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TO THE ASSEMBLY
OF THE
INTERNATIONAL CIVIL AVIATION ORGANIZATION

I have the honour to transmit, at the direction of the Council, its Report for the year 2000 prepared in compliance with Article 54(a) of the Convention on International Civil Aviation. With the Reports for 1998 (Doc 9732) and 1999 (Doc 9752), it constitutes documentation for Item 7 of the Provisional Agenda of the 33rd Session of the Assembly, and it will be supplemented by a brief review of the work of the Organization for the first six months of 2001. It is being circulated to Contracting States now for their information and will also be sent to the Economic and Social Council of the United Nations in pursuance of Article VI, paragraph 2 (a) of the Agreement between the United Nations and ICAO.

The Report was prepared by the Secretariat and circulated in draft form to the Representatives of Council Member States for their suggestions. The Council, as a body, did not formally examine or adopt it but, as in the past, delegated to its President authority to approve the final text after considering all the suggestions received.

Chapter I summarizes the principal trends and developments in civil aviation and the work of the Organization during the year; the activities of ICAO itself are described in Chapters II to X.

The Council held three sessions in 2000. These were the One hundred and fifty-ninth Session from 17 January to 17 March, with a total of thirteen meetings; the One hundred and sixtieth Session from 17 April to 16 June, with a total of fourteen meetings; and the One hundred and sixty-first Session from 10 October to 8 December, with a total of eighteen meetings, two of which were held outside the Council phase. Authority was delegated to the President to act on a number of matters, as necessary, when the Council was not in session.


Assad Kotaite
President of the Council

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Glossary

- ACAS.** Airborne collision avoidance systems
ACC. Area control centre
ACDB. Airport Characteristics Data Bank
ADIZ. Air defence identification zone
ADREP. Accident and incident reporting data
ADS. Automatic dependent surveillance
AFDD. Audit findings and differences database
AFI. African Region
AFIS. Aerodrome flight information services
AFS. Aeronautical fixed service
AFTN. Aeronautical fixed telecommunication network
AIC. Aeronautical information circular
AIPs. Aeronautical Information Publications
AIS/MAP. Aeronautical Information Services/Aeronautical Charts
AMHS. Aeronautical message handling system
AMSS. Aeronautical mobile satellite service
ANC. Air Navigation Commission
ANS. Air navigation services
AOSCF. Administrative and operational services cost fund
APANPIRG. ASIA/PAC Planning and Implementation Regional Group
ARDMS. Aviation regulatory database management system
ASAS. Airborne separation assurance system
ASP. Aeronautical surveillance plans
ASTC. AVSEC training centre
ATC. Air traffic control
ATFM. Air traffic flow management
ATM. Air traffic management
ATN. Aeronautical telecommunication network
ATO. Air transportation office
ATS. Air traffic services
AVSEC. Aviation Security
BUFR. Binary Universal Form for the Representation of meteorological data
CAA. Civil Aviation Authority
CAMP. Civil Aviation Master Plan
CAPS. Civil aviation purchasing service
CAR. Caribbean Region
CARICOM. Caribbean community
CAST. Commercial aviation safety team
CCTV. Closed-circuit television
CDU. Course development unit
CFIT. Controlled flight into terrain
CNS/ATM. Communications, navigation, surveillance and air traffic management
COM. Communication
COMESA. Common market for Eastern and Southern Africa
CORPAC. Corporación Peruana de Aeropuertos y Aviación Comercial
COSCAP. The Cooperative Development of Operational Safety and Continuing Airworthiness
COSPAS. Space system for search of vessels in distress
CPDLC. Controller-pilot data link communications
CRS. Computer reservation systems
DCA. Department of Civil Aviation
DGCA. Directorate General of Civil Aviation
DME. Distance measuring equipment
DOJ. Department of Justice
DOT. Department of Transportation
EANPG. EUR Air Navigation Planning Group
EATCHIP. European ATC Harmonization and Integration Programme
EC. European Commission
ECA. Economic Commission for Africa
ECAC. European Civil Aviation Conference
ECOSOC. Economic and Social Council
EDR. Eddy dissipation rate
EGR. Equitable Geographic Representation
ESCAP. Economic and Social Commission for Asia and the Pacific
EU. European Union
EUROCONTROL. European Organization for the Safety of Air Navigation
FAA. Federal Aviation Administration
FASID. Facilities and Services Implementation Document
FIR. Flight information region
FIS. Flight information services
GASP. Global aviation safety plan
GATS. General Agreement on Trade in Services

- GDP.** Gross domestic product
- GEOSAR.** Geostationary satellites
- GEPEJTA.** Group of Experts on Policies, Economics and Legal Matters in Air Transport
- GNSS.** Global navigation satellite systems
- GPS.** Global position system
- GREPECAS.** CAR/SAM Regional Planning and Implementation Group
- HF.** High frequency
- HRD.** Human resource development
- IAVW.** International airways volcano watch
- IBIS.** ICAO bird strike information system
- ICDB.** ICAO central database for documents
- ICPO/INTERPOL.** International Criminal Police Organization
- ILS.** Instrument landing systems
- JAA.** Joint Aviation Authority
- LACAC.** Latin American Civil Aviation Commission
- MET.** Meteorology
- METAR.** Aviation routine weather report (in aeronautical meteorological code)
- MIDANPIRG.** MID Air Navigation Planning and Implementation Regional Group
- MNT.** Mach number technique
- MoU.** Memorandum of Understanding
- MRTD.** Machine readable travel documents
- MSA.** Management service agreement
- NAT SPG.** NAT Systems Planning Group
- NDT.** Non-destructive testing
- OCL.** Obstacle clearance limit
- OECD.** Organization for Economic Co-operation and Development
- OIFM.** Objectives implementation funding mechanism
- OPAS.** Operational assignment
- OPMET.** Operational meteorological information
- OPS.** Operations
- PANS.** Procedures for Air Navigation Services
- PC.** Project Coordinator
- PIRGs.** Planning and implementation regional groups
- RAC.** Rules of the air and air traffic services
- RAFC.** Regional area forecast centre
- REDDIG.** SAM digital network
- RFF.** Rescue and fire fighting
- RNAV.** Area navigation
- RNP.** Required navigation performance
- RVR.** Runway visual range
- RVSM.** Reduced vertical separation minima
- SA.** South Asia
- SADC.** Southern African Development Community
- SADIS.** Satellite distribution system
- SAFA.** Safety assessment of foreign aircraft
- SAM.** South American Region
- SARPs.** Standards and Recommended Practices
- SARSAT.** Search and rescue satellite-aided tracking
- SCAR.** SADIS cost allocation and recovery
- SFOR.** Stabilization force
- SIDS.** Small island developing States
- SIGMET.** Information concerning en-route weather phenomena which may affect the safety of aircraft operations
- SIGWX.** Significant weather
- SIP.** Special implementation project
- SME.** Subject matter expert
- SOI.** Safety oversight issues
- SPPD.** Support Services for Policy and Programme Development
- SSR.** Secondary surveillance radar
- STE.** Short-term expert
- STP.** Standardized Training Package
- STS.** Support for technical services
- TAF.** Terminal aerodrome forecast
- TCCA.** Transatlantic Common Aviation Area
- TF.** Trust Funds
- UNCTAD.** United Nations Conference on Trade and Development
- UNDCP.** United Nations Drug Control Programme
- UNDP.** United Nations Development Programme
- UNEP.** United Nations Environment Programme
- UNFCCC.** United Nations Framework Convention on Climate Change
- UNIDROIT.** International Institute for the Unification of Private Law
- UPU.** Universal Postal Union
- USOAP.** Universal Safety Oversight Audit Programme
- VAAC.** Volcanic ash advisory centre
- VDL.** VHF digital link
- VHF.** Very high frequency
- VOR.** VHF omnidirectional radio range
- VSAT.** Very small aperture terminal
- WAFC.** World area forecast centre
- WAFS.** World area forecast system
- WFP.** World Food Programme
- WGS-84.** World Geodetic System — 1984
- WPR.** Waypoint positioning reporting
- WRC-2000.** World Radiocommunication Conference (2000)
- Y2K.** Year 2000 problem

Chapter I

The Year in Summary

This chapter summarizes the principal trends and developments in civil aviation and the work of ICAO in 2000. Tables in Appendix 12 provide detailed statistics on the data presented in this chapter.



In 2000, world gross domestic product (GDP) grew approximately 4.4 per cent in real terms (Figure 1). For the industrialized countries GDP grew 4.0 per cent, somewhat below the global average; however, North America experienced a robust economic growth of about 5.3 per cent. GDP growth for developing countries amounted to 5.6 per cent, almost 1 per cent higher than the previous year.

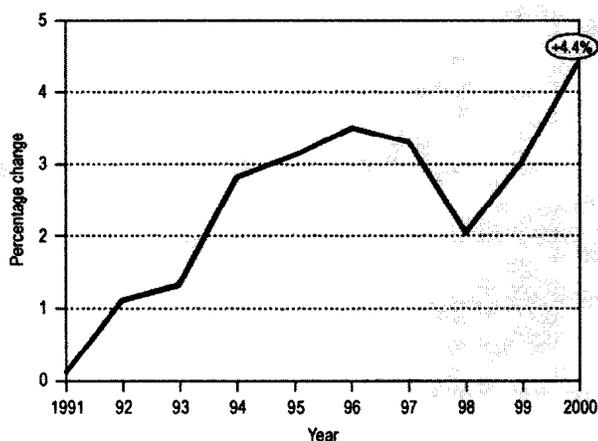


Figure 1. Development in world GDP in constant prices year-on-year changes, 1991-2000

Africa's economy achieved a 3.6 per cent GDP increase. The Region with the largest share of the world economy, Asia and the Pacific, continued to regain its economic strength with approximately 4.3 per cent GDP growth in 2000, close to the world average. Developing countries in the Asia and the Pacific Region contributed significantly as their average GDP grew 6.7 per cent. China's GDP again showed a strong growth, of 7.7 per cent. Several South-East Asian economies continued to show strong growth in 2000. Japan's GDP continued to stabilize with almost 2 per cent growth during 2000, while Asia's 4 newly industrialized economies averaged almost 8 per cent GDP growth. Australia's and New Zealand's economies grew at about 4.0 per cent, closer to the world average.

Europe achieved an average GDP growth of 3.5 per cent, over 1 per cent higher than the previous year and a rate consistent throughout the European Union. The Central and Eastern European economies grew around 3.8 per cent. The countries of the Commonwealth of Independent States (CIS) showed a significant GDP growth, averaging about 5.0 per cent, following moderate growth experienced in the previous year.

Latin America and the Caribbean recovered from a weak economic performance and posted a healthy 4.3 per cent GDP growth, close to the world average; the Middle East also experienced a high growth of over 6 per cent, significantly greater than the previous year.

The world trade volume in goods and services is estimated to have grown approximately 10 per cent in 2000, the highest rate achieved during the last decade and more than twice that experienced in the previous year.

International tourism grew significantly in 2000 by an estimated 7.4 per cent, almost double the increase in 1999. The World Tourism Organization (WTO) estimates that almost 700 million tourists

travelled to foreign countries spending approximately \$475 billion¹, an increase of 4.5 per cent over the previous year.

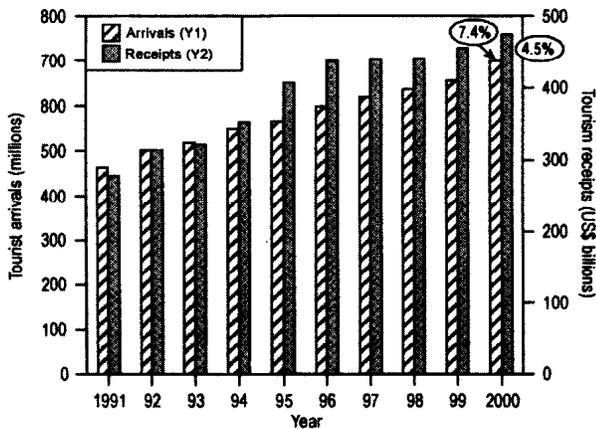


Figure 2. International tourism receipts and arrivals
U.S. dollars, 1991-2000

On a regional basis, some 36 per cent of the total traffic volume (passengers/freight/mail) was carried by North American airlines. European airlines carried 28 per cent, Asia/Pacific airlines 27 per cent, Latin American and the Caribbean airlines 4 per cent, Middle East airlines 3 per cent and African airlines 2 per cent (Table 4).

Data for individual countries (Tables 5 and 6) show that in 2000 about 45 per cent of the total volume of scheduled passenger, freight and mail traffic was accounted for by the airlines of the

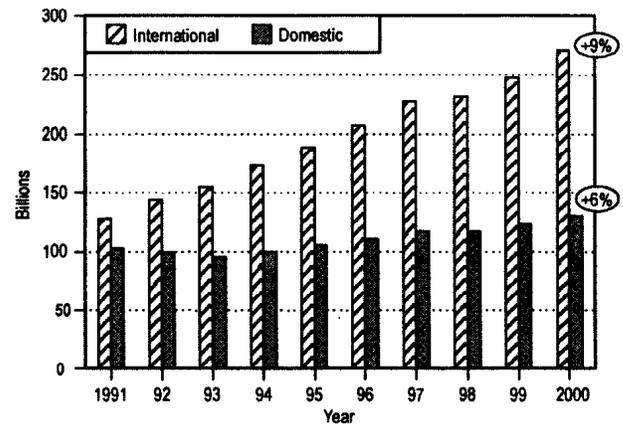


Figure 3. Scheduled traffic
tonne-kilometres performed, 1991-2000



Scheduled Operations

In 2000, the total scheduled traffic carried by the airlines of the 185 Contracting States of ICAO amounted to a total of about 1 647 million passengers and some 30.2 million tonnes of freight. Overall passenger/freight/mail tonne-kilometres performed increased by some 8 per cent over 1999 and international tonne-kilometres by some 9 per cent (Tables 1 and 2). Figure 3 shows the trend from 1991 to 2000.

In 2000, the overall capacity increased at a slightly lower rate than traffic (Figure 4). Hence, the average passenger load factor on total scheduled services (domestic plus international) increased to 71 per cent in 2000 and the average weight load factor increased to 61 per cent (Table 3).

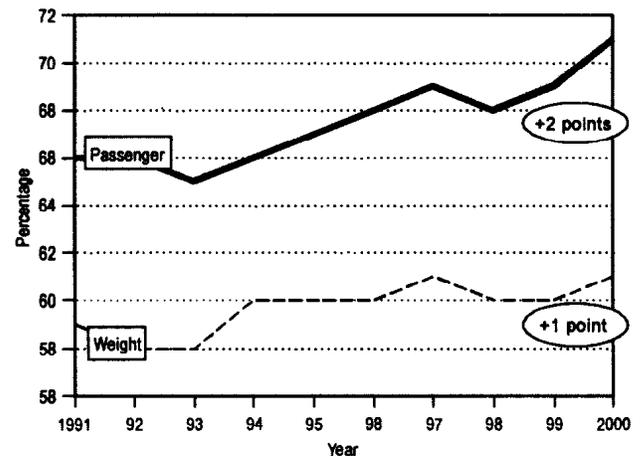


Figure 4. Scheduled traffic
achieved load factors, 1991-2000

1. All amounts listed in this chapter are in U.S. dollars.

United States, Japan and the United Kingdom (34, 6 and 5 per cent respectively). On international services, almost 39 per cent of all traffic was carried by the airlines of the United States, the United Kingdom, Germany and Japan (18, 8, 7 and 6 per cent respectively).

Non-scheduled Commercial Operations

It is estimated that in 2000 total international non-scheduled passenger-kilometres increased by some 11 per cent, with the non-scheduled share of overall international air passenger traffic remaining at about 13 per cent (Figure 5 and Table 7). Domestic non-scheduled passenger traffic represents only about 8 per cent of total non-scheduled passenger traffic and some 2 per cent of total domestic passenger traffic worldwide.

Airport Operations

In 2000, the 25 largest airports in the world handled some 1 096 million passengers, according to preliminary estimates (Table 8). During the same period, the airports concerned (16 of which are located in North America, 6 in Europe and 3 in Asia) also handled some 11.5 million commercial air transport movements.

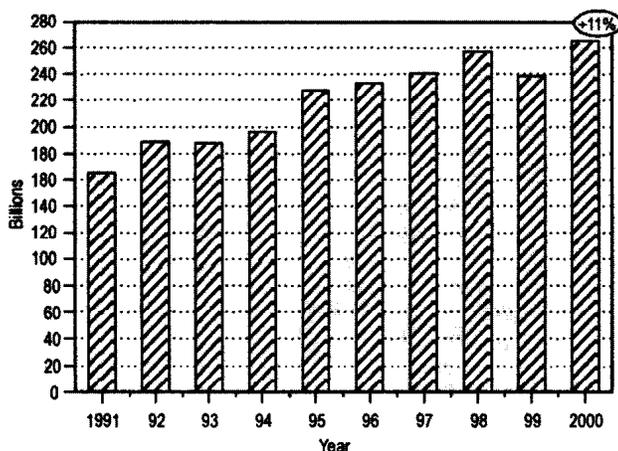
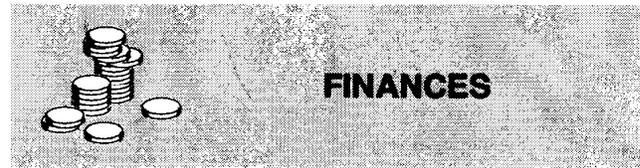


Figure 5. International non-scheduled traffic passenger-kilometres performed, 1991-2000



Airlines

Preliminary estimates for 2000 indicate that the world's scheduled airlines as a whole experienced an operating profit for the eighth year in succession (Table 9 and Figure 6).

The operating revenues of scheduled airlines of ICAO Contracting States are tentatively estimated at \$328 700 million in 2000 and operating expenses for the same airlines at \$317 700 million, giving an operating profit of 3.3 per cent of operating revenues. This follows an operating profit of 4.0 per cent in 1999.

Per tonne-kilometre, operating revenues decreased from 77.9 cents in 1999 to an estimated 77.6 cents in 2000, while operating expenses increased from 74.7 cents to an estimated 75.0 cents.

Airports and Air Navigation Services

Although details are not yet available, the overall financial situation of airports and air navigation service providers continued to improve in 2000 and the larger operators are generally financially robust. However, it is apparent that for many

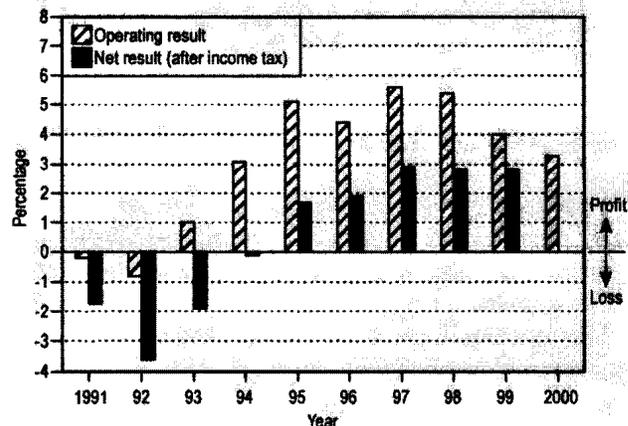


Figure 6. Scheduled airlines operating and net, 1991-2000

airports around the world, capital costs are not included at all or are only partly included in their accounts, as are, frequently, other costs; similarly, for air navigation service providers, depreciation, amortization and MET costs are frequently not included. Thus, the full costs of both airports and air navigation service providers are not recovered.



COMMERCIAL DEVELOPMENTS

Carriers

On the basis of schedules published in multilateral airline schedule guides, it is estimated that at the end of 2000 there were some 716 air carriers worldwide providing scheduled passenger services (international and/or domestic) and about 91 operating scheduled all-freight services. Compared with the same period in 1999, this represents a net overall increase of just 1 air carrier.

The trend of privatization of government-owned airlines continued in 2000. Four airlines achieved their partial privatization aims and another 2 airlines further reduced their government shares. Preparations for privatization were reported during the year for 29 government-owned carriers. The Government of Malaysia raised the foreign ownership limit of its national carriers from 30 to 45 per cent. The Government of India was also considering an increase in its limit in connection with the proposed privatization of its national carriers.

Airports and Air Navigation Services

The strong growth in the autonomy of airports and air navigation service providers worldwide continued. The involvement of private interests also accelerated but principally in the airport sector. This occurred not so much through outright purchases of airports, but rather through various other forms of private involvement such as partial ownership and management contracts. A noticeable emerging development was the expansion and growing activity of airport alliances.

★ *The Conference on the Economics of Airports and Air Navigation Services (ANSCONF 2000), held in*

June, was attended by more than 600 participants from 113 Contracting States of ICAO and 22 international aviation organizations, including government officials, directors general of civil aviation authorities, airport managers, service providers and users. By the end of the year, the Council had acted on all the Conference recommendations and adopted the new ICAO's Policies on Charges for Airports and Air Navigation Services (Doc 9082/6) to supersede the former Statements by the Council to Contracting States on Charges for Airports and Air Navigation Services (Doc 9082/5). The new guidance material addresses such issues as independent mechanisms for the economic regulation of airports and air navigation services; the development and application of performance parameters; the application of the best commercial practices; joint charges collections; pre-funding of projects through charges in specific circumstances; and the use of "first resort" mechanisms for the settlement of disputes.

Aircraft

Between 1991 and 2000, the reported number of commercial air transport aircraft in service increased by about 5 per cent from 18 544 to 19 469 (excluding aircraft with a maximum take-off mass of less than 9 000 kg). Within these totals, turbo-jet aircraft numbers increased by about 6 per cent, from 15 192 to 16 045, over the same period (Figure 7 and Table 10).

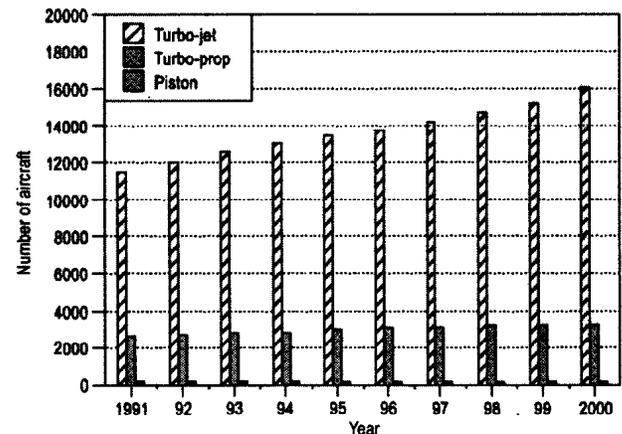


Figure 7. Total commercial air transport fleet 1991-2000

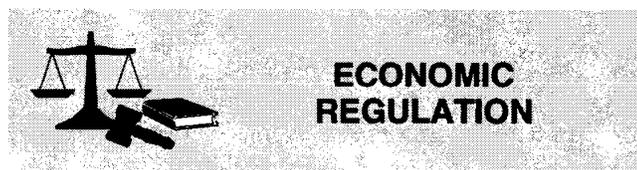
In 2000, 1 553 jet aircraft were ordered (compared with 987 in 1999) and 1 009 aircraft were delivered (compared with 1 074 in 1999). The backlog of unfilled orders at the end of 2000 was 3 649 aircraft compared with 3 306 at the end of 1999.

The financial commitment in terms of jet aircraft orders placed with the major aircraft manufacturers in 2000 is estimated to be about 80 billion.

The number of turboprop aircraft ordered in 2000 was 68, and 57 turboprop aircraft were delivered during the year.

Most active aircraft type transactions, 2000

Aircraft	Orders	Deliveries	Backlog
Boeing 737	379	271	963
Airbus A 319/ 320/321	324	236	1 083
Canadair RJ	259	94	505
Embraer EMB-145	252	109	252
Boeing 777	111	55	243



States continued to expand the international air transport network. During the year, States are reported to have concluded or amended a total of 73 bilateral air service agreements, compared to 67 in 1999, a slight increase after a 3-year decline. Continuing a trend, over 70 per cent of these agreements and amendments contained some form of liberalized regulatory arrangements. For example, of the 17 "open skies" agreements concluded, which provide for unrestricted route rights and free-market access, 7 were for immediate introduction, another 8 were on a phase-in basis while the remaining 2 applied only to all-cargo services. By December 2000, nearly 80 "open skies" bilateral agreements had been concluded since 1995 (36 in the last 3 years) between approximately 60 countries. These agreements involved not only developed countries, but also an increasing number of developing countries (about 60 per cent of the agreements).

Air transport liberalization activity also continued at the regional level. In Africa, the Heads of States and Governments of the Organization for African Unity (OAU) endorsed, in August, the regional provisional aviation agreement reached in 1999 by the African Transport Ministers (known as the Yamoussoukro II Decision). This agreement will gradually liberalize the African skies with the aim of achieving its full integration by 2002. The Council of Ministers of the Common Market for Eastern and Southern Africa (COMESA) decided, in December, to put in abeyance the implementation of the second phase of its air transport liberalization programme (i.e. full-market access) pending the establishment of the COMESA Air Transport Regulatory Board and the formulation and implementation of the COMESA Air Transport Competition Rules. However, COMESA member States in a position to implement the programme could do so.

In the Asia and the Pacific Region, 5 members of the Asia Pacific Economic Cooperation (APEC) (Brunei Darussalam, Chile, New Zealand, Singapore and the United States) concluded a new "Multilateral Agreement on the Liberalization of International Air Transportation" in November. This agreement mirrors the United States' "open skies" bilateral agreements, but further liberalizes the traditional ownership requirement to enhance cross-border investment among foreign carriers.

In Europe, a referendum in Switzerland in May approved the wide-ranging bilateral agreement with the European Union (EU), under which Switzerland would be fully integrated into the European Common Aviation Area (ECAA). The Transport Ministers of the European Council adopted, in December, an agreement on a new EU Treaty dealing with the institutional operations of an enlarged EU. The enlargement will include 12 additional States, of which 10 are from Central and Eastern Europe, and their accession is targeted for completion by January 2004. The European Commission continued to pursue a proposal to negotiate on behalf of the EU with the United States for a Transatlantic Common Aviation Area (TCAA). The proposal, which was originated by the Association of European Airlines (AEA) in September 1999, identifies core areas for liberalization including airline ownership and the right of establishment, the freedom to provide services, competition policy, and leasing of aircraft. It advocates liberalization between the EU-U.S.

market on an incremental and regional basis, with provisions for other interested States to join later.

In Latin America, the Aeronautical Authorities Council of the Fortaleza Agreement (signed in 1997 by 6 countries in the Region), set up a commission in August under the chairmanship of Chile to further study liberalization options including a possible harmonization with States in the Andean Pact (signed in 1991 by 5 countries). In September, representatives of the Caribbean Community (CARICOM) and the United States met in Jamaica to exchange views on a possible regional "open skies" agreement.

Another significant development was the increasing involvement of some other organizations in air transport matters, most notably the World Trade Organization (WTO-OMC). In 2000, the WTO-OMC launched a review process of the General Agreement on Trade in Services (GATS). Included is a mandated review of the Air Transport Annex, consisting of a review of developments in the sector and the operation of the Annex, with a view to the possible extension of its application. Although at an early stage, there has already been mention of not only the possible addition of certain "soft rights" in the Air Transport Annex, such as "airport services", but also some aspects of "hard" or "traffic" rights, such as those covering air cargo services. ICAO actively participated in the review and attended, as an observer, meetings held by the WTO-OMC's Council for Trade in Services concerning air transport, at which representations were made on the regulatory developments in the air transport sector as well as ICAO's role in economic regulation and its work in facilitating regulatory reform. The Organization for Economic Co-operation and Development (OECD) launched an initiative to develop a model bilateral agreement and a multilateral agreement for the liberalization of air cargo transport.

At the national level, the Government of Australia formally issued its new liberal aviation policy in June, which provided for negotiation of reciprocal "open skies" agreements with interested States. This policy calls for multiple airline designations and unrestricted market access, pricing, freight and codesharing. The Government of Japan liberalized its domestic air transport by removing both upper and lower limits on fares, and by allowing airlines to enter new routes or withdraw from unprofitable operations without prior government authorization. The Government of China continued to encourage the restructuring

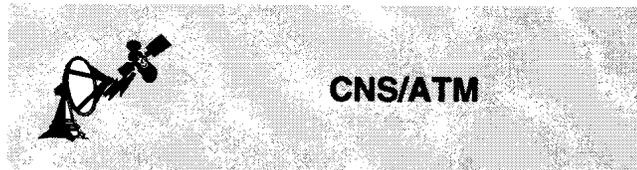
of its air transport industry, including through the consolidation of national carriers into several airline groups in order to adapt to an increasingly competitive environment. The Governments of Cambodia and Lebanon also announced, in March and November respectively, liberal aviation policies, which allow more liberal access by foreign carriers to their international airports.

Along with the liberalization activity, the use of competition laws in dealing with air transport has occurred with greater frequency. In Canada, the Commission of Competition, in response to CanJet's complaint, issued a temporary order requiring Air Canada to desist from selling discount fares on 5 routes. In Latin America, Mexico's Federal Competition Commission ordered the break-up of Cintra, the holding company that has control of AeroMexico and Mexicana. Chile's antitrust authorities started an investigation of charges brought by Avant Airlines and the National Bus Federation against AeroContinente Chile for unfair competitive practices. The Justice Ministry of Brazil opened a case against Varig, Viacao Aerea, Sao Paulo, S.A. (VASP), Transportes Aereos Regionais S.A. (TAM) and Transbrasil, alleging that they formed a cartel for simultaneous domestic fare hikes. In Europe, the European Commission ruled that the airports in Spain had been discriminating in favour of Spanish carriers. The United States Department of Transportation (DOT) as well as the European Commission received a number of complaints against alleged predatory practices by major carriers from smaller airlines.

Airline alliances and mergers, particularly those involving major carriers, continued to attract attention from regulatory authorities because of their potential effect on market access, competition and consumer interest, although regulatory treatment varied. The European Commission launched investigations into the alliance arrangements between Austrian Airlines, Lufthansa and SAS, and between British Midland Airways, Lufthansa and SAS, which would form a part of the Star Alliance. The Commission also investigated a plan by the SAir Group to take a 42 per cent stake in Portugalia, which subsequently led to SAir Group's withdrawal from its original plan. In the United States, the DOT approved and granted antitrust immunity to cooperation agreements filed by American Airlines, Sabena and Swissair, by Malaysia Airlines and Northwest Airlines, and by SAS and Icelandair (the first immunized

alliance of non-United States carriers). The Department of Justice (DOJ) initiated the examination of the proposed merger of United Airlines and US Airways. In November, Northwest Airlines took action to divest its majority voting stock in Continental Airlines to meet DOJ's antitrust requirement. In Australia, the Competition and Consumer Commission (ACCC) authorized Qantas and British Airways to expand their cooperative agreement for an additional 3 years.

The advance of information technology continued to have an impact on the airline industry in its product distribution as well as its regulation. During the year, the European Civil Aviation Conference (ECAC) adopted a recommendation on a revised ECAC Code of Conduct on computer reservation systems (CRS) based on the new EU CRS regulation. The United States DOT continued to review its CRS rules and sought comments on whether the CRS rules remain necessary and effective in light of the airlines' diminishing control of CRS, and whether new rules covering the Internet should be adopted. The United States DOJ and the European Commission each started investigations as to whether Internet-based joint ventures by airlines meet competition requirements.



Planning for the implementation of communications, navigation, surveillance/air traffic management (CNS/ATM) systems continued in 2000 through the individual and combined efforts of Contracting States and the work of several Planning and Implementation Regional Groups (PIRGs). Following the initiative taken by the CAR/SAM/3 RAN meeting in October 1999, some specific CNS/ATM system elements and implementation plans were integrated into regional air navigation plans. The *Global Air Navigation Plan for CNS/ATM Systems* (Global Plan) (Doc 9750) was distributed to States and was successfully integrated into the work of the PIRGs. Based on the work of the PIRGs, the tables

in Part II of the Global Plan are continuously being updated to reflect the evolution timelines being developed. Additionally, significant efforts are being made to conduct cost-benefit analyses in order to facilitate the implementation of new systems.

Substantial progress was made in all Regions toward the implementation of reduced separation minima based on CNS/ATM systems and concepts. In the Pacific Region, the concept of required navigation performance (RNP) formed the basis for a reduction of separation to 50 NM both longitudinally and laterally. Initial steps continued to be taken to implement similar reductions in the African, Caribbean, Latin American, Middle East and South American Regions. RNP5 airspace is being planned for implementation in parts of the Middle East Region and in the South Atlantic corridor connecting Europe and South America. RNP5, in conjunction with area navigation (RNAV), allowed States and aircraft operators in the European Region to take advantage of airborne RNAV capabilities within the coverage of existing VOR-based systems. Work continued on the introduction of reduced vertical separation minima (RVSM) in the European Region and was successfully implemented in parts of the Pacific Region.

Programmes to implement controller-pilot data link communications (CPDLC), and the ATS message handling system (AMHS) commenced in some ICAO Regions. Also, the automatic dependent surveillance (ADS) trials currently being conducted, together with extensive work on the development of ADS procedures aimed at using ADS for separation purposes, should lead to the application of ADS in oceanic airspace for conformance monitoring and separation purposes. These developments should eventually lead to a more efficient utilization of the airspace while increasing capacity.

- ★ *ICAO, through the Planning and Implementation Regional Groups (PIRGs), continued to monitor the progress of implementation by States of the provisions of Annexes 4 and 15, which require the publication of aeronautical coordinates referenced to the World Geodetic System — 1984 (WGS-84). Implementation is expected to improve in 2001, and ICAO will continue to monitor progress and assist States, as required.*

Communications

Work was completed on the development of SARPs for VDL Mode 3 (TDMA integrated voice/data) and VDL Mode 4 (data link for surveillance applications). These systems provide for the introduction of digitized voice and enhanced air-ground data communications. VDL Mode 4 is particularly developed to satisfy requirements for ADS. Both data links are ATN compatible.

- ★ *SARPs extending the provision of AMSS to a greater range of aircraft and to provide for improved utilization of the radio frequency spectrum developed at the sixth meeting of the Aeronautical Mobile Communications Panel (AMCP), were adopted by the Council and became applicable (as part of Amendment 75 to Annex 10) on 2 November.*

Navigation

Progress continued in a number of States and international organizations on the development and implementation of global navigation satellite systems (GNSS). The ICAO GNSS Panel completed (in June) the validation of the first package of SARPs for GNSS and these SARPs were processed for inclusion in Annex 10, Volume I, to become applicable in November 2001.

Development of satellite-based augmentation systems continued. This form of augmentation is expected to support the use of GNSS for all phases of flight down to Category I precision approach. Several architectures for ground-based augmentation systems with the potential to support Category II/III precision approach applications also continued to be developed and tested. The latter type of augmentation may be used by some States as an alternative in support of Category I operations. A number of States approved the global positioning system (GPS) for supplemental or primary use for some operations and types of airspace.

Surveillance

Considerable progress continued to be reported during the year on the improvement of surveillance capabilities. This included the development of the airborne separation assurance

system (ASAS) and automatic dependent surveillance-broadcast (ADS-B) concepts, based on SSR Mode S extended squitter technique. Work was completed on the development of proposed amendments to the Annex 10 SARPs for SSR Mode S, the Mode S subnetwork of the aeronautical telecommunication network (ATN) and airborne collision avoidance systems (ACAS II), in order to facilitate the timely implementation of those systems by Contracting States. Aeronautical surveillance plans (ASP) aimed at the coherent implementation of surveillance facilities, including Mode S, ACAS and ADS, are under development in the Regions.

Aeronautical Spectrum

ICAO participated at the International Telecommunication Union (ITU) World Radio-communication Conference (2000) (WRC-2000), held in Istanbul, Turkey, from 8 May to 2 June. ICAO's aim was to ensure that decisions related to spectrum management would secure the long-term availability of the radio frequency spectrum for CNS services. The ICAO position was formulated in concert with Contracting States. The President of the Council headed the ICAO Delegation and addressed the WRC underlining the need to secure an adequate and protected spectrum for aviation. The outcome of the Conference fully satisfied the ICAO position on all agenda items. Preparation of an ICAO position for WRC-2003 has started.

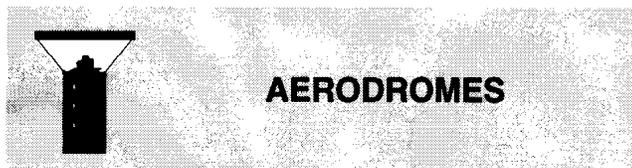
Air Traffic Management

As part of the evolutionary process leading to the implementation of a seamless global air traffic management (ATM) system, air traffic control (ATC) systems around the world continued to be updated with modern equipment capable of supporting advanced ATM concepts.

Progress was made in the development of airspace planning and ATM infrastructure requirements in line with the ICAO Global Plan. Several PIRGs developed ATM implementation plans with associated timelines and evolution tables.

Several concepts for the operation of ATM systems were advanced. The United States progressed work on its "National Airspace System

Concept" of operations which encompasses its "Free Flight" concept and several automation capabilities, including conflict resolution and metering software. In order to build on the success of the European Air Traffic Control Harmonization and Integration Programme (EATCHIP), the ATM Strategy for 2000 and Beyond was developed. The strategy falls within the framework of ICAO CNS/ATM systems and has, as its major thrust, the objective of achieving one uniform airspace for Europe. The "single European sky" is a cornerstone of the emerging and future European ATM system. The ATM Strategy 2000 and Beyond document states that "European ATM will actively contribute to the design and planning of ICAO CNS/ATM systems and adhere to the European Regional Air Navigation Plan to meet the airspace users' requirements on a worldwide basis, and to ensure an effective interface with neighbouring regions and adjacent States within those regions." The ICAO Air Traffic Management Operational Concept Panel (ATMCP) met 5 times as a working group of the whole and made significant progress in its work toward describing a gate-to-gate ATM operational concept that will facilitate the evolutionary implementation of a seamless global ATM system.



Amendment 3 to Annex 14, Volume I, included new specifications on airport development to handle the operation of new larger aeroplanes, such as the Airbus A380, with wingspans greater than 65 metres (i.e. larger than the B747-400) and capable of carrying more than 550 passengers, which are likely to enter service by 2005/2006.

The ICAO study on airport pavement design and evaluation procedures for analysing complex loading by new larger aeroplanes with 6 or more wheels per main building gear strut (e.g. B777) was progressed. The full-scale pavement testing research projects in 2 States also progressed despite a technical problem in 1 of them.

As for the issue of identifying a suitable alternative to halon for aerodrome rescue and fire fighting (RFF), the study continues with ICAO

monitoring research in the industry. The next amendment to Annex 14, Volume I, will include improved specifications on rescue and fire fighting, particularly on rescue in water and difficult terrain, and response time of aerodrome RFF services.

In order to meet the increasing demands on airport infrastructure development due to continuous growth of air traffic, there is a growing trend towards autonomy in the provision of airports. As this also has safety implications, States need to ensure that appropriate legislation and safety regulations are in place. In this context, ICAO's work on the licensing/certification of aerodromes, currently in the final review stage, should be useful to States to ensure safety and to meet their obligations under the *Convention on International Civil Aviation*.



An increasing use of improved automatic weather observing systems for general meteorological observations in States has prompted requests for a review by ICAO of the role of these systems in the provision of observations for aviation. The use of meteorological information to support measures being taken to increase airport capacity is being studied by States, in particular in the European Region. In this context, the feasibility of forecasting runway visual range (RVR) is being examined. Renewed interest has been shown in a number of States in conducting research on improving the quality and timeliness of forecasts of icing and turbulence.

Progress continued in the computer preparation of global forecasts of significant weather (SIGWX) by the world area forecast centres (WAFCs). As a result, high-level SIGWX charts for global coverage were prepared by means of interactive computer workstations by the WAFCs. Very small aperture terminals to receive data and products from the 3 ICAO satellite broadcasts were installed in almost 140 States. These broadcasts provide global WAFS data, products and operational meteorological (OPMET) information,

such as METARs, TAFs and SIGMETs, directly to States. The implementation of the satellite broadcasts and the provision of SIGWX forecasts by the WAFCs have permitted the closure of 5 of the 15 regional area forecast centres (RAFCs), and transition plans for the phased transfer of responsibilities from the remaining RAFCs to the WAFCs were implemented in the Regions concerned.

Work continued in States responsible for Volcanic Ash Advisory Centres (VAACs) to develop and issue graphical volcanic ash advisories for provision to area control centres and meteorological watch offices.



The COSPAS-SARSAT satellite alert and detection system was improved. By January 2000, the existing low altitude earth orbiting (LEOSAR) constellation of satellites had been complemented with 3 geostationary (GEOSAR) satellites (plus 1 spare) providing almost immediate distress alerts for 406 MHz beacons transmitting in their field of view. To take full advantage of these GEOSAR alerting facilities, some 406 MHz beacons now in production have a built-in satellite navigation receiver or an interface for external navigation data input and are capable of transmitting position data in the 406 MHz digital message.

Since it began trial operations in September 1982, the international COSPAS-SARSAT system has contributed to the rescue of more than 11 000 persons in aeronautical, maritime and terrestrial incidents. The International COSPAS-SARSAT Programme Agreement between Canada, France, the former Union of Soviet Socialist Republics and the United States was signed in Paris on 1 July 1988 and entered into force on 30 August 1988. It allows for the use of the system by all States on a long-term, non-discriminatory basis. States which are not Party to the Agreement can participate in the system either as user-States or ground segment providers. The Secretary General of ICAO is one of the Depositories of the Agreement.



- ★ *In order to help alleviate groundside congestion at airports, ICAO adopted new editions of the — Machine Readable Travel Documents (Doc 9303), Part 1 — Machine Readable Passports and Part 3 — Size 1 and Size 2 Machine Readable Official Travel Documents designed to implement systems for the automated border inspection of passengers. Such systems will enable frequent travellers to bypass the queues at immigration booths, particularly at airports with high traffic volumes at peak periods. Increasing airside congestion continued to affect operations in many areas of the world.*



Scheduled Operations

Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services worldwide shows that in 2000 there were 18 aircraft accidents with passenger fatalities involving aircraft with a certificated maximum take-off mass of more than 2 250 kg. The number of passenger fatalities involved was 755. This compares with 21 fatal accidents and 499 passenger fatalities in 1999 (Table 11). Relating passenger fatalities to the volume of traffic, the number of passenger fatalities per 100 million passenger-kilometres increased to 0.025 from 0.02 in 1999. However, the number of fatal aircraft accidents per 100 million aircraft-kilometres flown decreased to 0.07 from 0.09 in 1999 and the number of fatal aircraft accidents per 100 000 landings decreased to 0.09 from 0.10 in 1999 (Figure 8).

The safety levels are significantly different for the various types of aircraft operated on scheduled passenger services. For instance, in turbo-jet aircraft operations, which account for about 95 per cent of the total volume of scheduled traffic (in

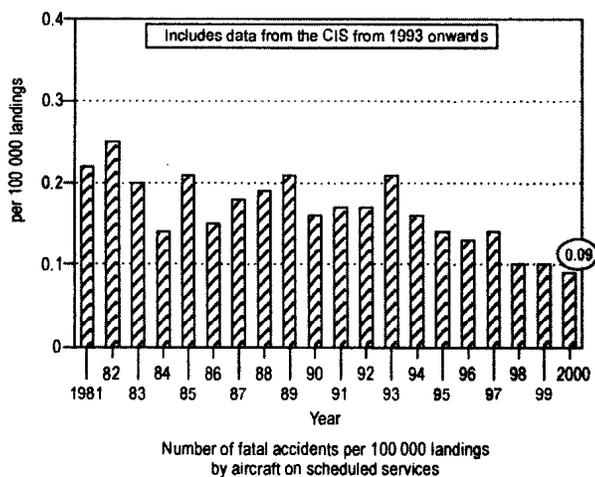
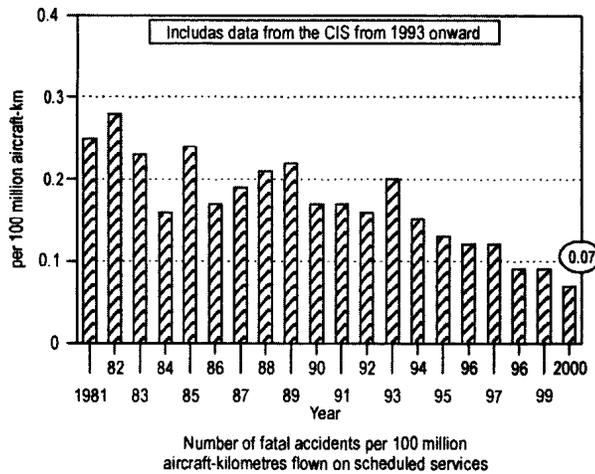
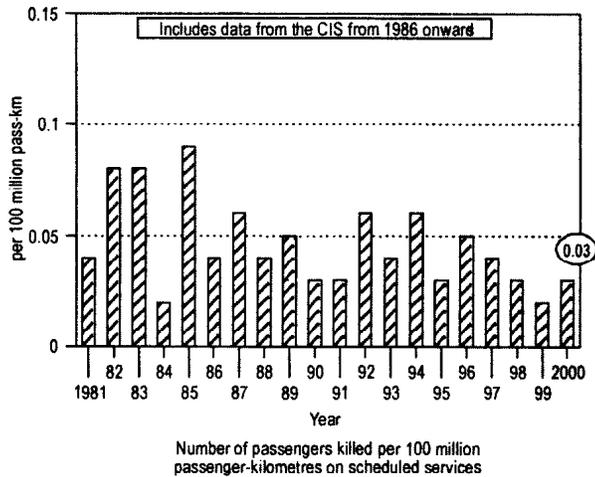


Figure 8. Aircraft accident statistics 1981-2000

terms of passenger-kilometres performed), there were 6 accidents in 2000 with 625 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 5 per cent of the scheduled traffic volume, there were 12 accidents with 130 passenger fatalities. The fatality rate for turbo-jet aircraft operations was, therefore, far lower than for propeller-driven aircraft.

Non-scheduled Commercial Operations

Non-scheduled commercial operations include both the non-scheduled flights of scheduled airlines and all air transport flights of non-scheduled commercial operators. Data available to ICAO on the safety of non-scheduled passenger operations show that there were 22 fatal accidents involving aircraft with a maximum certificated take-off mass of more than 2 250 kg both in 2000 and 1999 (the earlier year including 6 involving aircraft operating all-cargo services with passengers on board). These accidents accounted for 291 passenger fatalities in 2000 compared with 129 in 1999.

In non-scheduled operations performed with aircraft of more than 9 000 kg take-off mass, whether by scheduled airlines or non-scheduled operators, there were 10 fatal accidents with 238 passenger fatalities in 2000.



The ICAO Universal Safety Oversight Audit Programme (USOAP), established in January 1999, continued its audit activities. An Audit Findings and Differences Database was developed to assist ICAO in identifying and quantifying safety concerns. Preparatory work for the expansion of the Programme to other technical fields continued.

★ In February, Airbus Industrie and Boeing Company safety experts held a successful exploratory meeting with the President of the ICAO Council, on ways of

expanding cooperation among all members of the world aviation community to meet the aviation safety challenges of the 21st century. Representatives of the Federal Aviation Administration (FAA) of the United States, of the European Joint Aviation Authority (JAA) and of the delegations of France, Germany, Spain, the United Kingdom and the United States to the ICAO Council joined the discussions, which involved decisions on how best to coordinate the safety programmes of the FAA, JAA and ICAO.

- ★ In May, the Air Navigation Commission successfully held its fourth informal meeting with the industry to address the ICAO Universal Safety Oversight Audit Programme, with particular emphasis on the remedial actions highlighted by the audits and the expansion of the programme into the areas of air traffic services and aerodromes, and with the objective of assisting the Air Navigation Commission in prioritizing the global efforts of ICAO in order to advance aviation safety. Participants included the President of the ICAO Council, some Council Representatives, members of the Air Navigation Commission and 33 representatives of industry and international organizations.
- ★ In May, ICAO was presented, by the Federal Aviation Administration (FAA) of the United States, with the first in a series of Government Safety Inspectors' Standardized Training Packages, designed to assist Contracting States of ICAO to meet international Standards.
- ★ By the end of the year, ICAO had audited 131 of its 185 Contracting States under its Universal Safety Oversight Audit Programme. The objectives are to audit all States before the 33rd Session of the ICAO Assembly, to be held in September 2001, and to present a comprehensive report on the findings of the audits.

YEAR 2000 (Y2K) CONTINGENCY PLANNING

The considerable investment in human and financial resources, which resulted in the safe and

effective transition of international civil aviation to the year 2000, provided many substantial and long-lasting benefits. Aviation systems in air traffic control, airlines and airports worldwide were thoroughly reviewed and tested and, when required, renewed or replaced with state-of-the-art equipment, resulting in overall improvements in the functionality of systems. The harmonization of regional contingency plans provided, for the first time, a truly global integrated contingency plan that will prove invaluable in reacting quickly and effectively to other regional or global concerns in the future. Existing contingency plans of air traffic service providers, airlines and airports were also enhanced by the review process. A comprehensive worldwide inventory of world aviation facilities and air traffic systems now exists.



The international aviation community and Contracting States focused on the Human Factors issues involved in runway incursions with a major international event being held in Washington, D.C.

The first joint ICAO/IATA Flight Safety and Human Factors Regional Seminar was held in Rio de Janeiro, Brazil, from 16 to 18 August. The event was attended by representatives from Contracting States from both the CAR and SAM Regions, as well by representatives from industry, training organizations and academia. The focus of the event was on communications, exchange of information and error management, within the specific cultural context of Central and Latin American operations.



The Eighth Global TRAINAIR Conference and Training Symposium was held in Madrid, Spain, from 25 to 29 September. The Conference was the

single largest ICAO meeting strictly dedicated to human resource development and training. Over 320 participants attended from 57 States and 11 international organizations. Steps were taken during the Conference that will nurture international cooperation among all civil aviation training centres and enhance the ability of the TRAINAIR Programme to meet future civil aviation training challenges.



★ *By the end of 2000, the Convention for the Unification of Certain Rules for International Carriage by Air, done at Montreal on 28 May 1999, had been signed by 66 States and 1 Regional Economic Integration Organization (the European Community), and had been ratified by 7 States. The Convention requires 30 ratifications to enter into force.*



During the reporting period, 11 acts of unlawful interference were officially reported or confirmed by concerned States. These included 4 unlawful seizures and 1 attempted seizure involving international flights, 4 seizures of domestic aircraft, 1 in-flight attack and 1 unlawful act against the safety of civil aviation (Table 12). These acts are included in the annual statistics to assist in the analysis of trends and developments (Figure 9).

★ *Since the commencement of the Aviation Security Mechanism in 1989, 139 States have requested assistance; of these, 111 received technical evaluation missions, 35 were visited during follow-up missions and 183 training events were staged in which 3 804 trainees participated. In 2000, these activities were financed through voluntary contributions by 2 donor States totalling \$209 000 and through the funding of 4 posts by 3 donor States.*

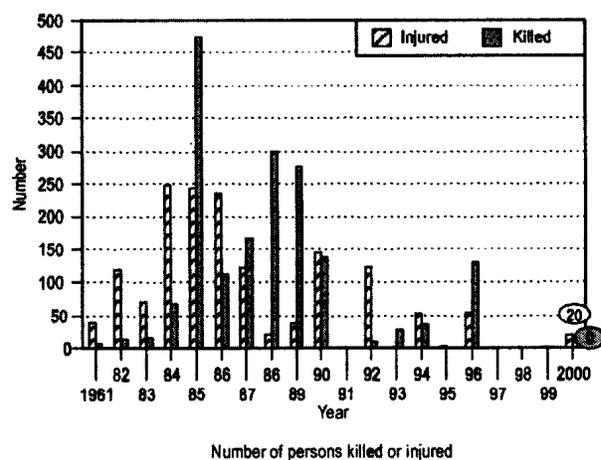
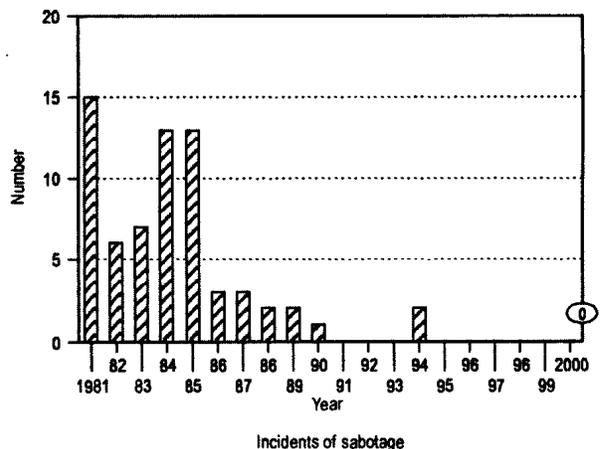
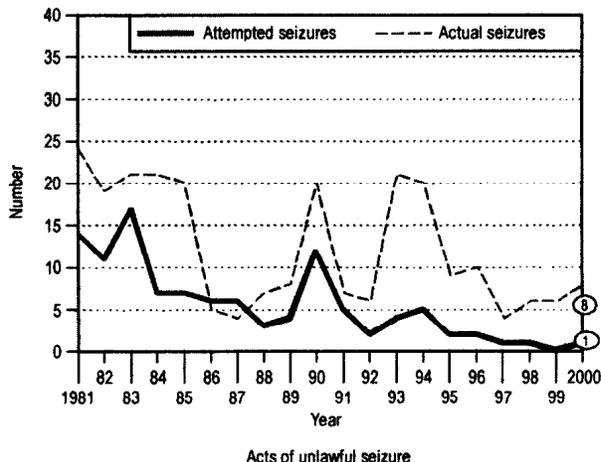


Figure 9. Aviation security statistics 1981-2000



ENVIRONMENTAL PROTECTION

As decided in April 1999 when the Council of the European Union adopted Council Regulation (EC) No. 925/1999 on the registration and operation within the European Community of certain types of civil subsonic jet aeroplanes that have been modified and recertificated as meeting the noise Standards in Chapter 3 of Annex 16, this Regulation became applicable on 4 May 2000. On 14 March, the United States submitted an Application and Memorial pursuant to Article 84 of the *Convention on International Civil Aviation* and the Rules for the Settlement of Differences, seeking a decision by the ICAO Council on a disagreement with 15 European States relating to the Regulation. At the end of the year, this matter was under review by the Council.

Following the adoption in December 1997 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, negotiations continued on developing the rules governing the new mechanisms provided for in the Protocol. These include emissions trading, which could be of relevance to aviation.

- ★ *ICAO's Committee on Aviation Environmental Protection (CAEP) finalized its work on aircraft noise and aircraft engine emissions in preparation for its next meeting, CAEP/5, to be held in January 2001.*
- ★ *Concerning noise, CAEP continued to give high priority to the development of a new noise Standard more stringent than the Standard in Annex 16, Volume I, Chapter 3, and to exploring worldwide the issue of operating restrictions on Chapter 3 aircraft.*
- ★ *Concerning engine emissions, as requested by the Assembly in 1998, CAEP placed particular emphasis on developing policy options to limit or reduce greenhouse gas emissions from civil aviation.*

In doing so, it took into account the Special Report on Aviation and the Global Atmosphere prepared by the Intergovernmental Panel on Climate Change and the requirements of the Kyoto Protocol. This work included monitoring advances in technology and exploring the further development of Annex 16 to specifically address emissions of global concern; and developing guidance material on operational measures to reduce emissions as well as a methodology for assessing the environmental benefits of the implementation of CNS/ATM systems. This work also included analysing the potential role of market-based options, such as emissions-related levies (charges or taxes), emissions trading and voluntary agreements, with a view to reporting on this subject to the Assembly in 2001.



SMOKING RESTRICTIONS

Complete smoking bans are in place in all passenger carriers in Australia, New Zealand, the Nordic countries and North America, while a large majority of all flights in Asia, Europe and the Middle East are also smoke-free. Implementation of Assembly Resolution A29-15 — Smoking restrictions on international passenger flights — is in progress.



SUBSTANCE ABUSE

In collaboration with the private sector and the World Health Organization, ICAO updated the *Manual on Prevention of Problematic Use of Substances in the Aviation Workplace* (Doc 9654).



TECHNICAL CO-OPERATION

The ICAO Technical Co-operation Programme for 2000 was valued at \$88.2 million, of which \$56.9 million (or 65 per cent) was implemented.

During the year, the Technical Co-operation Bureau (TCB) executed 127 projects in 77 developing countries and a total of 12 new and revised large-scale projects were approved. The

TCB employed 361 experts from 43 countries to work in its field projects. A total of 565 fellowships were awarded and procurement expenditures for field projects totalled \$18.6 million.

It should be noted that since the creation of the Technical Co-operation Bureau in 1951 a record high in funding was reached in the year 2000. The fact that States provided almost all of this funding strongly confirms their satisfaction with the technical services which ICAO provides through its Technical Co-operation Bureau for the worldwide implementation of ICAO Standards and Recommended Practices (SARPs), particularly in the area of flight safety.

THE ORGANIZATION

- ★ *In March, the ICAO Council appointed Mr. Renato Cláudio Costa Pereira (Brazil) as Secretary General of ICAO for a second three-year term, effective 1 August 2000. Mr. Costa Pereira began his first term on 1 August 1997.*
- ★ *In March, the Sub-Committee of the ICAO Legal Committee on International Interests in Mobile Equipment (aircraft equipment), pursuant to its third joint session with the Committee of Governmental Experts of the International Institute for the Unification of Private Law (UNIDROIT), concluded its examination of the texts of a draft Convention and a draft Protocol. These texts were reviewed by the 31st Session of the ICAO Legal Committee and submitted to the Council with a recommendation for their adoption and signature at a Diplomatic Conference in 2001. During its 161st Session, the Council decided in principle to convene a Diplomatic Conference in 2001 in South Africa under the joint auspices of ICAO and UNIDROIT.*
- ★ *In June, the Council adopted revised text for ICAO's Strategic Action Plan, primarily to reflect the implementation of the Universal Safety Oversight Audit Programme, the adoption of the 1999 Montreal Convention as a successor to the Warsaw System, the development of a new instrument or instruments on International Interests in Mobile Equipment, and the re-emphasized focus in increasing the effectiveness of ICAO arising from Assembly Resolution A32-1 (the follow-up to Resolution A31-2).*
- ★ *On 20 September, the Agreement of Cooperation between the International Civil Aviation Organization and the International Mobile Satellite Organization (IMSO) was signed at ICAO Headquarters in Montreal by the President of the Council and the Director of IMSO. This Agreement supersedes the former Agreement of Cooperation between ICAO and Inmarsat dated 27 June 1989, since IMSO is the intergovernmental organization having succeeded Inmarsat as from 15 April 1999.*
- ★ *In November, the Council conferred the 34th Edward Warner Award, the highest honour in the world of civil aviation, on the Singapore Aviation Academy (SAA), in recognition of its eminent contribution as a centre of excellence in international civil aviation training.*
- ★ *"Implementing SARPs – The Key to Aviation Safety and Efficiency" was the theme of the International Civil Aviation Day celebrated annually to mark the creation of ICAO on 7 December 1944.*
- ★ *On 7 December 2000 — International Civil Aviation Day — the Civil Aviation Administrations of China and Viet Nam confirmed their agreement reached in September 2000 at the ICAO Regional Office in Bangkok concerning the trial application of a "package" consisting of a revised route structure and airspace organization in the South China Sea area for a period of 3 years. Both administrations reiterated their commitment to expedite and facilitate the preparations already under way to meet the operational target implementation date of 1 November 2001. The implementation programme will be guided by a task force under the auspices of ICAO, and full support will be given by China, Viet Nam and other parties concerned.*

- ★ *On 8 December, the Council adopted ICAO's Policies on Charges for Airports and Air Navigation Services. These policies, now published in Doc 9082/6, contain recommendations and conclusions of the Council resulting from ICAO's continuing study on charges in relation to the economic situation of airports and air navigation services provided for international civil aviation. They are intended for the guidance of Contracting States and take into account recommendations made in this field by the Conference on the Economics of Airports and Air Navigation Services (ANSCConf 2000), held in Montreal from 19 to 28 June 2000.*

 - ★ *In keeping with Assembly Resolution A32-1 — Increasing the effectiveness of ICAO, substantial progress was made in the streamlining of communication networks with the Organization's 185 Contracting States, resulting in the establishment of the ICAO-NET for worldwide and instantaneous availability of information via the INTERNET. The Organization's Regional Offices were linked electronically to ICAO Headquarters to form a wide area network for secure access to information.*
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