

*Documentation for the session  
of the Assembly in 1998*



# Annual Report of the Council 1996

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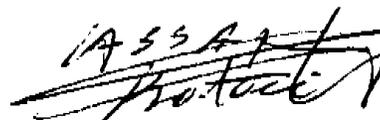
TO THE ASSEMBLY  
OF THE  
INTERNATIONAL CIVIL AVIATION ORGANIZATION

*I have the honour to transmit, at the direction of the Council, its Report for the year 1996 prepared in compliance with Article 54(a) of the Convention on International Civil Aviation. It constitutes documentation for the next ordinary Session of the Assembly, which will be convened in 1998, but it is being circulated to Contracting States now for their information. It 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 1996. These were the One hundred and forty-seventh Session from 19 February to 15 March, with a total of sixteen meetings; the One hundred and forty-eighth Session from 6 May to 28 June, with a total of twenty-one meetings, two of which were held outside the Council phase; and the One hundred and forty-ninth Session from 25 September to 13 December, with a total of twenty 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

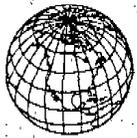
- AACO.** Arab Air Carriers Organization  
**ACAC.** Arab Civil Aviation Commission  
**ACAS.** Airborne collision avoidance systems  
**ACC.** Area control centre  
**ACI.** Airports Council International  
**ADREP.** Accident and incident reporting data  
**ADS.** Automatic dependent surveillance  
**AFCAC.** African Civil Aviation Commission  
**AFRAA.** African Airlines Association  
**AH-DE.** Ad hoc group of specialists on the detection of explosives  
**AIMS.** ANB integrated management system  
**AIS.** Aeronautical information service  
**AMBEX.** AFI bulletins exchange  
**ANC.** Air Navigation Commission  
**AOSCF.** Administrative and operational services cost fund  
**APANPIRG.** ASIA/PAC Planning and Implementation Regional Group  
**APATSI.** Airport and Air Traffic System Interface Task Force  
**APIRG.** AFI Planning and Implementation Group  
**ASECNA.** Agency for the Security of Aerial Navigation in Africa and Madagascar  
**AsMA.** Aerospace Medical Association  
**A-SMCGS.** Advanced surface movement guidance and control systems  
**ATM.** Air traffic management  
**ATN.** Aeronautical telecommunication network  
**ATS.** Air traffic services  
**CAEP.** Committee on Aviation Environmental Protection  
**CAI.** CNS/ATM Implementation Committee  
**CAMA.** Civil Aviation and Meteorology Authority  
**CAMP.** Civil Aviation Master Plan  
**CAPS.** Civil aviation purchasing service  
**CFIT.** Controlled flight into terrain  
**CIDIN.** Common ICAO data interchange network  
**CNS.** Communications, navigation and surveillance  
**CNS/ATM.** Communications, navigation, surveillance and air traffic management  
**COCESNA.** Central American Corporation for Air Navigation Services  
**COMESA.** Common market for Eastern and Southern Africa  
**COSPAS.** Space system for search of vessels in distress  
**CPDLC.** Controller-pilot data link communications  
**DCA.** Department of Civil Aviation  
**DFIS.** Data link flight information services  
**DGCA.** Directorate General of Civil Aviation  
**DGTA.** Directorate General of Air Transport  
**EANPG.** EUR Air Navigation Planning Group  
**EASA.** East African School of Aviation  
**EATCHIP.** European ATC Harmonization and Integration Programme  
**EC.** European Commission  
**ECAC.** European Civil Aviation Conference  
**ECE.** Economic Commission for Europe  
**ECOSOC.** Economic and Social Council  
**ESCAP.** Economic and Social Commission for Asia and the Pacific  
**EU.** European Union  
**EUROCONTROL.** European Organization for the Safety of Air Navigation  
**FAI.** Fédération aéronautique internationale  
**GATS.** General Agreement on Trade in Services  
**GDP.** Gross domestic product  
**GLONASS.** Global orbiting navigation satellite system  
**GNSS.** Global navigation satellite systems  
**GREPECAS.** CAR/SAM Regional Planning and Implementation Group  
**GTS.** Global telecommunications system  
**IACA.** International Air Carrier Association  
**IAEA.** International Atomic Energy Agency  
**IAOPA.** International Council of Aircraft Owner and Pilot Associations  
**IATA.** International Air Transport Association  
**IAVW.** International airways volcano watch  
**IBAC.** International Business Aviation Council  
**IBIS.** ICAO bird strike information system  
**IBS.** Intelsat Business Service  
**ICC.** International Chamber of Commerce  
**ICPO/INTERPOL.** International Criminal Police Organization  
**IFAD.** International Fund for Agricultural Development  
**IFALPA.** International Federation of Air Line Pilots' Associations

- IFATCA.** International Federation of Air Traffic Controllers' Associations
- IFOR.** Implementation Force
- IMO.** International Maritime Organization
- INMARSAT.** International Mobile Satellite Organization
- IPCC.** Intergovernmental Panel on Climate Change
- ISCS.** International Satellite Communications System
- ISO.** International Organization for Standardization
- ITF.** International Transport Workers' Federation
- ITU.** International Telecommunication Union
- JAA.** Joint Aviation Authorities
- JIU.** Joint Inspection Unit
- LACAC.** Latin American Civil Aviation Commission
- LAN.** Local area network
- LUT.** Local user terminal
- MCC.** Mission control centre
- MET.** Meteorology
- MIDANPIRG.** MID Air Navigation Planning and Implementation Regional Group
- MLS.** Microwave landing system
- MOTNEG.** Meteorological Operational Telecommunications Network Europe — Regional Planning Group
- MOU.** Memorandum of understanding
- MSA.** Management service agreement
- MWO.** Meteorological watch office
- NAT SPG.** NAT Systems Planning Group
- OAS.** Obstacle assessment surface
- OPAS.** Operational assignment
- OPMET.** Operational meteorological information
- OPS.** Operations
- PANS.** Procedures for Air Navigation Services
- RAC.** Rules of the air and air traffic services
- RAS.** Regional augmentation system
- RCAG.** Remote control air/ground
- RCP.** Required communication performance
- RNAV.** Area navigation
- RNP.** Required navigation performance
- RVSM.** Reduced vertical separation minima
- SADIS.** Satellite distribution system
- SARPs.** Standards and Recommended Practices
- SARSAT.** Search and rescue satellite-aided tracking
- SATCOM.** Satellite communication
- SBAS.** Satellite based augmentation system
- SIP.** Special implementation project
- STP.** Standardized Training Package
- TF.** Trust Funds
- UNCTAD.** United Nations Conference on Trade and Development
- UNDP.** United Nations Development Programme
- UNEP.** United Nations Environment Programme
- UPU.** Universal Postal Union
- VDL.** VHF digital link
- VSAT.** Very small aperture terminal
- WAFC.** World area forecast centre
- WAFS.** World area forecast system
- WCO.** World Customs Organization
- WGS-84.** World Geodetic System — 1984
- WHO.** World Health Organization
- WMO.** World Meteorological Organization
- WTO.** World Tourism Organization.
-

# Chapter I

## The Year in Summary

This chapter summarizes the principal trends and developments in civil aviation and the work of ICAO in 1996. References are made in brackets to relevant tables in Appendix 12, which provide statistics used in the diagrams broken down into further details and identify the sources and extent of coverage of these statistics.



### THE WORLD ECONOMY

In 1996, world gross domestic product (GDP) grew by approximately 3.8 per cent in real terms,

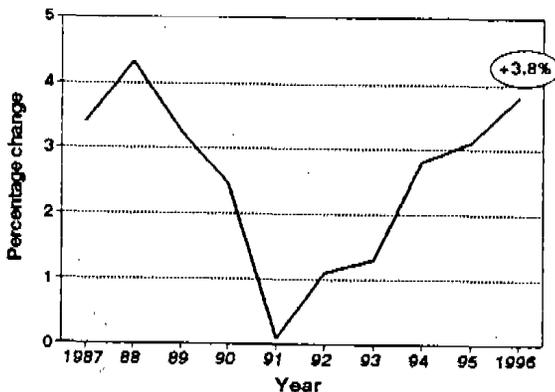


Figure 1. Development in world GDP in constant prices year-on-year changes, 1987-1996

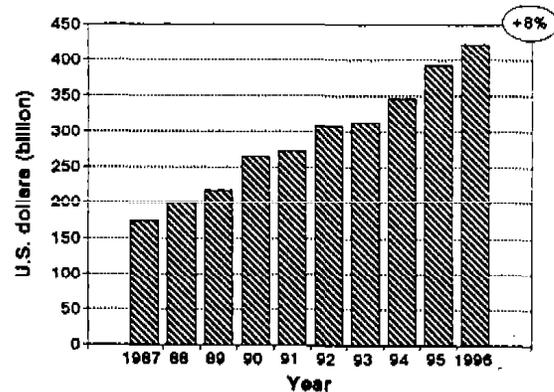


Figure 2. International tourism receipts U.S. dollars, 1987-1996

following growth of 3.1 per cent in 1995 (Figure 1). The Asia/Pacific and the Middle East regions experienced strong growth in GDP (around 5 per cent).

For the industrialized countries, GDP grew by about 2.3 per cent. Developing countries generally showed stronger growth than the industrialized countries, with those in Asia exhibiting a GDP increase of almost 8 per cent. The Japanese economy recovered in 1996 and experienced a growth of almost 3.5 per cent. Eastern European economies showed GDP growth of over 3 per cent for the second consecutive year.

In 1996, developments in international tourism reflected the generally improved economic situation and, at a global level, tourism showed over-all gains compared with 1995 in both arrivals and receipts (Figure 2).

In 1996, world trade is estimated to have grown by over 6 per cent.

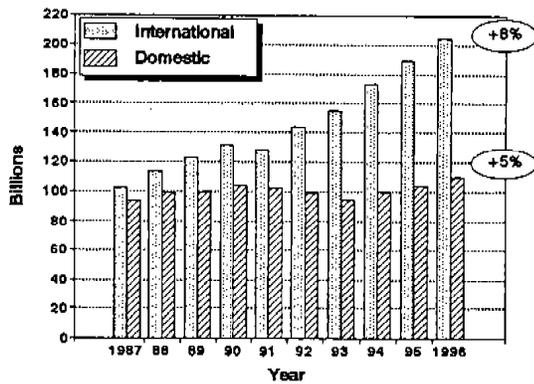


Figure 3. Scheduled traffic tonne-kilometres performed, 1987-1996

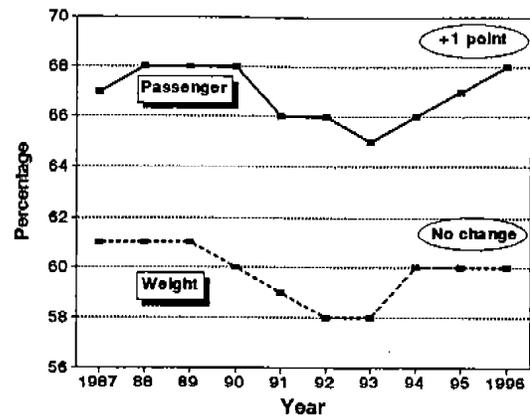
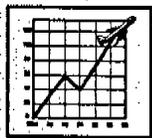


Figure 4. Scheduled traffic achieved load factors, 1987-1996



## TRAFFIC

### Scheduled Operations

In 1996, the total scheduled traffic carried by the airlines of the 185 Contracting States of ICAO amounted to a total of about 1 380 million passengers and some 23 million tonnes of freight. Overall passenger/freight/mail tonne-kilometres performed were up by 7 per cent (Table 1) and international tonne-kilometres by 8 per cent (Table 2). Domestic traffic showed an increase of 4 per cent. Figure 3 shows the trend from 1987 to 1996.

Capacity increases continued to be kept in check, as shown in Figure 4. The passenger load factor on total scheduled services (domestic plus international) increased by 1 percentage point to 68 per cent whereas the aircraft load factor remained at 60 per cent (Table 3).

On a regional basis, some 37 per cent of the total traffic volume (passengers/freight/mail) was carried by North American airlines. Asia/Pacific airlines carried 27 per cent, European airlines 26 per cent, Latin American airlines 5 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 1996 approximately 43 per cent of the total volume of scheduled passenger, freight and mail traffic was accounted for by the airlines of the United States and the United Kingdom (35 and 8 per cent respectively). On international services, about 30 per cent of all traffic was carried by the airlines of the same two countries, the United States and the United Kingdom (18 and 12 per cent respectively).

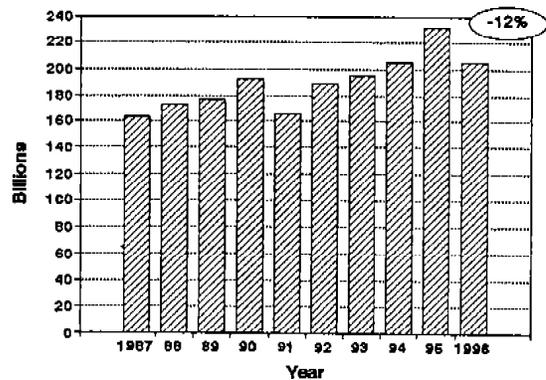
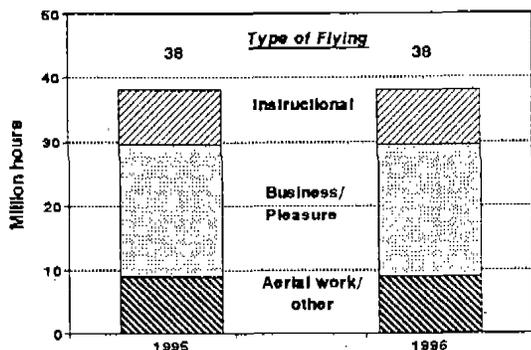


Figure 5. International non-scheduled traffic passenger-kilometres performed, 1987-1996



**Figure 6. General aviation activities**  
estimated number of hours flown, 1995-1996

### Non-scheduled Commercial Operations

It is estimated that in 1996 total international non-scheduled passenger-kilometres decreased by almost 12 per cent, with its share of over-all international air passenger traffic decreasing from some 16 per cent in 1995 to an estimated 13 per cent in 1996 (Figure 5 and Table 7). Domestic non-scheduled passenger traffic represents only about 10 per cent of total non-scheduled passenger traffic and some 2 per cent of total domestic passenger traffic world wide.

### General Aviation

In 1996 general aviation flying is estimated to have remained at the 1995 level estimate of about 38 million hours (Figure 6).

### Airport Operations

In 1996, the 25 largest airports in the world handled some 933 million passengers, according to preliminary estimates (Table 8). During the same period the airports concerned (16 of which

are located in North America, 5 in Europe and 4 in Asia) also handled some 10.3 million commercial air transport movements.

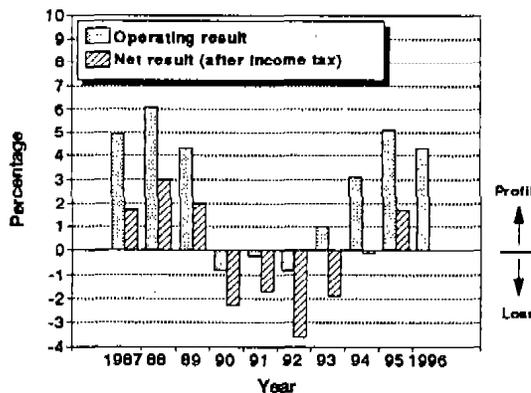


## FINANCES

Preliminary estimates for 1996 indicate that the world's scheduled airlines as a whole experienced an operating profit for the fourth year in succession (Table 9 and Figure 7).

The operating revenues of scheduled airlines of ICAO Contracting States are tentatively estimated at U.S.\$281 500 million in 1996 and operating expenses for the same airlines at U.S.\$269 500 million, giving an operating profit of 4.3 per cent of operating revenues. This follows an operating profit of 5.1 per cent in 1995.

Per tonne-kilometre, operating revenues fell from 87.3 U.S. cents in 1995 to an estimated 85.4 U.S. cents in 1996, while operating expenses decreased from 82.9 U.S. cents to an estimated 81.8 U.S. cents.



**Figure 7. Scheduled airlines**  
Operating and net results, 1987-1996



## COMMERCIAL DEVELOPMENTS

### Carriers

On the basis of schedules published in multilateral airline schedule guides it is estimated that at the end of 1996 there were some 720 air carriers world-wide providing scheduled passenger services (international and/or domestic) and about 70 operating scheduled all-freight services. Compared with the same period in 1995 this represents a net over-all decrease of about 30 air carriers.

Airline alliances continued to attract great interest in 1996. Among the most noteworthy: Air France, the last major European carrier without a transatlantic partner, signed an agreement with Delta and Continental Airlines. American Airlines and British Airways announced their intention to create a transatlantic alliance, which was followed by the dismantling of the British Airways/USAir alliance, which had become incompatible with the new project.

These and other airlines continued to expand co-operative ties, including codesharing, joint services and joint participation in frequent flyer programmes.

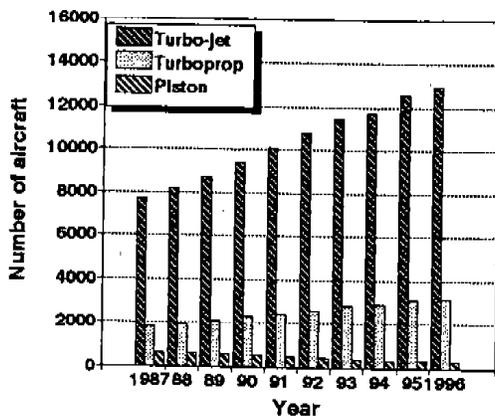


Figure 8. Total commercial air transport fleet 1987-1996

### Aircraft

Between 1987 and 1996 the reported number of commercial air transport aircraft in service increased by about 62 per cent from 10 145 to 16 460 (excluding aircraft with a maximum take-off weight of less than 9 000 kg). Within these totals, turbo-jet aircraft numbers increased by about 68 per cent, from 7 721 to 12 980, over the same period (Figure 8 and Table 10).

In 1996, 1 003 jet aircraft were ordered (compared with 678 in 1995) and 491 aircraft were delivered (compared with 481 in 1995). The backlog of unfilled orders at the end of 1996 was 2 501 aircraft compared with 2 032 at the end of 1995.

The financial commitment in terms of jet aircraft orders placed in 1996 is estimated to be about U.S.\$65 000 million compared with U.S.\$36 000 million for orders in 1995.

The number of turboprop aircraft ordered in 1996 was 173 and 177 turboprop aircraft were delivered during the year.

#### Most active aircraft type transactions, 1996

Aircraft	Orders	Deliveries	Backlog
Boeing 737	349	76	764
Airbus A 319/ 320/321	220	72	521
Boeing 777	88	32	273
Boeing 747	66	26	161
Canadair RJ	60	52	51
Boeing 757	44	42	134
Airbus A330	42	10	113



## ECONOMIC REGULATION

In 1996, States concluded fewer bilateral air service agreements than in the previous year (60 agreements reported in 1996 against 91 agreements reported in 1995). Similar to 1995,

about three-quarters of the bilateral agreements reported were new, first-time accords, primarily involving States in the Asia and Pacific region; 6 agreements, almost all of which cover North Atlantic services, contained full market access provisions; and 9 agreements included code-sharing arrangements. In comparison with 1995, the number of reported amendments to existing agreements increased from 12 to 16 and there was one memorandum of understanding (MOU) reported in 1996. Most of the amendments and the MOU concluded in 1996 dealt with additional capacity in passenger and cargo services, expansion of route rights, multiple designation or third-country codesharing arrangements.

Among the bilateral air service agreements concluded in 1996 were: an agreement between Australia and New Zealand which provided for a single aviation market with the unrestricted right to fly anywhere in the other country; separate agreements involving Germany with Canada, Mexico and the United States, and also the United States with Brazil, Fiji, Jordan, Pakistan, Poland, South Africa and Thailand, which provided for more liberalized market access and other arrangements; and agreements between Australia and South Africa, Japan and the United States, and Thailand and the United States which provided for expanded freight service opportunities.

Two sub-regional air services agreements were concluded in the Latin American region in 1996. In July, 14 Caribbean States concluded a Multilateral Agreement Concerning the Operation of Air Services Within the Caribbean Community which covers third and fourth freedom air services and air taxi operatives. In December, 6 States in South America (which are members or associate members of the MERCOSUR trade area) concluded a sub-regional air services agreement to encourage third and fourth freedom services between cities which are not being served under bilateral agreements. In the African area, States sought to increase co-operation in implementing the Yamoussoukro Declaration's provisions concerning liberalized traffic rights for African airlines, particularly at the sub-regional and regional levels.

In June, the European Union's (EU) Council of Ministers approved a two-phase plan for negotiating an air service agreement with the United States, with the first phase including such topics as airline ownership limits, competition rules, codesharing and computer reservations

systems; the second phase would include traffic rights and directly related aspects such as capacity and tariffs. Existing bilateral agreements between EU States and the United States would be respected and movement to the second phase would have to be authorized by the Council. In late October officials from the United States and the European Commission (EC) exchanged initial views. In October the Council authorized the Commission to begin negotiations on air transport agreements with 10 eastern and central European States.

In October, the EC issued an amended directive on the liberalization of ground handling services which took account of suggestions made by the European Parliament. The Commission also made an assessment of the impact of the third package of air transport liberalization measures which found that liberalization had been progressive with a balance between increased competition and control but that further action was required in such areas as tariffs, air traffic control constraints and management, slot allocation and airport fees. With respect to tariff co-ordination, the Commission ended effective 20 August the bloc exemption from competition rules for air freight.

★ *In June the ICAO Council adopted a revised and updated code of conduct for the regulation and operation of computer reservations systems (CRSs) which takes into account current market practices and the need for harmonization of various national and regional CRS regulations and is compatible with the General Agreement on Trade in Services (GATS) whose Annex on Air Transport Services includes computer reservation systems.*

The European Commission proposed several changes to its CRS Code in such areas as subscriber obligations, ticketing, charging policy and information systems. The United States, in addition to continuing a general review of its CRS regulations, issued two proposed rules concerning the level of participation in CRSs by certain airlines and the ranking of services for display to travel agents. Australia amended its CRS code of conduct to require system vendors to offer CRS access to subscriber groups using a communications system different from that of the system vendor and to include more detailed conciliation procedures for dispute settlement.

Major airline alliances were factors in the process of bilateral negotiations between the countries involved. The extent of some alliances also prompted relevant competition authorities to launch investigations into their potential effects. The Lufthansa-SAS-United Airlines, Austrian-Sabena-Swissair-Delta Airlines, and the American Airlines-Canadian International groups were granted antitrust immunity by the United States authorities.

The trend towards partial or full privatization of government-owned airlines continued in 1996. Preparations for privatization continued for some 20 government-owned carriers which had been targeted in previous years. Particular progress was reported on the African continent where Kenya Airways successfully achieved its privatization aim and privatization objectives were made known for four other airlines. Elsewhere, privatization plans were made for another six carriers. However, several other privatizations had to be deferred or postponed because of economic conditions, the state of the airlines concerned or local circumstances.

- ★ *A reactivated Air Transport Regulation Panel met from 18 to 22 March and undertook further work on several important topics identified by the World-wide Air Transport Conference, notably safeguards for fair competition, measures to ensure effective and sustained participation in international air transport, broadening the traditional ownership and control criteria for the use of market access and certain arrangements on commercial matters.*



Implementation of communications, navigation, surveillance/air traffic management (CNS/ATM) systems continued at an ever-increasing pace. This has allowed States to gain valuable experience and data. Early benefits of CNS/ATM were being realized through the opening of new ATS routes (for instance, over the vast airspaces of China and

the Russian Federation as well as in other parts of Asia), while reduced separation standards were being introduced in the Pacific and in parts of Asia, based on required navigation performance (RNP). Communication via data link was increasingly being used for transmission of ATM-related information such as oceanic clearances, pre-departure clearances and weather information. Many regions were conducting trials and experiments, using controller-pilot data link communications and other data link applications for a broad range of ATM communications. In the field of navigation, Japan, the United States and European States are committed to implementation of global navigation satellite systems augmentation systems, and progress was achieved by all of these States. Finally, automatic dependent surveillance was being used as a supplemental means of monitoring aircraft in a number of oceanic and continental airspaces.

## Communications

Work continued in a number of States and international organizations, with industry input, on developing sub-systems for the aeronautical telecommunications network (ATN). Work also continued in the development and assessment of technologies such as time-division multiple access (TDMA) digital voice/data systems to improve VHF communication spectrum utilization and HF data link. Work on the VHF digital link (Modes 1 and 2) was completed.

Controller-pilot data link communication, which allows controllers to communicate via data link, is being used increasingly to communicate with suitably equipped aircraft in oceanic and remote areas of the world.

## Navigation

Significant progress continued in a number of States and international organizations in global navigation satellite systems (GNSS) development and implementation. The ICAO GNSS Panel continued development of Standards and Recommended Practices (SARPs) for GNSS.

Development of satellite-based augmentation systems continued in a number of regions. This form of augmentation has the potential to support sole-means 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 continue to be developed and tested. This type of augmentation may be used by some States as an alternative in support of Category I operations. A number of States have approved global positioning system for supplemental or primary use for some operations and types of airspace.

Considering that as of 1 January 1998 all published aeronautical coordinates must be referenced to the World Geodetic System — 1984 (WGS-84), progress continued in a number of States to implement this standard.

- ★ *The Panel of legal and technical experts on the establishment of a legal framework with regard to GNSS held its first meeting in Montreal. It established two working groups which will draft a Charter formulating fundamental legal principles for GNSS and examine legal issues relating to liability, certification, institutional questions and other matters related to GNSS.*

### Surveillance

Considerable progress continued to be reported during the year in improving surveillance capabilities. This included development of automatic dependent surveillance and implementation of new radar systems, such as monopulse secondary surveillance radar and SSR Mode S stations.

### Air Traffic Management

Air traffic control systems around the world continued to be updated as part of the evolutionary process leading to a future global air traffic management system. Supporting CNS/ATM systems were being implemented with a view to achieving early benefits as well as meeting long-term requirements. Several regions developed ATM operational concepts, aimed at the progressive introduction of CNS technology in support of integrated ATM systems. This comprehensive approach should lead toward a progressive and balanced implementation of CNS/ATM systems.

Modernization of systems was achieved through introduction of multi-radar tracking

systems, raster scan colour displays, new flight plan data processing systems and ATC simulators. Moreover, in areas where the implementation of radar service was not possible or practical, automatic dependent surveillance and controller-pilot data link communication systems were introduced to provide air traffic control with additional surveillance and intervention capability.

Many States developed short- and medium-term programmes and ordered equipment to update their air traffic control systems within the near future. Improvements and operational procedures were being developed to support the integration of airborne and ground systems components.

Major milestones were achieved concerning the use of required navigation performance (RNP) as an integral tool for airspace planning and implementation of CNS/ATM systems. In parallel with developments associated with RNP, the concept of required communication performance will allow airspace planners to develop the airspace infrastructure based on ATM operational requirements. The implementation of RNP, together with the progressive introduction of area navigation techniques in compliance with RNP requirements, was anticipated to support a more efficient utilization of the available airspace. It is envisaged that satellite-based navigation systems, in combination with airborne navigation systems, will meet any future navigation performance requirements.

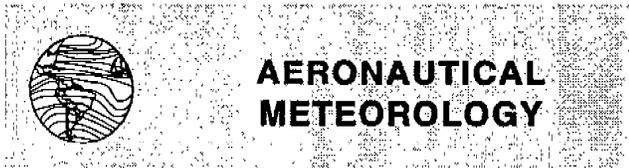


Future larger aeroplanes with wing spans greater than 65 m (larger than the B747-400) and capable of carrying more than 550 passengers may enter service by the year 2000, and they would have an impact on the airport infrastructure. To assist States in planning to accommodate these aeroplanes, a review of the Annex 14, Volume I specifications on airport design is necessary.

States are required to evaluate and publish the strength of airport pavements using ICAO's ACN/PCN system. A review of the current procedures for pavement design and evaluation

indicated the inherent limitations of these procedures when used for the design of aerodrome pavements for some types of new larger aeroplanes equipped with six or more wheels per strut (e.g. Boeing 777). A review of the other design methods available indicated the need to identify more mature and globally acceptable procedures. In this context, a full-scale research project is being planned in one State.

Annex 14, Volume I recommends halogenated carbons (halons) as one of the three complementary fire extinguishing agents for aerodrome rescue and fire fighting. However, as a result of the *Montreal Protocol on Substances that Deplete the Ozone Layer*, the production of halons ceased on 31 December 1993. Since then, only remaining stocks of halons and recycled halons have been permitted for essential uses until a suitable alternative is identified. In this regard, research in the industry is being monitored by ICAO in order to keep the related specifications current.



The tendency towards the centralization and commercialization of meteorological forecast services continued in 1996. Developments continued towards computer preparation of global forecasts of significant weather by the world area forecast centres (WAFCs). As a result, the significant weather charts for Europe, Middle East and the North Atlantic are currently prepared in WAFc London by means of an interactive computer workstation. Global coverage by three WAFc satellite broadcasts has been achieved, and very small aperture terminals are being installed in many States.

The implementation of volcanic ash advisory centres continued. Nine centres — Buenos Aires (Argentina), Darwin (Australia), Montreal (Canada), Toulouse (France), Tokyo (Japan), Wellington (New Zealand), London (United Kingdom), Anchorage and Washington (United States) — provide advisory information to area control centres and meteorological watch offices

concerning the extent and trajectory of volcanic ash "clouds".

The implementation of tropical cyclone advisory centres also continued. All six centres — Darwin (Australia), Nadi (Fiji), La Réunion (France), New Delhi (India), Tokyo (Japan) and Miami (United States) — covering the areas prone to tropical cyclones became operational.



The satellite-based COSPAS-SARSAT system continued to play an important role in detecting emergency locator transmitters and in locating aviation distress sites.

The system also continued to expand its capability. There were 5 satellites in operation, plus one in-orbit spare satellite, and several replacement satellites incorporating technical enhancements were being built. The ground system of local user terminals (LUTs) and mission control centres (MCCs) was improved and expanded. At year's end, 33 LUTs and 20 MCCs were in operation or under test. Although global coverage was already provided on 406 MHz, additional LUTs and MCCs were planned to increase the real-time coverage of the system and reduce over-all response time. A geostationary component of the system was being developed which would provide for almost instantaneous alert. Since it began trial operations in September 1982, the COSPAS-SARSAT system has contributed to the rescue of over 6 000 persons in aeronautical, maritime and terrestrial incidents.



To help alleviate the problems of landside congestion, particularly that related to immigration or

customs inspection of passengers and cargo at airports, facilitation meetings and guidance materials continued to promote the application of facilitation concepts to such processes. Such concepts include risk management to enable authorities to focus inspection resources selectively; use of advance information for pre-arrival processing; automation of procedures to replace paper documentation; and co-ordination of government control procedures to optimize efficiency.



### Scheduled Operations

Preliminary information on aircraft accidents involving passenger fatalities in scheduled air services for ICAO Contracting States shows that there were 23 fatal aircraft accidents in 1996 involving 1 135 passenger fatalities<sup>1</sup> compared to 26 fatal accidents and 710 passenger fatalities in 1995 (Table 11). Relating passenger fatalities to the volume of traffic, the number of passenger fatalities per 100 million passenger-kilometres increased from 0.03 to 0.05 in 1996. The number of fatal aircraft accidents per 100 million aircraft-kilometres flown decreased to 0.11 in 1996 from 0.13 in 1995, and the number of fatal aircraft accidents per 100 000 landings also decreased, to 0.13 in 1996 from the previous rate of 0.15 in 1995 (Figure 9).

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 (i.e. in terms of passenger-kilometres performed), there were 11 accidents in 1996 with 1 017 passenger fatalities; in turboprop and piston-engined aircraft operations, which account for about 5 per

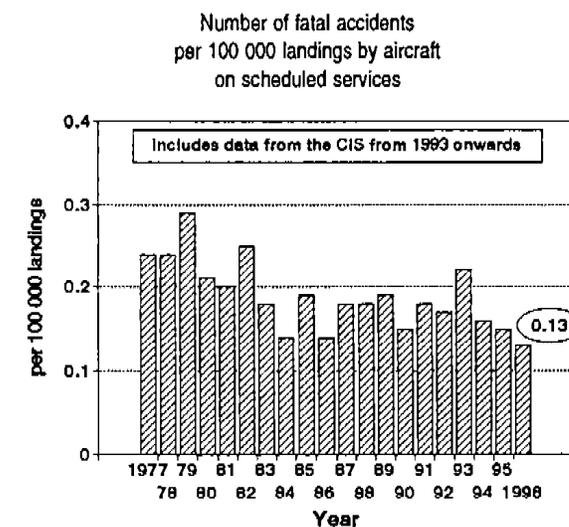
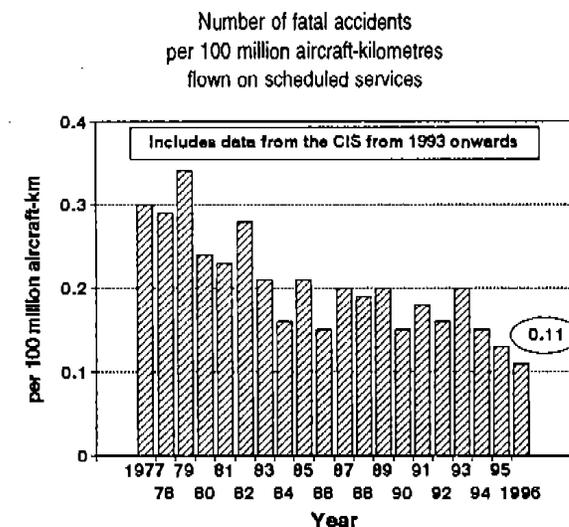
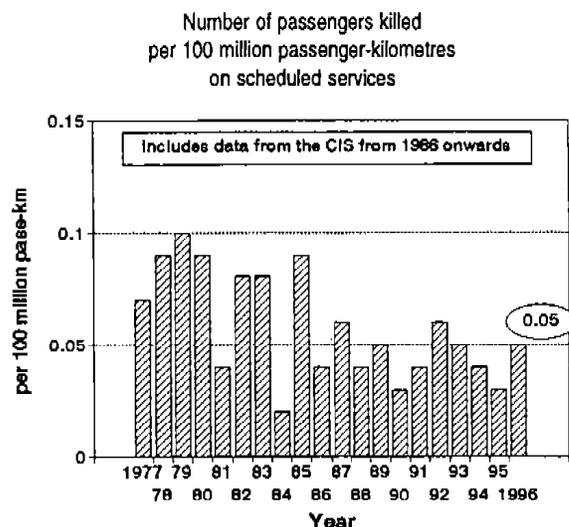


Figure 9. Aircraft accident statistics  
1977-1996

1. Preliminary 1996 figures for scheduled carriers include 212 passenger fatalities in a Boeing 747 accident off New York, for which the cause has not yet been established.

cent of the scheduled traffic volume, there were 12 accidents with 118 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 in 1996 there were 25 fatal accidents with 479 passenger fatalities compared to 40 fatal accidents with 391 passenger fatalities in 1995.

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 4 fatal accidents with 342 passenger fatalities in 1996.

### General Aviation

Complete statistical information is not available on safety in general aviation operations. In 1995, it is estimated that general aviation aircraft were involved in about 780 fatal accidents and that the number of fatalities in these accidents was about 1 670. The number of fatal accidents per 100 000 aircraft hours flown was about 2.05 in 1995. In the United States, which accounts for about 60 per cent of all reported general aviation activities in the world there were 358 fatal accidents in 1996 resulting in 631 fatalities, according to preliminary information. The corresponding numbers for 1995 were 408 fatal accidents and 733 fatalities. For the United States, the rate of fatal general aviation accidents per 100 000 aircraft hours flown was about 1.51 in 1996, compared to 2.04 in 1995.

### Safety Oversight

- ★ *The safety oversight programme, endorsed by the 31st Session of the Assembly, initiated its activities in March. By the end of 1996, 56 States had requested a safety oversight assessment by an ICAO team. Thirty-two*

*States administrations were assessed during an eight-month period, and it is expected that 24 States will be assessed during 1997. New requests for assessment are also expected during 1997.*

- ★ *The assessed States have been requested to prepare action plans to respond to the recommendations contained in the assessment reports in order to rectify deficiencies or to implement ICAO Standards and Recommended Practices.*
- ★ *Follow-up action on the safety oversight assessment reports will start during 1997 and will be conducted by experts from Headquarters and the ICAO Regional Offices. Technical assistance to help States to implement SARPs or rectify deficiencies will be provided through the ICAO Technical Co-operation Programme.*

### Accident Investigation and Prevention

The 1996 fatality numbers underline the continuing need to improve accident prevention strategies and methods. ICAO is closely monitoring and supporting recent incident reporting initiatives in the industry, such as the proposed "Global Analysis and Information Network" which may provide the tools required to direct future accident prevention efforts.

### Controlled Flight into Terrain (CFIT)

- ★ *In February, States were informed of the resolution adopted by the 31st Session of the Assembly urging States to implement the ICAO programme for the prevention of CFIT in both international and domestic operations. The development of CFIT prevention material by the ICAO and Industry CFIT Task Force continued throughout the year. In early October, the ICAO programme for the prevention of CFIT was presented to the Air Navigation Commission (ANC) with detailed information on the material to be published. The ANC approved publication of the programme and in late October reported on the programme to the Council. The CFIT Task*

Force announced the imminent publication of its CFIT prevention package in Dubai, United Arab Emirates in November. The ICAO programme for the prevention of CFIT will be published in early 1997.



## HUMAN FACTORS

The drive to incorporate Human Factors requirements into the certification process of equipment, procedures and personnel continued to gain momentum during 1996. ICAO has been involved in several fora where the subject was discussed. An industry consensus concerning practical implementation of these requirements in highly automated flight deck aircraft was achieved during 1996.

- ★ To develop Human Factors-related SARPs an initial review of the Annexes to the Convention was completed during 1996. The results will be circulated to States and international organizations for comments.
- ★ Several Human Factors-related international symposia, seminars and meetings were held in various Contracting States. ICAO was represented at most of them, affirming its leadership role in this field.



## TRAINING

There is an increasing need to develop training in ICAO CNS/ATM systems. TRAINAIR members have begun to meet this need through the development of CNS/ATM-related Standardized Training Packages (STPs). The Airports Authority of India, Institute of Aviation Management, began preparation of the first TRAINAIR STP concerning CNS/ATM systems.



## WARSAW SYSTEM

- ★ A draft of a new international legal instrument, developed by the Legal Bureau assisted by a Secretariat Study Group, for the modernization and consolidation of the "Warsaw System", was noted by the Council and referred to the Legal Committee.



## SECURITY

During the reporting period there were 14 acts of unlawful interference officially reported or confirmed by concerned States, of which ten were unlawful seizures, two were attempted seizures, one was an attack on a ground facility and one was an unlawful act against the safety of civil aviation (Table 12). These acts have been included in the annual statistics to assist in the analysis of trends and developments (Figure 10).

- ★ In accordance with the ICAO policy of reviewing Annexes every three years, Amendment 9 to Annex 17 was adopted by the Council on 12 November. The amendment will become effective on 31 March 1997 and will become applicable on 1 August 1997.
- ★ Since the commencement of Mechanism activities in 1989, 126 States have requested assistance; of these, 90 received technical evaluation missions, 28 were visited during follow-up missions and 71 training events were staged in which 1 623 trainees participated. These activities were financed through voluntary contributions by 15 donor States totalling U.S.\$3 773 146 and the funding of 7 posts by 3 donor States.
- ★ Standardized Training Packages (STPs) 123/Management, 123/Instructors and 123/Crisis Management are being finalized. Distribution after translation into five languages is anticipated for early 1997. STPs

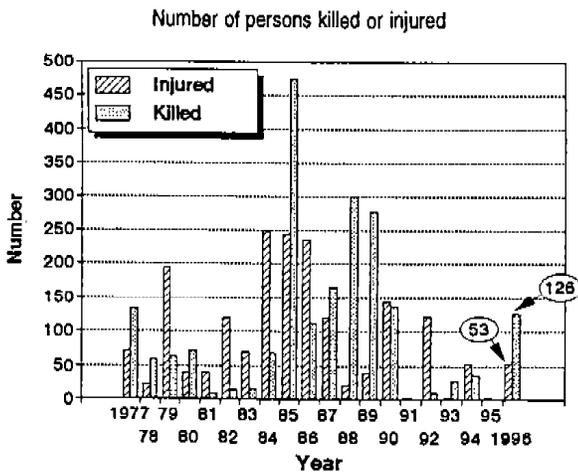
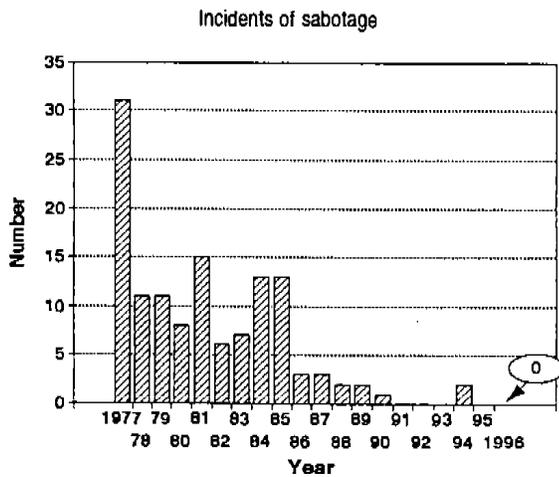
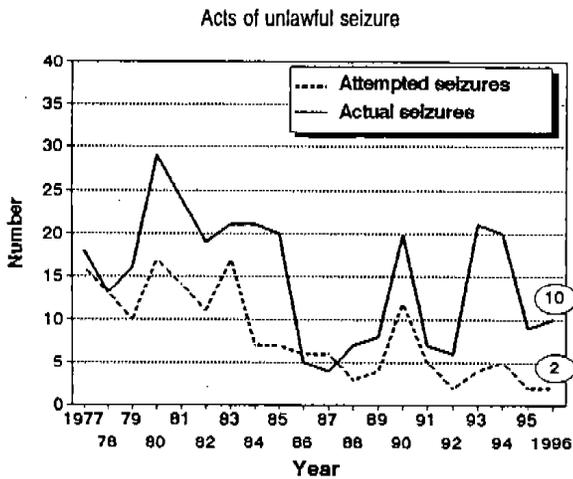


Figure 10. Aviation security statistics 1977-1996

123/Airline Security, 123/Cargo Security, 123/Systems Testing, 123/ Programme Development, 123/Awareness and 123/Supervisors are being progressively developed. The validation process will be undertaken as each STP becomes ready in 1997.

★ The Council decided during its 148th Session to include in the General Work Programme of the Legal Committee the subject "Acts or offences of concern to the international aviation community and not covered by existing air law instruments".



## ENVIRONMENTAL PROTECTION

Parties to the United Nations Framework Convention on Climate Change, which has the objective of stabilizing greenhouse gas concentrations in the atmosphere at safe levels, continued to work towards the 1997 deadline for strengthening developed country commitments that they had agreed to in 1995 (the "Berlin Mandate"). While the Convention has no specific provisions regarding civil aviation, some States would like to see measures to control aircraft engine emissions that contribute to climate change. In September, at ICAO's request, the Intergovernmental Panel on Climate Change agreed to undertake a special report on *Aviation and the Global Atmosphere*, in co-operation with the Ozone Scientific Assessment Panel under the Montreal Protocol and with ICAO involvement, for completion in late 1998.

★ In May, the Council considered the recommendations made by its Committee on Aviation Environmental Protection (CAEP) in December 1995 and referred them to States for comment. The Council will take up this matter again in early 1997.

★ Also in May, the Council reviewed ICAO's relationships with other United Nations policy-making bodies in the environmental field and agreed on a number of concrete steps for further co-operation. Future co-operation was also the main theme of a statement by the

*President of the Council at the second session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (Geneva, July).*

- ★ *In December, the Council adopted a resolution containing a policy statement on environmental charges and taxes. The resolution reaffirms that ICAO is seeking to identify a rational common basis on which States wishing to do so could introduce environmental levies and strongly recommends that any such levies be in the form of charges rather than taxes.*



## SUBSTANCE ABUSE

- ★ *As support for the guidance material contained in the Manual on Prevention of Problematic Use of Substances in the Aviation Workplace (Doc 9654), States and international organizations were consulted on a proposal to amend Annex 1 by adding a new provision relating to the use of psychoactive substances. The Air Navigation Commission will review the proposal and the responses received in 1997.*



## TECHNICAL CO-OPERATION

- ★ *The ICAO Technical Co-operation Programme for 1996 was valued at \$72 million, of which*

*\$59.3 million (or 82 per cent) was implemented.*

- ★ *During the year, the Technical Co-operation Bureau (TCB) executed 121 projects in 64 developing countries and a total of 11 new and revised large-scale projects were approved. The TCB employed 284 experts from 36 countries to work in its field projects. A total of 732 fellowships were awarded and procurement expenditures for field projects totalled \$26.87 million.*
- ★ *Registration for the ICAO Civil Aviation Purchasing Service (CAPS) was made by 8 additional countries, bringing the total to 81.*
- ★ *From 1990 to 1995, the ICAO Technical Co-operation Programme experienced a continuous decline in the number of fellowships awarded each year. This trend was reversed in 1996 when the total number of awards reached 732, an increase of 42 per cent over the previous year. This increase contributed to the continuation of a government-funded training project in Botswana as well as to the commencement of a new training project in Indonesia which complemented an ongoing training project in that country. In addition, the South American Regional Office (Lima) continued to be the leading Office in the awarding of fellowships for training. The total number of awards processed in this office reached 289, of which 120 were issued under country projects and 169 under regional projects. An effective fellowship component is often considered the most important component of a project, as it ensures the continuity and the efficient use of facilities provided by a project long after its completion.*

## THE ORGANIZATION

- ★ *During 1996, the Convention on International Civil Aviation was adhered to by one State (Western Samoa) and at year-end there were 185 Contracting States.*
  - ★ *In March, the ICAO Council adopted a resolution directing the Secretary General to investigate the shooting down of two United States-registered private civil aircraft by Cuban military aircraft on 24 February 1996. The investigation was completed in June, and on 27 June the Council adopted a resolution noting the report and forwarded it to the United Nations Security Council. The UN Security Council on 26 July 1996 endorsed the findings of the investigation.*
  - ★ *During the month of October, the Organization moved to its new Headquarters at 999 University Street, in Montreal. The new premises were officially opened on 5 December by the Prime Minister of Canada, the Rt. Hon. Jean Chrétien, the President of the Council of the International Civil Aviation Organization, Dr. Assad Kotaite, and the Secretary General of the International Civil Aviation Organization, Dr. Philippe Rochat, in the presence of the Premier of Quebec, Mr. Lucien Bouchard and the Mayor of Montreal, His Worship Pierre Bourque.*
  - ★ *In December, the United Nations General Assembly adopted a Resolution declaring that each year 7 December be recognized as International Civil Aviation Day*
  - ★ *In December, the Council identified a number of expeditious actions in response to indications of deficiencies in the air navigation field in the Africa-Indian Ocean Region. Some short-term actions were for immediate attention with priority, while others were for the medium and long term. This latter group incorporates the possible expansion of the ICAO Safety Oversight Programme to include safety of airports, air traffic services and supporting facilities and means of assistance to States in improving the organization and financing of airport and air navigation services.*
  - ★ *By the end of 1996, 56 States had requested an ICAO safety oversight assessment. Thirty-two of these States were assessed. From the results of these assessments, it was concluded that the vast majority of States, in spite of their best intentions and efforts, are facing serious difficulties in fulfilling their safety oversight obligations. The major deficiencies fall into three categories: primary aviation legislation and regulations; institutional structure and human/financial resources; and certification and supervision of commercial air transport operators.*
  - ★ *Although the financial situation of the Organization improved, delays in payments of 1996 contributions and the accumulation of contributions in arrears had an adverse effect on the ICAO work programme.*
-