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Air traffic controllers can make six figures, but they train hard to get there. Learn how to become an air traffic controller in our step-by-step guide.Many air traffic controllers have an associate degree in air traffic management.The federal government hires air traffic trainees during a short window each year.After landing a job, trainees complete months of special academy training.New controllers continue training on the job to gain certification within three years.On any given day, the Federal Aviation Administration (FAA) handles over 45,000 flights, carrying more than 2.9 million passengers. While pilots do the flying, air traffic controllers, also called air traffic control specialists, guide and instruct pilots. They watch out for weather and traffic congestion and reroute planes if necessary.This article lists the steps to becoming an air traffic controller and answers questions about the job.The path to becoming an air traffic controller is unique and takes several levels of training. Heres where to get started.Earn a GED or High School Diploma: Most air traffic control degree programs and the armed services require you to have a high school or GED diploma to enroll or enlist.Complete Pre-Employment Education and Experience Requirements: In addition to meeting certain medical and age requirements, you must complete pre-training. The FAA provides different ways to complete your pre-training. You may:Work for at least three years in progressively responsible rolesEarn a four-year degreeCombine education and work experience for a total of three years (E.g., Complete a two-year degree and military service)The above are minimum requirements. To strengthen your application, consider completing a degree at an Air Traffic-Collegiate Training Initiative (AT-CTI) school. These programs teach students air traffic management and other aviation subjects. They are located at several colleges throughout the country. Graduates may receive a letter of recommendation to help them land a job.You can also gain air traffic control experience in the military. Veterans may earn credits toward an air traffic degree.Apply for a Job During a Hiring Window: Apply for an air traffic controller job through USAJOBS. Air traffic controller jobs typically accept applicants for just a few days, so its a good idea to sign up for USAJOBS alerts.Attend the FAA Academy: The FAA academy trains air traffic controllers through classroom learning and simulations. Trainees may complete coursework in 2-5 months. It is located in Oklahoma City.In an interview on the FAAs Up in the Air podcast, academy director Jim Doskow said that students with higher course scores may get to choose their site assignment first, whereas students with lower scores choose last. Hows that for an incentive to study?Work on Assignment as a Developmental Controller: Sort of like an apprentice, developmental controllers work under supervision while training for another 1.5-3 years.Become Certified: After completing all of the necessary training components to work in a tower or radar facility, you can become an FAA-certified professional controller (CPC).Air traffic controllers monitor flight paths. They give pilots instructions and information about weather and other air traffic from pre-departure to arrival.Air traffic controllers prioritize safety. They guide pilots to make sure they avoid collisions and dangerous weather. These professionals also try to prevent congestion around airports. They help pilots and passengers take off and arrive on time.Air traffic controller jobs require communication, concentration, and constant troubleshooting. They practice organization and attentiveness, frequently monitoring several flights at once. Even under great stress, these pros must make fast, effective decisions.On any given shift, an air traffic controller may be responsible for:Instructing pilots during takeoff and landingDirecting other airport workers, including baggage and maintenance personnelHanding off flight paths to colleagues stationed throughout the countryWarning pilots about weather conditions, runway closures, and other issuesDetecting and reporting emergencies during a flightAir traffic controllers have different roles, categorized generally by how close to an airport they work. Types of air traffic controllers include:Tower Controllers or Operators: These professionals work in towers at the airport. They oversee the runways and air traffic within about 30 miles of an airport.Approach and Departure or Radar Approach Controllers: Further out, about 20-50 miles from the airport, these controllers guide pilots approaching and departing from the vicinity. They hand off traffic between tower and en route control specialists.En Route Controllers: These professionals work throughout the country to monitor flights far away from any airport.Sometimes, there may be other roles, such as control specialists who work between tower and radar approach controllers or supervisors who oversee employees at a tower.In addition to completing education or work experience, aspiring air traffic controllers must meet certain requirements before the FAA accepts them as job candidates and academy students.To meet the FAAs requirements to become an air traffic controller, you must: Be a U.S. citizen Be 30 years old or younger Pass a medical examination and continue to pass it annually once youre hired Pass a security investigation Pass the FAAs pre-employment test Speak English clearly so colleagues using communications equipment can understand you Be up for relocating to any facility the FAA may need to staff Work for three years in progressively responsible roles, obtain a bachelors degree, or have some combination of work and postsecondary education equaling three yearsOnce you complete your academy training, you will be assigned to work at a tower or radar facility somewhere in the country. There, you will continue training, which the FAA monitors closely. After completing all of the necessary training components to work in a tower or a radar facility, you qualify to become a CPC. The FAA expects trainees to complete all necessary training in 1.5-3 years.The median annual wage for air traffic controllers in 2021 was $129,750, according to the BLS. Your exact salary as an air traffic controller may depend on your experience, where in the country you work, and the complexity of the air traffic you manage. Air traffic controllers also may receive federal benefits, including insurance and retirement plans.Even though more people are flying these days, new satellite-based technology may enable control specialists to cover more traffic, lowering the demand for these jobs. The BLS projects that employment for air traffic controllers will grow 4% from 2020 to 2030. Thats just half the projected growth rate for all applications, which is around 8%.Throughout your career, you may continue training in different types of air traffic management for example, tower versus en-route control to expand your experience and move to new cities.The law requires air traffic controllers to retire at age 56, and some may retire earlier than that. Some retired air traffic controllers become instructors or work as supervisors.StateAverage Air Traffic Controller Salary (May 2021)Virginia$152,450New Hampshire$150,490Illinois$145,470Georgia$144,840California$141,200It may take 4.5-7.5 years to become an air traffic controller.You must spend 3-4 years completing pre-employment qualifications. Then, if you land a job right away, you need to spend 2-4 months in FAA training and then another 1.5-3 years in on-the-job training before the FAA certifies you.According to data from the National Center for Education Statistics, most air traffic control and aviation management degree programs cost between $7,000 and $20,000 a year. These include two- and four-year degree programs.Once youre hired, you do not pay for the required training at the FAA Academy. The Academy will pay for or reimburse your lodging and meal expenses up to a certain amount while youre enrolled in courses.Specialised agency of the United NationsNot to be confused with the International Air Transport Association."Civil Aviation Organization" redirects here. For the Civil Aviation Organization of Iran, see Civil Aviation Organization (Iran).International Civil Aviation Organization[1]ICAO's headquarters in MontrealAbbreviationICAOFormation4April 1947; 78 years ago(1947-04-04)TypeUnited Nations specialised agencyLegal statusActiveHeadquartersMontreal, Quebec, CanadaOfficial language ArabicChineseEnglishFrenchRussianSpanishSecretary GeneralJuan Carlos Salazar Gmez[2]Council PresidentSalvatore SciacchitanoMain organTriennial AssemblyICAO CouncilICAO SecretariatWebsiteicao.int Politics portalThe International Civil Aviation Organization (ICAO /akeo/ eye-KAY-oh) is a specialized agency of the United Nations that coordinates the principles and techniques of international air navigation, and fosters the planning and development of international air transport to ensure safe and orderly growth.[3] The ICAO headquarters are located in the Quartier international de Montral of Montreal, Quebec, Canada.The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. ICAO defines the protocols for air accident investigation that are followed by transport safety authorities in countries signatory to the Convention on International Civil Aviation.[4]The Air Navigation Commission (ANC) is the technical body within ICAO. The commission is composed of 19 commissioners, nominated by the ICAO's contracting states and appointed by the ICAO Council.[5] Commissioners serve as independent experts, who although nominated by their states, do not serve as state or political representatives. International Standards and Recommended Practices are developed under the direction of the ANC through the formal process of ICAO Panels. Once approved by the commission, standards are sent to the council, the political body of ICAO, for consultation and coordination with the member states before final adoption.ICAO is distinct from other international air transport organizations, particularly because it alone is vested with international authority (among signatory states): other organizations include the International Air Transport Association (IATA), a trade association representing airlines; the Civil Air Navigation Services Organisation (CANSO), an organization for air navigation service providers (ANSPs); and the Airports Council International, a trade association of airport authorities. In addition there are several regional civil aviation commissions, such as the Latin America Civil Aviation Commission (LACAC) who focus on challenges and growth in specific regions.In the early 20th Century, the International Telecommunication Union met to discuss and implement one of the first internationally agreed upon standards relating to aviation, country-specific prefixes for aircraft callsigns. The first convention was held in 1903 in Berlin, Germany, but no agreements were reached among the eight countries that attended. At the second convention in 1906, also held in Berlin, twenty-seven countries attended.[6] The third convention, held in London in 1912, allocated the first radio callsigns for use by aircraft. Following this, at the Paris Convention of 1919, a forerunner to ICAO named ICAN was established, the International Commission for Air Navigation. ICAN continued to operate until 1945.[7][8]The Convention on International Civil Aviation, also known as the Chicago Convention, in Chicago, was signed by 52 countries on 7 December 1944. Under its terms, a Provisional International Civil Aviation Organization was to be established, to be replaced in turn by a permanent organization when twenty-six countries ratified the convention. PICAO began operating on 6 June 1945, replacing ICAN. The 26th country ratified the convention on 5 March 1947 and, consequently, PICAO was disestablished on 4 April 1947 and replaced by ICAO, which began operations the same day.[citation needed]In October 1947, ICAO became an agency of the United Nations under its Economic and Social Council (ECOSOC).[7][9]In April 2013, Qatar offered to serve as the new permanent seat of the Organization. Qatar promised to construct a massive new headquarters for ICAO and to cover all moving expenses, stating that Montreal "was too far from Europe and Asia", "had cold winters", was hard to attend due to the Canadian government's slow issuance of visas, and that the taxes imposed on ICAO by Canada were too high.[10] According to The Globe and Mail, Qatar's invitation was at least partly motivated by the pro-Israel foreign policy of Canadian Prime Minister Stephen Harper.[11][12]Approximately a month later, Qatar withdrew its bid after a separate proposal to the ICAO's governing council to move the ICAO triennial conference to Doha was defeated by a vote of 2214.[13][14][15]In January 2020, ICAO blocked several Twitter users, including think-tank analysts, U.S. Congressional staff, and journalists, who mentioned Taiwan in tweets related to ICAO. Many of the tweets were related to the COVID-19 pandemic and Taiwan's exclusion from ICAO safety and health bulletins due to pressure from China. In response, ICAO issued a tweet stating that publishers of "irrelevant, compromising and offensive material" would be "precluded".[16][17][18]Since that action, the organization has followed a policy of blocking anyone asking about it.[19][20]The United States House Committee on Foreign Affairs harshly criticized ICAO's perceived failure to uphold principles of fairness, inclusion, and transparency by silencing non-disruptive opposing voices. Senator Marco Rubio also criticized the move.[21] The Taiwanese Ministry of Foreign Affairs (MOFA) and legislators criticized the move, with MOFA head Jaushieh Joseph Wu tweeting in support of those blocked.In January 2020, Anthony Philbin, Chief of Communications for the ICAO Secretary General, defended ICAO's actions, stating, 'We felt completely justified in taking steps to protect the integrity of the information and discussions that our followers reasonably expect from our feeds.' In exchanges with the International Flight Network, Philbin refused to acknowledge the existence of Taiwan.[22]On 1 February 2020, the United States Department of State issued a press release heavily criticizing ICAO's actions, characterizing them as "outrageous, unacceptable, and not befitting of a UN organization."[23][24]On May 2, 2025, the ICAO Council expressed grave concern over ongoing Global Navigation Satellite System (GNSS) radio frequency interference in the Incheon Flight Information Region (FIR), incidents that have persisted since October 2, 2024, and are attributed to North Korea, officially known as the Democratic People's Republic of Korea (DPRK). The Council emphasized that such interference endangers international air navigation safety and violates the principles of the Chicago Convention. It strongly urged the DPRK to adhere to its international obligations and prevent future occurrences. Given the severity of the situation, the Council is considering reporting the matter to the 42nd Session of the ICAO Assembly in September 2025, as per Article 54(k) of the Convention, and will continue to monitor developments closely.[25]The 9th edition of the Convention on International Civil Aviation includes modifications from years 1948 up to 2006. ICAO refers to its current edition of the convention as the Statute and designates it as ICAO Document 7300/9. The convention has 19 Annexes that are listed by title in the article Convention on International Civil Aviation.[26]International Civil Aviation Organization member statesAs of April2019[update], there are 193 ICAO members, consisting of 192 of the 193 UN members (all but Liechtenstein, which lacks an international airport), plus the Cook Islands.[27][28]Despite Liechtenstein not being a direct party to ICAO, its government delegated Switzerland to enter into the treaty on its behalf in 1947, and the treaty is applicable in the territory of Liechtenstein.[29]The Republic of China was a founding member of ICAO. Following its retreat to Taiwan, it was eventually replaced by the People's Republic of China as the legal representative of China in 1971.In 2013, Taiwan was for the first time invited to attend the ICAO Assembly, at its 38th session, as a guest under the name of "Chinese Taipei". As of September2019[update], it has not been invited to participate again, due to renewed PRC pressure.[30][31][32][33]The host government, Canada, supports Taiwan's inclusion in ICAO. Support also comes from Canada's commercial sector with the president of the Air Transport Association of Canada saying in 2019 that "It's about safety in aviation so from a strictly operational and non-political point of view, I believe Taiwan should be there."[34]The ICAO's council chamber in July 2013The ICAO Council is elected by the Assembly every three years and consists of 36 members elected in three groups. The present council was elected in October 2022.[35]The structure of the present Council is as follows:Group I (Chief Importance)Group II (Large Contributions)Group III (Geographic Representations)AustraliaBrazilCanadaChinaFranceGermanyItalyJapanUnited KingdomUnited StatesArgentinaAustriaEgyptIcelandIndiaMexicoNigeriaSaudi ArabiaSingaporeSouth AfricaSpainVenezuelaBoliviaChileEl SalvadorEquatorial GuineaEthiopiaGhanaJamaicaMalaysiaMauritaniaQatarSouth KoreaRomaniaUnited Arab EmiratesZimbabweMeeting room of ICAO's Air Navigation Commission in July 2013The Air Navigation Commission (ANC) is the ICAO Council technical executive body in charge of 17 of the 19 Annexes to the Chicago Convention. ANC develops and recommend ICAO minimal standards that are related to these Annexes. To review and/or finalize the ongoing developments the commission meets for three sessions per year. Each session normally considers a number of documents being developments of ANC expert Panels. The ANC is composed of nineteen commissioners nominated by ICAO States in various aviation domains. However, legally these commissioners do not represent the interest of their State or any particular State or region. They have to conduct independently in the interest of the entire international civil aviation community. Additionally, several other representatives from ICAO States and up to eight members from the civil aviation industry may be invited to take part in ANC meetings as observers.[36][37]Further information: Standards And Recommended PracticesICAO also standardizes certain functions for use in the airline industry, such as the Aeronautical Message Handling System (AMHS). This makes it a standards organization.Each country should have an accessible Aeronautical Information Publication (AIP), based on standards defined by ICAO, containing information essential to air navigation. Countries are required to update their AIP manuals every 28 days and so provide definitive regulations, procedures and information for each country about airspace and airports. ICAO's standards also dictate that temporary hazards to aircraft must be regularly published using NOTAMs.ICAO defines an International Standard Atmosphere (also known as ICAO Standard Atmosphere), a model of the standard variation of pressure, temperature, density, and viscosity with altitude in the Earth's atmosphere. This is useful in calibrating instruments and designing aircraft.[38] The standardized pressure is also used in calibrating instruments in-flight, particularly above the transition altitude.ICAO is active in infrastructure management, including communication, navigation and surveillance / air traffic management (CNS/ATM) systems, which employ digital technologies (like satellite systems with various levels of automation) in order to maintain a seamless global air traffic management system.[39]ICAO has published standards for machine-readable passports.[40] Machine-readable passports have an area where some of the information otherwise written in textual form is also written as strings of alphanumeric characters, printed in a manner suitable for optical character recognition, which enables border controllers and other law enforcement agents to process such passports more quickly without having to enter the information manually into a computer.ICAO's technical standard for machine-readable passports is contained in Document 9303 Machine Readable Travel Documents.[41]A more recent standard covers biometric passports. These contain biometrics to authenticate the identity of travellers. The passport's critical information is stored on a tiny RFID computer chip, much like information stored on smart cards. Like some smart cards, the passport book design calls for an embedded contactless chip that is able to hold digital signature data to ensure the integrity of the passport and the biometric data.Aerodrome reference code[42]NumberField length1< 800m (2,625ft)28001,200m (2,6253,937ft)31,2001,800m (3,9375,906ft)4 1,800m (5,906ft)Aerodrome reference code[42]LetterWingspanMain gear spanAirbus[43]Boeing[44]OthersA< 15m (49.2ft)< 4.5m (14.8ft)BN-2 Islander, Tecnam P2012B1524m (49.278.7ft)4.56m (14.819.7ft)CRJ 100/200/700, Embraer ERJ, Saab 340, EMB 120C2436m (78.7118.1ft)69m (19.729.5ft)A220, A320 familyB717, B727, B737ATR 42/72, CRJ900/1000, Dash 8, Embraer E-JetD3652m (118.1170.6ft)914m (29.545.9ft)A300/A310B707, B757, B767DC-10/MD-11, IL-86, L-1011E5265m (170.6213.3ft)914m (29.545.9ft)A330/A340, A350B747, B777, B787IL-96F6580m (213.3262.5ft)1416m (45.952.5ft)A380B747-8Antonov An-124 RuslanBoth ICAO and IATA have their own airport and airline code systems.Main article: ICAO airport codeICAO uses 4-letter airport codes (vs. IATA's 3-letter codes). The ICAO code is based on the region and country of the airportfor example, Charles de Gaulle Airport has an ICAO code of LFPG, where L indicates Southern Europe, F, France, PG, Paris de Gaulle, while Orly Airport has the code LFPO (the 3rd letter sometimes refers to the particular flight information region (FIR) or the last two may be arbitrary). In most parts of the world, ICAO and IATA codes are unrelated; for example, Charles de Gaulle Airport has an IATA code of CDG. However, the location prefix for the continental United States is K, and ICAO codes are usually the IATA code with this prefix. For example, the ICAO code for Los Angeles International Airport is KLAX. Canada follows a similar pattern, where a prefix of C is usually added to an IATA code to create the ICAO code. For example, Calgary International Airport is YYC or CYYC. (In contrast, airports in Hawaii are in the Pacific region and so have ICAO codes that start with PH; Kona International Airport's code is PHKO. Similarly, airports in Alaska have ICAO codes that start with PA. Merrill Field, for instance is PAMR.) Not all airports are assigned codes in both systems; for example, airports that do not have airline service do not need an IATA code.ICAO also assigns three-letter airline codes versus the more-familiar two-letter IATA codesfor example, UAL vs. UA for United Airlines. ICAO also provides telephony designators to aircraft operators worldwide, a one- or two-word designator used on the radio, usually, but not always, similar to the aircraft operator name. For example, the identifier for Japan Airlines International is JAL and the designator is Japan Air, but Aer Lingus is EIN and Shamrock. Thus, a Japan Airlines flight numbered 111 would be written as "JAL111" and pronounced "Japan Air One One One" on the radio, while a similarly numbered Aer Lingus would be written as "EIN111" and pronounced "Shamrock One One One". In the US, FAA practices[45] require the digits of the flight number to be spoken in group format ("Japan Air One Eleven" in the above example) while individual digits are used for the aircraft tail number used for unscheduled civil flights.Main article: List of aircraft registration prefixesICAO maintains the standards for aircraft registration, including the alphanumeric codes that identify the country of registration.Main article: List of aircraft type designatorsSee also: Type ratingICAO is also responsible for issuing two to four character alphanumeric aircraft type designators for those aircraft types which are most commonly provided with air traffic service. These codes provide an abbreviated aircraft type identification, typically used in flight plans. For example, the Boeing 747-100, -200 and -300 are given the type designators B741, B742 and B743 respectively.[46]Since 2010, ICAO recommends a unification of units of measurement within aviation based on the International System of Units (SI), using:[47][48]kilometres per hour (km/h) for speed during travel.metres per second (m/s) for wind speed during landing.kilometres (km) for distance.metres (m) for elevation.Non-SI units have been permitted for temporary use since 1979,[49] but a termination date has not yet been established, which would complete metrication of worldwide aviation,[50] and the following units are still in widespread use within commercial aviation:knots (kn or kt) for speed.nautical mile (NM) for distance.foot (ft) for elevation.inches of mercury are used in Japan and North America to measure pressure, although sometimes METAR at Japanese airports show only hPa.[50]Aviation in Russia and China currently use km/h for reporting airspeed, and many present-day European glider planes also indicate airspeed in kilometres per hour.[citation needed] China[50] and North Korea[50] use metres for reporting altitude when communicating with pilots.[50] Russia also formerly used metres exclusively for reporting altitude, but in 2011 changed to feet for high altitude flight. From February 2017, Russian airspace started transitioning to reporting altitude in feet only.[50] Runway lengths are now commonly given in metres worldwide, except in North America where feet are commonly used.[50]The following table summarizes units commonly used in flight and ground operations and their recommended replacement.[48] A full list of recommended units can be found in annex 5 to the Convention on International Civil Aviation.[48]Table of units commonly used in aviationMeasurementRecommendedCurrent de factoCommentAirspeed and ground speedkm/hkn or ktMach is sometimes instead used for high altitude flight.Distance (ground)kmnmiDistance in km has widespread use in European gliders.Flight levelmftMetres are used by China, Mongolia, North Korea, Kyrgyzstan, Kazakhstan, Tajikistan and Uzbekistan, and formerly Russia. From 2017, Russian airspace has transitioned from metres to feet.Runway lengthmm or ftFeet are still used for runway lengths in North America.Wind speedm/skn or ktUntil 2010 ICAO recommended km/h for reporting wind speed on runways.[48] Metres per second is used by Russian and Chinese airports.[50]Rate of climbm/sft/min, kn, m/sLift and sink rate is measured using a variometer.[51]TemperatureCCCelsius is used for aviation weather reporting globally. Fahrenheit (F) may be used for displaying, controlling, and documenting system temperatures (HVAC, engine) on older North American aircraft.Liquid precipitationmminAtmospheric pressurehPainHg, mbar, hPaHectopascals are mostly used in aviation worldwide, while inches of mercury are used in Japan and North America.[50] One hectopascal is equal to one millibar.Visibilitymft, mi, mReported in metres for most of the world. Visibility over 5000m may be given in kilometres.[48] Canadian, American, and Mexican airports use statute miles, or feet when reporting laser measurements.[50]Cloud heightmftTimeUTCUTCTank capacityLkg, lb, UK gallon, US gallon, LUsed for fuel tank capacity of an aircraft. Unit varies depending on the gauges fitted to the aircraft. The most common current unit is kilograms.[citation needed]Volumem3m3Used for general volume capacity.Masskglb, tonne, long ton, short ton, kgUsed for cargo capacity, fuel capacity, gross mass, payload. Tonne may also be used for gross mass and payload.[48] Tons are often used informally during flight planning to gauge approximate weights. Ton then usually either refers to the tonne, or the long ton or short ton which differ from the tonne by about 2% and 10% respectively.AttitudedegMeasured with an attitude indicator, and are always presented in degrees. (Sensors, data and calculations may however use a mix of degrees and radians, as many scientists and engineers prefer to work with radians.)Turn and slipdeg/s, min/trA common turn rate for commercial aircraft is 3 degrees per second, which is often translated to (the inverse unit) 2 minutes per turn.Headingcompass pointsMeasured with a heading indicator. Altitude, elevation, height.[48]ICAO has a headquarters, seven regional offices, and one regional sub-office:[52]Headquarters Montreal, Quebec, CanadaAsia and Pacific (APAC) Bangkok, Thailand; Sub-office Beijing, ChinaEastern and Southern African (ESAF) Nairobi, KenyaEurope and North Atlantic (EUR/NAT) Paris, FranceMiddle East (MID) Cairo, EgyptNorth American, Central American and Caribbean (NACC) Mexico City, MexicoSouth American (SAM) Lima, PeruWestern and Central African (WACAF) Dakar, SenegalSecretaryCountry of nationalityTermJuan Carlos Salazar GmezColombiaFrom August 2021Fang LiuChina2015August 2021[53]Raymond BenjaminFrance20092015Taeb ChrifAlgeria20032009Renato Claudio Costa PereiraBrazil19972003Philippe RochatSwitzerland19911997Shivinder Singh SidhuIndia19881991Yves LambertFrance19761988Assad KotaiteLebanon19701976Bernardus Tielman TwigtNetherlands19641970Ronald MacAllister MacdonnellCanada19591964Carl LjungbergSweden19521959Albert RoperFrance19441951PresidentCountry of nationalityTermSalvatore SciacchitanoItaly2020presentOlumuyiwa Benard AliuNigeria20132019Roberto Kobeh GonzlezMexico20062013Assad KotaiteLebanon19762006Walter BinaghiArgentina19571976Edward Pearson WarnerUnited States19471957Further information: Environmental impact of aviationThis section's factual accuracy may be compromised due to out-of-date information. Please help update this article to reflect recent events or newly available information. (February 2009)Emissions from international aviation are specifically excluded from the targets agreed under the Kyoto Protocol. Instead, the Protocol invites developed countries to pursue the limitation or reduction of emissions through the International Civil Aviation Organization. ICAO's environmental committee continues to consider the potential for using market-based measures such as trading and charging, but this work is unlikely to lead to global action. It is currently developing guidance for states who wish to include aviation in an emissions trading scheme (ETS) to meet their Kyoto commitments, and for airlines who wish to participate voluntarily in a trading scheme.[citation needed]Emissions from domestic aviation are included within the Kyoto targets agreed by countries. This has led to some national policies such as fuel and emission taxes for domestic air travel in the Netherlands and Norway, respectively. Although some countries tax the fuel used by domestic aviation, there is no duty on kerosene used on international flights.[54]ICAO is currently opposed to the inclusion of aviation in the European Union Emission Trading Scheme (EU ETS). The EU, however, is pressing ahead with its plans to include aviation.[citation needed]ICAO has been called "flawed and biased in favour of the industry" by Jo Dardenne, the manager for aviation at Transport & Environment.[55]Further information: Carbon Offsetting and Reduction Scheme for International AviationOn 6 October 2016, the ICAO finalized an agreement among its 191 member nations to address the more than 1000million tonnes of carbon dioxide emitted annually by international passenger and cargo flights. The agreement will use an offsetting scheme called CORSIA (the Carbon Offsetting and Reduction Scheme for International Aviation) under which forestry and other carbon-reducing activities are directly funded, amounting to about 2% of annual revenues for the sector. Rules against 'double counting' should ensure that existing forest protection efforts are not recycled. The scheme did not take effect until 2021 and will be voluntary until 2027, but many countries, including the US and China, have promised to begin at its 2020 inception date. Under the agreement, the global aviation emissions target is a 50% reduction by 2050 relative to 2005.[56] NGO reaction to the deal was mixed.[57][58][59]The agreement has critics. It is not aligned with the 2015 Paris climate agreement, which set the objective of restricting global warming to 1.5 to 2C. A late draft of the agreement would have required the air transport industry to assess its share of global carbon budgeting to meet that objective, but the text was removed in the agreed version.[60][61] CORSIA will regulate only about 25 percent of aviation's international emissions, since it grandfathers all emissions below the 2020 level, allowing unregulated growth until then.[62] Only 65 nations will participate in the initial voluntary period, not including significant emitters Russia, India and perhaps Brazil. The agreement does not cover domestic emissions, which are 40% of the global industry's overall emissions.[61] One observer of the ICAO convention made this summary: Airline claims that flying will now be green are a myth. Taking a plane is the fastest and cheapest way to fry the planet and this deal won't reduce demand for jet fuel one drop. Instead offsetting aims to cut emissions in other industries, although another critic called it "a timid step in the right direction."[63]ICAO has expressed strong opposition to 2025 proposals from various UN bodies and international organizations, including the International Monetary Fund, suggesting new taxes or levies on international aviation to fund global climate initiatives. ICAO contends that such measures could undermine CORSIA, emphasizing that CORSIA is the sole global framework for addressing international aviation emissions and warning that additional levies could disrupt its implementation and the broader goal of sustainable aviation development. While acknowledging the need for increased climate finance, ICAO urged stakeholders to support existing mechanisms like CORSIA rather than introducing potentially conflicting financial measures. [64]Emissions limits for aircraft engines are defined by the Annex 16, Volume 2 of the ICAO Technology Standards, they include standards for hydrocarbons, carbon monoxide, NOx, smoke and particulate matter for local air quality near airports, below 3,000ft (910m).[65] The first ICAO emissions regulation was adopted in 1981, and more stringent NOx standards were subsequently adopted: CAEP/2 in 1993, CAEP/4 in 1999, CAEP/6 in 2005 and CAEP/8 in 2011.[65] Higher bypass ratios, lean burn and Rich Quick Quench Lean combustor design can reduce NOx emissions.[65]Most air accident investigations are carried out by an agency of a country that is associated in some way with the accident. For example, the Air Accidents Investigation Branch conducts accident investigations on behalf of the British Government. ICAO has conducted four investigations involving air disasters, of which two were passenger airliners shot down while in international flight over hostile territory.Libyan Arab Airlines Flight 114 which was shot down on 21 February 1973 by Israeli F-4 jets over the Sinai Peninsula during a period of tension that led to the Arab-Israeli Yom Kippur War killing 108 people.Korean Air Lines Flight 007, which was shot down on 1 September 1983 by a Soviet Su-15 interceptor near Moneron Island just west of Sakhalin Island during a period of heightened Cold War tension killing all 269 people on board including U.S. Representative Larry McDonald.[66]UTA Flight 772, which was destroyed by a bomb on 19 September 1989 above the Sahara Desert in Niger, en route from N'Djamena, Chad, to Paris, France. The explosion caused the aircraft to break up, killing all 156 passengers and 15 crew members, including the wife of U.S. Ambassador Robert L. Pugh. Investigators determined that a bomb placed in the cargo hold by Chadian rebels backed by Libya was responsible for the explosion. A French court convicted in absentia six Libyans of planning and implementing the attack.[67]The 1996 shootdown of Brothers to the Rescue aircraft on 24 February 1996, when two civilian aircraft operating north of Cuba were shot down by two jets of the Cuban Air Force. The Cuban military alleged that aircraft operated by the group Brothers to the Rescue had scattered propaganda leaflets onto Cuba prior to the incident, and issued orders that such aircraft be shot down. All four crew members aboard the two aircraft were killed, whilst a third aircraft managed to escape and return to the American mainland.ICAO is looking at having a singular ledger for drone registration to help law enforcement globally. Currently, ICAO is responsible for creating drone regulations across the globe, and it is expected that it will only maintain the registry. This activity is seen as a forerunner to global regulations on flying drones under the auspices of the ICAO.[68]ICAO currently maintains the 'UAS Regulation Portal'[69] for various countries to list their country's UAS regulations and also review the best practices from across the globe.Airline codes (includes ICAO codes)Fdration Aronautique Internationale (FAI)Freedoms of the airICAO airport codeInternational Maritime OrganizationKenneth Macdonald BeaumontList of aircraft manufacturers by ICAO nameInternational Aviation Services Organization[70]^ Staff writer (2024). "International Civil Aviation Organization (ICAO)". UIA Global Civil Society Database. uia.org. Brussels, Belgium: Union of International Associations. Yearbook of International Organizations Online. Retrieved 24 December 2024.^ "Juan Carlos Salazar of Colombia begins mandate as ICAO Secretary General". icao.int. Archived from the original on 25 July 2022. Retrieved 10 August 2021.^ Hhne, Sebastian. 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