



ICAO's Strength: Reinventing Itself to Address the Challenges Facing International Aviation

By Ambassador Donald T. Bliss (Ret.)

Amid the destructive use of air power in the Second World War, President Franklin Roosevelt perspicaciously foresaw aviation's potential as an instrument of peace, global friendship, commerce, and economic development. The United States invited representatives of 54 nations to Chicago to draft a Convention on International Civil Aviation (Chicago Convention). A Provisional International Civil Aviation Organization (PICAO) was created on December 7, 1944, when 52 states signed the convention in New York, and PICAO convened in Montreal on August 15, 1945. When the convention was ratified on March 5, 1947, the International Civil Aviation Organization (ICAO) formally came into being. In October 1947, it became a United Nations (UN) specialized agency.

Over the past 75 years, international aviation and the work of ICAO have evolved dramatically. What has remained constant is the global commitment to technical cooperation to strengthen and maintain the safety of air travel. In 2018, 38 million flights by the global aviation industry carried over four and a half billion passengers. Look up in the sky and, at any given moment, there are 9,728 planes carrying 1,270,406 passengers, and they compete for airspace with cargo, business, and privately piloted planes and now with drones, rockets, spacecraft, and all manner of novel aircraft types. Maintaining safety and security during a time of fast-changing technologies, climate change, cybersecurity threats, metastasizing terrorism, volatile fuel prices, and the fierce competition of "open skies" presents a formidable challenge to ICAO's 193 contracting states and the 36-member Council which serves as its governing board. The record speaks for itself. Four and a half billion passengers on international trips demonstrate their confidence in this record.

Yet, maintaining an outstanding safety record, facilitating a modern and efficient global air navigation system, and "leaving no country behind" present enormous challenges, as well as great potential, in today's technology revolution in which 2,000 satellites are launched annually, the transformation to digital communication is accelerating, forecasts project a doubling of traffic in 20 years, and the sky is increasingly cluttered with unmanned aircraft. This article describes how ICAO has responded to new challenges over the past 75 years and suggests how it can be reinvented and restructured to meet the challenges of the future.

ICAO Responds to Emerging Challenges

In addition to setting forth the foundational rules of airspace, the Chicago Convention established a mechanism for developing uniform global standards and recommended practices (SARPs) for air navigation and safety. During the initial decades, ICAO focused on air navigation routes and procedures, but gradually began to develop safety SARPs that addressed accident investigation findings. As new challenges and threats emerged, the convention proved sufficiently resilient to enable ICAO to respond to environmental issues (initially aircraft noise and now the effect of emissions on the climate), security threats presented by terrorism and regional conflicts, the need for technical assistance to strengthen developing nations' capability to meet ICAO's SARPs, the creation of safety and security audits to identify and correct deficiencies in state oversight, the facilitation of international cooperation in accident investigations, and the negotiation of international treaties to enhance the rule of law. The Chicago Conference adopted 12 annexes in 1944 dealing with such subjects as airways systems, communications, rules of the air, air traffic control procedures, licensing operational and mechanical personnel, civil aircraft airworthiness, aircraft registration and markings, meteorology, maps and charts, customs, and search and rescue. Rising to unanticipated challenges, ICAO has adopted seven additional annexes addressing, among other things, accident investigations, airports, the environment, security, dangerous goods, and safety management systems. Of course, the 19 annexes have been amended over the years and, to advance the convention's mandate of "securing the highest practical degree of uniformity," over 12,000 SARPs have been adopted implementing the annexes.

Every three years, the ICAO Assembly of 193 states and over 40 observer organizations meet, usually in Montreal, to set the agenda, approve a three-year budget, and elect a 36-member Council that will implement the policies set by the Assembly. The Council elects its president and appoints the secretary general to head the Secretariat and the 15-member Air Navigation Commission to develop

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technical recommendations. Under Chapter XVIII of the Chicago Convention, the Council is also empowered to settle disputes among contracting states.

Achieving consensus among the many states with different political and economic systems, languages, and cultures and at various stages of development is a daunting task. With a small budget of about \$100 million Canadian annually, of which the U.S. pays 20 percent, ICAO is dependent upon the voluntary contributions and the expertise of its member states, which makes U.S. leadership so critical to its effectiveness. While the U.S. must stand for election to the Council every three years, it has always had a seat at the table and was reelected in October 2019. Moreover, the key safety responsibility in the Secretariat is vested in the director of the Air Navigation Bureau (ANB), one of five bureaus, which has always been a U.S. appointee. The U.S. mission, led by an ambassador in recent years, facilitates a constant flow of experts from the State Department, the Department of Transportation (DOT), the Federal Aviation Administration (FAA), the Transportation Security Administration (TSA), stakeholder organizations, and the private sector to bring the best technical knowledge to the table while addressing political and geopolitical issues that arise in the context of global diplomacy.

Working closely with like-minded allies and seeking common ground with all Council members, the U.S. has been a leader in reinventing ICAO to address the changing dynamics of air travel. ICAO has avoided, for the most part, the political divisions that have constrained other UN venues by tirelessly working for consensus around shared values of safe and secure air travel—values shared by the citizens of every state. In a global economy interconnected by aviation, we are all vulnerable to the weakest link in the chain.

ICAO Initiatives

While some legal scholars have asserted that ICAO has reached far beyond the express mandates of the Chicago Convention, ICAO's legal advisor has opined, based in part on international customary law, that ICAO has appropriately adapted to the changing challenges of international aviation. Spurred by U.S. leadership, some of the most important initiatives include the following.

Safety

With fast-changing technologies, *prescriptive* safety standards, usually three to seven years in development, quickly become obsolete. Accordingly, ICAO had stressed *performance* standards, coordination with technical standard-setting bodies on prescriptive requirements, safety management systems that cultivate a culture of effective safety oversight, and the sharing of safety information that prevents accidents. ICAO seeks to minimize confusion and miscommunication by harmonizing standards, clarifying state differences, and establishing English proficiency as the language

of international aviation. A long-recognized concern, made more urgent by the Boeing 737 MAX accidents, ICAO is addressing automation dependency in the cockpit by working with member states and the industry to improve pilot skills in the manual handling of the aircraft when automated systems do not function as intended. In increasingly congested airspace, the ANB seeks to maintain the downward trend in the worldwide accident rate from over four accidents per million flights in 1978 to a fraction of one in 2017.

Historically, most safety standards have resulted from accident investigations, but increasingly ICAO relies on the protected voluntary reporting and exchange of information about safety incidents and concerns to prevent accidents. After the disappearance of Malaysian Airlines flight 370 (MH370) in November 2018, ICAO adopted the Global Aeronautical Distress and Safety System (GADSS), requiring aircraft position reporting every 15 minutes, and setting a target date of 2021 for systems that can report coordinates every minute for an aircraft in distress. This would enable finding an aircraft's location within roughly a six-nautical-mile radius. The technology is currently available to meet this target, and the only question is why it took the disappearance of MH370 to initiate a global tracking system. ICAO also has established special programs that focus on regional safety issues. For example, after a series of accidents, it dedicated \$5 million to address safety oversight in Africa. In response to another emerging threat, ICAO is working closely with other UN agencies to address the scourge of human trafficking.

Enforcement

Under the convention, the enforcement of safety standards is the responsibility of contracting states. Yet, ICAO creatively has provided strong incentives for state enforcement and regulatory oversight. Most importantly, in 1999, ICAO initiated the Universal Safety Oversight Audit Programme (USOAP), which audits the safety oversight of each contracting state. In 2007, the Assembly passed a U.S.-sponsored resolution providing for the public release of safety audits, which has created a strong incentive for states to address safety deficiencies and which has resulted in significant measurable improvements in safety audit findings. ICAO follows up the audits by continuous monitoring of significant deficiencies and by providing technical assistance to states that need help in addressing safety concerns. The Council president and secretary general have taken specific actions to address potential "flags of convenience"—states that register aircraft, certificate operators, or license pilots without adequate oversight—and ICAO has established an international aircraft registry to provide timely information about registration, ownership, and control of aircraft. Finally, ICAO has implemented the mutual recognition provision embodied in Article 33 of the convention by encouraging states in

recognizing the certificates and licenses of other states to verify that ICAO standards have been met.

Security

Despite the convention's silence on the subject, ICAO has developed a five-pronged approach to aviation security. First, the Universal Security Audit Programme (USAP) conducts airport security audits in all contracting states. Second, ICAO issues SARPs and guidance on issues such as the hardening of cockpit doors, flight crew procedures, and machine-readable passports. For example, the Global Aviation Security Plan (GASeP) will elevate security measures and capacities worldwide, issuing outcome-focused standards, guidance material, and data-informed impact assessments, although the GASeP's time frame should be accelerated. Passenger name record data is being elevated to a standard, which requires states to review airplane reservation data and a passenger's flying history to determine hidden connections to other travelers and patterns of activity that enable an assessment of a traveler's potential to commit hostile acts. Technical experts provide harmonized guidance on items permitted on board aircraft, providing necessary protections while minimizing passenger inconvenience and commercial disruption. Importantly, new fast-moving procedures are required because the convention's standards-setting processes cannot respond quickly enough to inventive new security threats. As chair of the Unlawful Interference Committee in 2008, I had to deal with the liquid, aerosol, and gels threat. Some states saw this as a U.S.-only problem. They were reluctant to impose the inconvenience on their travelers and resented the TSA's unilateral imposition of new requirements. Because global cooperation is essential to address the weakest link in the chain, I urged TSA to work through ICAO to achieve the most effective results. When we worked through the problems, including the need for global standards that would facilitate the transfer of items purchased in duty free shops, I found a willingness by states to accept ICAO's guidance. The third prong of the security initiative is to provide technical assistance to states without the capacity to remedy security deficiencies. The fourth prong is the negotiation and amendment of aviation treaties to address the changing threats of terrorism and the means by which they are effected, including by those who plan, finance, and conspire to attack aviation. Finally, conversion to digital communication in the internet age increases aviation's vulnerability to cyberattacks. Accordingly, ICAO has a cybersecurity team working to stay ahead of hackers with hostile intent.

Environment

Despite the silence of the Chicago Convention on environmental issues, ICAO has been thrust into the global climate change debate, having been delegated the responsibility by the Paris Agreement to reduce aircraft

emissions, which constitute about 2 percent of overall greenhouse gas emissions. During my tenure at the U.S. mission, this was the most time-consuming, intractable problem I faced with little progress toward a consensus solution. It pitted Europe against the rest of the world, and threatened to bring the north-south divide into ICAO deliberations, which have always been premised on equal treatment of all nations. The U.S. was an honest broker seeking to find common ground. The 2016 Assembly adopted Resolution A39-2 implementing the voluntary Carbon Offsetting and Reduction Scheme for International Aviation (CORSA), which stitched together various initiatives, including technology and operational improvements, sustainable aviation fuels, and market-based mechanisms. CORSA aspired to reduce aircraft emissions by 1.5–2 percent annually through 2050, achieve carbon-neutral growth by 2020, and reduce carbon emissions by 50 percent against a 2005 base by 2050. The issue remains highly controversial as environmental groups advocate for tougher and mandatory requirements.

Technical Cooperation

While not anticipated in the convention, it became evident that the capacity of developing states to comply with SARPs would require technical assistance, and thus the Technical Cooperation Bureau (TCB) was established. Over time this program has evolved from technical assistance to technical cooperation and has become self-funding as ICAO partnerships with 138 states have initiated some 100 projects annually, including construction of a new airport in Panama, implementation of an e-passport system, and specific projects that address deficiencies identified by ICAO safety and security audits. A key objective is building human capacity through the Global Aviation Training program, which offers 200 courses for over 17,000 trainees in skills development, SARP compliance, credentialing instructors, and promoting best practices.

Global Navigation

Enhancing the efficiency and capacity of global navigation helps to achieve other important ICAO safety and environmental objectives. It also significantly reduces costs that can be passed through in reduced fares in a competitive environment. ICAO's Global Air Navigation Plan (GANP) is updated every three years and overhauled every six years. The 2019 GANP takes into account 23,000 airlines flying 362,000 aircraft with upwards of four million drones. The Global Navigation Satellite System (GNSS) guides the transition to the next generation of satellite-based air navigation by fostering interoperable systems and data, greener airports, optimum capacity, and flexible and efficient flight paths, enabling international aircraft to operate efficiently in satellite-based systems of different states and regions. Automatic Dependent

Surveillance—Broadcast (ADS-B) has been endorsed by ICAO as part of its GANP to bring the precision and reliability of satellite-based surveillance to international aviation. In furtherance of global air navigation modernization, ICAO will establish a fully coordinated aviation trust framework that interconnects the global aviation community and increases information sharing to achieve operational improvements.

ICAO Reform

Governance reforms have been essential to ICAO's reinventing itself to address the growing and fast-changing aviation sector. Given its limited resources, establishing priorities is essential, and ICAO has adopted five strategic objectives: (1) enhancing global aviation safety, (2) increasing the capacity and efficiency of the global civil aviation system, (3) strengthening global civil aviation security and facilitation, (4) fostering the development of a sound and economically viable civil aviation system, and (5) minimizing the adverse environmental impacts of civil aviation activities. In addition, the adoption of a results-based budget has enabled targeting limited resources on these objectives. In any human institution, fighting corruption requires ongoing vigilance, and ICAO is no exception. Limiting key positions to two terms and prohibiting former Council members from taking positions in the Secretariat for a fixed period are among the steps the U.S. pushed through during my tenure. We also pushed through strong provisions to recruit, retain, and promote women into professional positions, an area where ICAO's record had been woefully inadequate. When I arrived, there were no women in charge of any of ICAO's five bureaus; by the time I left, three of the five directorships were held by women, one of whom later became secretary general. We also worked diligently to streamline Council deliberations, transforming talkfests into an efficient decision-making mechanism. More recent reforms include the establishment of an independent process to investigate complaints expeditiously and transparency in dealing with cyberattacks on ICAO's IT systems.

ICAO's Future

My most important takeaway from serving on the ICAO Council is that U.S. leadership is absolutely critical. Although the U.S. is the largest contributor in funding and expertise, we have only one vote in 36, and thus the U.S. needs to work closely with like-minded counterparts to build coalitions in support of important initiatives, priorities, and reforms.

ICAO must constantly be reinvented to meet the challenges of the 21st century. Rapidly changing technologies such as the digitalization of communications, satellite-based navigational efficiencies, artificial intelligence and blockchain innovations, and millions of drones and novel aircraft types all require a far more agile and nimble ICAO if it is to maintain and improve its extraordinary record of safety, thwart cybersecurity

threats, meet its CORSIA obligations, and facilitate the interoperability that is essential to a global aviation system. ICAO's standards-setting process is too slow and cumbersome. The budget is too limited to address serious deficiencies in the capacity of some states and regions. Competing technologies in the private sector threaten to fragment and segment global navigation.

Everything should be on the table, including the respective roles of a uniquely dual-headed organization with both a Council president and secretary general, the ability to recruit and retain the highest quality of professionals, the organization of the Secretariat, the size and procedures of the Council, and the funding mechanisms. There are ongoing discussions about reorganizing the Secretariat to eliminate duplication and fragmentation and improve coordination. One proposal would create separate bureaus for data gathering, standard setting, and implementation. Other proposals would elevate security and the environment to bureau status. Strengthening partnerships with stakeholders and the private sector is critical to enable rapid adjustment to innovative technologies. With clear lines of demarcation that prevent conflicts of interest, industry's expertise and innovative technologies must be utilized effectively to advance safety and efficiency priorities. The work of the regional offices must be better integrated with headquarters as they undertake regional planning and apply best practices and new generation-skipping technologies to regional air navigation, safety, and security priorities. As we are on the cusp of commercial space travel, and space/rocket launches and debris are an increasing factor in airspace management, it is time for ICAO to integrate space launches and travel into its air navigation planning and SARP development.

Given the enormity of the challenges of maintaining a safe, secure, and efficient global aviation system at a time of accelerating change, ICAO's budget is woefully inadequate and subject to the annual appropriations and political whims of individual states. As ICAO is reformed and restructured to advance its strategic objectives more efficiently and with greater accountability, it should also expand its capability to self-fund its operations. The TCB has demonstrated one approach through its state partnerships. The sale of print and online publications and data including, with appropriate safeguards, advertising is another source of revenue. By organizing task forces with technology firms, ICAO might develop innovative solutions in areas such as passport control, facilitation, infrastructure development, dangerous goods transport, the digitalization of shared safety information, and cybersecurity protection that create intellectual property that can be sold to the states. ICAO could work with partners to provide fee-based licensing and credentialing services to certify that innovative technologies are interoperable and safe; promote navigation, infrastructure, and facilitation efficiencies; and protect against cyberattacks. The UN and individual states are always coming up with

ideas to tax aviation to serve other noble purposes, such as health care in Africa, proposals that contravene the Chicago Convention. It would make more sense to assess a small charge on each international flight or miles traveled in international airspace with restrictions on how the funds would be used to further ICAO's strategic missions. All options should be explored.

As Americans increasingly traverse the globe, ICAO remains critically important to maintaining and improving the safety, security, efficiency, and environmental

sustainability of air travel. Among UN specialized agencies, ICAO is a shining example of technical cooperation among 193 nations in advancing shared values.

For 75 years, ICAO has repeatedly reinvented itself to address emerging challenges and, in coordination with the states and the private sector, has achieved an enviable record of safety, security, and seamless air navigation that will require continuous diligence, reinvention, and U.S. leadership to maintain and improve in the future.