.

Other forms of familiarization, which are usually spread over the two or three years of training, may include flying training to Private Pilot Licence (PPL) standard, route experience flights, aircraft simulator exercises etc. Whilst most students enjoy learning to fly, not many are able to maintain their licences once their training has ceased. A PPL gives basic knowledge and skills in flying but little experience of regular route flying with an airline. Whichever system is to be chosen is for the ATC administration to decide but some form of flying or in-flight experience is desirable for student controllers. As the controller needs to know something about flight operations so pilots could benefit from knowing something about ATC operations. Good understanding goes a long way toward solving problems.

Initial training should include:

A programme of familiarization flights, assignment for short periods of time, to commercial dispatch offices, aircraft maintenance shops, and aviation flying schools.

A programme of flight training including training exercises in multi-engine aircraft simulators.

Note: In discussion with controllers who possessed at least a Private Pilot Licence prior to becoming controllers, the general opinion was that expo- sure of flight deck operations during IFR flight and familiarization with other operations aspects of civil aviation was more meaningful prior to becoming a licensed controller than extended flight training.

17. FORMAL TRAINING (ATC College)

IFATCA advocates formal training courses for ATC students at ICAO approved training colleges as a way to achieve the standardisation of training throughout the world. The training of students at operational ATC units on a self-study basis is not to be recommended and should be discouraged. More scholarships should be made available to those students who find themselves in this situation so that they will be able to attend approved training courses. The standardisation of training is one way in which the basic quality of Air Traffic Services throughout the world can be actively promoted. It cannot be denied that there are variances in the quality of the services provided. Some of these may be caused by lack of funds failing to produce modern equipment or conditions of service of controllers may mean that Air Traffic Control is just one of two or even three jobs that the controller is holding down purely in order to make a decent living. Career advancement becomes non-existent and motivation suffers. IFATCA is working for the controller in all these areas but improvement in these areas alone is not sufficient if there is lacking a standardisation of training. If IFATCA can help to raise the basic standard of proficiency of the Air Traffic Control Service, through a real improvement in the efficiency of the training systems, then the safety of air traffic will be all the more assured.

It will be seen that the efficiency of a training system is brought about by a number of related factors i.e. proper selection, well designed courses, motivated and qualified instructors, suitable training aids and effective period of on-the-job training.

Some variations in course content and training methods are inevitable depending upon regional and national requirements but the basic standard of proficiency for Air Traffic Control remains. It is the responsibility of training units and instructors to see that these standards are reached and maintained.

Training will benefit from prepared objectives. It is helpful and motivating to a student to know, in terms of time and knowledge, goals ahead which must be achieved in order to qualify as an Air Traffic Controller. That there is a definite period of training and that each stage is outlined, helps the student to determine his learning rate and note his progress as each goal is passed. From the final goal of qualification as an Air Traffic Controller, objectives can be set for each stage of training, each phase of training right down to each learning unit. With the objectives in a logical progression the student is able to see his achievements and so increase his motivation.

Training in Air Traffic Control can be divided into three main stages which are: Aerodrome Control, Approach Control and Area Control. In addition, where radar equipment is used we may consider procedures and techniques relating to Approach Radar Control, Precision Approach Radar Control and Area Radar Control.

The design of training will depend to a great extent on the national airspace structure and airspace users. National policy may decide whether or not to train students to a specialisation e. g. either Approach or Area Control.

This paper does not propose to go into any detail regarding the duration of courses or course content. The ICAO Training Manual Part D-2 Air Traffic Control in conjunction with ICAO Annex 1 and the relevant Technical Assistance Guideline provides instructors and training officers with sufficient information on these matters. Local conditions such as airspace structure, air traffic requirements, climate etc, may dictate some slight variations in course length and content. In all cases emphasis should be placed on the practical application of the training given and the importance of developing the qualities, as distinct from the qualifications, required in an Air Traffic Controller.

Training Officers and Instructors should use the ICAO Training Manual Part D-2 in conjunction with Annex 1 and the relevant Technical Assistance Guidelines to assist

them to organise the Training Courses. Variations dictated by local conditions should be borne in mind.

Students need to acquire knowledge, develop understanding and demonstrate proficiency in skills. Objectives should be set for each learning unit, for each aspect and subject, for each stage of training and for the overall training period. These objectives will state the amount of knowledge to be learnt, the degree of understanding to be developed and the standard of skill at which to be proficient. By setting these objectives in a logical sequence the student is able to progress successfully from learning unit to learning unit and from stage to stage of training. Awareness of established objectives by students and instructors alike, aids learning increases motivation and progress is easily monitored.

Formal training courses provide students with qualified guidance and the benefits of group working. A sense of competitiveness aids learning and the social skills required in Air Traffic Control can be developed. There is no room in Air Traffic Control for the pure individualist who cannot work either with or alongside his colleagues and is intolerant of their behaviour. Students gain a sense of identity with their group which increases motivation often to the extent that they strive to produce the best overall results when compared to other student groups. A good instructor will make use of this characteristic to improve learning. During the training there becomes noticeable a subtle change in the behaviour pattern or the group as they mature and become more aware of the responsibilities which lie ahead of them.

Where applicants have been selected from those who have little or no knowledge or experience of aviation, a basic or introductory course should be given. This course, which would precede the Aerodrome Control course, will introduce the students to navigation, meteorology, aircraft types and performance, ICAO, telecommunications, flight planning, Rules of the Air etc. Where possible, classroom presentations should be supported by suitable training films and educational visits to operational units. The students will be encouraged to research for themselves all aspects of aviation in order to obtain good background knowledge of their chosen profession and to maintain interest and motivation.

a. The Instructor

This is a specialist task demanding knowledge and experience of Air Traffic Control coupled with the desire and ability to teach. The post of instructor at an ATC college should be available to all controllers and not necessarily reserved to those who have been retired from operational duties. If accompanied by a management policy of limited term appointments (e. g. five years) then there should be no shortage of volunteers, all of whom will have had recent operational experience and be well motivated.

It should be appreciated that teaching techniques between college and on-the-job are quite different. During the more formal classroom and simulator phases of training students acquire knowledge, gain some understanding and accomplish BASIC controller skills. Operational controllers employed on a short term basis as college instructors, although fully conversant with all operational procedures, can- not help but consider the student's training in terms of the fully qualified controller. In today's cluttered airspaces nearly all ATC procedures are complicated and seemingly bear little resemblance to standard ICAO procedures. It can be argued that students are being trained for a specific function in a particular airspace so, why wasting time with simplified procedures which they will never use. But, such simplified procedures, with relatively simple air traffic situations will greatly in- crease the student's understanding of the basic principles of Air Traffic Control so that effective application of these principles can be made to the operational environment with confidence.

Controllers would therefore be selected for instructional duties on the basis of a reasonable operational experience, the desire to become an instructor and ability to teach. The job of ATC instructor should not be a permanent position nor seen as an end of career stop-gap. The instructor needs to be kept aware of operational developments in ATC and aviation.

The ATC school instructors should be given the opportunity to update their knowledge regularly in operational units.

Instructor technique in the classroom should favour an informal atmosphere where students are encouraged to ask questions and where the instructor leads discussions so as to develop the student's understanding of the subject. In generalisation, most facts and thus knowledge can be studied from suitable textbooks. The instructor can be best employed in explanations rather than quoting from the book. A few minutes spent at the beginning of each day can determine whether or not the previous day's work has been studied. Active participation of the whole class is important which means that the instructor will have to use his skill in restraining the “know-it-alls” and encouraging the more introvert and those lacking confidence. It is vital for the instructor to establish a good working relationship with his students, if his teaching is to be effective. Regular tests, which force students to learn, can have meaning and be acceptable when followed by review sessions and assessments of progress. Students are always very keen to know how well they are doing. Such tests can help to identify weak points in the instruction or in the learning and revisions can be made easily.

The instructor should receive appropriate training to enable him to make full use of all available training aids in order to emphasise the teaching points. He will have learnt how to plan and prepare a lesson and how to question students effectively.

Classroom instruction is closely allied to practical training in that knowledge taught should be related to a skill. For example, when primary radar identification procedures are taught in the classroom the students will immediately thereafter practise these procedures in the simulator. The process will be repeated for other learning units so that theory and practice are soon related and understanding and appreciation are increased.

b. Simulation

Practical training on simulators will probably occupy about two-thirds of the training time on a course. It must be remembered that at the ATC training college basic techniques will be taught and that the finer points will be learnt during the operational training phase.

Using simulators, aspects of safety can be drilled until for the student all thoughts, all spoken phrases, all actions mirror safety in air traffic as second nature. Expedition follows later. There are advantages if all the students on a course come from the same country or even the same ATC unit. Practical simulation can be based upon the student's own area and procedures. The simulation does not have to re- produce faithfully every detailed procedure but the area, navigation aids, traffic samples and basic procedures would be as realistic as possible. Basic principles of Air Traffic Control and techniques in handling a limited number of aircraft in safety are taught at this stage. Exercises are graded progressively toward an agreed examination standard. It is important that operational training coaches should know what the students have been taught and the level of proficiency they are supposed to have reached before the students join an ATC unit.

For this reason the assistance of operational coaches, under the supervision of college instructors, during simulation training can greatly assist the student in familiarization and thus make the transition from college simulator to ATC unit a smooth one. Basic principles become related to known environment making their acceptance and understanding easier.

On-the-Job Instructors – OJTIs (i.e. controllers trained to supervise trainees during on-the-job training) should assist in simulation training at the ATC School whenever possible.

An exchange of information on the performance of students should be maintained between ATC School and ATC unit.

Simulator displays for Tower training can vary from a mock-up of a control tower with "aircraft" being flown round a model airfield to more sophisticated ones.

Approach or Area Control (non-radar) simulators depicting a flight progress strip display are relatively simple and very effective. Depending on the number of students on the course, the students can act as "pilot" and adjacent units as well as controller and perhaps assistant controller. Acting as "pilot" in a non-radar simulation leads to a better understanding of R/T phraseology, types of approaches to be flown, pilot procedures and time keeping.

Radar simulators, being much more sophisticated pieces of equipment, are naturally a lot more expensive. However, careful analysis of the training requirements and future developments should ensure that a suitable simulator is purchased. Good co-operation between manufacturer and user should include technical and instructor training if the full potential of the chosen equipment is to be utilised.

Any simulator is safer than an operational experience and for this reason intensive training can take place and mistakes made which would not or could not be tolerated in real life. There is a limit to the amount of time that students will accept on simulators before the realism and challenge wears off and is replaced by boredom.

Particular airspace structures and specific procedures can be set up. Exercises are designed which whilst emphasising theoretical learning steps, increase understanding and allow for the practice and acquisition of skills. At the same time challenge is given to the student through set goals and objectives.

During the practical training session the instructor guides the student providing assistance as necessary, ensuring that basic routine skills are quickly and successfully mastered before going on to finer points of technique. A good understanding of basic skills will provide for sound control in the operational environment.

Debriefing sessions after each practical training session are invaluable times during which instructor and student go over the exercise analysing and correcting. It is important that the instructor, who must often comment on faults, does not dwell on these but demonstrates to the student how improvement can be made.

A record should be kept of the student's progress which is available to the student himself. Weaknesses can be corrected before they become habits and students are motivated by success.

c. Examinations

Written examinations test knowledge, oral examinations test understanding and practical examinations test skill. To be effective, an examination must have at least validity (i.e. it measures what it is supposed to measure), reliability (i.e. it gives consistent results) and objectivity (i.e. it should not depend upon the subjective belief, opinion, interpretation or judgement of the examiner). Students should under- stand the reasons underlying the use of tests and assessments if results are not to be unfairly influenced by "examination nerves". Briefings to students on the con- duct of examinations and on the various aspects at which the examiners will be looking will reduce the "unknown" and help students to be more relaxed and less likely to make uncharacteristic and needless errors. An examination system which has validity, reliability and objectivity should enable accurate information to be obtained about a student's achievement of the objectives set for the course. In addition the information thus obtained could also be used to evaluate the effectiveness of the training system.

Whether formal examinations should be set or performance assessed over a period is a debatable point. Air Traffic Control is a responsible profession demanding high standards of proficiency and where a licence is issued this usually has to be obtained by the satisfactory passing of examinations.

It is suggested that:

During school training regular progress tests should be given on all theoretical subjects. Results should be analysed and discussed with the students.

The students should be regularly assessed and debriefed throughout the period of simulation training. A written report should be made by the instructor on a regular basis and should reflect the level attained by the students plus his overall course performance. Both the assessment and the final practical examination should contribute to the total marks.

Oral examinations allow assessing that knowledge and understanding which cannot be determined from the written examination. They also examine the ability of the student to express him in a clear and unambiguous manner.

A student that has failed an examination should, provided he has shown some signs of success and it can be determined that he has controller potential, after a suitable period of further training, be permitted a re- examination.

No student should be given unlimited training time but neither do all students reach the required standard in the same training time.

By now the student will have satisfied the basic requirements for obtaining an Air Traffic Control Licence but has yet to prove his ability to apply this knowledge and skill in the operational environment.

d. Summary

The total training time, depending upon requirements, will be between one and three years. For each phase (Aerodrome, Approach and Area) a study period of classroom lessons and simulation exercises at an ATC college will be followed by on-the-job training.

To improve on the overall quality of training and to assist in a smooth transition from college to operational unit it is desirable that operational coaches help in the simulation training whenever possible.

The task of the coach will be:

i. To assist the instructor in making the simulation exercises as realistic as possible;
ii. To give the students advice and guidance on the operational procedures which they will shortly be encountering;
iii. To familiarise himself with the students' progress (i.e. identify specific weaknesses that may require attention during OJT).

It is not necessary for coaches to be involved in all stages of simulation training and most benefit is probably gained during the last two weeks of training prior to the examinations when the students have attained a reasonable standard of performance and are consolidating skills.

The requirement for close co-operation between ATC College and operational unit should extend beyond that of coaches assisting in simulation. ATC training is classroom / simulator and on-the-job.

It should be brought to the attention of ATC administrations that there is a requirement for close co-operation between ATC training schools and ATC units for which training is performed.

18. INFORMAL TRAINING (ON-THE-JOB)

At this stage the student really begins to feel like an Air Traffic Controller, crammed with knowledge and full of confidence. Yet for many this can be a daunting time. The full impact of the "responsibilities of the Air Traffic Controller" begins to become apparent. Few mistakes can be tolerated and then only minor ones. The situation is live, dynamic. No time to "stop clocks" and sort out the problem. More knowledge has yet to be learned; new skills and techniques to be acquired and practised. An important factor for the trainee controller, at this time, is his acceptance into the team by the other controllers. Unless the trainee feels settled and to some extent accepted in his new environment then there could arise problems during on-the-job training (OJT).

The task of the OJT coach is a demanding one. Not all controllers make good coaches nor do all controllers want to become coaches. The controller who coaches must want to teach. He must be proficient and confident in his own skills. He must be able to handle a traffic situation through another person, at the same teaching skills to that person and still have overall command of the situation. There are principles and techniques in coaching which all who coach should be aware of so that the coaching is efficient and the standard of Air Traffic Services is maintained.

The selection of controllers as OJT instructors should not only be made on the basis of experience but also on motivation and instructional aptitude.

All OJT instructors should attend a suitable course of training in order to increase their awareness of the techniques available in OJT and of the application of such techniques.

An efficient training organisation at an operational ATC unit employs qualified coaches and training officers - specialists. Close links are maintained with the ATC College, so that the previous performance is known and there is neither gap nor overlap as the trainee progresses through his training.

As in school training, the practical performance of a trainee can be assessed against specific objectives for a particular stage of training. Initial objectives might relate to strip marking, phraseology, management of strip display etc., (i.e. routine skills). Thereafter, basic techniques of controlling aircraft in light traffic situations, conflict detection etc. leading up to complex situations in heavy traffic, conflict resolution and traffic expedition. If objectives are set in this manner the trainee is able to judge his own performance, pace his work accordingly and on the successful completion of one phase move forward with confidence to the next.

For the coach also, regular assessments of objectives against trainee performance can identify weaknesses so that the correct action can be taken immediately be- fore unsafe habits develop. Training then becomes a smooth progression toward check-out in an acceptable period of time.

Simulation exercises can be carefully graded so that students achieve maximum learning benefit. This situation is not entirely possible during OJT as the flow of air traffic cannot be adapted to suit individual student requirements. However, known traffic flows and peaks can be effectively utilised. Initially working periods of light traffic until the basic routine skills are mastered, the trainee controller progresses to medium level traffic (planning and analysis) and then on to heavy traffic (consolidation and experience). At times, when the traffic level is unsuitable for training, classroom instruction or discussion sessions can be held dealing with local procedures, new equipment, traffic analysis etc. Ideally the use of a simulator or off-line computer facility could supplement live traffic training for teaching unusual situations and more complex problems.

When the trainee controller has reached a standard regarded as being proficient and has satisfied requirements that he can work without supervision he is normally granted a licence permitting him to carry out the duties of an Air Traffic Controller for a specific task (Aerodrome Control, Approach Control etc.) at a particular unit.

Examination on local procedures, local area, letters of agreement etc., should be made.

During OJT regular assessments by OJT instructors should be provided. Reports on student progress should be forwarded to the training section. At all times the student should be kept informed and permitted to see his report.

If assessments are conducted controllers must have the opportunity of sighting these assessments and discussing them with the assessing officer. Additionally a controller must have the opportunity of registering, on the assessment form, his comments regarding the assessment and the manner in which it was carried out.

Experience has still to be gained and the prudent supervisor would permit the newly qualified controller only to work on those sectors where the traffic level is expected to be well within the capabilities of one lacking in experience. Gradually, as experience and confidence increase, the new controller works on busier sectors until considered to be fully integrated.

Coaching is a specialist task and one that is carried out in addition to controlling aircraft. For this reason it will be seen that a certain amount of operational experience is necessary before a controller commences coaching. For a newly qualified controller this period may last three years. The first seasonal or summer peak gives an awareness of limitations and confidence is gained. During the second summer experience builds up and perhaps by the third summer the controller may feel able to accept the extra responsibility of coaching a trainee in light traffic situations having followed a course on coaching techniques.

A period of consolidation should follow a check-out. The previous experience of the student must be taken into account.

Apart from being validated on the position concerned, a controller should not be engaged in training student controllers unless he has at least two years operational experience.

19. CONTINUATION TRAINING REQUIREMENTS

The quality and efficiency of training is dependent upon the skills and expertise of those involved at all stages i.e. selection, classroom and simulation instruction, examinations, on-the-job etc, and their close co-operation with one another. They should be aware of the objectives relevant to their involvement and that of their predecessors and successors. These tasks rightly belong to the controller but they are specialist tasks and therefore require the development of specialist skills. Those who accept the challenge of training should first and foremost want to do it then they should be given the opportunity to follow suitable training courses. An efficient training system ensures that after careful selection the successful candidates are given formal and informal training by expert staff at ATC College and an operational ATC unit in order to reach the required standard, demonstrating thorough knowledge and comprehension of Air Traffic Control, in the optimum training time.

Three different types of Continuation Training are determined:

Continuation Training is a generic term indicating a training phase following licensing and rating training. Continuation Training can include Refresher Training, Additional Training and Development Training.

- Refresher Training: organised on a regular basis and forming part of a competency scheme (towards rating validation);

The process of further training in order to maintain current operational tasks requirements by refreshing knowledge and skills previously required. It will also apply to any training undertaken to maintain competency or retrain a controller prior to re-assessment of competency.

- Additional Training: organised when required, likely in conjunction with refresher training;

The process of further training in order to meet or enhance operational tasks requirements by learning new or changed procedures, upgraded systems and operational and / or environmental aspects of concern.

- Development Training: This is not site specific and aims to prepare an ATCO for new and/or extra tasks not reflected in the licence.

The process of further training where a licensed ATCO is prepared for ancillary tasks such as coaching, supervision, OJT instruction, etc.

a. Refresher Training

Refresher training for the Air Traffic Controller means a re-acquaintance with previously learned facts, a re-assessment of skills and an awareness of current specialist developments in aviation. Spectacular advances are being made in ATC in both technical equipment and the associated procedures, which must be developed so as to incorporate the new technology.

Refresher training courses, through discussions and simulator exercises, should permit controllers to review their knowledge and skills so as to identify areas of ambiguity and misunderstanding between written procedures and operational practice.

As a means of maintaining a world-wide Air Traffic Control Service of the highest standards, controllers should participate in a refresher course, which should not have a bearing on the test of the proficiency of the controller, (training and simulation designed to ensure maintenance of knowledge and abilities with respect to all standards, procedures, equipment and technique currently in use).

The requirement is emphasised for Air Traffic Controllers to regularly attend training courses which should not have a bearing on the test of proficiency of the controller.

Training before Competency Checks

Methods of checking the proficiency of the controller are desirable. The sophistication of modern equipment, the complexity of air traffic and airspace structure and the volume of air traffic demand that the Air Traffic Controller exercise his skills to the highest standards at all times if safety is to be preserved.

From the training point of view when a system of proficiency checking is to be set up and then implemented, all the staff concerned need to be educated on the purpose of the system, its aims and how it will be administered.

Specialist checkers will have to be selected and trained so as to reach a common standard of assisting and reporting. Specific training or refresher courses plus adequate facilities may have to be established whenever there is doubt about the ability of controllers to perform their tasks to the required standard. If controllers do not come up to the necessary standard then they must be given the chance to receive the re-training they need.

Before proficiency checking system is implemented adequate training facilities should exist to enable further training to take place where necessary.

Topics to be covered will include changes in local procedures, letters of agreement, revised phraseology, updating on new aircraft performance, ability to adhere to standard practices, ability to handle an unusual situation.

Emergency Training

An Air Traffic Controller may perform his task satisfactorily for many years without ever being faced with an emergency situation or flight emergency responses nor having handled unlawful interference situations and thus be not fully aware of the correct procedures to apply quickly, should such a situation develop.

Emergency training, including Flight Emergency Response (IFER) and coordination training and handling of Unlawful Interference situations should be part of the refresher training.

Special Circumstances Training

One aspect of training that should not be neglected is that relating to unusual situations i.e. ATC System malfunctions. It is felt that whilst such occurrences may be infrequent, when they do occur they do so without warning and often at a time that requires prompt and timely action by the controller if the situation is to remain safe. Controllers must know thoroughly the likely results of any system failure and the correct action to take to avoid a worsening of the situation.

Whatever the ATC environment, controllers should receive suitable, regular training on the published back-up procedures which would be put into operation in the event of a system failure.

Controllers need also to be aware of the limited service that can be provided by a modern computer-generated synthetic radar display when such a system is de- graded through technical failure.

It should be noted that many Air Traffic Control units who work with sophisticated and advanced automated radar systems do revert to non-radar methods of controlling aircraft when transferring flights from unit to unit. Whilst working aircraft within his own area of responsibility the controller may rely entirely on radar separation procedures but because of letters of agreement he will use other methods of separation when transferring aircraft to an adjacent unit. It is necessary that the controller in this situation be as familiar with non-radar as with radar procedures for the separation of aircraft.

Procedures in ATC

Topics to be covered will include changes in local procedures, letters of agreement, revised phraseology, updating on new aircraft performance, ability to adhere to standard practices, ability to handle an unusual situation.

b. Additional Training

English Language Training

The ICAO requirements are that ATCOs and Pilots meet ‘Level 4’ standards of English competency, and these are broadly described below, but MAs should note that the terminology used is predominantly that of expert linguists and is not meant for operational ATCOs to necessarily understand.

The requirements became operative in 2003 for new recruits, but will be implemented in 2008 for current ATC Licence holders operating International Services:

- **Pronunciation**

Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation, but only sometimes interfere with ease of understanding.

- **Structure**

Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.

- **Vocabulary**

Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work related topics. Can often paraphrase successfully when lacking vocabulary in unusual or unexpected circumstances.

- **Fluency**

Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers or connectors. Fillers are not distracting.

- **Comprehension**

Comprehension is mostly accurate on common, concrete, and work related topics when the accent or variety used is sufficiently intelligible for an inter- national community of users. When the speaker is confronted with a linguis- tic or situational complication or unexpected turn of events, comprehension may be slower or require clarification strategies

- **Interactions**

Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals with apparent misunderstandings by checking, confirming or clarifying.

Sufficient training must be available for current ATCOs of all English language abilities so as to be able to meet the required ICAO level and subsequently to retain (or improve) that competency.

Staff who are unable to achieve and maintain the English language requirements must have their positions protected and given opportunities to reach the required ICAO level.

System Upgrade Training

Technical development in aviation is making a big impact on the Air Traffic Control systems of the world. Change is inevitable and the controller has to adapt himself to meet the challenge of the systems and new procedures. Training must be given in order to equip the controller with the knowledge and understanding that he re- quires to help him adapt to his new environment.

Suitable training will have to be given in due time so that when the new equipment and procedures are introduced operationally, all those concerned are familiar with and have confidence in the new system.

One of the greatest changes that have taken place in ATC in recent years has been the introduction of automation in varying degrees. Basic knowledge of computers and automatic data processing as applied to ATC will be a requirement for all controllers. Such background knowledge will be useful in helping the controller to understand the extent to which automation will affect his working life and how he may have to develop new skills. Further training will be necessary to familiarise controllers with new equipment and operating procedures. It is essential that training on the system be carried out not only on an individual basis but also on a team basis. Often faults and misunderstandings do not become apparent until the whole system is put to the test.

Training programmes will require careful planning as the new system will have to be integrated along with the old one and much training will probably have to take place during breaks and off-duty periods. As the automation of an Air Traffic Control system expands and further technological innovations is introduced the controllers will require more training in order to maintain confidence in the new system and the new skills that undoubtedly will have to acquire.

Controllers required to operate in an automated Air Traffic Control system should receive relevant instruction in automatic data processing for ATC.

Formal training should be established for all ATC personnel in the theoretical and practical procedures associated with the automated ATC system.

The above training should be carefully integrated with the implementation of each stage of the automated ATC system.

Flight Experience

It is important that the Air Traffic Controller be familiar with the environment in which he works. This includes having some knowledge and understanding of ATC from the airspace user's point of view. Such familiarity can be achieved by gaining flying experience.

The Federation (IFATCA) recommends to all authorities responsible for the operation of Air Traffic Services:

1) **To provide for familiarisation flights in the cockpits of aircraft for Air Traffic Controllers, with combined facilities to visit adjacent and distant Air Traffic Control units.**
2) **Licensed and trainee controllers should participate in familiarisation flights each year.**
3)
    a. **To encourage air traffic controllers with flying experience to maintain their proficiency by offering special facilities, and**

b. To encourage air traffic controllers without flying experience to gain such experience by providing facilities for pilot-training to the level of the Private Pilot Licence, and

4) To exploit the use of link trainers for the familiarisation of air traffic controllers with specific in-flight problems.

ACAS/TCAS - GNSS

The use of ACAS in the form of TCAS has been implemented worldwide by air- lines. In most countries there is a lack of suitable ATC training as far the use of TCAS is concerned. Therefore controllers are not familiar with TCAS dynamics, and particularly with reference to manoeuvres performed by pilots as a result of resolution advisories (RA).

Existing IFATCA policy emphasises that "the primary means of collision avoidance within a controlled airspace environment must continue to be the air traffic control system". Therefore controllers should be fully aware of their functions and responsibilities connected with the use of TCAS. Pilots, also, should be more conscious of all possible outcomes caused by aircraft not complying with as ATC clearance when following a TCAS advisory.

In most countries ACAS information is almost non-existent. This is not as adequate situation as far as the controller's functions and responsibilities are concerned. Controllers should be provided with guidelines, familiarisation and training programme in the use of ACAS. This programme should cover the following subjects:

a) Official Definition of ACAS (TCAS)
b) Technical Description and Cockpit Displays
c) Pilot Responsibilities and Reactions to Traffic Advisories and Resolution Advisories
d) Controller Reactions and Legal Responsibilities
e) Phraseologies used in TCAS Communications
f) Experience of Simulated ACAS (TCAS) events either in a Simulator or on video.

Air Traffic Controllers require training in the technical and operational aspects of ACAS (TCAS) in order to fulfil their duties and responsibilities. Controller training packages should contain, at a minimum, the elements described above.

Other areas as GNSS, RVSM or other 'new' areas should be dealt with as well.

Environmental Aspects

Team Resource Management, Human Factors in ATC, Critical Incident Stress Management and other related ATC items are to be included in a total package of additional training.

Team Resource Management as a concept should be considered in the basic and continuation training of ATCOs as well as prior to an appointment as supervisor or management position.

Presentations by pilot representatives and aviation industry experts should also be included in the course. Items of interest could be aircraft performance, new type of aircraft, cockpit policies.

c. Development Training

OJTI/Check Examiner

The OJT coach has a very responsible task to fulfil. It is rarely the case that the "best" controller makes a good coach. Also, many operational controllers obtain much satisfaction from using their skills in controlling aircraft and may be unwilling to become instructors. They do not wish to accept the additional responsibility of training whilst at the same time being more remote from the traffic situation. The OJT coach must be experienced in ATC and be able to get on well with people. Above all he must be highly motivated towards teaching and enjoy the job. Many coaches are unaware of the number and variety of training techniques so that consequently their own techniques are very restricted.

In contrast to simulation training OJT is difficult to plan and develop systematically. Safety always has priority. The objective of OJT is to train a student for operational status and unless some thought is given to matching the traffic load to the student's present ability; little or no benefit will be obtained. There are techniques to be learnt so that the coach and student can obtain the maximum benefit from training sessions. The interpersonal relationship between coach and student is very important in creating an optimum atmosphere for learning.

It is recommended that all OJT coaches attend a suitable course of training in order to increase their awareness of the techniques available in OJT and of the application of such techniques.

This training should be organised as part of the OJTI-rating requirements.

Supervisor / Management and Second Career

Whenever controllers are promoted to operational or non-operational posts they should receive suitable training to enable them to carry out these new tasks effectively.

Senior career posts in Air Traffic Control are often very restricted and the nature of the job with its inherent stresses means that controllers are very frequently forced to retire from the job at an earlier age than is customary in other professions.

Administrations are not always able to absorb all the ex-controllers in supervisory, management or other non-operational posts. Therefore, assistance should be given, at an early stage, to provide second career opportunities for Air Traffic Controllers.

Prior to appointment to a supervisory or management position, controllers should be provided with suitable supervisory and management courses which meet the requirements of the new position.

Controllers should also be provided the opportunity to take courses which will prepare them for employment on other duties, including management positions.

Others

Before controllers take up any other tasks as may be in the field of airspace management, safety management, safety regulation, competency checker, any specialist task or a general management function, proper training should be provided.

20. CONCLUSION

This paper has attempted to show how careful selection followed by a well de- signed training programme can go a long way toward consistently producing Air Traffic Controllers qualified to the highest standards of operational performance required of the profession. It has outlined the necessity of having trained specialists at all stages of training.

Although theoretical and simulation training may appear to be totally divorced from on-the-job training they are only parts of the whole training which will be experienced by today's controller. It is important that the various objectives set during the different phases of training do relate to the overall objective which we might define as:

- to consistently produce Air Traffic Controllers trained to the same high standard thereby maintaining the high level of safety and quality of service expected from the profession of Air Traffic Control.

The theory learnt by the student in class is immediately taken into the simulation so that it can be fully understood, applied and the skills mastered. The effective instructor will combine his classroom work and practical exercises in this manner thus building up the student's knowledge, understanding and skill from learning unit objectives, step by step, as one builds a house brick by brick each supporting the other. The assistance of operational coaches during simulation training and the use of the students' own area and procedures reduces training time, eases the transition from formal (ATC college) to informal (OJT) training and assists students in settling into live traffic situations. All this requires close cooperation and co- ordination between all those involved in training but if the result is a shorter overall training time for the same high standard and consistent successes are achieved then the effort must be considered as being worthwhile.

Furthermore, it has been observed that training does not end with the check-out. Refresher training courses should be available on a regular basis and familiarization flights undertaken annually. A change in duties or the introduction of new equipment and new procedures necessitates further training.

Constant reviewing of the training system and an exchange of information and opinions between all those involved in training will help to promote a more thorough approach to training and possibly in a shorter and more economic time.

It is the task before all those involved in training in Air Traffic Control in today's rapidly changing world to make the ideal a reality and to be able to say in all honesty that we have a world-wide standard in training.

***** THOROUGH TRAINING PROMOTES SAFETY *****

ANNEX

REFERENCES

IFATCA MANUAL
Professional Policy - Training

INTERNATIONAL LABOUR OFFICE
Meeting of Experts on problems concerning Air Traffic Controllers (Geneva, 8 –16 May 1979)

INTERNATIONAL CIVIL AVIATION ORGANISATION
ICAO Training Manual

LM:

LEGAL MATTERS

POLSTATS

LM 4.1 LEGAL LIABILITY OF THE CONTROLLER

LM 4.1.1 FOUNDATIONAL AND GENERAL POLICY ON THE LEGAL LIABILITY OF THE CONTROLLER

IFATCA Policy is:

It is imperative to provide adequate legislative protection for the air traffic controller in order to reduce such strains as may be engendered from improper legal status.

See: WP 79 - Brussels 1979
See also: WP 62 - Athens 1985, WP 59 - Toronto 1980, WP 63 - Brussels 1979 and WP 51 - Copenhagen 1978

IFATCA is of the opinion that the criminal and civil prosecution of controllers following aviation accidents and incidents is not in the public interest. This is a matter of how and where laws are applied in a very technical area and is not just a matter of inappropriate laws. This problem, then, should not be addressed through an international convention proscribing criminal prosecution in these cases, but rather through an international understanding of the problems created in the technical field by such prosecutions and an understanding of the various matters of public policy involved.

See: WP 159 – Dubrovnik 2009

IFATCA can never support any controller who is guilty of gross negligence and / or flagrant dereliction of duty. However, the Federation must reserve the right to use any legal means available to it to protect any member who is accused of such tort.

IFATCA defines that it should be necessary to prove "mens rea" (guilty mind) beyond all reasonable doubt, before a crime can exist.

All other cases where "mens rea" cannot be proven must fall under Civil law, as opposed to Criminal Law. It must be heard by a competent Civil Court, and must be subject to the following conditions:

- **d) No controller to be imprisoned pending a civil court hearing, nor after a civil court hearing if it is proven that a controller has committed a tort only;**
- **e) No controller subjected to disciplinary action under administrative law to have the administrative case heard prior to the Civil Court action. If there is likelihood of a Civil action, it would be fairer to transfer the controller to non-active duties without loss of any financial benefits in all cases, thereby avoiding prejudging the Civil Court's ruling;**
- **f) Employing Agencies to be responsible for the torts of their employees;**
- **g) Military authorities and controllers to be subject to the same legislation when either they are controlling general air traffic, or an accident occurs involving general air traffic and operational air traffic, the latter being under military control or flying without control;**

h) **IFATCA is not renouncing legal liability for air traffic controllers, but seeking only to keep it within reasonable bounds so that the controller may suffer less stress in carrying out his day-to-day duties.**

See: WP 172 - Santiago 1999
See also: WP 155 - Toulouse 1998 (2) and WP 64 - Athens 1985

IFATCA shall continue the efforts towards a suitable Convention limiting the Legal Liability of air traffic controllers.

See: WP 64 - Athens 1985

In the event of an accident or incident that can be shown to have been caused wholly or in part due to inadequate standards, regulations, staffing, equipment and training or any other professional tool given to the ATCO, the employer should demonstrate that they are not vicarious liable whether or not such acts or omissions were specifically authorized by the employer.

Member Associations shall bring to the attention of their national administration written details of any persistent deficiency in order to create a deficiency data base and to emphasize their vicarious liability.

During the legal proceedings following an investigation, all legal representatives should consider the controllers work environment and any other pertinent factors that contributed to the incident or accident as an overall evaluation of the event (holistic approach).

The controller's employer should indemnify the controller for all damages and legal costs for defence incurred if a controller is held liable as a result of carrying out his duties for his employer.

See: WP 159 - Dubrovnik 2009

An aerodrome controller cannot be held liable for any accident or incident that occurs on that portion of the aerodrome or its vicinity under his control if there is no direct visual observation of the area and a surface movement surveillance system is not in use. Surface movement surveillance systems shall only be used to supplement direct visual observation.

See: WP 159 - Dubrovnik 2009 and also WP 165 - Kaohsiung 2006

LM 4.1.2 THIRD PARTY RISK

IFATCA policy is:

Third Party Risk can be defined as the probability that individuals on the ground are affected by aircraft accidents.

Procedures to reduce third party risk should clearly describe the responsibility of the ATCO providing ATS to the emergency aircraft.

ATCO's providing ATS to aircraft in an emergency situation should not be held liable for losses suffered by third parties caused by the emergency aircraft.

See: WP 164 - Hong Kong 2004 and WP 159 Dubrovnik 2009

LM 4.1.3 LIABILITY RELATED TO AERODROME CONTROLLERS

IFATCA policy is:

Where apron management services are established and not provided by an aerodrome ATS Unit, aerodrome controllers cannot be held liable for accidents or incidents that occur whilst aircraft are under the jurisdiction of the Unit providing such a service.

See: WP 159 - Dubrovnik 2009 and WP 163 - Cancun 2002

LM 4.1.4 TRANSFER OF CONTROL FUNCTIONS - LEGAL ASPECTS

IFATCA policy is:

States must have in place regulations detailing procedures to be followed before Separation Assurance can be transferred to the cockpit.

The Initial and final points at which Separation Assurance are transferred from ATC to the pilot must be accurately defined in all cases.

The responsibility for providing separation between the intercepting aircraft and all other aircraft must be clearly defined. ATCO's should not be held liable for incidents or accidents resulting from an interception.

See: WP 166 - Santiago 1999 and WP 89 - Kaohsiung 2006

LM 4.2 ACCIDENT AND INCIDENT INVESTIGATION

LM 4.2.1 JUST CULTURE, TRUST AND MUTUAL RESPECT

Accidents and incidents in the aviation have been used to enhance aviation safety. Safety information is a main source for the permanent enhancement of safety in aviation. But there are many risks of its inappropriate use. As a result safety information is very sensitive and needs special protection.

The information is not to be put into the public domain or to be used against the personnel involved.

Voluntary reporting system are different than mandatory, they shall contain safety concerns, issues or even hazards, connected with the suggestions how this can be avoided in the future. ICAO states that there should be a voluntary reporting system established and it shall be non punitive.

IFATCA policy is:

A Just Culture in Accident and Incident Investigation is defined as follows: "A culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated."

Just Culture requires a corresponding national legal framework because the administration of justice is the responsibility of States. IFATCA shall encourage ICAO to foster the establishment accordingly in its Member States.

~~**Member Associations shall promote the creation of Air Safety Reporting Systems based on confidential reporting in a just culture among their service provider(s), Civil Aviation Administration(s), National Supervisory Authority(ies) and members.**~~

Member Associations shall promote the creation of mandatory incident reporting systems based on confidential reporting in a just culture among their service provider(s), Civil Aviation Administration(s), National Supervisory Authority(ies) and members.

Member Associations shall promote the creation of voluntary incident reporting systems provided that the reported information will never be used against the reporting person. Compliant with the guidelines of the ICAO SAFETY MANAGEMENT MANUAL.

IFATCA shall not encourage Member Associations to join Incident Reporting Systems unless provisions exist that adequately protect all persons involved in the reporting, collection and / or analysis of safety-related information in aviation.

Any incident reporting system, including the collection, storage and dissemination of safety related data, shall be based on the following principles:

a) in accordance and in cooperation with pilots, air traffic controllers and Air Navigation Service Providers;
b) the whole procedure shall be confidential, which shall be guaranteed by law;
c) adequate protection for those involved, the provision of which be within the remit of an independent body

Air Navigation Service Providers and their respective employee groups shall develop mechanisms that foster an environment of trust and mutual respect in order to improve the capability to compile, assess and disseminate safety-related information with each other, as well as with other national and international aviation organizations.

See: WP 156 – Kathmandu 2012 and WP 159 - Istanbul 2007
See also: WP 167 and 168 - Hong Kong 2004 and WP 167 - Geneva 2001

LM 4.2.2 EXEMPTION FROM DUTY

IFATCA policy is:

When an accident or incident is alleged to have occurred where the actions of an Air Traffic Controller may have had a bearing, the Controller shall have the right to be exempted from control duties until he is physically and psychologically fit again. The removal is without prejudice, and is non-disciplinary.

A Controller thus exempted or removed shall not suffer loss of pay during any period in any way associated with the investigation of an incident / accident.

See: WP 159 - Istanbul 2007
See also: WP C.9. - Nairobi 1987 amended WP C.9. – Acapulco 1990

LM 4.2.3 RIGHT OF REPRESENTATION

IFATCA Policy is:

The Controller has the right to be accompanied by a representative of his choice at any hearing, inquiry or investigation into any Air Traffic Control incident or accident.

The Controller should make no written statements without the advice of a legal representative of his choice, even at pre-investigation board stages.

The circumstances prompting the investigation, and the perceived operational situation immediately prior to the alleged incident / accident, shall be made available to the Controller and his representative prior to any questions being put to the Controller.

When an Investigation Board is convened, it shall be confidential and non-disciplinary in nature. The Board should be comprised of individuals who have operational experience in Air Traffic Control.

The Controller and his representative have the right to make representations and direct questions to the officials in charge of the investigation.

MAs shall inform their members that any statement made in an accident or incident investigation could also be used by prosecutors in legal proceedings.

The Controller and his representative have the right, prior to appearing before any investigative Board, to review all relevant video and audio recordings and computer readouts of Air Traffic Control operations where available. In addition, the Controller and his representative shall be provided with copies of transcripts of all relevant audio recordings prior to appearing before any Investigative Board.

See: WP 156 – Kathmandu 2012, WP 159 - Istanbul 2007 and WPs. - Nairobi 1987 amended WP C.9. – Acapulco 1990

LM 4.2.4 PROTECTION OF IDENTITY

IFATCA Policy is:

Protection of the identity(ies) of ATM staff involved in incidents or accidents shall be guaranteed (Melbourne 05.C.9).

See: WP 159 - Istanbul 2007, WP 165 - Melbourne 2005

LM 4.2.5 REFERENCE CARD

IFATCA policy is:

Member Associations should provide their members with a card containing the basic rights they have and the rules that will be applied in case of incident/accident investigations (Acapulco 90.C.7).

See: WP 159 - Istanbul 2007, WP C.9. - Acapulco 1990

LM 4.2.6 USE OF RECORDED DATA

IFATCA Policy is:

Audio, visual and area recordings, together with associated computer data and transcripts of air traffic control communications are intended to provide a record of such communications for use in the monitoring of air traffic control operations, and the investigation of incidents and accidents. Such recordings are confidential and are not permitted to be released to the public. Such recordings are not to be used to provide direct evidence such as in disciplinary cases, or to be used to determine controller incompetence.

[2.6.2] Except for area recordings, recorded data shall only be used in the following cases:

a) **when investigating ATC related accidents and incidents;**
b) **for search and rescue purposes;**
c) **for training and review purposes provided all ATCOs affected agree;**
d) **for the purposes of adjusting and repairing ATC equipment. Area recordings shall only be used for accident investigation purposes.**

An area recording may generally be defined as any type of recording, audio and / or visual, instituted in an air traffic control operations room that records accurately the conversation of controllers and the environment within an air traffic control operations room on a continuous basis.

Access to recorded data shall be limited to authorised personnel for the purposes listed in 2.6.2 above. Authorised personnel shall be mutually agreed by the controllers' representative and the appropriate authority.

Recorded data used shall be identical as presented to and / or originated by the controller at the relevant controller's position.

IFATCA is opposed to the use of Visual Area recordings for reasons of invasion of privacy. Prior to the installation of Area recorders, legislation shall be in place which prohibits the use of any area recorder information against a controller in any criminal or civil litigation or disciplinary proceedings of any kind. The legislation should provide for substantial penalties for any breach of the legislation.

Except when an accident occurs, area recordings shall be capable of being erased when a controller is relieved from his position. Controllers shall have prompt confirmation of the erasure. Agreement between the Member Association and the employer on procedures for the erasure of area recordings shall be established prior to the operation of area recorders.

See: WP 159 - Istanbul 2007, WPs Nairobi 1987, WP7 - Acapulco 1990, WP 100 - Bournemouth 1992, WP 151 - Ottawa 1994, WP 154 - Taipei 1997

LM 4.2.7 ATTACHMENT: IFATCA POLICY ON ACCIDENT AND INCIDENT INVESTIGATION

IFATCA POLICY ON ACCIDENT AND INCIDENT INVESTIGATION

MARCH 1992
Amended 2004, 2006 and 2012

Introduction

The International Federation of Air Traffic Controllers' Association (IFATCA) lists among its objectives - "**to promote safety, efficiency and regularity in International Air Navigation**".

The basic purpose of any investigative process is to determine what happened, why it happened, and what can be done to prevent a recurrence. The investigative process can be more successful if air traffic controllers are protected from any discipline or legal liability flowing from an investigative process. They are less likely to practice wilfully or otherwise their implicit right to remain silent, if the investigation is confidential and non-punitive.

The International Civil Aviation Organization (ICAO), in Annex 13 to the Chicago Convention, states that "**the sole objective of the investigation of an accident or incident shall be the prevention of accidents or incidents. It is not the purpose of this activity to apportion blame or liability**."

In support this philosophy IFATCA has produced policy on Accident/Incident Investigation in order that air traffic controllers can contribute fully to an investigation. It is necessary to gather all relevant facts that led up to the incident/accident in order that we can continue to use this knowledge to improve the safety of the air traffic control system.

1. Just Culture, Trust and Mutual Respect

IFATCA Policy is:

A Just Culture in Accident and Incident Investigation is defined as follows: "*A culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated*."

Just Culture requires a corresponding national legal framework because the administration of justice is the responsibility of States. IFATCA shall encourage ICAO to foster the establishment accordingly in its Member States.

Member Associations shall promote the creation of mandatory incident reporting systems based on confidential reporting in a just culture among their service provider(s), Civil Aviation Administration(s), National Supervisory Authority(ies) and members.

Member Associations shall promote the creation of voluntary incident reporting systems provided that the reported information will never be used against the reporting person. Compliant with the guidelines of the ICAO SAFETY MANAGEMENT MANUAL.

IFATCA shall not encourage Member Associations to join Incident Reporting Systems unless provisions exist that adequately protect all persons involved in the reporting, collection and/or analysis of safety-related information in aviation.

Any incident reporting system, including the collection, storage and dissemination of safety related data, shall be based on the following principles:

- **a) in accordance and in cooperation with pilots, air traffic controllers and Air Navigation Service Providers;**
- **b) the whole procedure shall be confidential, which shall be guaranteed by law;**
- **c) adequate protection for those involved, the provision of which be within the remit of an independent body.**

Air Navigation Service Providers and their respective employee groups shall develop mechanisms that foster an environment of trust and mutual respect in order to improve the capability to compile, assess and disseminate safety-related information with each other, as well as with other national and international aviation organizations."

The aviation industry has accepted that humans cannot be changed but nonetheless are required to make the system work safely. The legal world holds the view that the system is inherently safe and that the humans are the main threat to that safety. Safety improvements in the aviation system will be achieved as a result of an open exchange of information. Human error cannot be avoided by "designing it out of the system" or disciplining operators. Error is a normal component of human performance. This fact must be incorporated into the design, implementation and operation of complex systems where safety is the expected outcome. Air traffic management (ATM) systems are a prime example of such a complex system.

IFATCA proposes that all incident reporting schemes should contain the following principles and criteria:

1. Mutual Trust,
2. Openness of communication,
3. A demonstration of care and concern,
4. A commitment to organisational learning
5. A transparent management commitment to safety,
6. An accountable and open system of information flow, i.e. Staff→ Management ATM →Staff.

Specifically, the "Incident Reporting System" must give the possibility to report in confidence rather than anonymously and provide some level of protection / immunity for the controller who is reporting deficiencies or anomalies. There should also be some level of guarantee for a fair hearing and an objective and impartial investigation that any such information given is not used for punitive or enforcement purposes. Reliable and documented follow-up should be provided with a detailed database available to all involved parties.

The Member Associations of IFATCA should play, where necessary, an important role in the process of creating the correct legal framework enabling a “just culture” in Safety Reporting.

2. Exemption from Duty

IFATCA Policy is:

When an accident or incident is alleged to have occurred, where the actions of an air traffic controller may have had a bearing, the controller shall have the right to be exempted from control duties until he is physically and psychologically fit again. The removal is without prejudice, and is non-disciplinary.

In case of an accident or traumatic incident/event, it is recommended that immediate psychological or medical advice be sought for all parties involved. The time required to obtain this advice and the subsequent return to duty of the controller should be considered part of the investigation for the purpose of protecting the pay and employment benefits of the parties involved. It is not always possible for a controller to assess his own state of mind after a traumatic situation such as an accident/incident. Therefore, it is recommended that the controller take at least the remainder of the shift to “collect” himself. A psychologist or medical professional can be of use in helping one determine a suitable time to return to duty.

“A controller thus exempted or removed shall not suffer loss of pay during any period in any way associated with the investigation of an accident/incident.”

The controller shall not be required to take any type of leave, e.g. sick leave, vacation leave, or any form of leave without pay to cover his absence from work as a result of being exempted from control duties when involved in an accident/incident. A controller may not be able to return to duty during the course of the investigations, which may at times be lengthy. It is not fair then to expect him to take any form of financial or other penalty while he awaits the outcome of the investigation.

3. Right of Representation

IFATCA Policy is:

“The controller has the right to be accompanied by a representative of his choice at any hearing, inquiry or investigation into any air traffic control incident or accident.”

The controller can be accompanied by an employee or Association representative. He should also have the right to be represented by legal counsel. The choice is his. Justice must be seen to have been served; therefore, the controller should be able to determine who would best serve his interests in the investigation.

"The controller should make no written statements without the advice of a legal representative of his choice, even at pre-investigation board stages."

It is not mandatory that a controller obtain advice from a legal representative prior to making written statements. In the case of an incident a controller should obtain advice from a representative (employee, Association, legal). In the case of an accident it is strongly recommended that the controller obtain legal advice. To keep track of the facts during a confusing time immediately after the incident / accident, it is often prudent to make some personal notes of the facts as he remembers them. These personal notes should not be made after he has had a lot of time to reflect on what happened. Notes should be made while the facts have not been coloured by rationalization or interpretation. Caution is suggested when making these notes. In some Member Association countries these personal notes may be admissible as evidence. Therefore, a preface should be included in the notes which state that they are for use of legal counsel only and that they are not an admission of guilt and that the controller reserves the right to change them as more facts become available to the controller.

"The circumstances prompting the investigation, and the perceived operational situation immediately prior to the alleged incident/accident, shall be made available to the controller and his representative prior to any questions being put to the controller."

The controller and his representative should be granted a reasonable amount of time to peruse this information. The controller should obtain the information dealing with the circumstances prompting the investigation prior to answering any questions. This will allow the controller and his representative to only respond to questions that deal with the alleged incident/accident. This would also ensure time to review what happened in order to arrive at complete and relevant answers to aid the investigation.

"When an Investigation Board is convened, it shall be confidential and non-disciplinary in nature. The Board should be comprised of individuals who have operational experience in air traffic control."

An Investigation Board is convened, in the case of an incident, to determine if a loss of separation or dangerous situation occurred and if so, what the cause was. Their findings are to be utilized to prevent such a situation occurring in the future. Accurate findings can only be made if all the information is available. Information will be made available when the Board is confidential and non- disciplinary.

If ATC matters are being investigated then it is only logical that the investigators have operational experience in ATC. The facts must not be confused. It is also recommended that another controller, preferably from the same area of responsibility, be on the Investigation Board to ensure impartiality, and to act as an expert advisor on questions that explore practices that may be unique to the facility or sector where the incident allegedly occurred. The same would apply in an accident where the possibility exists of ATC involvement.

"The Controller and his representative have the right to make representations and direct questions to the officials in charge of the investigation."

"MAs shall inform their members that any statement made in an accident or incident investigation could also be used by prosecutors in legal proceedings."

One of the objectives of an Investigation Board is to determine all the facts. This can be accomplished by allowing the controller and his representative to make representations and direct questions to members of the Board. This would allow for the opportunity to clear up any misunderstandings or misinterpretations of questions asked. It would also aid in obtaining full cooperation in achieving the common goal - prevention of a similar occurrence.

"The controller and his representative should use the Human Factor checklist in the appendix to this policy to make sure that all Human Factor aspects that might have had an impact on the occurrence being investigated are identified and taken into account."

See appendix hereafter. This checklist is based on the SHEL Model.

"The controller and his representative have the right, prior to appearing before any investigative Board, to review all relevant audio, visual and area recordings, also any computer readouts of air traffic control operations pertaining to this investigation. In addition, the controller and his representative shall be provided with copies of transcripts of all relevant audio recordings prior to appearing before any investigative Board."

When the controller and his representative have access to all relevant information prior to an Investigation Board hearing, they are fully prepared to participate in the hearing. This will assist the Board in determining the facts.

4. Protection of Identity

IFATCA Policy is:

"Protection of the identity(ies) of ATM staff involved in incidents or accidents shall be guaranteed."

The disclosure of personal information details, i.e.: names and addresses of individuals associated/involved with a serious ATC incident or accident have had tragic results for air traffic controllers.

Employers and Service Providers must take firm steps to establish and enforce appropriate legislation that would ensure that identities of air traffic controllers and other ATM staff involved in serious accidents/incidents remains privileged and protected.

5. Reference Card

IFATCA Policy is:

"Member Associations should provide their members with a card containing the basic rights they have and the rules that will be applied in case of accident / incident investigation".

This would educate the members as to their rights/responsibilities, and the steps to follow to protect these rights. This also puts members at ease by ensuring them that no steps in the process were forgotten and that there is a procedure or plan in place to protect and guide them through what can be a traumatic experience they have little knowledge of.

6. Use of recorded data

IFATCA Policy is:

"Audio, visual and area recordings, together with associated computer data and transcripts of air traffic control communications are intended to provide a record of such communications for use in the monitoring air traffic control operations and the investigation of incidents and accidents. Such recordings are confidential, are not permitted to be released to the public. Such recordings are not to be used to provide direct evidence in disciplinary cases, or to be used to determine controller incompetence."

Air traffic control recordings are intended to provide a record for the investigation of accidents/incidents and to provide protection for controllers. The protection of these recordings is essential to establishing a credible Accident/Incident Investigation Process.

"Except for area recordings, recorded data shall only be used in the following cases:

- **a) when investigating ATC related accidents and incidents;**
- **b) for search and rescue purposes;**
- **c) for training and review purposes provided all ATCOs affected agree;**
- **d) for the purposes of adjusting and repairing ATC equipment."**

It is recognised that recorded data can be used for more purposes than just the investigation of incidents and accidents.

In connection to SAR its use may be instrumental to determine the last known position of an aircraft.

In relation to ATC training its use is highly effective to allow students to see and/or hear a replay of a traffic situation they handled earlier. In this case prior agreement from all affected ATCOs should be sought, for reasons of courtesy and privacy protection.

Furthermore, there are no objections against the use of recorded data (including computer readouts) by technicians who are adjusting and/or repairing ATC equipment.

"Area recordings shall only be used for accident investigation purposes. An area recording may generally be defined as any type of recording, audio and/or visual, instituted in an air traffic control operations room that records accurately the conversation of controllers and the environment within an air traffic control operations room on a continuous basis.

Access to recorded data shall be limited to authorised personnel for the purposes listed above. Authorised personnel shall be mutually agreed by the Controllers' representative and the appropriate authority."

Since there may be differences of opinion as to whom has access to recorded data, it is believed there should be mutual agreement between the Controllers' representative and the Authorities on what personnel is authorised to use the data. It should be noted that in some countries national legislation may have a bearing on this topic as well.

"Recorded data used shall be identical as presented to and/or originated by the Controller at the relevant controller's position."

If recorded data is to be used to reconstruct what happened in a given situation, it is of paramount importance that what is recorded (and replayed) is an exact replica of what was presented to and / or originated by the Controller at his working position. Any omissions or additions in the recording will make a correct reconstruction impossible, and are therefore unacceptable.

"IFATCA is opposed to the use of Visual Area recordings for reasons of invasion of privacy.

Prior to the installation of Area recorders, legislation shall be in place which prohibits the use of any area recorder information against a controller in any criminal or civil litigation or disciplinary proceedings of any kind. The legislation should provide for substantial penalties for any breach of the legislation.

Except when an accident occurs, area recordings shall be capable of being erased when a controller is relieved from his position. Controllers shall have prompt confirmation of the erasure. Agreement between the Member Association and the employer on procedures for the erasure of area recordings shall be established prior to the operation of area recorders."

7. Summary

In summary, this policy allows for an effective Accident/Incident Investigation Process which will promote aviation safety and efficiency. It provides protection for a controller who has to appear before an Investigation Board which allows him to fully participate in the investigation process. A "just culture" investigative process ensures full disclosure which is conducive to making the correct changes to the system and thus ensuring and improving its safety.

(Istanbul07.C4)

Appendix

CHECKLIST BASED ON THE SHEL MODEL

(Geneva 01.C.4)

1. **PHYSICAL FACTORS**
   Physical Characteristics

   - **Height, weight, age, sex**
   - **Build, height, functional reach**
   - **Vision**
   - **Hearing**

2. **PHYSIOLOGICAL FACTORS**
   Nutritional factors

   - **Food intake 24 hours**
   - **Hours since last meal**
   - **Dehydration**
   - **On a diet / weight loss**

   Health

   - **Disease**
   - **Fitness**
   - **Pain**
   - **Dental conditions**
   - **Blood donation**
   - **Obesity, pregnancy**
   - **Stress coping (emotional / behavioral signs)**
   - **Smoker**

   Lifestyle

   - **Friendships**
   - **Relations with others**
   - **Change in activities**
   - **Life habits**

   Fatigue

   - **Acute (short term)**
   - **Chronic (long term)**
   - **Skill (due to task)**
   - **Activity level (mental/physical)**

Duty

- **Duration of watch**
- **Duty hours last week/month**
- **Overtime**
- **Leave periods - activities**

Sleep

- **Rest, nap duration**
- **Impairment**
- **Hangover**
- **Addiction**

3. PSYCHOLOGICAL FACTORS
Perceptions

Situational awareness

Types
- **Non perception**
- **Misperception**
- **Delayed perception**

Reaction time
- **To detect**
- **To make an appropriate decision**
- **To take the appropriate action**

Attention
- **Attention span**
- **Inattention (general, selective)**
- **Distraction (internal, external)**
- **Channelized attention**
- **Fascination, fixation**
- **Vigilance, boredom, monotony**
- **Habit pattern interference**
- **Habit pattern substitution**
- **Time distortion**

Information Processing
- **Mental capacity**
- **Decision making (delayed, poor)**
- **Judgement (delayed, poor)**
- **Memory capacity**
- **Forgetting**
- **Co-ordination – timing**

Workload

- **Task saturation**
- **Underload**
- **Prioritization**
- **Task components**

Experience / recency

- **In position**
- **Total years as controller**
- **Total years at specific unit**
- **Sleep deficit, disruption**
- **Circadian disrythmia**

Drugs

- **Medication over the counter**
- **Medication - prescription**
- **Illicit drugs**
- **Cigarettes, coffee, others**
- **Total years at specific sector**
- **Emergency procedures**

Knowledge

- **Competence**
- **Skills/techniques**
- **Procedures**

Training

- **Selection**
- **Initial**
- **On the job**
- **Transition, learning transfer from other units**
- **Recurrent**
- **Problem areas**
- **Emergency procedures**

Planning

- **Briefing prior to duty**

Attitudes/moods

- **Mood**
- **Motivation**
- **Habituation**
- **Attitude**
- **Boredom**
- **Complacency**

Expectations

- **Mind set/expectancy**
- **False hypothesis**
- **Risk-taking**

Confidence

- **In equipment**
- **In self**
- **In controllers on shift**
- **Overconfidence, showing off**

Mental/emotional State

- **Emotional state**
- **Anxiety**
- **Apprehension**
- **Panic**
- **Arousal level/reactions**
- **Self-induced mental**
- **Pressure/stress**

Personality

- **Withdrawn, grouchy, inflexible**
- **Hostile, sarcastic, negative**
- **Aggressive, assertive, impulsive**
- **Excitable, careless, immature**
- **Risk taker, insecure, follower**
- **Disorganised, late, messy**
- **Anti-authoritative, resigned**
- **Invulnerable, "macho"**

4. PSYCHO SOCIAL FACTORS

- **Mental pressure**
- **Interpersonal conflict**
- **Personal loss**
- **Financial problems**
- **Significant lifestyle changes**
- **Family pressure**

FACTORS RELATED TO INDIVIDUALS AND THEIR WORK

1. LIVEWARE-LIVEWARE (HUMAN-HUMAN) INTERFACE

Oral communication

- **Noise interfernce**
- **Misinterpretation**
- **Phraseology (operational)**
- **Content, rate of speech**
- **Language barrier**
- **Read back/hear back**

Visual signals

- **Hand signals**
- **Body-language**

Crew Interactions

- **Supervision**
- **Briefings**
- **Co-ordination**
- **Compatibility/pairing**
- **Resource management**
- **Task assignment**
- **Age, personality, experience**

Supervisors

- **Briefing**
- **Co-ordination**

WORKER-MANAGEMENT

Personnel

- **Recruitment/selection**
- **Staffing requirements**
- **Training**
- **Policies**
- **Remuneration/incentives**
- **Rostering**
- **Seniority**
- **Resource allocation**
- **Operational/directions/orders**
- **Managerial operating pressure**

Supervision

- **Operational supervision**
- **Quality control**
- **Standards**

Labour relations

- **Employee/employee-management**
- **Industrial action**
- **Unions/professional group**

Pressures

- **Mental pressure - operational**
- **Morale**
- **Peer pressure**

Regulatory agency

- **Standards**
- **Regulations**
- **Implementation**
- **Audit**
- **Inspection**
- **Monitoring**
- **Surveillance**

2. LIVEWARE-HARDWARE (HUMAN-MACHINE) INTERFACE

Equipment

- **Ergonomics**
- **Work place**
- **Colours, markings, illumination**
- **Confusion, standardisation**

Workspace

- **Workspace layout**
- **Control room temperature**
- **Relative humidity**
- **Adapted rest areas**
- **Facilities for eating and drinking**
- **Workspace standardisation**
- **Radar/data systems**
- **Flight progress strips/flight progress board systems**
- **Communication equipment**
- **Information systems**
- **Associated backup systems**
- **Chair design**
- **Restrictions to movement**
- **Illumination level, lighting**
- **Visibility restrictions**
- **Alerting and warning systems**
- **Personal equipment interference (comfort)**
- **Operation of instruments (finger trouble)**

3. LIVEWARE-SOFTWARE (HUMAN-SYSTEM) INTERFACE

Written Information

- **Manuals**
- **Letter of agreements (LoAs)**
- **Checklists**
- **Publications**
- **Regulations**
- **Maps and charts**
- **NOTAMs**
- **Standard operating procedures**

Computers

- **Computer software**
- **User friendliness**

Automation

- **Operator workload**
- **Monitoring task**
- **Task saturation**
- **Situational awareness**
- **Skill maintenance**
- **Utilisation**

Regulatory Requirements

- **Qualification - in position**
- **Qualification - in management**
- **Certification**
- **Medical certificate**
- **Licence/ratings**
- **Non-compliance**
- **Infraction history**

4. LIVEWARE-ENVIRONMENT (HUMAN-ENVIRONMENT) INTERFACE

EXTERNAL

Weather

- **Weather briefing, AIS facilities**
- **Actual and forecast weather**
- **Visibility, ceiling, light conditions**

Other factors

- **Time of day**
- **Lighting**
- **Other air traffic**

Aerodrome

- **Runway/taxiway characteristics**
- **Markings, lighting, obstructions**
- **SMGC-systems**
- **Radar facilities**
- **Approach aids**
- **Emergency equipment**
- **RWY surface conditions**
- **Low visibility procedures**

Maintenance

- **Support equipment and technicians**
- **Availability of parts**
- **Operational standards, procedures and practices**
- **Quality assurance practices**
- **Servicing and inspection**
- **Training**
- **Documentation requirements**

*** * * E N D * * ***

LM 4.3 LEGAL ASSISTANCE

LM 4.3.1 LEGAL ASSISTANCE FROM IFATCA

IFATCA policy is:

When accidents or incidents involving air traffic controllers are brought before an investigation board or court of law, IFATCA shall endeavour to provide legal assistance, if so requested in a timely manner by the concerned MA or any Associated Professional member of IFATCA.

When seeking legal assistance from IFATCA, the Member Associations shall establish contact with the Executive Board who will consult with the Chairman of PLC.

See: WP 155 - Toulouse 1998 (5)
See also: WP 102 - Bournemouth 1992 and WP 83 - Acapulco 1990

LM 4.3.2 EQUAL OPPORTUNITY LEGISLATION

IFATCA policy is:

MA's should bring to the notice of PLC any evidence of anomalies caused by equal opportunity legislation which they would wish the Standing Committee to study.

IFATCA accepts the ILO declaration concerning discrimination and equal opportunities. MAs should endeavour to ensure that the relevant authorities provide equal opportunities for all air traffic control staff.

See: WP?? - Nairobi 1987 and WP 166 - Geneva 2001
See also: WP 138 - Tunis 1996

LM 4.3.3 CENTRAL DATABANK OF JURISPRUDENCE

IFATCA policy is:

A databank of jurisprudence relating to legal proceedings involving ATCOs shall be maintained by IFATCA. The information in the databank will be made available to all Member Associations on request to the IFATCA Office.

The Reporting Form be included as an attachment in the IFATCA [T. & P.] Manual.

See: WP 151 - Marrakech 2000
See also: WP 136 - Santiago 1999, WP 136 - Toulouse 1998, WP 155 - Taipei 1997, WP 136 - Tunis 1996

LM 4.3.3.1 ATTACHMENT: DATABANK OF JURISPRUDENCE REPORTING FORM

Reporting Form: Please note your personal contact details will not be published.

Name of Country	
Name of Member Association	
Name and Position of Contract person	
Contact address	
Tel	
Fax	
Email	
Judgment and Case date	
Case facts in brief	
Central issues of the case	
Reason for decision	
Remarks	

Please return this form to: Chairman PLC - IFATCA, 1255 University Street, Suite 408, MONTREAL, Quebec, Canada. HB3 3B6. (Fax +1 514 866 7612)

LM 4.4 UNLAWFUL INTERFERENCE WITH INTERNATIONAL CIVIL AVIATION FACILITIES

IFATCA policy is:

ATC personnel are entitled to maximum security with respect to the safeguarding of personal life, operational environment and the safety of aircraft under their control.

If, during unlawful interference with Civil Aviation, the appropriate authorities instruct the Controller to deviate from, or violate, the ICAO rules, he shall in no way be held legally responsible for carrying out such an order.

[4.3] All orders which imply a deviation from the established air traffic rules shall be conveyed through the appropriate authorities, normally the immediate superior, and always through the authority responsible for the provision of Air Traffic Services. Such orders shall always be issued in written form, clearly identifying their origin and authority, and retained for investigative purposes.

The Air Traffic Controller on duty shall be granted relief from his working position when the conditions stated in para. 4.3 above are not followed, or when he considers the content of the order wrong or criminal.

During unlawful interference against ATC facilities, or its threat, services may be withdrawn. Measures shall be included in national or international contingency procedures, designed in such a manner, to ensure there will be minimal disruption of service.

Member Associations shall also urge their governments to ratify the existing protocols, conventions and treaties on these matters, to make them available to whom it concerns and to refrain from any course of action contrary to those rules.

Member Associations should seek formal agreement on the conduct of an Air Traffic Controller during situations of unlawful interference and the adoption of contingency procedures during such situations.

IFATCA will undertake, through its Executive Board, to transmit the contents of this policy to the appropriate international organisations, namely the United Nations, ICAO and the ILO, and also regional organisations who may be concerned with these matters.

See: WP 125 - Christchurch 1993

LM 4.4.1 ATTACHMENT:

POLICY DOCUMENT ON UNLAWFUL SEIZURE OF AIRCRAFT AND UNLAWFUL INTERFERENCE WITH CIVIL AVIATION AND ITS FACILITIES

1. Introduction

IFATCA, established in 1961, is a non-profit, non-political professional federation having as its main objectives the safety, efficiency and regularity of international air navigation, assists and advises in the development of orderly systems of air traffic control. In order to achieve these objectives, the Federation closely co- operates with national and international aviation authorities, sponsors and sup- ports the passage of legislation and regulations which will increase the safety of air navigation and safeguard the integrity of its members.

Bearing in mind the controllers' fundamental responsibility to preserve safety in the air and deriving authority from its constitution, IFATCA adopts the following policy document as a tool designed to highlight the basic policies set out in the Manual on this subject.

2. Policy Document

ATC personnel are entitled to maximum security with respect to the safe- guarding of personal life, operational environment and the safety of aircraft under their control;

IFATCA endeavours to formulate some form of machinery by which it will effectively support its member controllers who assist aircraft victims of unlawful interference and as a result may have to act contrary to their administrative directions. IFATCA insists that it is the duty of every controller to provide all assistance possible to relieve the occupants of an aircraft in that situation from their ordeal and ensure a safe landing as soon as possible.

If during unlawful interference with civil aviation, the appropriate authorities instruct the Controller to deviate from or violate the ICAO rules, he shall in no way be held legally responsible for carrying out such an order.

All orders which imply a deviation from the established air traffic rules shall be conveyed through the appropriate authorities, normally the immediate superior and always through the authority responsible for the provision of Air Traffic Services. Such orders shall always be issued in written form, clearly identifying their origin and authority, and retained for investigative purposes.

The Air Traffic Controller on duty shall be granted relief from his working position when the conditions stated above are not followed, or when he considers the content of the order wrong or criminal.

During unlawful interference against ATC facilities or its threat, services may be withdrawn. Measures shall be included in national or international contingency

procedures, designed in such a manner to ensure there will be minimal disruption of service.

According to the aims and objectives of his profession, the controller is required to sustain safety in the air and in cases of aircraft in emergency he is obliged to give those aircraft priority for landing. No doubt an aircraft victim of unlawful interference is one in emergency requiring immediate assistance. However, if it is quite clear that under normal circumstances a controller who acts according to instructions sees any responsibility arising out of such instructions automatically shifted to his immediate superiors (since only civil liability is, in principle, involved), when an aircraft victim of unlawful interference is involved criminal court will necessarily be involved and hence a controller who deviates from the ICAO rules - e.g. refusing landing clearance -, even when obeying orders, may be found criminally liable according to international law and many national laws, if in his opinion such order was wrong or criminal. The compliance with superior orders will then serve only as a mitigating factor.

Furthermore, other forms of unlawful interference may occur that do not involve direct action against aircraft (e.g. bomb attack against an ATC facility, terrorist at- tack, damaging or destruction of air traffic control equipment or air navigation facilities), but also impair the safe operation of flights.

In both cases, the only way to ensure that the principles stated in IFATCA policy (namely the principle that the controller is entitled to achieve the maximum security regarding safeguarding personal life, operational environment and the safety of the aircraft under his control and the principle that the controller shall be granted indemnity for the results of actions taken in obedience to direct orders) will have some practical validity is to seek for agreement as to those principles, for the following reasons.

- Once a controller departs from or infringes the established air traffic rules, that fact can always be submitted to a court in terms of negligence, in the form of non-compliance with existing rules, even if obeying direct orders, unless the exception is clearly defined in a document with legal value (e.g. labour contract).
- It is also frequent that in these types of situations, police authorities, Home Office or even the Government intervene and conduct the whole situation. How- ever, since such authorities are not prepared to understand the technical implications of their intended actions, it is essential that their orders are "filtered" through someone who has the technical expertise and at the same time has a clear position on the chain of command.
- The request for written form is a guarantee that the content of the order won't be object of court controversy; accordingly, such written order should be issued "on the spot" and only when that is not possible should it be issued afterwards.
- The right to be granted relief aims at exempting the controller from any criminal liability without falling under disciplinary action. It must also be made clear that this principle includes the right to refuse relief by someone who has not the appropriate valid ratings or someone other than a controller.

- The need for contingency planning against these kinds of situations is vital not only to protect the controllers and the operational environment but also the aircraft, passengers, crews and ground facilities.

Member Associations shall also urge their Governments to ratify the existing protocols, conventions and treaties on these matters, to make them available to whom it concerns and to refrain from any course of action contrary to those rules:

IFATCA encourages States to enter into bilateral or multilateral agreements on the problems raised by unlawful interference with civil aviation facilities and unlawful seizure of aircraft hoping that an international instrument will be made available through which the States will be given the choice of either complying with its provisions or face the consequences. Such instrument should, in addition, not only proscribe unlawful seizure of aircraft and unlawful interference with civil aviation facilities serving international air traffic, but also treat it as an inter- national crime and as a result, the author of such action as an international criminal. This position has been made known in the past by IFATCA, both to the United Nations Organisation (UNO) and the International Civil Aviation Organisation (ICAO).

Still, the present status is that:

- the existing international agreements concentrate exclusively on security at international airports ignoring the ATC facilities that are not located at international airports, not to mention air navigation aids that are not located at international airports;
- even the existing agreements have not been signed by all States and there-fore cannot be used as guidance since they are ineffective in a great number of countries;
- there is absolutely no reference to the action required from the Controller during or after such occurrences;
- several countries have not yet established basic security measures outlined in international conventions, such as the establishment of security areas surrounding airports and air navigation facilities, preventing unauthorised personnel to have access to areas close to parked aircraft or Air Traffic Control premises; establishment of scrutiny points in the airports, with a clear indication of its existence to the general public; imposition upon operators to adopt security measures, especially regarding "carry-on" baggage.

This situation is obviously unsatisfactory and even potentially dangerous, calling for the best effort of the Federation, the Member Associations and individual members in order to achieve substantial improvement in the near future.

Member Associations should seek formal agreement on the conduct of an Air Traffic Controller during situations of unlawful interference and the adoption of contingency procedures during such situations.

IFATCA will undertake, through its Executive Board, to transmit the contents of this policy to the appropriate international organisations, namely the United Nations, ICAO and ILO and also regional organisations who may be concerned with this matter.

IFATCA requests the appropriate international organisations to condemn all actions contrary to the rules established in the Chicago Convention and its Annexes.

IFATCA believes that the UN Security Council is in a position to call for international action against States which default from the objectives of air navigation safety or depart from the established rules, taking such actions as refusal to grant Air Traffic Control service, refusal to grant landing clearance to aircraft object of unlawful interference or deliberately rendering unserviceable air navigation and/or landing aids to such flights. It is also IFATCA's view that such actions may frustrate the criminals and cause them to harm crew and passengers and create unnecessary hazard to other traffic.

IFATCA also encourages national authorities and international bodies to take measures against Sates which tend to harbour the authors of crimes of unlawful interference with aircraft, including, if needed, the suspension of air services to and from such countries. Where States are reluctant to punish the authors of such crimes, IFATCA supports that extradition should be requested to the State of the aircraft's registry.

IFATCA expects the appropriate international organisations to encourage the establishment of special bodies to deal with these types of situations and strongly recommends national authorities to consult with the organisations involved in civil aviation before implementing measures dealing with this matter in order to ensure that adequate air traffic procedures are carried out and obeyed to.

The Federation's primary task on these issues is to promote standards additional to those stipulated by ICAO and to standardise procedures and phraseology applicable in such situations. The results of such work should be submitted by the Federation and the Member Associations to the appropriate international organisations, national Governments, airspace users and other organisations involved in civil aviation in the best spirit of co-operation.

* * * E N D * * *

LM 4.5 UNSAFE AIRSPACE/AERODROME

An airspace/aerodrome is deemed unsafe whenever there is an unacceptable risk to the safety of aircraft.

IFATCA policy is:

IFATCA should issue a warning to airlines, air traffic service providers and all other relevant bodies concerning the aviation industry and users of the risk of operating in unsafe airspace according to the unsafe airspace definition and criterions.

See: WP 164 - Kaohsiung 2006

INFO:

COLLECTION & DISSEMINATION OF INFORMATION ON PROFESSIONAL MATTERS

POLSTATS

INFO 5.1 INFORMATION HANDBOOK (IHB)

INFO 5.1.1 INTRODUCTION

IFATCA Policy is:

Article I, paragraph 3, Objects, of the IFATCA Constitution specifies that the Federation shall "collect and distribute information on professional problems and developments".

As early as 1966 SC4 (now PLC) "Human and Environmental Factors in ATC", at that time formed by members of the Irish Association, produced an extensive questionnaire to be processed and made available to interested organisations.

When, in 1969, responsibility for PLC went to the German Association, in co-operation with the Belgian and Dutch Guilds, collection of information was continued. The 1973 Reykjavik Conference resolved that the information should be published in form of an "Information Handbook".

The Belgian Guild undertook to compile this Handbook. A first edition was submitted to, and accepted by, the 1974 Tel Aviv Conference.

In 1997, the Executive Board created the function of Editor IHB, moving the responsibility of updating and editing the IHB from a member association to an appointed official.

At the Kaohsiung Conference in 2006 the first edition of the Electronic Information Handbook, together with the Electronic IHB Questionnaire was presented, after which the Questionnaire was made available on the web.

In 2008 the Information Handbook was made available on the web allowing every professional member to access the information.

See: Punta Cana 2010 –WP 163

INFO 5.1.2 PURPOSE OF THE IHB

IFATCA policy is:

The Handbook should contain current information on aspects relating to professional and legal matters in ATC in the countries represented in the Federation.

It should enable its users to identify those MAs that may have useful information on specific professional and legal matters, after which direct contacts with such MAs should be established to obtain the desired detail of information.

As ultimate goal the information thus provided and used should help to achieve a certain standard of conditions in all MA's countries.

In 1990, at the Acapulco Conference, the following recommendation was accepted: "that the first reply to the IHB Questionnaire to the IHB Questionnaire be part of the application procedure for membership of the Federation".

See: Resolution C9 - WP 163 - Punta Cana 2010

INFO 5.1.3 CONTENTS AND DISTRIBUTION

IFATCA policy is:

The Information Handbook presented in "country by country" format contains the following chapters:

Chapter 1: **General Information**
containing: **Information on the Association**
Affiliation with Trade Unions
Information on the Employer
Chapter 2: **Working Conditions**
containing: **Work and Rest Scheme**
Overtime Working
Vacation Scheme
Chapter 3: **Career**
containing: **Recruitment**
Training
Remuneration
Allowances
Promotion
Retirement
Chapter 4: **Social Security**
containing: **Licenses**
Sick Leave
Pregnancy Leave
Parental Leave
Chapter 5: **Medical Aspects**
Chapter 6: **Conditions of Employment**
Chapter 7: **Legal Aspects**
Chapter 8: **Technical Aspects.**

See: Resolution C9 - WP 163 - Punta Cana 2010

The Information Handbook is only made available to professional members of the Federation.

See: WP 166 - Toulouse 1998 and Resolution C9 - WP 163 - Punta Cana 2010

INFO 5.1.4 METHOD OF UPDATING

IFATCA policy is:

The Editor Information Handbook (IHB@ifatca.org) shall update the Information Handbook by means of an electronic questionnaire, made available on the IFATCA website.

Every even year a new enquiry shall take place. This enquiry will be announced in the first IFATCA Circular of that year. The enquiry shall start at the first day of the "Committee C" proceedings at the Annual Conference and end on the last day of the Regional Meeting held that year. Member Associations having new information regarding items listed in the IHB are requested to inform the Editor IHB and the Office by means of refilling the E-questionnaire or by e-mail stating changed topics.

The Executive Vice-Presidents Region have the responsibility to ensure that up-to-date information from every MA within their region is available. To accomplish such, the Editor IHB will draft reports for the Regional Meetings stating the unavailability of information and outdated information from the MAs. They will inform the Editor Information Handbook on any problem with regard to the collection of information.

Update on the Information Handbook should be a standard agenda item at each Regional Meeting.

The Editor Information Handbook shall compile amendments to the Information Handbook at least every 2 years.

See: WP 18 - Rio 1988; WP 106 - Bournemouth 1992; WP 158 - Geneva 2001 and Resolution C9 - WP 163 – Punta Cana 2010

INFO 5.1.5 EDITOR INFORMATION HANDBOOK

Geert Maesen
Vilvoordsesteenweg 81
B-1820 Perk
Belgium

Tel: +32 2 751 7694
Fax: +1 514 866 7612
E-mail: ihb@ifatca.org

International Labour Organisation

MEETING OF EXPERTS ON PROBLEMS CONCERNING AIR TRAFFIC CONTROLLERS (Geneva, 8-16 May 1979)

REPORT

1. In accordance with the decisions taken by the Governing Body of the International Labour Office at its 201st Session (November 1976) on the recommendation of the Preparatory Meeting for Civil Aviation (Geneva, 3-10 October 1974), a Meeting of Experts on Problems concerning Air Traffic Controllers took place at the ILO headquarters, Geneva from 8 to 16 May 1979. It held 14 sittings.

2. The Meeting was composed of 30 experts, 15 of whom were appointed on the proposal of governments after appropriate consultations, and 15 after consultation with the Workers' group of the Governing Body. It was understood that the government of any country where air traffic control services were run by private bodies would be asked to invite these bodies to nominate the expert. Out of the 30 experts, 29 attended the Meeting. Some of the experts were accompanied by personal advisers. The Meeting was also attended by observers from the International Confederation of Free Trade Unions; the International Federation of Air Line Pilots' Associations; the International Federation of Air Traffic Controllers' Associations; the International Federation of Air Traffic Safety Electronic Associations; the International Federation of Trade Unions of Transport Workers; the International Organisation of Employers; the International Transport Workers' Federation; the Public Services International; the Trade Unions International of Transport Workers; the World Confederation of Labour; and the World Federation of Trade Unions. A list of the participants will be found in Appendix II.

3. The representative of the Director-General of the ILO was Mr. Jean Reynaud, Chief of the Industrial Sectors Branch, and the Executive Secretary was Mr. A. Gil of the same branch.

<u>Terms of reference</u>

4. At its 208th Session, the Governing Body decided that the agenda of the Meeting would consist of a single item, namely "Problems concerning air traffic controllers: identification and possible solutions".

<u>Opening of the Meeting</u>

5. The representative of the Director-General (Mr. J. Reynaud) opened the proceedings and welcomed the experts and other participants on behalf of the Director-General of the ILO. He pointed out that air traffic control nowadays played a vital part in the orderly operation and development of air transport. The enormous technological advances in air navigation, radar and data processing enabled modern air traffic control systems to handle a considerable and growing number of aircraft. They had also drastically modified the functions and the

working environment of the air traffic controller, who now assumed wider responsibilities. However, concurrently with such progress, many professional and human problems highlighted by certain recent events had arisen in the air traffic control systems of many developing and developed countries, drawing world-wide concern to the problems of air traffic controllers. The ILO's unique structure, expertise and experience of social and labour issues at the international level could make an important contribution to the work already accomplished in this area.

6. Mr. P.V. Dawson, Director of Employee Relations, Transport Canada, Ottawa, Canada, and Mr. G. Kandasamy, General Secretary, Amalgamated Union of Public Employees, Singapore were elected unanimously as Chairman and Vice-Chairman of the Meeting, respectively.

<u>General introduction</u>

7. The representative of the Director-General emphasised that future ILO activities in air traffic control should be orientated by people who knew and experienced these problems and would be directly concerned with their solution. The Governing Body of the ILO and the Director-General looked to the experts for authoritative opinions, ideas and concrete proposals on what the ILO should do. The Meeting was expected to identify the problems concerning air traffic controllers and propose possible solutions to them. In order to assist the experts in this complex task, the Office had prepared and circulated a working document. While admitting that the information therein was incomplete, especially as regarded statistics and comparative analyses, he hoped that the Meeting would nevertheless find it useful, if only as a basis for an exchange of views and information. The results of its work, possibly in the form of a report and a set of conclusions embodying points of agreement, would be submitted to the Governing Body and, among other purposes, lay the basis for future ILO action.

8. The Meeting agreed to tackle its programme of work on the basis of the points for discussion suggested in the working document prepared by the Office, in the order reflected in this report.

9. The International Civil Aviation Organization (ICAO) provided the Office with comments on the working document covering the technical and operational aspects of ATC. These comments were distributed to the Meeting for information.

10. The Worker experts felt the Meeting was a welcome opportunity to present and discuss some of the controllers' problems. They stressed the importance of sound, democratic procedures which would enable organisations representing air traffic controllers (ATCOs) to participate in the determination of all aspects of their working lives and conditions. The principles embodied in ILO Conventions Nos. 87, 98 and 151 constituted the basic rights of workers, from which ATCOs should not be excluded. They were concerned with deficiencies concerning industrial relations and social and labour aspects of the ATC systems, as the ATCO's profession had not yet been duly recognised in civil aviation. Long working hours, overtime and continuous shift work affected air safety. In view of the peculiarity of their profession, ATCOs should enjoy a lower age of retirement with pensions comparable with those of other workers at normal retirement age. Remuneration

should be commensurate with the ATCO's responsibility, which should be related to that of airline pilots. Co-operation should be established on occupational safety, health and welfare between organisations representing ATCOs and the ATC authorities. The ILO should investigate health and stress hazards among ATCOs. Legal liability was essentially of an international nature and should be solved by an international agreement.

11. A Worker expert commended the Governing Body of the ILO for having convened the Meeting. Air safety and staff interests were being sacrificed to purely economic considerations as investment in ATC was insufficient while air traffic volume was growing. The conditions of work and life of ATCOs were therefore deteriorating and concern about their future resulted in serious nervous strain. Their trade union rights had been violated and decisions were taken without their being consulted, except through joint committees which only had an advisory role. In view of the importance of these problems and their international character, the Meeting should put forward a proposal for the drawing up of an international instrument.

12. The observer of the International Transport Workers' Federation (ITF) pointed out that the frequent industrial disputes, go-slows and strikes indicated that labour-management relations in this field were far from satisfactory. In many countries ATCOs enjoyed no trade union rights, and in others they were victimised for engaging in trade union activities. The ATCO's profession and status had not yet obtained the international attention these deserved in view of his role and responsibilities. His conditions of work were deteriorating both professionally and socially. The safety aspects related to the ATCO's responsibility and profession were comparable to other professions in civil aviation, but no international guidelines existed to regulate the ATCO's hours of work, and his remuneration was totally unrelated to his responsibilities. Safety should not be compromised for financial reasons and budgetary restraints which were the root of world-wide staff shortages, the use of out-of-date equipment and low remuneration of ATCOs.

13. The observer of the International Federation of Air Traffic Controllers' Associations (IFATCA) was grateful to the ILO for convening this Meeting. Air navigation safety could not be ensured without taking account of the important human and social factors relating to the status, working environment and conditions of work of ATCOs. Present international regulations for ATC procedures took no account of human factors essential to safety such as workload, hours of work, rest periods, retirement age, remuneration and training. He hoped that the Meeting would take the first step towards international standardisation of the human and social conditions in ATC.

14. The observer of the International Federation of Air Traffic Safety Electronic Associations (IFATSEA) said that his organisation fully recognised the urgent need to discuss and solve the problems concerning ATCOs, especially the need to ensure that they were provided with all the necessary equipment to maintain the safety of the travelling public.

15. The observer of the Trade Unions International of Transport Workers pointed out that his organisation had studied the situation of ATCOs through surveys, and found that their status and conditions of service varied greatly from country to country.

He felt that the type of ATC administration and the ATCOs' status should not preclude them from enjoying the rights embodied in Conventions Nos. 87 and 98, and from having the right to strike. All other conditions of work such as hours of work, remuneration, retirement age and pensions, training, manpower and career planning should be adapted to the specific demands of ATC work within the civil aviation framework, and form the subject of international instruments.

16. The observer of the Public Services International stated that his organisation attached great importance to the Meeting and had closely collaborated with the ITF in preparing for it. He looked forward to its successful outcome as a further step towards the full recognition of trade union rights of public servants all over the world.

17. The Government expert from the USSR made available to the participants information on air traffic controllers in the USSR.

Discussion

Industrial relations

18. The Worker experts felt that the right to establish and join associations of the ATCO's own choosing was of fundamental importance and should be recognised everywhere. ATCOs should be able not only to join associations of their own choosing, but as a professional body establish their own professional association or trade union without having to belong to a conglomerate one, and without interference from public authorities or their employer. However, in many countries, especially where ATCOs were assimilated to military personnel, this right was not recognised. It was essential that ATCOs should, as a professional group, be free to establish and join an organisation representing ATCOs.

19. The Worker experts felt that participation by ATCOs in procedures for determining their physical and professional working environment and their general terms and conditions of employment was a logical follow-up to the right of association, and that ATCOs should be able to participate in all decisions relating to their physical and professional working environment and their general terms and conditions of employment. Such consultation and participation should take place at the early stages of the planning or decision-making process, and the ATCOs' views should be taken into account. The principles embodied in the relevant provisions of Conventions Nos. 87 and 98 should be incorporated into the conclusions. Participation had also to cover the technical aspects of the ATC system.

20. A Government expert pointed out that workers' participation varied from country to country and that the determination of particular conditions of employment was a matter of negotiations at the national level between the employers and the trade unions. In the Federal Republic of Germany there were extensive provisions for worker participation in decision making.

21. As regards the frequency and causes of industrial disputes the Worker experts felt that disputes usually arose when the employer did not use the machinery provided

for in the Conventions Nos. 87, 98 and 151. Lack of proper recognition of the profession, poor quality equipment and working conditions, and the absence of an adequate dispute settlement machinery also caused disputes. Lack of the right to strike prevented the ATCOs from effectively negotiating their conditions of employment and governments tended to take advantage of that. In countries where these problems were solved satisfactorily, there were practically no major industrial disputes. Disputes were also linked to the lack of ATC capacity for handling a growing volume of air traffic which caused overload and ATCO discontent. A major cause for disputes was that governments and employers did not take the ATCOs' views seriously unless ATCOs took action.

22. A Government expert felt that lack of contacts between management and ATCOs caused a breakdown in communication and therefore disputes. Having a similar educational background and career aims and prospects, the air traffic safety electronicians in France were, on the whole, less prone to resort to industrial action because management had more frequent contacts with them, probably because they were not subject to shift work.

23. On behalf of a Worker expert it was pointed out that electronic technicians were involved in many recent disputes, and their contacts with management were informal and limited to the lower echelons. No comparison was possible between the two professions, and the causes of disputes lay in poor working conditions, understaffing, overload, low remuneration, etc.

24. The Government expert from the Federal Republic of Germany felt that unrealistic demands by ATCOs were also causes of disputes, for instance when in his country in 1973 they demanded to have their salaries based on those of private airline pilots.

25. The Worker experts pointed out that the comparison of ATCOs with the wrong professions and their being placed in the wrong organisational and administrative structure contributed to disputes. ATCOs were not unrealistic in wishing to be compared to airline pilots, since in New Zealand an independent judicial body had already reached such a conclusion. As professional and operational people, they should certainly not be compared with civil servants. Furthermore, pay disparities were major causes for disputes in several African States where ATC was provided by semi-state agencies such as the Air Navigation Security Agency (ASECNA). Nationally recruited ATCOs in some of those States were paid only a third of what an expatriate ATCO received. It was also pointed out that status was not the real cause of disputes, and that comparison with other professions would not solve the basic problem of letting all workers and civil servants enjoy trade union rights and negotiate their conditions of employment.

26. With regard to settlement of disputes, the Worker experts proposed that the proposed conclusions should include the principles embodied in Conventions Nos. 87, 98 and 151. ATCOs should not be excluded from their scope, since by doing so, one merely increased the number of illegal strikes or industrial actions, and turned disputes into long and bitter conflicts. A sound dispute settlement machinery was essential for preventing disputes.

27. The Government expert from the Federal Republic of Germany pointed out that in his country the conditions of work, remuneration and dispute settlement procedures for ATCOs, as public servants, were subject to parliamentary law, and as regards Article 8 of Convention No. 151 concerning dispute settlement procedures, the parliament had to take into account the special constitutional situation in the Federal Republic of Germany.

28. With regard to industrial action the Worker experts recognised that strikes were detrimental to the operations and safety of civil aviation, but felt that the right to strike should be included within the dispute settlement machinery to make it more effective and to prevent long and drawn-out illegal strikes more easily. It did not mean that strikes would be resorted to lightly. Under no circumstances should unqualified personnel be substituted for ATCOs because air navigation safety could not be maintained.

29. A Government expert stated that in France, the right to strike had been withdrawn for the controllers after repeated strikes which had disorganised ATC services. He therefore wondered whether the restoration of the right to strike would offer any advantage over the present situation. Furthermore, in many developing and developed countries the right to strike was constitutionally established, but ATCOs were excluded from having access to it because of the serious consequences of strikes in ATC on the economy and on public life.

30. At the request of the Chairman, Mr. Gernigon of the ILO Freedom of Association Branch explained that the Committee on Freedom of Association of the Governing Body of the ILO has considered that the right to strike was one of the essential means through which workers' organisations may promote their occupational interest. Nevertheless, the Committee has agreed that the right to strike could be restricted or even prohibited in the civil service or in essential services because a strike there could cause serious hardship to the national community. Such a restriction should be accompanied by adequate, impartial and speedy mediation, conciliation and arbitration procedures.

31. A Government expert said that in Canada ATCOs had the right to strike only in specific circumstances and after the legal dispute settlement machinery was fully exhausted. Prior to negotiation each bargaining agent chose between compulsory arbitration, precluding the recourse to strike, and mediation and conciliation which included it. Where bargaining units select the conciliation method of dispute settlement, efficient arrangements for essential service must be ensured through a process of designation of employees required to perform specific essential duties in the event of a strike prior to the establishment of a conciliation board. If negotiations failed a tripartite conciliation board would be established which would attempt to bring about a negotiated agreement. On those issues where agreement cannot be reached, the conciliation board, within specified time limits, makes recommendations to the Public Services Staff Relations Board. Seven days after these recommendations were made the right to strike was available for ATCOs.

32. The Worker experts thought the Canadian system was a desirable example to follow. ATC, however, could not be termed an essential service as a means of precluding ATCOs from the right to strike. ATC was not an essential service since

other means of transport apart from air transport were available if ATCOs went on strike. The civil servant status of ATCOs should also not be invoked as a means to deprive them of this right.

33. Some Government experts were opposed to that view and felt that ATC was a vital service and therefore the right to strike should not be recognised for ATCOs. They also felt that a reference to national conditions was essential in view of the importance attached in some countries to air transport. Unlike Europe which had an efficient railway network capable of ensuring transport in case of ATCO strike, many developing countries and other States relied on civil aviation as a vital means of communication. A Government expert indicated that ATCOs in Japan, as civil servants, were precluded from the right to strike by legislation.

34. The observer of the International Organisation of Employers stated that any right to strike must entail a corresponding right to lock out. However, governments were not free to exercise the right of lockout since air traffic control was an essential service. In any case, there could be no absolute right to strike, and none of the relevant ILO Conventions mentioned the right of strike.

35. A Worker expert pointed out that in many countries in Latin America and to a lesser extent in Europe, ATCOs were assimilated to or under the military, and had no right to strike. Some countries had no regard for basic human rights at all and no workers were allowed to strike. ATCOs were preoccupied with air safety and wanted the right to strike as a last resort to ensure and demonstrate the need for a high level of safety.

36. The observer of the International Federation of Air Line Pilots Associations supported all efforts to improve safety. ATCOs were essential to safety, but also to the economy and regularity of air traffic services. Governments should recognise the requirements of ATCOs and meet them.

<u>Social and labour aspects of the ATC systems</u>

37. With regard to technological and organisational factors associated with safe and efficient ATC performance, the Government experts felt that ICAO was perhaps a better forum to discuss flow control and capacity problems, except for their social and labour aspects.

38. The Worker experts stressed that temporary flow control measures imposed by ATCOs during peak traffic periods for reasons of safety were often interpreted by the mass media as industrial action. Insufficient investment in ATC equipment had made the system incapable of coping with the yearly increases in air traffic. The ILO should investigate this problem, since growing demand for air traffic and chronic lack of ATC capacity have an impact on conditions of service, and put the ATCO under strain. Although ATCOs implemented flow control on occasion for safety reasons, ICAO had recognised that industrial disputes are one of the causes of flow control measures.

39. The observer of IFATSEA underlined his organisation’s support for the ATCOs’ claims for reliable equipment, and felt that the ILO should draw ICAO’s attention to

the need for establishing international standards for the maintenance and design of ATC premises and ground equipment.

40. As regards the ATCO's functions and workload, the Government experts stressed that the findings referred to in the working document were only indicative and could not be taken as definitive limits on the ATCO's workload. The findings varied from country to country, and often reflected the particular conditions prevailing at the time of the study. No outright comparison among countries was possible, and even within a country, account had to be taken of differences among regions or even sectors. Each country should conduct research into this problem. However, States having similar ATC systems and conditions might benefit from an exchange of information.

41. The Worker experts agreed that the findings were not definitive, but they could offer some basic models for planning hours of work, preventing overload and planning the traffic to maintain an orderly flow when an ATC facility might cease operations. They proposed that these studies be forwarded to the ILO for dissemination.

42. With regard to the type of ATC administration and the basic employment status of the ATCO, several Government experts felt that ensuring air safety was a matter for the State and ATC had to operate under the government, with ATCOs as civil servants.

43. Several Worker experts favoured the semi-private or private ATC company as best suited to deal with the social and labour aspects of ATC, and even the technical aspects. Regardless of the type of administration and structure they felt that ATC should not be provided by military units because military and civilian ATC operated with different specifications, military and civil ATCOs received different training, the latter undergoing a much longer training programme, and were thus not easily interchangeable, if at all. The military ATC system was also unsuitable since generally remuneration was lower and the promotion system conducive to a high turnover of staff, often at a point in their career when their proficiency was at or near its highest. Other Worker experts attached little importance to the existing structure so long as it was civilian, well-defined and capable of managing the social and labour problems of ATC.

<u>Hours of work</u>

44. A Worker expert said that in the USSR following a 1979 study of a research institute, which had focused on psychosomatic elements influencing working capacity, shifts were shortened and ATCOs were currently working shifts of 7 hours by day and 10 hours by night, on a 37-hour week, which could in certain cases be prolonged to 41 hours. There was an interval of at least 24 hours between two shifts. In the interest of safety, no overtime was allowed.

45. A Government expert wished to specify that the hours of work in Kenya given in the working document reflected a very temporary measure which became necessary when the aviation authority of the East African Community was dissolved. Currently ATCOs were working no more than 35 hours a week, and no overtime.

46. Several Worker experts felt that in the interest of safety duty hours for ATCOs should be essentially shorter than those of office workers, as was the case for flying and cabin crews. They proposed the following limits: a maximum (including meal breaks) of 32 hours per week and 7 ½ hours per shift, at least 30 minutes break after a 2-hour period at a control position; and an interval of at least 12 hours between shifts. A study carried out in Switzerland in 1968 had recommended an average of 37 hours a week, broken into a weekly timetable of 34 hours and 24 minutes during daytime, and a weekly timetable of 50 hours during night-time, the latter being repeated once every 6 weeks. The desirable average recommended for each shift was 8 hours as the absolute maximum, 7 ½ hours by day and 10 hours by night. It was not the only study of its kind.

47. A Worker expert proposed that the Meeting should not go into details but only lay down the basic principles of maximum hours of work per week and the limit of two hours uninterrupted working time on a control position. ATCOs were sufficiently responsible to arrange their own shifts within those limits.

48. Another Worker expert felt that maximum and minimum limits were essential for manpower planning, but that they should be somewhat flexible to permit adaptation to local conditions.

49. Several Government experts wondered whether the study mentioned could be applied indiscriminately in all countries. The Government expert from India said that in his country the workload of the ATCO was not uniform as some airports handled only one or two flights a day. He pointed out that in India; ATCOs worked a 12-hour night shift because of local problems.

50. Several Government experts requested an explanation on how the figures proposed by the Worker experts had been determined. In some countries such as the Federal Republic of Germany, meal breaks and rest periods were calculated at 8 hours a week, and if the 32 hours limit were adopted, ATCOs would work effectively only 22-25 hours per week. These breaks were taken into consideration in determining manning requirements. In the United Kingdom, Civil Aviation Authority ATCOs are scheduled (conditioned) for 41 hours' duty a week of which 35-36 hours are effectively worked. Some doubts were also expressed by Government experts concerning the feasibility of limiting the number of uninterrupted hours of work at a control position, and the 2-hour limit proposed required more intensive study.

51. The Worker experts explained that the 32-hour limit was reached on the basis of their direct work experience.

52. On behalf of a Government expert, it was pointed out that there should not be an absolute limit on shift hours. However, there should be regular fixed breaks. If a controller suffered from stress, he should be transferred to other duties.

53. A Worker expert drew attention to the dangers of overtime work, especially when the number of staff was insufficient and the volume of traffic heavy. This resulted in fatigue, and endangered air safety. It was also pointed out that the variations in workload at different times of the day should be taken into account. There should

be a break after two hours when traffic was intense. Night work should be forbidden after a certain age. ATCOs should have a shorter working week than other categories of workers and overtime should be banned except in cases of force majeure. It was also stated that pilots were very concerned about the working hours of ATCOs, since efficiency diminished proportionately with length of working hours, and this could have serious consequences on the safety and regularity of flights.

54. Government and Worker experts exchanged texts which led to agreed conclusions with respect to this area of concern. These were subsequently submitted to the Chairman for discussion by the experts. Several Government experts indicated that limits on hours of work, and the assignment of overtime, should be flexible and adapted to local conditions. Furthermore, such limits should be determined in relation to fatigue, and therefore only net hours of work which would exclude meal breaks should be counted as "hours actually worked". The Worker experts preferred a more flexible approach and thus wanted all hours of attendance at the workplace to be considered as "hours of Work", which would include both meal breaks and rest periods. If ATCOs were to be compared to other categories, then this comparison should be based on an equitable common denominator.

Remuneration

55. With respect to pay levels and components the Worker experts emphasised the economic value and contribution of the ATCO's work, the ATCO's responsibilities, short working life and high specialisation which made re-employment difficult. Current pay systems took little or no account of these factors. ATCOs were unique, and should in principle not be compared with any category of workers other than airline pilots. This had been done in New Zealand in March 1979 on the finding of the Government Services Tribunal and in Venezuela through the ATCO association. The ATCO's legal liabilities had been growing, perhaps unwillingly, in some countries. The professions of pilot and ATCO were justifiably comparable due to similarities in licensing requirements and practices, health hazards such as hypertension and stress, and the risk of losing a job through loss of licence.

56. The Government experts acknowledged that ATCOs deserved full recognition of their unique profession. In Mexico, for example, they were paid in accordance with the important responsibilities inherent in their profession. If ATCOs were to be compared to pilots, since they are civil servants they could be compared also to government or even military pilots, not necessarily airline pilots. Moreover, as a civil servant an ATCO enjoyed better employment security than a pilot, and if he lost his licence he would be re- employed. As to hypertension and early incapacity among United States ATCOs, findings there were hardly applicable elsewhere, in part due to the number of hours worked and the methods by which employees are assigned to the high density positions.

57. The Worker experts stated that military pilots and civilian airline captains had totally different responsibilities and could not be compared. Moreover, flying or aviation experience was in most countries considered an asset for an ATCO

candidate. If ATCOs could not be compared with airline captains they should not be compared with civil servants either. ATCOs were unique and in principle should not be compared with anyone, but if a comparison were inevitable, airline captains would be the only realistic yardstick.

58. The observer of IFALPA agreed that the ATCO's profession was unique, and wondered whether any comparison was justified other than with the ATCO's performance, and professional responsibilities. He indicated that he believed that it was inappropriate to pay controllers at comparable levels to pilots. Unique professions require unique remuneration systems, and comparing the ATCO with a civil servant was just as wrong as comparing him with a pilot.

59. A Government expert felt that a unique profession should be assessed uniquely. In the United Kingdom, the Civil Aviation Authority was now undertaking a job evaluation survey among its employees and would negotiate remuneration levels with the trade unions on the basis of its findings.

60. A Worker expert declared that the security of employment offered by the civil service should not be taken as a pretext for underpaying the ATCOs. Several Government experts, however, emphasised that this security of employment did and should have an impact on the ATCOs' remuneration and should certainly be taken into consideration when their remuneration was being determined.

61. With regard to the impact of remuneration on staffing and turnover, the Worker experts felt that in the interest of safety remuneration should be sufficient to attract and retain highly qualified staff. This was not so in many developing countries where ATCOs were leaving for better paid jobs after being trained at great cost. Such systems were also unsafe because of constant staff turnover. Employers should take staffing and turnover into account when determining remuneration levels.

62. The observer of IFALPA fully supported the views of the Worker experts. A highly proficient ATCO was essential to air safety, and mistakes could have fatal consequences.

<u>Age of retirement and pensions</u>

63. Several Government and Worker experts referred to early retirement pensions for air traffic controllers existing in various countries. For example, in one country this age was fixed at 55, whereas in some other countries their retirement age was set at 50. It was pointed out, however, that the great majority of ATCOs were disqualified from their work long before reaching the regular compulsory retirement age of other employees. In one country, ATCOs were entitled to retire with a full pension after 20 years of service, regardless of age. The Worker experts felt that this example might usefully be followed in all countries.

64. The Worker experts stressed that the age of retirement must be lower for ATCOs than for other groups of workers, in view of the unique nature of their work and in the interests of safety. The medical studies undertaken so far and experience had

shown that ATCOs' efficiency, and in particular their powers of concentration, tended to diminish after a certain age and this created risks for aviation safety. There should be available to ATCOs optional early retirement but there should be an age beyond which they should not continue to be employed. Since density of air traffic and conditions of work varied from country to country, the exact early age of retirement might be determined by negotiation at the national level in each case.

65. As regards the level of pensions the Worker experts pointed out that retirement at an early age penalised ATCOs because not only did they accumulate fewer years of service than other workers but they also had to retire at an age when other workers at that age were at their period of highest remuneration. They therefore urged that measures be taken to compensate ATCOs for the disadvantages of early retirement at an early age, such as a supplementary pension. In one country, such a supplementary benefit was paid between the ages of 55 (the retirement age of ATCOs) and 65, after which retired ATCOs were paid the same pensions as other people. The pensionable remuneration should be based on total remuneration (basic pay plus allowances).

66. There was general agreement that there should be a compulsory age of retirement for ATCOs, probably earlier than that applicable to other workers, which should be determined by negotiation at the national level, and that such earlier retirement should not adversely affect the level of pension benefits of ATCOs.

<u>Occupational safety, health and welfare</u>

67. At the invitation of the Chairman, Dr. Stilon de Piro of the ILO Occupational Safety and Health Branch outlined the basic principles of occupational safety and health. A major principle underlying the ILO's International Programme for the Improvement of Working Conditions and Environment (PIACT) was that work should respect the worker's life and health. To be healthy, a working environment must provide for the worker's physiological requirements, protect him against accidents and diseases, provide adequate hygiene and recreational facilities and meet essential psycho-social requirements. While it was often difficult to establish cause and effect in the case of stress-related impairments, there was no doubt that occupationally related stress diseases occurred in many occupational settings. He referred to a number of studies which had been carried out in certain countries which were consistent in associating stress-related impairments or syndromes with the work of ATCOs. However, further research was required to identify more clearly the factors involved to measure levels of stress and to work out methods for preventing, diagnosing and treating its manifestations.

68. The Worker experts requested improvements in this field. In the long term, governments should be recommended to carry out studies on occupational safety and health and welfare of ATCOs and communicate them to the ILO. In the short term, governments should be recommended to take steps such as frequent cleaning of the premises, lighting sources, etc.; reducing overcrowding of the rooms; suppressing all possibilities for dazzling glare; maintaining of air conditioning; providing sufficient number of sanitary facilities, etc.

69. On the question of stress, several Worker experts pointed out that their conditions of work subjected ATCOs to unacceptable levels of stress which caused deterioration of their level of health and performance and thus endangered air safety. A Worker expert pointed out that the constant increase in the amount of air traffic to be handled was also an important cause of stress and States should therefore collaborate internationally in working out methods of predicting and regulating traffic flows so as to reduce the burden on ATCOs. Another Worker expert stated that the difficulties which ATCOs encountered in having to use inadequate equipment added considerably to their stress and that air traffic controllers should therefore be directly involved in the selection and design of their technical equipment; ICAO should be recommended to lay down specific international standards in this respect.

70. A medical personal adviser to a Government expert agreed that, while there were no agreed criteria for the definition and measurement of stress, there was a need to continue work in this field, particularly through inter-disciplinary studies, because of the suspicion that ATCOs were more prone than other groups of workers to hypertension and coronary diseases.

71. As regards the physiological effects of ATC work, a personal adviser to a Worker expert referred to a recent study in the United States, which had brought out the harmful effects of microwave radiations on the eyesight of controllers. More studies should be carried out on this subject and governments should be asked to take measures to reduce visual fatigue resulting from ATC work. A medical personal adviser to a Government expert disputed these findings as not having secured acceptance internationally by specialists in this field; in his view, there was no evidence that properly designed ATC equipment produced any harmful emissions. A Worker expert pointed out that the findings of the above-mentioned study had not been contradicted by any other studies.

72. The Worker experts pointed out that the physical premises and facilities provided to ATCOs were unsatisfactory in many countries. ATCOs and their organisations should be consulted at the initial stage in the design of ATC premises. A Government expert drew attention to the special problems faced by developing countries, and urged that standards be laid down at the international level with regard to the design of control towers and rooms. A Worker expert felt that IFATCA could be of assistance in establishing such standards.

73. The Worker experts stressed the need to provide all control towers with adequate escape facilities in case of fire. A Worker expert drew attention to the need to protect the safety of ATC facilities and staff not only against natural disasters but against other hazards such as terrorist attacks.

74. There was general agreement that the medical examination for the selection of ATC candidates should take place before training was begun, since no licence could in any case be issued unless the applicant was found medically fit for this work. Such a medical examination should be thorough and in accordance with the standards laid down by ICAO. The Worker experts referred to the policy laid down by IFATCA on medical provisions for air traffic controllers and stressed in particular that medical centres should be established for ATCOs; there should be regular medical

examinations for ATCOs and appropriate medical follow-up, so as to ensure that preventive measures could be taken against any medical problems which might affect their capacity to perform their functions and that any health problem coming to light would be treated. In the latter event, ATCOs should have the option of being examined by the specialist of their choice. The medical files of ATCOs should be accessible to them and their own physicians.

75. Some Worker experts and a medical personal adviser to a Government expert felt that it would be desirable to eliminate from the outset on medical grounds any candidates who might be prone to develop hypertension at a later stage. In this connection, there was some discussion as to the possible role of aptitude or personality tests in determining whether a particular candidate was suitable for this type of work. Several experts felt that, while psychological factors might need to be taken into account, great care should be exercised in applying criteria of this kind and that they should be balanced against all other relevant factors. One Worker expert felt that only educational qualifications and physical aptitude should be taken into consideration in selecting candidates, since one could not determine at an early age that a person was psychologically unsuited for ATC work.

76. The Worker experts mentioned that in many countries recreational and sports facilities were provided for ATCOs close to their workplace; such facilities were very important for ensuring that ATCOs maintained the necessary physical fitness. Adequate rest and hygiene facilities at the workplace were at present lacking in many places and should be provided for ATCOs everywhere. Such facilities should, in particular, be planned and installed whenever new ATC premises were constructed in any country.

Legal liabilities of air traffic controllers

77. The Worker experts stressed that the right of being associated with incident and accident investigations had already been recognised for other professions in civil aviation. They emphasised the value of the ATCO as a source of information on ATC performance, and suggested that a system of incident reporting and investigation which would not penalise the ATCO should be established in the interest of safety. Immunity from disciplinary action for ATCOs who were found to have committed human error should be a prime feature of such a system. ATCOs frequently did not report on incidents for fear of subsequent sanctions. The US system of reporting incidents to a third party (NASA) was an excellent one.

78. The observer of IFALPA fully supported such a system which would help prevent future accidents.

79. The Government experts expressed agreement with these views. A mandatory occurrence reporting system was satisfactorily operating in the United Kingdom. However, total immunity for ATCOs would be illogical. It depended on the seriousness of the employee’s behaviour and whether it was considered to be gross negligence. This protection should not prevent the authorities from providing the ATCO involved with additional training to improve his proficiency. In India and other countries, ATCOs were involved in investigation procedures, but the question of an immunity system would have to be examined by the government.

80. The observer of IFATCA outlined his Federation's policy with respect to the criminal, civil and disciplinary liabilities of ATCOs. IFATCA advocated that ATCOs should not be criminally liable for simple human errors, and wished for better protection of the ATCO against individual lawsuits where vicarious responsibility did not apply, or was insufficient. Clear laws and regulations were essential to enable the ATCO to exercise his profession efficiently.

81. At the invitation of the Chairman, Mr. I. Chambers of the Office of the ILO Legal Adviser drew the Meeting's attention to the difference between intent and intention. No legal system recognised vicarious criminal liability, but an ATCO might in some legal systems have independent civil liability which might be invoked against him either separately from that of his employer, or jointly, and only legislation could abolish the ATCO's independent liability and thus protect him. Where ATCOs had no independent civil liability only the employer could be sued.

82. The Worker experts described several cases in Australia and the United States in which ATCOs were found guilty either of adhering strictly to the rules or, on the contrary, of departing from them. ICAO should be reminded of not overlooking the ATCO's interests when considering an international convention on the legal liability of air traffic control agencies. Mr. Chambers mentioned that the Australian case was a special one, although it could happen elsewhere; however, a decision of a British Columbia court in Canada rejected ATCO liability in a similar case.

Manpower and career planning

83. There was general agreement that adequate manpower and career planning activities were vital to the efficiency and safety of air traffic control systems.

84. A Government expert pointed out that the problem of manpower and career planning was linked directly to that of forecasting the volume of air traffic, which tended to vary considerably from one period of the year to another. It was uneconomical to staff ATC services on the basis of peak requirements. Because of the time required for training ATC recruits, efficient manpower planning had to be carried out at least five years in advance, but it was extremely difficult to forecast the volume of traffic so far ahead, especially when a large proportion of such traffic consisted of overflying of national territories. Another Government expert pointed out that there were financial limitations to manpower planning, since ATC services were run everywhere on a non-profit basis.

85. Some Worker experts expressed the view that the difficulties of forecasting future traffic demands should not be a pretext for the absence of planning. The ATC services should be adapted to the demand, and not vice versa. Governments should take the risk of some overstaffing in order to allow for seasonal peaks and for an unexpected future increase in demand. As regards the likely effects of automation on staffing requirements, a Worker expert noted that in many countries excessive reliance was placed on future prospects of automation to keep ATCO figures low. A Government expert pointed out that the effects of automation were limited and were offset by traffic increases.

86. A Government expert and a Worker expert agreed that it was desirable for air traffic control authorities to co-operate with airlines for the purposes of efficient manpower planning, although it might be difficult to obtain from airlines long-term forecasts of the volume of air traffic.

87. A Government expert pointed out that the ability to staff ATC units was closely dependent on working conditions. If the status of the profession was recognised and conditions of employment improved, more ATCOs could be recruited.

88. The Worker experts stressed that a number of factors other than the volume of air traffic had to be considered for purposes of manpower planning. These factors included the operating hours of the different working positions; number and length of shifts; hours of work; holidays, annual leave; time needed for specialised and refresher courses; time needed for ATCOs to participate in the establishment of their working conditions; attrition through retirement, medical incapacity and resignations. A Government expert mentioned the trend towards recruitment of women in this profession, and therefore to plan also for maternity leave.

Training and retraining

89. Reference was made to the policy of IFATCA on the training of air traffic controllers, which recommended in particular that applicants without previous aviation experience should be selected between the ages of 18 and 25 and should possess the educational qualifications required for entrance to post-secondary education in the country concerned and satisfy ICAO medical requirements. Training to licensing standards should combine classroom instruction on ATC duties and related aviation matters, including relevant material and simulation exercises, and practical experience in control work. After licensing, controllers should participate regularly in refresher training courses, and other forms of training, such as familiarisation flights, instructor training courses, supervisory and management courses, career development courses, and opportunities to prepare for alternative employment should be available to them.

90. Several Worker experts emphasised that, in order to ensure air navigation safety, the training provided to ATCOs at all stages should conform to the highest standards. Particular importance was attached to the selection and training of classroom and on-the-job instructors who should be selected from among ATCOs engaged in actual ATC work and be provided with opportunities to keep their knowledge up to date, and special instructor rating or qualification levels should be established in this respect. Retraining courses were important in order to keep abreast with technical developments, particularly when new ATC equipment and procedures were introduced. The usefulness of simulators as a training method contributing to a higher level of safety was mentioned by several Worker and Government experts.

91. A Government expert pointed out that selection criteria and training programmes differed considerably from country to country. Since it was important to ensure that candidates for ATCO work should meet certain basic requirements, international standards should be laid down as regards the aptitudes required for ATC work. Another Government expert stressed the heavy cost for developing countries of

training ATCOs; substantial assistance should be given to such countries to overcome this problem. Another Government expert felt that it would be desirable for ATCOs to be given training wider than the requirements of their profession. A Worker expert considered that controller training should include the acquisition of a private pilot licence.

92. A Worker expert drew attention to the problems arising in certain countries due to the inadequate level of training provided to military air traffic controllers.

Employment security

93. The Worker experts stressed the importance of employment security, since ATCOs were in constant danger of losing their job by reason of the loss of their licence on grounds of medical or technical incapacity. In view of their high degree of specialisation, it was difficult for them to adapt to other kinds of work with comparable levels of remuneration. Although controllers who were employed by public authorities could in principle be re- employed within the civil service, the number of suitable jobs at an appropriate level of responsibility within the civil was in practice highly limited in view of the ATCOs specialised background, training and experience. Provision should therefore be made for loss of licence insurance schemes and second career programmes for ATCOs in all countries, both of which should be sponsored by the employer. A Worker expert drew the Meeting's attention to the particularly delicate situation of ATCOs employed by private companies, who did not benefit from guaranteed employment despite operating in a monopolistic environment, and who nevertheless had been provided with certain guarantees concerning loss of licence insurance and early retirement.

94. Reference was made to the special allowance paid in Australia by the Government to ATCOs in case of loss of licence. The Worker experts felt that such allowances were very important for protecting the controller's level of income, as ATCOs reached a relatively high grade and level of remuneration at an early age, which could make it difficult for them to be transferred to other administrative posts in the public service. The options of early retirement with full pension in conjunction with the possible retraining for another career inside or outside the public service should also be available to ATCOs.

Consideration and adoption of Conclusions

95. At the request of the Meeting the Chairman submitted for consideration a set of proposed conclusions.

96. The Worker experts proposed that, in addition to the references to ILO Conventions Nos. 87, 98 and 151 reference should be made to the Workers' Representatives Convention, 1971 (No. 135 and the Paid Educational Leave Convention, 1974 (No. 140), which contained important provisions relating to facilities and time off for trade union activities that should also be applicable to ATCOs. It was agreed to include such a reference at the end of the section dealing with industrial relations.

97. The Government expert from the United Kingdom proposed that any reference to "public employees" in the conclusions relating to industrial relations be deleted, so

as not to exclude from their scope ATCOs employed by private companies. The Worker experts proposed that reference should be made throughout to ATCO "trade unions and/or other such representative organisations" so as to cover the whole range of occupational organisations representing ATCOs. These two proposals were agreed upon.

98. The Government expert from the United Kingdom stated that it would be preferable to recommend that ATCOs through their organisations should be consulted, rather than participate, in the determination of their conditions of employment and service, including the technical aspects of ATC. The Worker experts were opposed to this suggestion.

Participation in the determination of conditions affecting ATCOs was an active process whereas consultation could take place after the event or be devoid of substance. Collective bargaining was not merely a consultative process. Several Government experts pointed out that the proposed conclusion went beyond matters of conditions of employment and service; while in most countries, the right of negotiation covered conditions of employment and service, decisions on technical aspects of ATC were in the final resort the prerogative of the employer, although it was desirable that ATCOs be consulted thereon. It was finally agreed that ATCOs should, through their representatives, participate in the determination of their conditions of employment and service and should further be consulted in the conception, planning and implementation of technical provisions concerning ATC systems, the extent of such participation and consultation to be determined by national law and practice.

99. There was some discussion on whether a specific reference should be made to national joint committees in this connection. Some Government experts felt that this example was superfluous and that such committees might not be appropriate in all national conditions. The Worker experts pointed out that such national joint committees of ATCO organisations and ATC authorities already existed in some countries, and were a useful example to be followed. It was finally agreed to refer only to joint committees, the precise coverage of which should be decided upon in each country in agreement between the organisations and authorities concerned.

100. The Worker experts were in favour of a proposed conclusion which would state that the machinery for the settlement of disputes should not exclude the right to strike in principle but, in view of the serious economic, social and other consequences of the withdrawal of ATC services, this right should be resorted to by ATCOs only under specific conditions after all available procedures for dispute settlement have been exhausted and with the guarantee that ATC services which are essential to the health and safety of the public are assured.

101. The Government expert from the United Kingdom proposed that such a conclusion be qualified by the proviso that the right to strike be recognised in principle if national law so permits. The Worker experts said that they could not accept this proposal, since it would amount to maintaining the status quo, which everybody recognised to be unsatisfactory and had led to illegal strikes and serious disturbances in the operation of ATC services. Even in countries where the right to

strike of ATCOs was not provided for under national law, governments should, in principle, recognise this right which was one of the inalienable rights of all workers.

102. The Government expert from Japan stated that he could not accept any reference to the right to strike, since in his country ATCOs were part of the public service which did not have the right to strike. The Government expert from India stated that his Government did not recognise the right to strike of ATCOs. The Government expert from Australia said that, while he could sympathise with their position to some extent, ATCOs had no right to strike under Australian law. The Government expert from Mexico said that, as an expert, he could take no stand on this issue, which was for governments to decide. The Government expert from France recalled that the right to strike for ATCOs had existed previously in his country but had proved unsatisfactory and had been abolished by law in 1964.

103. The Government expert from the Federal Republic of Germany stated that, while there was no objection to including in the conclusions the principles of general policy embodied in ILO Conventions which were already in force, the present Meeting should not go beyond the provisions of these Conventions since this would amount to pronouncing upon issues of national policy relating to industrial relations. The right to strike was not referred to anywhere in the relevant ILO Conventions. While he did not object to this proposal being mentioned in the report as the opinion of the Worker experts, it could not be incorporated in the agreed conclusions of the Meeting.

104. After some further discussion, the Worker experts proposed that the conclusions of the Meeting on this point should be based on the principles embodied in Paragraph 19(2)(c) of the Nursing Personnel Recommendation, 1977 (No. 157), so as to provide that the settlement of disputes arising in connection with the determination of terms and conditions of employment should be sought through negotiation between the parties, or through independent and impartial machinery, such as mediation, conciliation and voluntary arbitration, with a view to making it unnecessary for the organisations representing ATCOs to have recourse to such other steps as are normally open to organisations of other workers in defence of their legitimate interests. There was some parallel between the situation of nursing personnel and air traffic controllers, since in both these professions there were workers both in public service and private employment and they both provided services which were, to some extent, essential. The Government expert from France objected to ATCOs being assimilated to other workers in general; in countries such as his own where ATCOs did not have the right to strike, one could not in this respect validly put ATCOs on the same footing as other groups of workers for whom the right to strike was recognised by law. It was finally agreed that the conclusions should incorporate a recommendation providing that the settlement of disputes arising in connection with the determination of terms and conditions of employment should be sought through negotiation between the parties, or through independent and impartial machinery such as mediation, conciliation and voluntary arbitration, with a view to making it unnecessary for the organisations representing ATCOs to have recourse to industrial action.

105. The Government expert from the Federal Republic of Germany stated that, while he did not oppose the inclusion of this proposal in the conclusions, his abstention on

this point should be recorded. He could not follow the other experts in accepting Paragraph 19(2)(c) of Recommendation No. 157 concerning nursing personnel as a basis for regulating the situation of ATCOs. In his opinion, the only guideline could be Articles 7 and 8 of Convention No. 151 dealing with the position of public servants; when the application of this Convention would be considered in the Federal Republic of Germany; the special constitutional situation would have to be taken into account.

106. After some discussion on standards of ATC equipment, during which the Worker experts argued that ATCOs should be provided with the very best equipment so as to ensure the highest level of safety, and some Government experts pointed out that heavy financial outlay might in some cases result only in a marginal increase in safety, the Meeting agreed to state that ATCOs should be provided with ATC equipment commensurate with operational requirements so as to promote an optimum level of safety.

107. The Government expert from the United Kingdom proposed that it should be specified that it was in areas where civilian air traffic predominates that a civilian ATC system seems preferable to a military one for the controlling of civil air traffic. After a lengthy discussion on this question in the light of such factors as the separate or concurrent use of airspace by civil and military aircraft, civilian air separation standards and the relative professional qualifications of civilian and military controllers, it was agreed that in areas where civil air traffic, in the normal course of events, predominates or where civil airspace is clearly defined, a civilian ATC system is preferable for controlling air traffic, the ICAO policy being that one controller should be responsible for any given area of airspace at any given time.

108. On the proposal of a Worker expert a statement was included to the effect that, in order to guarantee air safety, recourse should not be had to replacement ATC staff who do not have the required national or international qualifications. The Worker experts stressed that such staff should be familiar with the airspace they were controlling.

109. After a lengthy discussion on the maximum hours of attendance at the place of work, during which the Worker experts felt that these should include meal breaks and rest periods, and some Government experts felt that only rest periods should be included, it was agreed that the maximum hours of attendance at the place of work per week by ATCOs should normally be less than the generally accepted number of hours of attendance per week completed by other workers in civil aviation in the State concerned.

110. The Government expert from the United Kingdom stated that he could not agree with the conclusions on the maximum hours of attendance in view of the hours of work for Civil Aviation Authority ATCOs in his country. The Government expert from the Federal Republic of Germany pointed out that in his country the same objective is achieved by means of scheduling breaks.

111. The Worker experts felt that in the interest of safety the limit on shift lengths embracing periods of high activity should be absolute. Several Government experts

pointed out that some flexibility was essential to allow for local conditions since in some countries the ATCOs themselves preferred to work longer shifts. It was agreed that shift lengths which embrace periods of high activity should not normally exceed 8 hours and in other cases should not exceed 10-12 hours.

112. While the Worker experts felt that the general practice should be to provide ATCOs with 30-minute breaks after two hours' duty in all cases as was done in a certain number of countries, some Government experts doubted whether this should be laid down as a rigid rule except during high traffic density periods. It was finally concluded that agreement should be reached between ATCO trade unions and/or other such representative organisations and local managements as to which positions the entitlement and frequency of rest periods should apply. In view of the difficulty of defining the precise circumstances (e.g. emergency or force majeure) under which overtime might be allowed, the Meeting agreed that overtime should be avoided.

113. The Worker experts named several countries in which ATCOs were entitled to extra leave above that of office workers in general and shift workers in particular. It was recognised that this principle had been established in some countries.

114. At the request of the Worker experts, a reference to the Discrimination (Employment and Occupation) Convention, 1958 (No. 111), embodying principles which should be applicable to ATCOs, was included at the end of the section on remuneration.

115. The Government expert from the United Kingdom pointed out that the remuneration related job evaluation survey in his country to which reference had been made concerned all Civil Aviation Authority employees and not just ATCOs. Some Government experts suggested that the uniqueness of the ATCO profession should be qualified as being the opinion of the Worker experts, but after the latter pointed out that an Australian judicial body had defined the ATCO profession as "sui generis", it was agreed that the conclusions of the Meeting should refer to the uniqueness of the air traffic control profession.

116. After further discussion on the principle and feasibility of comparing ATCOs and pilots, in particular airline captains, for remuneration purposes, the Meeting agreed that because of the uniqueness of the air traffic control profession, it did not readily lend itself to comparisons with other professions. However, to ensure that the ATCOs' remuneration was commensurate with their responsibilities, it should be noted that one of the professions in which the responsibilities assumed closely resembled that of the ATCO is that of the professional pilot.

117. The Meeting agreed that the principle of an early age of retirement should be recognised for ATCOs, that such an age should not be made compulsory so as to allow ATCOs to go on working provided they were fit to do so and that this age should be determined by negotiations at the national level between the employer and ATCO trade unions and/or other such representative organisations.

118. There was agreement that the requirement for retirement at an earlier age than that of other employees should enable ATCOs to receive pension benefits as if

service had continued to normal retirement age. However, the problem of assessing and calculating such benefits gave rise to a lengthy debate on the factors which should be taken into account in calculating pension benefits. Several experts stressed that any conclusion should state principles and not go into specific details on their implementation. It was finally agreed that the method of assessment of such benefits should be the subject of negotiation.

119. Regarding Studies and research on health and welfare, the Meeting agreed, on the proposal of the Government expert from the Federal Republic of Germany and the Worker expert from Zambia, to delete any reference to hypertension and coronary heart diseases among ATCOs and introduce a reference to the impact of stress on the ATCOs, and to the prevention of stress.

120. On the proposal of the Worker experts the Meeting agreed that the medical examination system should include aptitude tests specifically geared to ATC requirements, without specifying whether or not these tests should be physical and psychological. The Government expert from the United Kingdom made known the doubts expressed by his medical personal adviser that, at least in his country, medical ethics would not admit that a patient could consult his own medical file. The Worker expert from Norway pointed out that in his country physicians had no right to prohibit their patients from receiving any information regarding their health. After some discussion, it was agreed that the ATCO should be entitled to have his medical file forwarded to his own physician at the latter's request.

121. The Worker experts proposed that nationally compiled statistics on the medical aspects of the ATCO profession should be forwarded to the ILO for collation annual publication in collaboration with the World Health Organisation (W HO), as a basis for future research. After the representative of the Director-General explained the budgetary constraints within which the ILO had to operate, it was agreed to mention that it would be desirable that the ILO in co-operation with WHO should collate the statistical results and that they should be published annually.

122. The Worker experts stressed the value of the ATCO as a source of information on the ATC system, and emphasised the necessity for establishing a system of reporting incidents, observations and suggestions which would not sanction or penalise the ATCO for human error. The Government experts felt that to take account of national law and practice, the establishment of such a system should first be considered in each country. Furthermore, while in order to be effective such a system should induce the ATCO to report on all incidents, it should not grant the ATCO immunity in cases of dereliction of duty, disregard for the law and gross negligence which would be made known by means other than the ATCO's reports. The Meeting agreed to these principles being reflected in the conclusion. The Government expert from the United Kingdom requested that his abstention on this conclusion be put on record.

123. The Worker experts pointed out that the right to participate in all stages of the investigation of incidents and accidents should be recognised for ATCO trade unions and other representative organisations, as it had already been recognised for other professions in civil aviation, such as pilots. Some Government experts, while acknowledging that the ATCO who was involved himself in an incident or accident

had a right to participate formally in the investigation procedure, doubted whether such participation was professionally or ethically desirable, let alone legally possible, except perhaps in the event that action was being taken against the ATCO, and only at the time such action was being considered. It was finally concluded that in every country ATCOs involved in the investigation of incidents and accidents should be entitled to representation from their trade unions and/or other such representative organisations to the extent that is legally possible. The Government expert from the United Kingdom stated that he did not agree with that conclusion. The Government expert from France requested that his abstention on this point be put on record.

124. Several Government experts proposed to specify that legislation should abolish the independent civil liabilities of ATCOs, and the Worker experts stressed the need for providing the ATCO with legal counsel in addition to legal protection. Both proposals were accepted.

125. On the proposal of the Worker experts, trade union activity leave was included among the factors to be taken into consideration in staffing formulae.

126. The Worker experts' proposal that training to private pilot licence standard should be part of the training process met with the objection of several Government experts who pointed out that such a training was not necessary to become an ATCO, and that many competent ATCOs had no pilot licence at all. Moreover, familiarisation flights provided the ATCOs with all the necessary knowledge of aircraft performance and pilot workload. On the proposal of the Chairman, it was agreed that training to private pilot standard could be considered where it would usefully contribute to the training programme. The Government expert from Australia requested that his abstention on this conclusion be put on record.

127. On the proposal of the Worker experts it was agreed to insert a new paragraph stating that, in order to sustain the required high degree of aviation safety and the high ATC standards and also to keep the ATCO abreast with aviation progress, it is considered essential that ATCOs receive regular refresher courses and benefit from regular familiarisation flights. The frequency of such courses and flights may be agreed upon by the ATCO trade unions and/or other such representative organisations and the respective aviation authorities. A Government expert proposed to add a sentence stating that in the interest of safety, a system of regular proficiency checks should be established for the ATCOs. A Worker expert pointed out that in Norway ATCOs had resisted proficiency checks and the Government had accepted their position. On the proposal of a Government expert, it was agreed to replace the word "checks" by "checking".

128. A new test incorporating all the amendments agreed upon was then circulated to the Meeting of Experts. The Meeting approved the draft conclusions as revised, with a few editorial changes. The text of the conclusions as finally adopted is reproduced in Appendix I.

<u>Consideration and adoption of the report</u>

129. A draft report on the proceedings up to the point at which the Meeting began the consideration of conclusions was submitted to the Meeting at its final sitting. It was agreed that the Office would prepare a draft record of the subsequent proceedings and that this would be sent to the Chairman, whom the Meeting entrusted with the task of correcting and approving it on its behalf. Paragraphs 95-135 were drawn up in accordance with this procedure.

130. Several Government and Worker experts requested that certain specific paragraphs be corrected or expanded to give a better representation of particular points and views they had emphasised during the Meeting.

131. A Worker expert questioned the statement made by the Government expert from the Federal Republic of Germany and reflected in paragraph 24 regarding the ATCOs' demands in his country in 1973.

132. Regarding a lower age of retirement for ATCOs, several Government experts considered that the medical studies referred to by the Worker experts were not fully conclusive on that point.

133. After taking note of all the corrections and editorial changes, the Meeting unanimously adopted the part of the report before it, as amended. The remainder of the report was drawn up and approved in accordance with the procedure described in paragraph 129.

Closing speeches

134. The Government experts thanked the Chairman for his excellent guidance and for the way he had steered the Meeting to a success. The Worker experts congratulated the Chairman on his able leadership, expressed their gratitude for having been given this opportunity of discussing the problems of the ATCO profession, and voiced their hope that this profession would gain its proper recognition within the aviation world. Several observers of non-governmental international organisations also expressed their appreciation of the Meeting and its successful outcome. The representative of the Director-General associated the secretariat and the Office to the compliments paid to the Chairman and thanked all participants for their valuable contribution.

135. The Chairman expressed his appreciation to the Vice-Chairman, the experts and all other participants for their contribution to the work accomplished. He felt that it had been a very useful and pleasant experience for him and that the Meeting's success stemmed from the degree of co-operation and goodwill shown by the experts themselves. He also thanked the representative of the Director-General of the ILO, the Executive Secretary and the staff members of the secretariat for the excellent work and dedication which they demonstrated and which had contributed in a very significant way to ensuring the success of the Meeting.

Geneva, 6 July 1979

(signed)
P. V. Dawson,
Chairman

APPENDIX I

CONCLUSIONS

The experts discussed a wide range of problems concerning air traffic controllers (ATCOs). Recognising that this profession is unique and has certain specific features which have to be taken into account in identifying its problems and finding solutions to them, they have agreed to put forward the following recommendations:

Industrial relations

1. The governments of all ILO member States should be urged to ratify and apply the Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87), the Right to Organise and Collective Bargaining Convention, 1949 (No. 98) and the Labour Relations (Public Service) Convention, 1978 (No. 151), as their provisions embody principles which should be recognised as applicable to ATCOs.

2. In particular, ATCOs should have the right to establish and join organisations of their own choosing without previous authorisation. These organisations should have the right to draw up their own constitutions and rules, elect their representatives in full freedom, organise their administration and activities and formulate their programmes without interference from public authorities. These organisations should not be dissolved or suspended by administrative authority and should have the right to establish and join federations and confederations. Any such organisation, federation or confederation should have the right to affiliate with international organisations.

3. ATCOs should enjoy adequate protection against acts of anti-union discrimination in respect of their employment. In particular the employment of ATCOs should not be made subject to the condition that they shall not join or that they shall relinquish membership of an ATCO trade union or other representative organisation, and they should be protected against acts calculated to cause their dismissal or otherwise prejudice them by reason of membership of such an organisation or because of participation in the normal activities of such an organisation.

4. These organisations should enjoy complete independence from employers and/or public authorities, and adequate protection against any interference by an employer and/or public authority in their establishment, functioning or administration.

5. ATCOs should participate, through their trade unions and/or other such representative organisations, in the determination of their conditions of employment and service. Furthermore, ATCOs should be consulted in the conception, planning and implementation of technical provisions concerning ATC systems, for example, through the establishment of joint committees of ATCO organisations and ATC authorities. The extent of this participation and consultation should be determined by national law and practice but in all cases they should take place in the early stages of the decision-making process where feasible.

6. Procedures appropriate to national conditions should be established to encourage and promote voluntary negotiation designed to resolve issues related to terms and conditions of employment.

7. Industrial disputes in ATC are due to a variety of causes. In particular there appears to be a correlation between their occurrence and inadequate professional recognition, quality of ATC equipment, a lack of capacity of ATC systems to cope with peak demand of air traffic as well as concern with wages and working conditions. This correlation appears to be more evident in situations where adequate dispute settlement machinery does not exist.

8. The settlement of disputes should be sought as may be appropriate to national conditions, through negotiation between the parties or through independent and impartial machinery, such as mediation, conciliation and arbitration, established in such a manner as to ensure the confidence of the parties involved. Where ATCOs are employed by the government, their civil servant status should not preclude them from having access to the following procedures: in particular, the settlement of disputes arising in connection with the determination of terms and conditions of employment should be sought through negotiation between the parties, or through independent and impartial machinery, such as mediation, conciliation and voluntary arbitration, with a view to making it unnecessary for the organisations representing ATCOs to have recourse to industrial action.

9. The principles relevant to trade union activities which are embodied in the Workers' Representatives Convention, 1971 (No. 135) and the Paid Educational Leave Convention, 1974 (No. 140) should be recognised as applicable to ATCOs.

Social and labour aspects of the ATC system

10. The technical aspects of any ATC system have a definite impact on the social and labour problems of ATCOs, and in most cases it is difficult to consider the two groups of issues separately.

11. In all countries research should be carried out with a view to defining the capacity of the ATC system and the ATCO's workload. Such research should take account of the differences among ATC regions, units and even sectors.

12. Although the findings of such national research cannot be directly applied in other countries, an exchange of information would be beneficial to States having similar ATC conditions and systems. The ILO, in collaboration with other international organisations concerned, should collect and disseminate such findings and information.

13. The ILO should call the attention of the International Civil Aviation Organisation (ICAO) to the need for establishing international minimum standards concerning the design and maintenance of ATC premises and ground equipment, the type of such equipment and the requirements of the working environment in order to maximise safety. The ILO, as well as the World Health Organisation (WHO) ant other international organisations concerned, should participate in the establishment of these standards. This suggestion does not in any way preclude

States from establishing national standards which meet their requirements. ATCOs, through their organisations, should participate in the elaboration of such standards.

14. ATCOs should be provided with ATC equipment commensurate with the operational requirements so as to promote an optimum level of safety. ATCOs, through their trade unions and/or other such representative organisations, should also be consulted in the early stages on the design of new ATC premises and the type of new ATC equipment.

15. In areas where civil air traffic, in the normal course of events, predominates, or where civil airspace is clearly defined, a civilian ATC system is preferable to a military one for the controlling of air traffic. Such a system should be a well-defined organisation responsible for managing the technical, social and labour aspects of ATC. The ICAO policy is that one controller should be responsible for any given area of airspace at any given time.

16. In order to guarantee air safety, recourse should not be had to replacement ATC staff who do not have the required national or international qualifications.

17. After considerable debate on different types of ATC administration, it is recognised that, regardless of the type of structure which exists, the system should in all cases ensure sound industrial relations and the proper functioning of ATC services.

Hours of work

18. ATCOs are directly involved in the safety of civil aviation and have problems which are unique to their profession, and their concern with safety could broadly be compared with that of pilots.

19. Hours of work, length of shifts, duration of uninterrupted work at air traffic control positions and other parameters of work schedules have a direct impact on air safety. It is therefore necessary to establish guidelines for work schedules to reduce fatigue of air traffic controllers.

20. Long working hours and inadequate rest periods for ATCOs are potential threats to the safety of aviation. However, it is very difficult to establish uniform standards for all countries, ATC systems, levels of traffic density and hours of the day. There are no internationally accepted medical criteria in relation to fatigue and working hours, but socio-domestic factors which are important must also be taken into account.

21. Maximum working hours per day, per week and per month with minimum rest periods should be laid down for ATCOs by the governments of all States in consultation with the trade unions and other representative organisations concerned. These should preferably be enforceable by law. For the reasons indicated in the preceding paragraphs, the maximum hours of attendance at the place of work per week by ATCOs should normally be less than the generally accepted number of hours of attendance per week completed by other workers in civil aviation in the State concerned.

22. Shift lengths which embrace periods of high activity should not normally exceed 8 hours and in other cases should not exceed 10-12 hours.

23. Timetables should be devised in consultation with staff organisations in such a manner that sufficient time is allowed to relieve fatigue, and should allow for short rest periods. The prevalent practice in some countries appears to provide controllers with 30-minute breaks after two hours' duty. Agreement should be reached between ATCO trade unions and/or other such representative organisations and local managements as to which positions the entitlement and frequency of rest periods should apply.

24. Since overtime work is undesirable from the safety as well as from the social points of view, it should be avoided.

25. 25. The ILO should as a matter of urgency undertake a thorough investigation into the impact of fatigue and the effect of stress on ATCOs in collaboration with other international organisations, such as WHO and ICAO, and should set minimum international standards on working hours and rest periods for ATCOs, as has been done for other categories of employees such as pilots.

26. With regard to holidays and days off, the principle of extra leave for ATCOs in view of the particular demands of their profession, either above that of office workers in general or above that of shift workers in particular, has been established in some countries.

<u>Remuneration</u>

27. Because of the uniqueness of the air traffic control profession, it does not readily lend itself to comparisons with other professions. However, to ensure that the ATCOs' remuneration is commensurate with their responsibilities, it should be noted that one of the professions in which the responsibilities assumed closely resemble that of the ATCO is that of the professional pilot. In fact, in at least one country, the controller's remuneration has been compared and linked to that of airline captain. In many countries ATCOs are compared to other public servants for remuneration purposes due to their employment status which has led to considerable dissatisfaction among ATCOs. In all cases, the trade unions and/or the appropriate organisations concerned should be consulted on the proposed remunerations resulting from these comparisons.

28. In the interest of air safety, when determining remuneration structure and levels, ATC authorities should take into consideration the impact of remuneration on staffing levels and turnover. The relevant principles which are embodied in the Discrimination (Employment and Occupation) Convention, 1958 (No. 111) should be recognised as applicable to ATCOs.

<u>Age of retirement and pensions</u>

29. The principle of an early age of retirement should be recognised for ATCOs in view of the peculiarity of this profession and in the interest of air safety. This early age of

retirement should be determined by negotiations at the national level between the employer and ATCO trade unions and/or such other representative organisations.

30. The requirement for retirement at an earlier age than that of other employees should enable ATCOs to receive pension benefits as if service had continued to normal retirement age, the method of assessment of such benefits to be the subject of negotiations between the employer and ATCO trade unions and/or other such representative organisations.

Occupational safety, health and welfare

31. Close co-operation should be established between ATC authorities in all countries and ATCO trade unions and other representative organisations in improving all aspects of occupational safety, health and welfare.

32. Studies and research on all aspects of the occupational safety, health and welfare of ATCOs, including ergonomics and equipment design, should be carried out in all countries. ATCO trade unions and other representative organisations should be involved in these efforts from the start. These studies should be communicated to the ILO.

33. With regard to safety, control towers and control rooms should be fitted with fire and emergency exits.

34. Studies carried out at the national level indicate that a stress problem exists in ATC. There is still scope for considerable research to identify the causes of stress and its impact on the ATCOs, measure it levels and work out measures for preventing, diagnosing and treating its manifestations as soon as possible.

35. A system of initial and regular follow-up medical examinations specifically for ATCOs is essential in the interest of safety. Such a system should be geared to selection, and be capable of: detecting any medical deficiencies in ATCOs before or during their ab initio training; providing for a thorough and regular monitoring of the ATCO's health throughout his career; detecting any deterioration in his health as early as possible; and preventing such deterioration wherever possible. Such a system should include aptitude tests specifically developed for ATC requirements. The ATCO should be entitled to have his medical file forwarded to his own physician at the latter's request. Statistics should be taken and evaluated by each national authority of the medical standards of the ATCO profession, and it would be desirable that these statistical results should be collated by the ILO in co-operation with the WHO and published annually.

36. Adequate recreation, rest, welfare and sanitary facilities should be planned for and available at all ATC units. Rest rooms should be separate from the place of work and the recreation facilities.

Legal liabilities

37. ATCOs are knowledgeable about the reliability and efficiency of the ATC systems, procedures and equipment that they operate and many improvements to the system originate in the lessons drawn from its failures. Therefore, in every country, it should be considered whether, in the interest of safety, a reporting system on incidents, observations and suggestions could be established, which does not penalise or sanction the ATCO, except in cases of dereliction of duty, disregard for the law and gross negligence, which would be made known by means other than the ATCO's reports.

38. In every country, where ATCOs are involved in the investigation of incidents and accidents, they should be entitled to representation from their trade unions and/or other such representative organisations to the extent that is legally possible.

39. In the light of recent court decisions in some countries and developments of case law, ATCOs in some countries may be held liable and found guilty either for strictly adhering to ATC rules and regulations or for departing from them in the interest of safety. They are therefore operating in a complex system with respect to their legal liability. Legislative action should be taken whenever necessary to harmonise air navigation and ATC regulations with developments in the law of the land on an ongoing basis.

40. Since no legal system recognises the principle of vicarious criminal liability and since under several legal systems the ATCO's civil liability may be invoked separately and independently from the vicarious civil liability of his employer, the ATCO may be sued both on criminal and civil grounds independently from his employer. Governments in the legal systems concerned should pass legislation to abolish such independent civil liabilities of ATCOs and provide them with adequate legal protection and counsel in those areas where this does not exist at present.

41. The ILO should call ICAO's attention to the need to safeguard the ATCO's legal interests when ICAO is considering an international Convention on the liability of air traffic control agencies, with a view to ensuring, in particular, that the ATCO will not be individually and independently sued for damages over and above the limits to be stipulated by that Convention.

42. The ILO should collect and disseminate all relevant information on this subject, and undertake a study of the ATCO's legal liabilities and legal position in different countries.

<u>Manpower and career planning</u>

43. Adequate manpower and career planning activities are vital to the efficiency and safety of air traffic control systems. These programmes should take into account all relevant factors such as seasonal fluctuations, air traffic forecasts in the short and medium term, the capacity of ATC systems, the ATCO's workload and capacity to handle traffic, the number of control positions needed, the level of competence and qualifications of staff and staffing formulas. A closer co-operation between airlines and air traffic control services is desirable in this respect, in order to overcome some of the inherent instability and fluctuations of these factors.

44. The staffing formulas should take into account all the relevant factors such as operating hours of the different working positions; number and length of shifts; hours of work; holidays, annual leave, time off, maternity leave, trade union activity leave and other days off; number of days lost on sick leave; time needed for holding positions other than actual control; time needed for specialised and refresher training courses; ATCO attrition through retirements, medical incapacity and resignations. Although these factors can be forecast with relatively greater accuracy than the ones outlined in the preceding paragraph, their values may change, sometimes abruptly, when new conditions of work are negotiated.

Training and retraining

45. In the interest of safety, the existing international guidelines for the training of ATCOs should be revised and the ILO should bring this to ICAO's attention.

46. With regard to recruitment, ATCO candidates with no previous aviation experience should be normally recruited between 17 and 25 years of age and their general education should be relevant to civil aviation, and at university entrance level. The basic training programme should provide for three phases before licensing: classroom instruction; exercises with simulators on ATC procedures; and practical experience. Training to private pilot licence standard could be considered where it would usefully contribute to the training process.

47. In order to sustain the required high degree of aviation safety and the high ATC standards and also to keep the ATCO abreast with aviation progress, it is considered essential that ATCOs receive regular refresher courses and benefit from regular familiarisation flights. The frequency of such courses and flights may be agreed upon by the ATCO trade unions and/or other such representative organisations and the respective aviation authorities. In the interest of safety, a system of regular proficiency checking should be established for the ATCOs.

48. Post-licensing training should provide for retraining courses prior to the introduction of new ATC equipment and procedures. Simulators could be suitable tools for on-the-job training, despite the complex problems their introduction would imply.

49. Both classroom and on-the-job instructors should be carefully selected and given adequate pedagogical training prior to their work. Classroom instructors should generally be selected from among ATCOs engaged in actual ATC work and be provided with opportunities to keep their knowledge up to date. A specific instructor rating, or qualification level, should be established as a distinct category of ATCO to facilitate the ensuring of proper selection of high quality instructors.

Employment security

50. Throughout his career the ATCO is exposed to the concrete and constant risk of losing his licence on grounds of medical or technical incapacity, thereby ceasing to be able to exercise his profession and thus losing his livelihood. Since the number of suitable and meaningful posts for re-employing the ATCO within the civil service is rather limited in view of his specialised background, training and experience,

employer-sponsored loss of licence insurance schemes and employer -sponsored second career programmes should be encouraged for ATCOs in all countries, more particularly where ATC is run by a private company and where re-employment possibilities are thus even more difficult to obtain. If the ATCO is to be re-employed after he has lost his licence, he should be given thorough retraining for his new post.

51. Since ATCOs attain a high level of professional specialisation and remuneration at a relatively young age, the impact on their incomes of loss of licence is much more significant than for other groups of workers. Consequently, the retraining requirements are greater and the difficulties more severe when ATCOs are reassigned to other positions to learn new responsibilities.

52. The Governing Body of the International Labour Office is invited to consider placing on the agenda of an early session of the International Labour Conference the question of conditions of employment and service of air traffic controllers with a view to the adoption of an appropriate international instrument.