

## CIVILIAN AIRCRAFT TRANSPONDER MANIPULATION IN RECONNAISSANCE MISSIONS, AERIAL INCIDENTS CASES AND CHICAGO CONVENTION 1944

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### ABSTRACT

Throughout 2020, the People's Republic of China (PRC) stated that the United States (US) manipulated the electronic identity code of its military aircraft (transponder code) over the South China Sea by using the identity of a civilian aircraft to carry out reconnaissance missions. The discussion of the incidents has faded in the past two years, even being regarded by some observers as a 'common' practice having been used since the Cold War era by the US. These incidents have never been heard to reappear in the South China Sea situation. However, the escalation of reconnaissance practices heated up again after a PRC's high altitude balloon was shot down by a US fighter jet over the US's territorial sea on February 4, 2023. The US had claimed that the aircraft was on a spy mission. This incident could be a starting point for the US to resume the practices throughout 2020 by imprisoning civilian aircraft in the South China Sea or even on the PRC's mainland because this practice is considered 'common' on the US side. By using the international legal research method, in which international legal sources are juxtaposed with the current context in the field, this article concludes that the practice of manipulating civil transponder codes cannot be justified as a 'common' practice because it is endangered the civil aviation and contrary to the Chicago Convention 1944.

**Keywords:** civilian aircraft; military aircraft; reconnaissance missions; safety; transponder manipulation.

### INTRODUCTION

A range of incidents happened in 2020 when PRC found that the US was camouflaging their military air reconnaissance missions above the South China Sea using manipulated aircraft identification code that was meant to be used for airplanes registered belonging to Malaysia Air. The incident happened on 8 September 2020 when PRC spotted an RC-135W from Kadena Airbase with hex code: AE01CD. Later on the same route, the hex code or transponder code changed to 750548 designated to Malaysian civilian aircraft, monitored to be patrolled between Hainan Island and Paracel Island in the South China Sea.<sup>1</sup> This detection repeated on 9 and 10 September 2020, above the Yellow Sea area, about 56 Nautical Miles from Shandong, and above the South China Sea area, 60 nautical miles from Guangdong.<sup>2</sup> Similar incidents frequently occur as the South China Sea Conflict escalates.<sup>3</sup>

In the airspace, the flights performed by civilian aircraft shares an operational area the with military aircraft flights. The two operations must be managed for the safety of aviation in general,

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<sup>1</sup> South China Sea Probing Initiatives, "Confirmed, US Surveillance Aircraft Masked as Malaysian Planes to Spy on China," 2020, <<http://www.scsapi.org/en/dtfx/confirmed-us-surveillance-aircraft-masked-malaysian-planes-spy-china>> [Accessed 01/04/2021].

<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*

especially considering that the popularity of air transportation modes has been steeply growing.<sup>4</sup> Therefore each of the operations has a different transponder identifying code. The Air Traffic Controllers (ATC) controlled each maneuver of the civilian aircraft so that they would not interfere with each other, among others, by relying upon the transponder code. ATC is responsible for air traffic management tasks, conflict detection, and resolution in a timely manner.<sup>5</sup> Confusion about the aircraft's identity can lead to an increased chance of danger.

The practice of changing the transponder code of military aircraft to civilian aircraft has to be analyzed under the safety consideration of international civil aviation. The US and PRC are the contracting states of the *Chicago Convention 1944*.<sup>6</sup> Thus, the two countries must fulfill the existing international obligations, including ensuring safety in civil aviation.<sup>7</sup> A transponder code related to aeronautical telecommunications, especially radio navigation aids,<sup>8</sup> communication procedures,<sup>9</sup> communication systems<sup>10</sup> and surveillance and collision avoidance systems.<sup>11</sup> Regarding to aviation safety, Annex 10 to the Chicago Convention 1944 on International Civil Aviation-*Aeronautical Telecommunications, Volume IV, Surveillance and Collision Avoidance Systems* relates it with the Secondary Surveillance Radar (SSR) in which the airborne collision avoidance system operates by: "...a system based on the SSR transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponder."<sup>12</sup> All aircraft registered must have a unique code that is automatically sent by the transponder on board the aircraft so that it can be detected and identified by ATC radar for aviation safety. Because the transponder code for military aircraft differs from that for civil aircraft, the reconnaissance mission using civilian aircraft manipulation remains a way to hide the military aircraft's status. Chicago Convention 1944 only applies to civilian aircraft, however, there is an obligation under Article 3 (d) of the Convention that gives an obligation to the contracting state to have due regard for the safety of navigation of civil aircraft when issuing regulations for state aircraft, including military aircraft.

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<sup>4</sup> A.Rangrazjeddi, A. D., González, K. Barker, "Applied Game Theory to Enhance Air Traffic Control in 3D Airspace," *Journal of Optimization Theory and Applications*, Vol. 196 No. 3, 2023, p. 1125.

<sup>5</sup> *Ibid*.

<sup>6</sup> ICAO Secretariat, (without year), <[https://www.icao.int/secretariat/legal/list%20of%20parties/chicago\\_en.pdf](https://www.icao.int/secretariat/legal/list%20of%20parties/chicago_en.pdf)>, [accessed 01/05/2022].

<sup>7</sup> Convention on International Chicago Convention 1944, Articles 3 and 4.

<sup>8</sup> See Annex 10 to the Chicago Convention on International Civil Aviation – Aeronautical Telecommunications, Volume I, Radio Navigation Aids, 7<sup>th</sup> Edition, July 2018.

<sup>9</sup> See Annex 10 to the Chicago Convention on International Civil Aviation – Aeronautical Telecommunications, Volume II, Communication Procedures including those with PANS status, 7<sup>th</sup> Edition, July 2016.

<sup>10</sup> See Annex 10 to the Chicago Convention on International Civil Aviation – Aeronautical Telecommunications, Volume III, Communications Systems, 2<sup>nd</sup> Edition, July 2007.

<sup>11</sup> See Annex 10 to the Chicago Convention on International Civil Aviation – Aeronautical Telecommunications, Volume IV, Surveillance and Collision Avoidance Systems, 5<sup>th</sup> Edition, July 2014.

<sup>12</sup> *Ibid*, A.C.A.S. definition.

The aircraft transponder code is an important identity that must be properly owned and emitted by an aircraft to ensure safe traffic.<sup>13</sup> Changing the transponder code of the RC-135W reconnaissance aircraft can lead to misinformation about ownership, nationality, and identification of the aircraft's location. The confusion this practice creates threatens the security of civil aviation in general. There have been cases of errors in shooting civilian aircraft due to misidentification in conflict or disputed areas throughout aviation history.

The discussion of the incidents has faded in the past two years, even being regarded as a 'common' practice<sup>14</sup>, having been used by the US since the Cold War era. This practice has never been heard to reappear in the South China Sea situation. However, the escalation of reconnaissance practices heated up again after a Chinese High Altitude Balloon was shot down by a US fighter jet over the US's territorial sea on February 4, 2023.<sup>15</sup> The US had claimed that the aircraft was on a spy mission.<sup>16</sup> This incident could be a starting point for the US to resume the practice throughout 2020 by imprisoning civilian aircraft in the South China Sea or even on the PRC's mainland.

Based on the background above, two main problems will be examined in this article. First is the problem of the violation from the practice of changing transponder identification codes under the Chicago Convention 1944. The object of the research is the practice of transponders changing from military to civilian while in flight. The following problem is whether impersonating civil transponder codes can be justified as a 'common' practice because it endangered civil aviation and is contrary to the Chicago Convention 1944. By 'common' practices is not a legal term, it is resonating that practices are happening often or exist in large numbers or in any place. This commonality may also see as state practice in the legal sense.

## RESEARCH METHOD

The type of research to approach the practice of civilian transponder impersonation by military aircraft is international legal research, where the law is analyzed within the context of the society.<sup>17</sup> Thus, the context of the reconnaissance mission in 2020 by the US will be analyzed using the Chicago Convention 1944 and its Annexes. Articles 3 and 4 of the Chicago Convention 1944, cases, and international trends will be used to analyze the legality of transponder changing from military to civil aircraft. One part of this article describes the factual and legal background surrounding transponder impersonation practices, whereas the other part contains legal analysis from the perspective of international air law.

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<sup>13</sup> Mode S Downlink Aircraft Parameters Implementation and Operations Guidance Document, ICAO Asia Pacific Office, CNS SG/23

<sup>14</sup> See further South China Sea Probing Initiatives, *Loc. Cit.*

<sup>15</sup> Jim Garamone, "F-22 Safely Shoots Down Chinese Spy Balloon Off South Carolina Coast," U.S. Department of Defense, 2023, <<https://www.defense.gov/News/News-Stories/Article/Article/3288543/f-22-safely-shoots-down-chinese-spy-balloon-off-south-carolina-coast/>> [accessed 04/03/2023].

<sup>16</sup> *Ibid.*

<sup>17</sup> See Michael McConville and Wing Hong Chui (eds.), *Research Methods for Law*, 2<sup>nd</sup> edition, 2017, p.7.

## DISCUSSION

**Civil aviation safety and security are the main focus of developing international air law, which also applies to civil-military operations.**

In 1944 states signed the Chicago Convention on International Civil Aviation, which supports and emphasizes the concept of airspace sovereignty<sup>18</sup> and provides a set of regulations for international civil flight operations. In the preamble of the *Chicago Convention 1944*, civil aviation safety became one of the main highlights:

*“Therefore,.....governments having agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically...”*

To achieve safety objectives, Chicago Convention 1944 mandated the establishment of the International Civil Aviation Organization (ICAO) to develop the principles and techniques of international air navigation and development of international air transport to ensure the safe and orderly growth of international civil aviation throughout the world.<sup>19</sup> ICAO is now the ‘United Nations (UN) specialized agency,’ despite the fact that it was established in 1944 before the UN existed. The drafter of the Chicago Convention 1944 had anticipated the UN establishment in Article 64 of the convention by giving the ICAO power to enter into arrangements with any “...*general organization set up by the nations of the world to preserve peace*”<sup>20</sup> which respect to air matters directly affecting world security. The first ICAO Assembly meeting in May 1947 adopted Resolution A1-2, which approved the relationship agreement with the UN and the appointment of the ICAO Council’s president to sign the agreement. ICAO then officially became one of the UN’s specialized agencies by the Protocol concerning the Entry into Force of the Agreement between the UN and ICAO, signed on 3 October 1947.

The relationship between civil aircraft and state aircraft safe co-operations is regulated in Article 3 of the Chicago Convention 1944, which states that the convention shall apply only to civil aircraft and shall not apply to state aircraft. The aircraft used in military, customs and police services shall be deemed state aircraft. No state aircraft of a contracting State shall fly over the territory of another State or land thereon without authorization by special agreement or otherwise and following the terms thereof. The states undertake when issuing regulations for their state aircraft that they will have due regard for the safety of navigation of civil aircraft.<sup>21</sup> Air navigation and services facilities contribute to aviation safety in practices when civil aircraft and military aircraft activities interfere. Three of these supporting facilities are the aircraft addressing system, surveillance radar, and collision avoidance system. Regulation for military aircraft navigation must be harmonized with this

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<sup>18</sup>See Convention on International Civil Aviation 1944, Article 1.

<sup>19</sup>Convention on International Civil Aviation 1944, Articles 43 and 44(a).

<sup>20</sup>*Ibid*, Articles 63.

<sup>21</sup>*Ibid*, Article 3 paras. (1)–(4).

requirement for supporting facilities to avoid incidents or accidents between military and civilian aircraft. The state's obligation to military aircraft activities is re-emphasized further in circular document No. 330 ICAO, which explains that:<sup>22</sup>

*“As a consequence of Article 3, in particular subparagraph 3 (d), States are required to safeguard navigation of civil aircraft when setting rules for their State aircraft. This leaves it up to the individual State to regulate these operations and services, generating a wide diversity of military regulations. However, especially in congested airspace, harmonized regulation is a precondition for a safe, efficient, and ecologically sustainable aviation system.”*

Throughout aviation history, civil aircraft have been endangered by military activities. The aerial incident on 29 April 1952 marked the first serious incident involving using weapons against civilian aircraft when Uni Soviet's military plane attacked Air France inbound for a flight between Frankfurt to Berlin.<sup>23</sup> The Uni Soviet declared that the action was due to East German airspace violation. After the incident, two more occurred in the 1950s cold war era. Chinese fighter shot down a British Cathay Pacific plane flying from Bangkok to Hong Kong, on 23 July 1954, because of misidentifying the plane as a military aircraft on a mission to attack the Port Yulin Chinese military base.<sup>24</sup> The same accident happened on 27 July 1955, when El Al airliner belonging to Israel was shot down by a Bulgarian anti-aircraft system from the ground because Bulgaria could not identify the airline.<sup>25</sup> The following fatal incident involving civilian aircraft was when a Libyan airliner was shot down by Israeli fighters 12 miles from Suez Canal. Even though Israel was aware of the status of civilian aircraft, a Libyan jet was shot down upon the security exception. Based on past Libyan, a civilian airline would be used for information-gathering missions or even hostile activity.<sup>26</sup>

Further development in the Chicago Convention 1944 tried to address the issue. The shot down of Korean Airlines (KAL) flight 007 in 1983 led to the establishment of article 3*bis* protocol to the Chicago Convention 1944 regarding the nonuse of weapons against civilian aircraft.<sup>27</sup> 269 passengers and crew on board were killed after the Uni Soviet jet fighter mistakenly identified it as a military plane and shot down the KAL 007.<sup>28</sup> This case shows that the misidentification of civilian aircraft with military aircraft can pose a danger to aviation.

In 1984, the ICAO Assembly adopted the Protocol relating to an Amendment to the Chicago Convention 1944, adding Article 3 *bis* as a new provision in the convention. Most of the state parties to the Chicago Convention 1944 have so far ratified the Protocol.<sup>29</sup> Under article 3 *bis*, every state

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<sup>22</sup> ICAO Circular 330-AN/189.

<sup>23</sup> John T. Phelps, “Aerial Intrusions by Civil and Military Aircraft in Time of Peace,” *Military Law Review*, Vol. 107 1985, p. 278.

<sup>24</sup> *Ibid.*

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid.*

<sup>27</sup> See Farooq Hassan, “The Shooting Down of Korean Airlines Flight 007 by the USSR and the Future of Air Safety for Passengers” *The International and Comparative Law Quarterly*, No. 3, Vol. 33, 1984, pp. 712–25.

<sup>28</sup> See Jeffrey D. Laveson, “Korean Airline Flight 007: Stalemate in International Aviation Law - a Proposal for Enforcement,” *The San Diego Law Review*, No. 4, Vol.22, 1985, p. 859.

<sup>29</sup> Several if the major accidents are the MH17, and Ukrainian An026 cases, see footnotes below.

must refrain from using weapons against civilian aircraft in flight.<sup>30</sup> An intruding civilian aircraft over the territory of a state may be intercepted and required to land at a designated airport.

A major aerial incident involving civilian aircraft and military activity remained even after establishing Article 3 *bis*. The more recent case is Malaysian Airlines flight MH-17 on the Amsterdam-Kuala Lumpur route, which was shot down on 17 July 2014 above Eastern Ukraine where a war between pro-Russian separatists and the Ukrainian government.<sup>31</sup> Yet the motive for the shot down by a BUK missile from the ground is still debated, a social media account of Igor Girkin, a Russian Military adventurer, proclaimed that rebels had shot down a Ukrainian An-26 near Torez<sup>32</sup>, the Antonov An-26, a light transport aircraft, designed and produced in the Soviet Union from 1969 to 1986 under the joint resolution of Ministry of Aviation Industry and the Air force of Uni Soviet.<sup>33</sup> The MH-17 case shows that a non-state actor had a chance also to misidentify civilian aircraft with military aircraft long after Article 3 *bis* of the Chicago Convention 1944 puts an obligation to states to refrain from using weapons against civilian aircraft.

### **Any action leading to the confusion of civil-military aircraft distinction threatens the safety of international civilian aircraft operations as a whole**

Inferring from the aforementioned aerial incident cases throughout history, In the modern context, any practice leading to the confusion of civil-military aircraft distinction threatens the safety of civilian obligations under international law, including manipulating aircraft transponder identification codes. The country's military initially used transponders on aircraft to distinguish between allied and opposing aircraft. Later in its development, transponders were used in general, both in civil aviation and military aviation. The use of transponders in busy airspace is a known standard. Each aircraft is assigned a unique code that ATC can identify using SSR.<sup>34</sup>

Military aircraft operations cannot ignore the provisions of the *Chicago Convention* 1944 even though the convention scope only applies to civil aircraft as Article 3(a) of the Chicago Convention 1944 stipulates: "*This Convention shall be applicable only to civil aircraft, and shall not be applicable to state aircraft.*"<sup>35</sup> Despite of the exclusion, state are obliged to regulate its military aircraft in such manner so as not to endanger civilian aircraft under Article 3 (d) of the Cichago Convention 1944. Military aircraft fall into the category of state aircraft.<sup>36</sup> The US military aircraft RC135-W action to replace the transponder identification code that was performed while in the air with an identification

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<sup>30</sup> Chicago Convention 1944, Article 3 *bis* (b).

<sup>31</sup> Gerard Toal, and John O'Loughlin. "Why Did MH17 Crash?": Blame Attribution, Television News and Public Opinion in Southeastern Ukraine, Crimea and the De Facto States of Abkhazia, South Ossetia and Transnistria," *Geopolitics*, Vol. 23, No. 4, 2018, p. 882.

<sup>32</sup> *Ibid*, p. 883.

<sup>33</sup> Antonov, "AN-26 Light Transport Aiplane", < <https://antonov.com/en/history/an-26>>, [Accesed 01/01/2023].

<sup>34</sup> Annex 10 to the Chicago Convention on International Civil Aviation – Aeronautical Telecommunications, Volume IV, Surveillance and Collision Avoidance Systems, 5<sup>th</sup> Edition, July 2014, Standard. 2.1.6.

<sup>35</sup> Convention on International Civil Aviation 1944, Article 3(a).

<sup>36</sup> Convention on International Civil Aviation 1944, Article 3(b).

code intended for civil aviation is not in line with the *due regard* principle stipulated under the Article 3 (d) of the Chicago Convention 1944, which states: “*The Contracting States undertake, when issuing regulations for their state aircraft, that they will have due regard for the safety of navigation of civil aircraft.*” In regulating the maneuver of its military aircraft, the US has to prioritize civil aviation safety and not allow transponder manipulation to be used by the US Air Force. The practice is endangering international civil aviation and inconsistent with the primary purpose of the *Chicago Convention 1944* to maintain the safety of international civil aviation as aircraft transponder identification codes have a function as an aircraft collision prevention system. State aircraft operations, especially military aircraft, cannot be given the same rights and facilities in the air. The function of the state aircraft is to carry out and prioritize the success of a mission, both military and state missions.

The practice of changing identification codes when flying military aircraft contradicts Article 3 of the Chicago Convention 1944. It constitutes the misuse of international civil aviation facilities governed in Article 4 of the Chicago Convention 1944. The article says: “Each contracting State agrees not to use civil aviation for any purpose inconsistent with the aims of this Convention.” Cuba, during the 25th ICAO Assembly (Extraordinary) Session in Montreal 1984, defined the act, which is inconsistent with Chicago Convention aims as:<sup>37</sup>

*“Acts of aggression, infiltration or espionage involving the discharge of harmful substances or pathogenic agents; transport contraband or prohibited traffic using the airspace of another State, even with destination to a third State or with any other purpose inconsistent with the aim of the Convention.”*

Article 4 of the Chicago Convention 1944 uses the terminology of ‘civil aviation,’ not ‘civil aircraft.’ The regulation must be interpreted in a broader sense than just a mere misuse of civilian aircraft. The term ‘international civil aviation’ is not defined in the Chicago Convention 1944.<sup>38</sup> However, further development courses can be drawn from the Annex A of the ICAO working paper STA/10-WP/7 for the 10th session of the Statistic Division proposed a broad categorization of civil aviation, including air navigation services. Manipulation of the transponder is under the category of air navigation services. Article 4 of the Chicago Convention 1944 obligates member countries not to misuse civil aviation, including transponder code, as part of air navigation facilities for purposes that do not follow the Chicago Convention 1944. The fact that the code emitted by a military aircraft does not preclude the application of Article 4 because it involves identity masking with civilian aircraft.

The change of transponder identification code by the US Air Force, as a state or military aircraft operator’ during its reconnaissance mission in the South China Sea violated Articles 3 and 4 of the Chicago Convention 1944. Even further interpretation of articles 3 and 4 is needed in a real court case to claim the practice is a violation of international obligations, at this point it is rational to see that the manipulation of the RC-135W aircraft identification code to the identification code designated for Malaysian civil aircraft endangered international civil aviation. This threat arose because changing

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<sup>37</sup>ICAO Assembly A23 Min. EX/6/ on Ruwantissa Abeyratne, *Convention on International Civil Aviation*, Springer, Switzerland: 2014, p. 75.

<sup>38</sup>Pablo Mendes de Leon., *Introduction to Air Law*, Kluwer Law International, the Netherlands: 2022, p. 13.

the identification code intended for military aircraft to that of civilian aircraft could trigger misidentification, which could lead to a repeat of the KAL 007 tragedy. In addition, changing the transponder identification code carried out in the air could trigger misinformation and confusion from ATC and aircraft pilots-civilians in the air.

## CLOSING

Aircraft transponder manipulation in military aircraft operations does not align with international air law obligations under the Chicago Convention 1944, and thus cannot be regarded as 'common practice'. The practice is against Articles 3 (d) of the Chicago Convention 1944 because it could endanger civil aviation by confusing ATC vertical surveillance activities,<sup>39</sup> on which the fate of all aircraft daily hangs.<sup>40</sup> In the specific case discussed in this article, the notion that the transponder identification code was used to replace the original code for the RC-135 W aircraft carrying out reconnaissance missions into the identification code designated for Malaysian civil aircraft has misused international civil aviation in its broad definition so that it has also violated the provisions contained in Article 4 of the Chicago Convention 1944. The US action to change the transponder identification code for the RC-135 W aircraft endangered the safety of civil aviation and created the risk of incorrect identification by other countries. History shows aerial incidents caused by aircraft identification errors, which are the Air France attack by Uni Soviet's military plane in 1952; the Chinese fighter shot down a British Cathay Pacific in 1954; the El Al shot down by Bulgarian anti-aircraft system in 1955; the shot down of Libyan airliner by Israeli jetfighter in 1973; the shot down of KAL flight 007 in 1983; and even the shot down claimed to involve non-state actor, the Malaysian Airlines flight MH-17 in 2014.

Having reach the aforementioned conclusion, the Interoperability of international civil aviation and military operations in the air is critical to maintaining the safety of international civil aviation. In addition to technology development, improving the standard procedures for military operations in international airspace is necessary. There is a need for guidelines for military operations not to manipulate the transponder for civilian aircraft in international airspace that are approved and implemented by all countries. In addition to maintaining the safety of international civil aviation, an international guideline can provide a common thread in ensuring accountability in similar incidents of civilian aircraft shot-downs. ICAO could play a role in highlighting the danger of aircraft transponder manipulation to international civil aviation as one of the functions of the ICAO Council is to receive and discuss issues related to international civil aviation submitted by ICAO member countries. International bureaucracies in ICAO are essential agents of change.<sup>41</sup>

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<sup>39</sup> Convention on International Civil Aviation 1944, Article 3(d).

<sup>40</sup> Weiqiang Lin, "Sky Watching: Vertical Surveillance in Civil Aviation", *Environment and Planning*, Vol. 35, No. 3, 2017, p. 399.

<sup>41</sup> M. Eilstrup-Sangiovanni, "Ordering global governance complexes: The evolution of the governance complex for international civil aviation," *The Review of International Organizations*, Vo. 17, No. 2, 2022, p.318.

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