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**CENTRE FOR RESEARCH IN AIR AND SPACE LAW
MAHARASHTRA NATIONAL LAW UNIVERSITY MUMBAI**



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Centre for Research in Air and Space Law,
Maharashtra National Law University Mumbai, India

Maharashtra National Law University Mumbai

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Nirbindu Banerjee

FOREWORD

It is with immense pride and great pleasure that I present to you the second issue of the *Indian Review of Air and Space Law*. This publication, an initiative of the Centre for Research in Air and Space Law at Maharashtra National Law University Mumbai, marks a significant milestone in our commitment to advancing the frontiers of legal scholarship in the dynamic fields of air and space law. As we stand at the cusp of unprecedented technological advancements and the rapid expansion of aerospace activities, the legal frameworks governing these domains must evolve in tandem. The *Indian Review of Air and Space Law* aims to serve as a platform for rigorous academic discourse, innovative research, and thoughtful analysis of the myriad legal issues that arise in the realms of aviation and outer space.

This journal is not only a testament to the dedication and intellectual prowess of our faculty, students, and contributors but also a reflection of our university's vision to be at the forefront of legal education and research. The contributions within these pages encompass a wide range of topics, from international space law and aviation regulations to the legal implications of emerging technologies and space exploration. I extend my heartfelt gratitude to the editorial team, contributors, and reviewers who have worked tirelessly to bring this journal to fruition. Your efforts have ensured that the *Indian Review of Air and Space Law* meets the highest standards of academic excellence and serves as a valuable resource for scholars, practitioners, policymakers, and students alike. As we read the journal, we are reminded of the critical role that legal scholarship plays in shaping policies and guiding the development of laws that govern air and space activities. It is my sincere hope that this publication will inspire meaningful dialogue, foster collaborative research, and contribute to the development of robust legal frameworks that promote the peaceful, equitable, and sustainable use of air and space. I invite you all to engage with the *Indian Review of Air and Space Law*, to share your insights, and to join us in our journey to explore the legal dimensions of the final frontier.

Prof. (Dr.) Dilip Ukey

Vice Chancellor, Maharashtra National Law University Mumbai

EDITORIAL

Welcome to the second edition of the *Indian Review of Air and Space Law* published by the Centre for Research in Air and Space Law at Maharashtra National Law University Mumbai. As we embark on this journey through the complex and dynamic realm of aviation and space exploration, we are reminded of the ever-evolving nature of this field and its profound impact on our global society.

As I pen this note for the current volume of the *Indian Review of Air and Space Law*, it is with a mix of pride, gratitude, and a touch of nostalgia that I announce this will be my last as the Editor-in-Chief. I am honored to have had the opportunity to serve in this capacity and to contribute to the growth and development of this esteemed publication. Reflecting on the journey of the *Indian Review of Air and Space Law*, I am immensely proud of what we have achieved. From our humble beginnings, we have grown into a respected platform for scholarly discourse on air and space law, attracting contributions from some of the most distinguished experts and brightest minds in the field. This journal has not only facilitated meaningful academic discussions but has also played a vital role in shaping the legal landscape of air and space activities both within India and globally.

Last year we published a diverse array of articles, research papers, and commentaries that have addressed critical issues, explored innovative ideas, and provided in-depth analyses of the evolving legal challenges in the aerospace sector. Each volume has been a testament to the dedication and intellectual rigor of our contributors, reviewers, and the editorial team. I would like to extend my deepest gratitude to the editorial board, whose unwavering commitment and hard work have been instrumental in maintaining the high standards of this publication. My sincere thanks also go to our contributors for their insightful and thought-provoking work, and to our readers for their continued support and engagement.

As I transition to my new role at a different institution, I carry with me a wealth of experiences and cherished memories from my time with the *Indian Review of Air and Space Law*. I am confident that the journal will continue to thrive and achieve new heights under the capable leadership of my successor. In closing, I encourage all of you to keep engaging with the journal, to contribute your valuable research, and to support the ongoing dialogue in the fascinating and ever-evolving field of air and space law. The future holds great promise, and I am excited to see the continued impact and influence of the *Indian Review of Air and Space Law* in the years to come.

We would also like to acknowledge my respect to Vice Chancellor Prof. Dilip Ukey for building up a research-friendly infrastructure and great community of academia at the Institute. This journal is an outcome of his belief in the centre. We also thank Prof. Sandeepa Bhat for everything he has done for the Centre. We thank all the contributors for accepting our invitation to contribute. They are the real stakeholders of this issue.

Thank you for your continued support, and we hope you find this edition both informative and inspiring. I have no disclaimer about faults. All are to blame.

Adithya Variath
Editor-in-Chief
(On behalf of the Editorial Board)
Indian Review of Air and Space Law

The India-U.S. Bilateral Air Service Agreement is Broken; Can it be Fixed?

*P. Paul Fitzgerald**

Abstract:

India and the United States are among the world's leading democracies; they share a passion for technology, the rule of law, the conquest of space. But when enlightened people from either country want to visit their colleagues in the other, they transit through Doha! It is a fact, that non-stop flights between India and the United States are a fraction of what they should be; less than 20% of the flight offerings between the U.S. and Japan. While several reasons may explain the gap, the most significant is the presence of airlines, based neither in Indian nor the United States, and that carry a disproportionate percentage of passengers between the two countries. This article will examine this situation, looking first at the basic concepts of a Bilateral Air Service Agreement (BASA), look at some of the factors that influence the negotiation of a BASA, compare a healthy BASA with a dysfunctional one, identify possible reasons for the gap,

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suggest ways in which the India-U.S. market can once again be the domain primarily of airlines based in India and the United States.

I. BASA Concepts

A Bilateral Air Service Agreement or BASA is a minor treaty that governs the commercial aviation relations ship between its two signatory States. There are always only two signatory States as implied by the word “Bilateral” which literally means “two sided” in Latin. Through the BASA, the two signatory States negotiate the terms and conditions of the routes that their airlines will fly, from the frequency of flights, aircraft size, cities to be served and other issues such as repatriation of profits, the ability to contract independent aircraft handlers, and security and marketing issues.

Of course, the most important part of any BASA is the Annex that lists the routes to be served. That is because airlines derive profits by flying international routes. Thus, the Annex will often specify that the designated carriers of State “A” will operate certain routes between the two States and the designated carriers of State “B” will operate other routes.

An example of this is the 1945 Canada – U.S. BASA,¹ which carefully allocated routes between American and Canadian carriers and scrupulously avoided any form of inter-carrier competition. Boston-Moncton, New York-Montreal, Buffalo-Toronto and Seattle-Vancouver were allocated to American carriers,²

¹ See *Exchange of Notes between Canada and the United States of America recording an Agreement for Civil Air Transport*, 17 February 1945, Can TS 1945 No 12 (entered into force 17 February 1945), 59 Stat. 1353; Executive Agreement Series 457.

² *Ibid*, Annex (A).

while Canadian carriers got Halifax-Boston, Toronto-New York and Victoria-Seattle.³

A) Privity of Contract

An essential element of a BASA is privity of contract in that the market created by the BASA is to be the exclusive purview of the airlines designated by the BASA's signatory States.

Within two years of the signing of the *Chicago Convention*⁴ the U.S. and the U.K. had negotiated the 1946 *Bermuda Agreement*⁵ which had, as its *raison d'être*, the regulation of traffic between those two States. Yet, the importance of the even distribution of traffic between the airlines designated by the two States cannot be exaggerated. When the U.K. learned that U.S. airlines were earning three times as much as British airlines from the routes between the U.K. and the U.S., the U.K. renounced the *Bermuda Agreement*.⁶ Thus that BASA was replaced by the 1977 US-UK '*Bermuda II Agreement*,'⁷ which was ““a unique agreement which enshrine[d] an elaborate system of controlling capacity on routes between the two countries”, in an attempt to “provide a

³ *Ibid*, Annex (B).

⁴ *Convention on International Civil Aviation*, 7 December 1944, 61 Stat 1180, TIAS No 1591, 15 UNTS 295, Can TS 1944 No 36, ICAO Doc 7300/9 [*Chicago Convention*].

⁵ *Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the United States of America relating to Air Services between their Respective Territories*, 11 February 1946, UKTS 1946/3. The agreement was signed on February 11, 1946 after weeks of negotiation (talks started on January 15) and was one of the first BASAs, signed after the *Chicago Convention*. It became the basis of other BASAs. [*Bermuda*]

⁶ “Britain to end Bermuda Agreement”, *Flight International* (3 July 1976) 4.

⁷ *Agreement between the United States and the United Kingdom concerning air services*, 23 July 1977, 28 US Stat 5367, UKTS 1977 No 76, TIAS 8641 [*Bermuda II*].

framework within which the airlines of the two countries can compete on broadly equal terms.”⁸

The negotiations of *Bermuda II*, were focused on two things; the U.K.-U.S. commercial aviation market needed to be divided evenly between the airlines designated by the U.K. or the U.S., and the dominant carriers operating on routes between the U.K. and the U.S. should be American and British.

Thus, twelve years after *Bermuda II*, the dominant airlines operating between the United Kingdom and the United States were British Airways,⁹ Pan Am¹⁰ and TWA.¹¹ Indeed, the only route on which foreign airlines operated was New York JFK to London Heathrow. Nonetheless, of the 88 weekly non-stop flights operated over that route¹² only 11 were operated by one of Air India,¹³ El Al¹⁴ and Kuwait Airways,¹⁵ as part of those airline’s services between the U.S. and their home countries via London. Thus, it could be said, that in every part of the market covered by *Bermuda II*, American and British carriers were dominant.

This principle that the airlines designated by the signatory States to a BASA, should be the dominant carrier on routes between the two BASA partners is central to the success of the BASA. Moreover, if they are not the dominant carriers, as has been seen in the U.K.-U.S. example above, the airlines will

⁸ See UK, HC, Environment, Transport and Regional Affairs Committee, “Air Service Agreements between the United Kingdom and the United States”, 18th Report, 1999–2000 Sess (26 July 2000).

⁹ *Official Airline Guides: OAG Desktop Flight Guide [Worldwide Edition]* 14:1 (Jan. 1989). British Airways served BOS, DTW, IAD, LAX, MIA, ORD and SFO. It also served JFK with three 747 and two Concorde flight daily.

¹⁰ *Ibid.* From London Pan Am served DTW, IAD, LAX, MIA, SFO and served JFK with three 747 flights.

¹¹ *Ibid.* From London TWA served BOS, LAX and ORD and served JFK with three 747 flights.

¹² *Ibid.*

¹³ *Ibid.* Air India operated New York-London-Mumbai daily.

¹⁴ *Ibid.* El Al operated New York-London-Tel Aviv weekly.

¹⁵ *Ibid.* Kuwait Airways operated New York-London-Kuwait three times weekly.

complain and may cause the BASA to be renegotiated or simply renounced. Indeed, if this principle is not observed, the BASA may not be necessary.

Consider the Canada – U.S. BASA.¹⁶ Its primary focus is to promote commercial air travel between the United States and Canada, and at the present time, airlines designated by Canada or the United States are the only ones operating non-stop routes between the two States.

However, if neither the United States nor Canada had a viable commercial aviation industry, airlines based in other States could operate on a fifth Freedom basis, routes between the two States. For example, Thai Airways could operate Bangkok-Seattle-Toronto, where Seattle-Toronto would be a fifth Freedom flight, an international extension to the Bangkok-Seattle route. Similarly, El Al could operate Tel Aviv-Toronto-Los Angeles, Varig could operate Chicago-Toronto as part of Sao Paulo-Chicago-Toronto and Pakistan International could operate New York-Toronto as part of Karachi-New York-Toronto. These are not hypothetical example, but real flights operated in the past by each of the airlines concerned.¹⁷ Arabian, European and South American airlines flew 5th Freedom services between Montreal and Boston, Chicago, Detroit, New York and Philadelphia.¹⁸ These illustrate the ability of airlines not based in either of the State whose passengers are being served, to serve commercially important routes between those States.

¹⁶ See *Air Transport Agreement Between the Government of Canada and the Government of the United States of America*, 12 March 2007, Can TS 2007 No 2 (entered into force 12 March 2007) [*Canada-US Air Transport Agreement 2007*].

¹⁷ See P. Paul Fitzgerald, “Reconsidering Cabotage: It Is Not the Danger it Appears”, 18 *Issues Aviation L. & Pol’y* 33 (2018), at 60.

¹⁸ *Ibid.*

However, it is worth noting that the Canada – U.S. BASA has always worked well and thus, even at the height of the use of 5th Freedom flights¹⁹ by airlines²⁰ based outside North America,²¹ airlines based in Canada or the United States and designated by their respective governments, were dominant on every route between Canada and the United States.²²

B) Open Skies

An Open Skies BASA is just like any other BASA except that basic terms and conditions are set by market principles rather than by government officials. Thus, in the 2007 U.S – EU ASA²³ it is the airlines that decide what cities they will serve, how often, with what size of plane and via which routing. Government officials no longer have any input into these matters.

However, market discipline ensures proper decision making. No European or American airline would offer non-stop wide-body service between Bucharest and Omaha, simply because there is no market for non-stop flights between these two cities.²⁴ Airlines will fly the obvious trunk routes, such as between New York and London, but others will use the power of their hubs, to operate routes that would otherwise be unfeasible. Thus, from its secondary hub in

¹⁹ *Ibid.* In 1992, there were a total of 12 trans-border routes offered as 5th Freedom services; four to Toronto, five to Montreal, both as mentioned above and also between Vancouver and each of Las Vegas, New York and Seattle.

²⁰ *Ibid.* In 1992, 14 airlines, Aerolineas Argentinas, British Airways, Cathay Pacific, Czechoslovakian, El Al, Olympic, Pakistan International, Philippine Airlines, Royal Air Maroc, Royal Jordanian, Sabena, Swissair, Thai Airways and Varig, operated 5th Freedom flights over one or more routes between Canada and the United States.

²¹ *Ibid.* In 1992, the 14 airlines were based in most parts of the world, including Asia, Europe, North Africa, Middle East, South America and South Asia.

²² *Ibid.*, at 62.

²³ *Air Transport Agreement*, United States and European Union, 30 April 2007, 46 ILM 470, [2007] OJ, L 134/ 4 [*US-EU Open Skies Agreement*].

²⁴ This routing was chosen to show how unlikely this route is; Bucharest has never seen a trans-Atlantic flight and Omaha has never seen a regularly scheduled flight from another country!

Charlotte, North Carolina, American flies to Dublin²⁵ and Madrid,²⁶ Delta serves London Heathrow from Salt Lake City²⁷ and United served Munich from San Francisco.²⁸

In addition to giving the chance for an airline to be able to operate any route it wants between the two partner States to the BASA, an open skies agreement usually also allows airlines liberal use of 5th Freedom, the ability to carry passenger beyond the second partner State to a third State, and 6th Freedom, the ability to carry passenger behind your State to the second partner State.

Thus, pursuant to the Canada – U.S. BASA, and benefitting from the Canada – Mexico BASA²⁹ and the Canada – EU BASA³⁰ Westjet, a Canadian airline could bring a passenger from Europe, to its hub in Calgary, and fly them to San Francisco and beyond to Mexico City. However, because open skies agreements are based on market principles, Westjet would never think of such an approach. It might carry a passenger from Europe via its Calgary hub to San Francisco, but it would do so in the knowledge that San Francisco has many non-stop flights to Europe and therefore Westjet would not likely be the first choice for passengers travelling between Europe and San Francisco.

Moreover, because of market discipline, Westjet would be unlikely to ever seriously consider carrying passengers to Mexico via San Francisco. This is because Westjet knows that passengers travelling between Calgary and Mexico

²⁵ See *American Airlines, Cargo Widebody Flight Schedule* September 1-30 2023, at 5.

²⁶ *Ibid.*

²⁷ See *Delta Cargo, International Flight Schedule* November 2023, at 3.

²⁸ See *United Cargo Widebody Schedule* October 2023, at 6.

²⁹ *Air Transport Agreement Between the Government of Canada and the Government of the United Mexican States, done at Mexico City on 18 February 2014*, 17 July 2015, CTS 2015/11. [Canada-Mexico Open Skies 2015]

³⁰ *Agreement on Air Transport between Canada and the European Community and its Member States*, 17-18 December 2009, [2010] OJ, L 207/ 32 [Canada-EU Open Skies Agreement].

are looking for non-stop flights. Westjet also knows that it could never effectively compete against American and Mexican carriers on the San Francisco – Mexico City route.

Just because an open skies BASA grants all kinds of possibilities to an airline, does not mean that it makes sense for the airline to use them. Thus, a market-driven carrier like Westjet, that focuses on profit rather than market share, would ignore possible 5th Freedom routes between the United State and points South, and also most if not all 6th Freedom opportunities to carry passenger between Europe and the U.S. via Calgary.

Westjet has never had any ties to government and thus its instincts are purely market driven. Its behavior in the context of the Canada – U.S. BASA is exactly what is normally expected of an airline in such a position. All of its routes between Canada and the United States depend on Americans and Canadian who are travelling between the two States by air.

At the current time, none of the airlines based in Canada, Europe, Mexico or the United States is government backed and so market principles prevail in all of these BASAs, competition is fair and these BASAs work well.

II. Negotiating a BASA

As in any treaty, the negotiation may be impacted by the bargaining strength of the State parties to the negotiations. It may also depend on whether the State is initiating the discussing, the “demandeur” or responding to the request for negotiations. In the past, negotiations were complex and sometimes went for several rounds, over several years. By way of example the first U.S – Mexico

BASA was negotiated in 1961³¹ and it was amended in 1970,³² 1988,³³ 1991,³⁴ 1998,³⁵ 1999,³⁶ 2005³⁷ and 2015.³⁸

Now, however, given the number of States that have working BASAs with other States, and the number of States that have Open Skies BASAs with other States, it should not come as a surprise that the U.S. State Department has posted a template of an Open Skies BASA on its website.³⁹ Similarly, negotiations may be done by an exchange of diplomatic notes, or negotiations on the sidelines of an ICAO General Assembly. Indeed, it is not unheard of for a State to negotiate multiple BASA with different States on the same day.⁴⁰

³¹ *Air Transport Agreement between the Government of the United States of America and the Government of the United Mexican States*, 15 August 1960, (entered into force January 17, 1961).

³² *Exchange of Notes*, July 31, 1970.

³³ *Exchange of Notes*, September 23, 1970 and *Exchange of Letters*, September 23, 1970.

³⁴ *Air Transport Agreement between the Government of the United States of America and the Government of the United Mexican States amending the Air Transport Agreement of August 15, 1960 as amended*, 21 November 1991.

³⁵ *Exchange of Notes*, December 4, 1997 (entered into force May 28, 1998).

³⁶ *Air Transport Agreement between the Government of the United States of America and the Government of the United Mexican States amending the Air Transport Agreement of August 15, 1960 as amended and extended*, 15 February 1999 (entered into force January 19, 2000).

³⁷ *Air Transport Agreement between the Government of the United States of America and the Government of the United Mexican States amending the Air Transport Agreement of August 15, 1960 as amended and extended*, 12 December 2005 (entered into force July 18, 2006).

³⁸ *Air Transport Agreement between the Government of the United States of America and the Government of the United Mexican States*, 18 December 2015.

³⁹ See U.S. Department of State “Current Model Open Skies Agreement Text” online: <<https://2009-2017.state.gov/documents/organization/114970.pdf>>.

⁴⁰ On May 8, 1997 the U.S. concluded BASAs with each of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua See U.S. Department of State “Open Skies Agreement” online: <<https://2009-2017.state.gov/e/eb/tra/ata/>>.

A) Normal BASA Negotiations

In a normal negotiation, each of the two negotiating States will offer access to its cities to the other State, as well as overflight permission and the ability to make additional stops for non-traffic purposes. Thus in January 2008, the Russian Federation and the United States concluded a Memorandum of Consultations⁴¹ in which the United States gave Russian carriers access either non-stop or via an intermediate point or points to Anchorage, Atlanta, Bangor, Boston, Chicago, Columbus, Dallas/Fort Worth, Detroit, Houston, Honolulu, Huntsville, Los Angeles, Miami, Minneapolis, New York, Orlando, Portland, Saipan, Seattle, San Francisco, Toledo and Washington.⁴² The Russian Federation granted American carriers access, either non-stop or via an intermediate point to Moscow, St. Petersburg, Khabarovsk, Magadan, Nizhny Novgorod, Petropavlovsk-Kamchatski, Yuzhno-Sakhalinsk and Vladivostok.⁴³ In both cases each State gave the other overflight of their territory to the inland points served and also to other States. One must always remember that where market forces dictate, there may be a gap between the traffic rights given, and the traffic rights ultimately used by the airline designated by the State signatories to the BASA. Thus, four years after the Memorandum of Consultations Aeroflot was serving Moscow-Washington once a week and Moscow-Los Angeles five times a week⁴⁴ and Delta was serving New York-Moscow daily.⁴⁵ In addition, Delta code-shared with SkyTeam partners Air France and KLM via their hubs to Moscow and St. Petersburg, and through

⁴¹ See *Memorandum of Consultations between the United States of America and the Russian Federation of January 1, 2008*, online: <<https://2009-2017.state.gov/documents/organization/114969.pdf>>.

⁴² See *Ibid.*

⁴³ See *Ibid.*

⁴⁴ See *Delta Worldwide Flight Schedule* July 2012, at 280.

⁴⁵ *Ibid.*

code-shared with SkyTeam partner Aeroflot to Khabarovsk, Yuzhno-Sakhalinsk, Vladivostok and other destinations in the Russian Federation.⁴⁶

Here, three things should become evident. First the United States and the Russian Federation each gave valuable traffic rights to the airlines designated by the other State. Second commercial air traffic resulted from the traffic rights granted in the BASA. Third and most important both the U.S. airlines and the Russian airline that are designated to offer flights pursuant to the BASA, are interested in carrying passengers between Russia and the United States. Thus, their flights, both as operated by them directly and via their code-share partners are designed to ensure that the airline capacity offered is focused on meeting the actual traffic demand between the two States. Thus, as in any healthy BASA, the airlines used market-based principles in planning their commercial operations to best serve the needs of the bilateral commercial aviation market, created by the Russia – U.S. BASA.

B) Extraordinary Factors

What happens when a potential BASA State partner cannot offer an expansive territory which could be overflowed, or a large population eager to travel to the other BASA partner? Should a State sign a BASA with such a country? Well, the answer, as in many other things, is “it depends.”

1) Tourist Potential

Canada has BASAs with both Cuba⁴⁷ and the Dominican Republic.⁴⁸ Until very recently, neither State had an airline which flew to Canada, their citizens do not visit Canada in large numbers, and their provision of overflight permission,

⁴⁶ See *Air France Timetable Summer 2012*, March 25, 2012 to October 27, 2012 and *KLM World Timetable KLM & Partners*, April 1 to May 31, 2012.

⁴⁷ *Air Transport Agreement between the Government of Canada and the Government of the Republic of Cuba*, 27 November 2000, CTS 2015/11.

⁴⁸ *Agreement on Air Transport between the Government of Canada and the Government of the Dominican Republic*, signed February 2, 2023.

assuming they were not member of the Transit Agreement⁴⁹ would be almost irrelevant as a Canadian airline could easily chose a different routing on a flight between Canada and South America.

However, both States are islands, whose warm sandy beaches attract hundreds of thousands of Canadians every winter. Pursuant to the Canada – Cuba BASA, four Canadian airlines⁵⁰ fly non-stop from any one of 13 Canadian cities⁵¹ to one or more of six places in Cuba.⁵² Further, pursuant to the Canada – Dominican Republic BASA, Canadian airlines fly from 19 cities in Canada⁵³ and to four cities in the Dominican Republic.⁵⁴ In every case, the routes are based in carrying Canadians to the beaches in Cuba or the Dominican Republic and back home again. Canadian airlines are also allowed to carry passengers originating in Cuba or the Dominican Republic to Canada and back. Both the Canada – Cuba and the Canada – Dominican Republic BASAs are healthy and every flight is entirely focused on meeting the needs of the bilateral commercial aviation market government by the applicable BASA.

⁴⁹ *International Air Services Transit Agreement*, opened for signature Dec. 7, 1944, 59 Stat. 1693, 84 U.N.T.S. 389 (entered into force Jan. 30, 1945). Signatories give airlines of other States the ability to overfly their State and to make stop for non-traffic purposes.

⁵⁰ These are Air Canada, Air Transat, Sunwing and Westjet.

⁵¹ These were Bagotville, Edmonton, Calgary, Halifax, Ottawa, Moncton, Montreal, Quebec City, Regina, Saskatoon, Toronto, Vancouver and Winnipeg.

⁵² These were Cayo Coco, Cayo Santa Maria, Havana, Holguin, Santa Clara and Varadero.

⁵³ These were Bagotville, Edmonton, Calgary, Fredericton, Gander, Halifax, Hamilton, London, Ottawa, Moncton, Montreal, North Bay, Quebec City, Regina, Saskatoon, Sudbury, Toronto, Vancouver and Winnipeg.

⁵⁴ These were La Romana, Puerto Plata, Punta Canada and Samana.

2) Lack of Interest in a BASA

There are 193 Members of ICAO. If every State had a BASA with every other State there would be over 18,000 candidate BASA agreements and the ICAO World Air Service Agreement Database only list fewer than 4,000 BASAs.⁵⁵

Thus, it would come as no surprise that Canada does not have BASAs with Bahrain, Bhutan, Bolivia, or Botswana. The absence of a BASA between Canada and any of the aforementioned States, would be largely due to a lack of large numbers of people travelling between the two States. Quite simply without a business case for bilateral traffic between two States, negotiating a BASA would not normally be a high priority for the governments of those States, especially given that those people who wish to travel between those States and Canada may currently do so through third States.

For this reason, it is curious that Canada has a BASA with Qatar. The latter has fewer than 350,000 citizens,⁵⁶ and they do not make many trips to Canada. Further, few Canadians have any reason to visit Doha; as a tourist destination, post World Cup, it ranks with Omaha, Nebraska as a tourist draw. Consequently, no Canadian airline flies to Doha and throughout the Americas, not a single airline serves Doha unless that carrier is in some sort of partnership with Qatar Airways.

Fundamentally, Qatar is tiny enough that their denial or grant of overflight permission would be irrelevant, and to the extent that any passenger would actually want to travel between Canada and Qatar they could always travel through Europe. Thus, the lack of a BASA between Canada and Qatar would

⁵⁵ See ICAO World Air Services Agreements (WASA) Database, Online <<https://www.icao.int/sustainability/Pages/WASA.aspx>>.

⁵⁶ The 332,000 citizens are roughly ten percent of Qatar's population. The remaining 90 percent are expatriate workers. See *Qatar Population*, POPULATIONU.COM, <https://www.populationu.com/qatar-population> (last visited Sept. 24, 2023).

not cause any great hardship to the travelling public, and certainly not a greater hardship than that caused by Canada's lack of BASAs with Bahrain, Bhutan, Bolivia and Botswana.

In the two paragraphs above, you could replace "Canada" with various other States and the conclusion would be equally robust.

3) Unusual Negotiating Tactics

If a State does not have an expansive territory, lots of popular tourist destinations or large and wealthy populace with penchant for air travel, it may not be an attractive BASA partner. In this context, certain State have been known to use unorthodox negotiating tactics.

Neither Qatar nor the UAE are attractive BASA partners. Both have relatively tiny territories such that a denial of overflight would not normally be a challenge. Both have such relatively small citizen populations that they would be unlikely to be a strong source of bilateral commercial airline traffic for any potential BASA partner.

Thus, when Qatar and/or the United Arab Emirates talks with the United States, they remind America how many Boeing aircraft and Pratt & Whitney engines they have on order.⁵⁷ When they talk with EU, they remind negotiators of their commitment to Airbus and CFM engines.⁵⁸ When they speak with South Asia, they remind negotiators of the millions of South Asians that work in Qatar and the UAE.⁵⁹

⁵⁷ See Peter Paul Fitzgerald, *A Level Playing Field for "Open Skies": the Need for Consistent Aviation Regulation* (The Hague, Holland: Eleven International Publishing 2016) at 2, 107, 286. [Fitzgerald2016].

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*

However, when the Canada denied the UAE dramatically expanded traffic rights in 2010,⁶⁰ the reaction was like that of a spoiled child. The UAE responded by imposing costly visas on Canadians,⁶¹ lobbying Canadian politicians,⁶² rerouting an aircraft carrying Canada's Minister of Defense,⁶³ campaigning against Canada's bid for a United Nations Security Council seat⁶⁴ and evicting Canada's military from Camp Mirage, a base near Dubai that the Canadian armed forces had been using to fly troops and supplies in and out of Afghanistan.⁶⁵ Indeed, had Canada not withdrawn from the *International Air Services Transit Agreement*⁶⁶ in 1988,⁶⁷ and thus been in a position to deny UAE carriers access to Canadian airspace on its multiple routes serving the US, the UAE might not have been willing to end its feud with Canada.⁶⁸

⁶⁰ Canada advised the UAE that it would not be getting expanded access to Canada on September 10, 2010.

⁶¹ See Laura Payton, "UAE landing rights in Canada still at issue: United Arab Emirates delegation includes aviation officials", *CBC News* 5 March 2012.

⁶² See Yael Berger, "Emirates Airline steps up lobbying for landing rights", *The Lobby Monitor* (19 April 2012).

⁶³ See Hannah Thibedeau, "Tories saw UAE airline demands as 'blackmail': Base access lost after more UAE flights to Canada denied", *CBC News* (12 October 2010).

⁶⁴ See "UAE lobbied against Canada's UN bid", *The Associated Press* 14 October 2010.

⁶⁵ Payton, *supra* note 61.

⁶⁶ *International Air Services Transit Agreement*, *supra* note 49. Canada's withdrawal from this Agreement allows it to deny overflight permission to airlines based in States that do not have a BASA with Canada.

⁶⁷ See ratifications of International Air Services Transit Agreement Signed at Chicago on 7 December 1944, online: ICAO <[www.icao.int/secretariat/legal/List of Parties/Transit_EN.pdf](http://www.icao.int/secretariat/legal/List_of_Parties/Transit_EN.pdf)>.

⁶⁸ See Awad Mustafa, "UAE to drop visa demand for Canadian citizens", *The National* April 2, 2013. See further, "John Baird Stages Tim Hortons Photo-Op in Unusual Location", *Huffington Post*, April 2, 2013.

The fact that UAE was willing to go to such lengths in its futile battle with Canada, confirms Emirates' thirst for access to North American cities with a large South Asian diaspora.⁶⁹ The UAE's willingness to carry on this 30-month battle for so long confirms the extraordinarily tight relationship between the State of the UAE and its two government-owned airlines.⁷⁰

The next section will look at those two government-owned airlines and the airline owned by the State of Qatar and examine their influence on the difference between two BASAs.

III. Comparing two BASA, U.S.-Japan and U.S.-India

A comparison of these two BASAs provides some useful insights, in both cases, Japan and India are important allies and trading partner of the United States and there is significant bilateral traffic between the United States and both Japan and India. Japan was chosen because it is further away from the United States than Western Europe and does not have a significant diaspora living in the United States.

Both of these U.S.-Japan and U.S.-India BASAs are of an open skies variety suggesting that airlines designated by each government may serve as many destinations in the other State as it wishes. Thus, it the board of directors of the airlines, rather than government officials that decides which routes are served, with which aircraft and with which frequency.

Here, a comparison between two market-driven BASAs is illustrative, because it removes any potential influence of government regulation and focuses uniquely on what makes sense for profit-driven airlines.

⁶⁹ In Canada, these cities are Toronto (Brampton) and Vancouver (Surrey).

⁷⁰ See *Fitzgerald* 2016, *supra* note 57 at 105-109.

A New York-Delhi flight covers 11,700 km, compared to 10,800 km for a New York-Tokyo flight, but most flights from Japan to the U.S. are within 8,000 to 10,000 km range. In this way, the two markets (U.S.-Japan and U.S.-India) are roughly comparable.

A) A Functional BASA; U.S. – Japan

The U.S.-Japan Open Skies Agreement was signed on October 25, 2010⁷¹ and both Japanese and American airlines compete vigorously on these routes.

1) The Market

One of the best ways of looking at the market is to look at historical service. In January 1996⁷², two Japanese carriers; All Nippon Airways⁷³ and Japan Airlines⁷⁴ served the United States and four American carriers; American⁷⁵, Delta⁷⁶, Northwest and United served Japan 24 times a day.

Of these, the latter two operated a hub at Tokyo's Narita airport; Northwest had been operating from Tokyo for decades and United had acquired a hub at Narita when it bought Pan Am's Pacific routes in 1985.⁷⁷ Thus Northwest flew to Tokyo from seven U.S. cities⁷⁸ and connected these via Tokyo with eight cities

⁷¹ See *United States and Japan Sign Open Skies Memorandum of Understanding on Air Transportation*, (October 25, 2010).

⁷² *Official Airline Guides: OAG Desktop Flight Guide [Worldwide Edition]* 21:8 (Oct. 1996).

⁷³ *Ibid.* All Nippon Airways served Los Angeles, New York and Washington.

⁷⁴ *Ibid.* Japan Airlines served Atlanta, Chicago, Los Angeles (2X), New York and San Francisco.

⁷⁵ *Ibid.* American served Tokyo from Dallas, San Jose and Seattle.

⁷⁶ *Ibid.* Delta served Tokyo from Los Angeles and Portland.

⁷⁷ Carol Jouzaitis & George Curry, "United Buys Pan Am's Pacific Unit: Cash Deal For \$750 Million Awaits Approval By U.S.," *Chicago Tribune [Business]* (23 April 1985).

⁷⁸ See *Official Airline Guides*, *supra* note 72. These were Chicago, Detroit, Los Angeles, Minneapolis, New York, San Francisco, and Seattle.

in Asia.⁷⁹ Similarly, United flew to Tokyo from four U.S. cities,⁸⁰ and connected this via Tokyo with six cities in Asia.⁸¹

The market was roughly evenly divided between Japanese and American carriers; All Nippon and Japan Air Lines flew 9 of the daily services and All Nippon offered the only nonstop flights to Washington⁸² and Japan Airlines offered the only nonstop flights to Atlanta.⁸³ In addition both Korean Airlines and Singapore Airlines offered non-stop service between Tokyo and Los Angeles⁸⁴ but these flights did not have a serious impact on the routes flown by American or Japanese airlines between Japan and the United States.

2) Competitive Service in 2023

The U.S. and Japan signed an open skies BASA in 2010.⁸⁵ The BASA permits unlimited flights between Japan and the United States but imposes certain limits on flights to Tokyo's Haneda⁸⁶ Airport, which is largely a domestic airport as compared with Tokyo Narita⁸⁷ which is more focused on intercontinental travel and does not have restrictions with respect to flights to or from the U.S.

⁷⁹ See *Ibid.* These were Bangkok, Beijing, Hong Kong, Manila, Seoul, Shanghai, Singapore and Taipei.

⁸⁰ See *Ibid.* These were Chicago O'Hare, Los Angeles (2X), New York and San Francisco (2X).

⁸¹ See *Ibid.* These were Bangkok, Beijing, Hong Kong, Seoul, Shanghai and Singapore.

⁸² See *Ibid.*

⁸³ See *Ibid.*

⁸⁴ See *Ibid.*

⁸⁵ *U.S.-Japan*, supra note 71.

⁸⁶ This airport is designated (H) in footnotes, infra 92 and 93.

⁸⁷ This airport is designated (N) in footnotes, infra 92 and 93.

As of December 2023, seven airlines offered 40 flights a day over 22 routes between Tokyo and 14 cities⁸⁸ and two flights over another two routes⁸⁹ between Osaka and two cities in the continental⁹⁰ United States.⁹¹ As one might expect with a normally functioning BASA, of the 42 daily flights between the U.S. and Japan, 21 are flown by airlines from the United States⁹² and 20 are flown by airlines from Japan.⁹³ Many of the U.S. – Japan routes see direct competition between non-stop flights offered by Japanese and American airlines⁹⁴ and some of the routes see three or more competitors.⁹⁵ Of particular

⁸⁸ Flights between Japan and Hawaii, non-stop or via Guam are not included in this list. This list is compiled from DATA in Airlines schedules, such as the *Narita Airport International Flight Schedule* (2023.10.01 – 2023.10.31), and the scheduled for *American Airlines*, supra note 25, *Delta Cargo*, supra note 27 and *United Cargo* note 28.

⁸⁹ These two routes are KIX-LAX (JL) and KIX-SFO (UA).

⁹⁰ New York, which has two airports, EWR and JFK, which are served with non-stop flights from Tokyo is counted as one city.

⁹¹ After each city is the two letter IATA code of the airlines offering daily nonstop service over the route: Atlanta (DL); Boston (JL); Chicago (JL, NH, UA); Dallas (AA, JL); Denver (UA); Detroit (DL); Houston (NH, UA); Los Angeles (AA, DL, JL, NH, UA); Minneapolis (DL); Newark (UA); New York (JL); Portland (DL); San Francisco (JL, NH, UA); Seattle (DL) and Washington (NH, UA).

⁹² See comment *supra* footnote 88. American serves Tokyo from Dallas (H); Dallas (N) and Los Angeles (2H). Delta served Tokyo from Atlanta (H); Detroit (H); Los Angeles (H); Minneapolis (H); Portland (H) and Seattle (H). United served Tokyo from Chicago (H); Denver (N); Houston (N); Los Angeles (H); Los Angeles (N); Newark(H); Newark (N); San Francisco (H); San Francisco (N) and Washington (H). United also serves Osaka from San Francisco.

⁹³ *Ibid.* All Nippon flies non-stop between Tokyo and Chicago (N); Chicago (H); Houston (H); Los Angeles (2H); New York (2H); San Francisco (H); Seattle (H) and Washington (H). Japan Airlines flies non-stop between Tokyo and Boston (N); Chicago (H); Dallas (H); Los Angeles (H); New York (2H); San Francisco (H) and Seattle (N). It also flies from Osaka to Los Angeles.

⁹⁴ Each of Dallas, Houston, Mexico, New York, Vancouver and Washington has non-stop flights to Tokyo by both North American and Japanese carriers.

⁹⁵ Three airlines; All Nippon, Japan Airlines and United all fly non-stop between Tokyo and Chicago and between Tokyo and San Francisco.

importance, the Tokyo-Los Angeles route is served non-stop by seven airlines⁹⁶ and is one of relatively few international routes in the world to have non-stop flights by airlines each of the major alliances; oneworld, Skyteam and Star.⁹⁷ Thus, commercial airlines routes between Japan and the United States, feature strong competition and routes are dominated by the airlines designated by the signatories to the applicable BASAs. Moreover, competing service is provided to various cities in the United States, confirming that the routes are based on bilateral traffic between Japan and the United States.

Sixth Freedom traffic is carried by Air Canada and Westjet between the U.S. and Japan via Canada but these operations have very little impact on the health of any of the 24 non-stop routes flown daily between the United States and Japan. In addition, Singapore Airlines serves the Tokyo-Los Angeles route, but it competes with nine daily nonstop flights offered by Japanese and American airlines over the same route.

Overall, the U.S. – Japan BASA is an example of a healthy BASA. There are many flights between Japan and the United States; all of the major international airlines based in the United States and Japan participate fully in the market. The market is roughly evenly shared between Japanese and American carriers, and most of the passengers travelling between the U.S. and Japan are travelling principally between those two countries and not connecting to another place.

B) A Dysfunctional BASA; U.S. – India

The U.S. India Open Skies Agreement was signed nearly two decades ago on April 14, 2005.⁹⁸ It allows American carriers to fly from anywhere in the U.S.

⁹⁶ Seven airlines; All Nippon, American, Delta, Japan Airlines, Singapore Airlines, United and ZipAir Tokyo all fly nonstop between Tokyo and Los Angeles.

⁹⁷ All Nippon, Singapore Airlines and United are members of the Star Alliance, American and Japan Airlines are members of oneworld and Delta is a member of Skyteam.

⁹⁸ See *Air Transport Agreement between the Government of the United States of America and the Government of India*, 14 April 2005, (entered into force June 21, 2005).

via any point or non-stop to any point in India and grants reciprocal rights to Indian carriers.⁹⁹ Literally, the market, as interpreted by the board of directors of the various American and Indian carriers decide what routes will be flown, by what aircraft and how often.

1) The Market

One of the best ways of looking at the market is to look at historical service. In October 1996¹⁰⁰ no airline flew non-stop between the U.S. and India even though it was possible.¹⁰¹ Air India served New York-London-Delhi-Mumbai three times a week, New York-London-Mumbai three times a week and New York-London-Delhi, once a week.¹⁰²

United Airlines served Delhi via London, daily from New York.¹⁰³ Delta flew daily between Mumbai and the Frankfurt hub¹⁰⁴ it had acquired from Pan Am,¹⁰⁵ and so was serving six destinations in Europe/South Asia¹⁰⁶ and connecting these via Frankfurt with five destinations in the U.S.¹⁰⁷

The American and Indian carriers offered a grand total of just 21 same-plane services in each direction between India and the United States. The direct routes

⁹⁹ *Ibid.*

¹⁰⁰ See Official Airline Guides, *supra* note 72.

¹⁰¹ *Ibid.* This is curious because United was flying the Boeing 747-400 non-stop from Chicago to Hong Kong, a route of 12,500 km, so New York-Delhi would have been possible if market conditions had warranted it.

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*

¹⁰⁵ See Scot J Paltrow, "Delta Wins the Bidding to Buy Most of Pan Am: Airlines: Purchaser to get prized Northeast shuttle. Federal bankruptcy court approves \$1.39-billion deal", *Los Angeles Times* (13 August 1991).

¹⁰⁶ See Official Airline Guides, *supra* note 72. These were Athens, Bucharest, Istanbul, Moscow, Mumbai and Warsaw.

¹⁰⁷ See *Ibid.* These were Atlanta, Cincinnati, Los Angeles, New York and Washington.

between the United States and India served only three points; New York, Delhi and Mumbai, and the fact that all of the 21 flights transited either London or Frankfurt means that at least some of the passengers on each of the flights was destined for Europe rather than the United States or India. Thus, the actual capacity offered for the United States – India market on direct flights would have been substantially less than 21 flights per week.

2) Competitive Service in 2023

In December 2023 Air India flew “44 weekly services [from India] to the US to New York, Newark, Chicago, Washington, D.C., and San Francisco.”¹⁰⁸ Air India operated eight routes linking these five cities with one of Bengaluru, Delhi or Mumbai.¹⁰⁹ U.S. airlines operated two routes to Delhi; American flew daily from New York, JFK¹¹⁰ and United flew 11 times weekly from Newark.¹¹¹

The combined offerings by American and India carriers amounted to just 58 weekly non-stop flights by three American and India airlines on nine routes between the U.S. and India. This compares to 294 weekly nonstop flights by six American and Japanese carriers on 24 routes between the U.S. and Japan. If one considers the fact that India has roughly 10 times Japan’s population and that both Japan and India are amongst the top 6 sources of foreign tourist to the

¹⁰⁸ Guarav Joshi, “Air India To Bring Back 3 More Weekly US Flights; The carrier is gradually resolving staffing issues to fly its widebody aircraft.” *Simple Flying*, 2 June 2023 online <<https://simpleflying.com/air-india-to-bring-back-3-more-weekly-us-flights/>>.

¹⁰⁹ The eight routes are Chicago-Delhi, Newark-Mumbai, Washington-Delhi, New York to each of Delhi and Mumbai and from San Francisco to each of Bengaluru, Delhi and Mumbai.

¹¹⁰ See *American Airlines*, supra note 25.

¹¹¹ See *United Cargo*, supra note 28.

United States,¹¹² one might expect at least equal airline services from both India and Japan to the United States. To the extent that there are five U.S. – Japan flights for every U.S. – India flight, it is worth looking into potential causes for such significant different in level of air services in the two markets.

3) Interloper Service

The most likely explanation for the difference in level of air service in the two different markets, is the fact that there are no major international airlines based in countries located between Japan and the United States. However, several such airlines are located between India and the United States. This section will explore the operation of some of those international airlines. For the purpose of this article, they are called “interlopers”, in that they are based in States that are not a Party to the U.S. – India BASA,¹¹³ and their operations may have the effect of impeding or hindering the development of more non-stop routes between India and the U.S.

a) Europe

Major European airlines like Air France/KLM, British Airways and Lufthansa offer excellent service between Europe and the United States. On most of these flights the majority of passengers are travelling between Europe and the United States, but their airlines also fly to Bangalore, Chennai, Delhi and Mumbai and so provide connections between India and the United States.

However, Indian passport holders may require a European visa in order to travel between India and the United States via hubs like Amsterdam, Frankfurt,

¹¹² Dawit Habtemariam, “U.S. Sees India Surge to its Second Top Traveler Market.” *Skift*, 24 October 2023 online <<https://skift.com/blog/indian-travel-to-u-s-continues-to-surge/#:~:text=On%20average%2C%20Indian%20travelers%20spent,National%20Travel%20and%20Tourism%20Office.>>.

¹¹³ See U.S. – India BASA, *supra* note 98.

London or Paris.¹¹⁴ This often reduces the attractiveness of Europe as a transit point between India and the United States.

b) Qatar

Unlike Europe, Qatar does not require a transit visa for Indian passport holders,¹¹⁵ and because Qatar only has one international airport, State-owned and backed, Qatar Airway's hub at Hamad International Airport has an impressive "no-man's land" where passengers of various citizenships may enter without a visa as long as they hold a visa for their final destination. Thus, persons who might have required a visa to take a connecting flight to the United States from Europe, do not need a visa to take a connecting flight from Doha to the United States.

Moreover, unlike the European carriers, Qatar Airways has arranged its schedule to cater specifically to the U.S. – India market. The airline offers 16 daily non-stop flights from Doha to 12 cities in the United States, and each of these flights is timed to depart Doha within 80-220 minutes of the arrival of one of its 13 flights from 12 cities in India.¹¹⁶ In the opposite direction the airline's flights to India are timed to depart within 80-240 minutes of the arrival of one of its 16 flights from the 12 cities it serves in the United States.¹¹⁷ In this manner Qatar Airways provides one-stop service from 12 U.S. cities to 12 cities in India. Atlanta is one-stop from Amritsar, Bengaluru is one-stop from Boston, Chennai is one-stop from Chicago and Houston is one-stop from Hyderabad. No Indian or American carrier can match the number of destinations served or the connectivity provided by Qatar Airways.

¹¹⁴ See Henley & Partners, "The Henley Passport Index" online <<https://www.henleyglobal.com/passport-index>>.

¹¹⁵ *Ibid.*

¹¹⁶ See, *infra* **Error! Reference source not found..**

¹¹⁷ *Ibid.*

Moreover, Qatar Airways Doha – U.S. service can be compared to the Tokyo – U.S. service. As noted above, six American and Japanese airlines offer 40 flights a day over 22 routes between Tokyo and 14 cities in the United States.¹¹⁸ Qatar Airways alone offers 15 daily non-stop flights from Doha to 11 cities in the United States.¹¹⁹ Its Doha – U.S. routes carry roughly 1/3 the amount of traffic as that carried on the Tokyo – U.S. routes.

Here it is useful to compare Tokyo with Doha. Tokyo has a population of nearly 38 million people¹²⁰ or roughly ten times the population of Qatar.¹²¹ Some of the global corporations based in Japan include Canon, Hitachi, Honda, Mitsubishi, Nissan, Panasonic, Sony and Toyota. Japan is a G-7 country and one of the top six countries whose citizens visit the United States.¹²² It is easy to see why Tokyo would attract many flights from the United States. Doha, on the other hand, is not a significant source of inbound tourism for the United States. Other than the World Cup, it has not been a significant tourist destination for Americans. Thus, one might question how Doha could justify 15 daily nonstops to the U.S. The answer is obvious; it is India-U.S. passengers that are filling the flights between Doha and the United States. If Qatar Airways did not exist, the passengers they carry between India and the United States via Doha, might travel with American or Indian carriers on routes between India and the United States.

¹¹⁸ See *supra* note 88.

¹¹⁹ The 12th U.S. city connected by a non-stop flight to Doha is Philadelphia. The route is flown by American Airlines as Qatar Airways partner.

¹²⁰ United Nations, Department of Economic and Social Affairs, “World Urbanization Prospects 2018,” *Table II Population size and ranking of urban agglomerations with more than 5 million inhabitants as of 1 July 2018*, <<https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf>>.

¹²¹ See *Qatar Population* *supra* note 56.

¹²² See *Habtemariam* *supra* note 112.

For this reason, Qatar Airways is a major interloper on routes between India and the U.S.

c) United Arab Emirates

The United Arab Emirates is the only State that has two Government-Backed Mega Carriers (GBMCs),¹²³ Emirates and Etihad. Both of these airlines serve many destinations in India and the United States and provide one-stop connections via their respective hubs in Dubai and Abu Dhabi. The two Emirati airline are both based in major government-owned international airports with no domestic flights and therefore have an impressive “no-man’s land” which allows persons of various nationalities to transfer between India and the United State in both directions, without a transit-visa.

i) Emirates

Emirates states that it provides 175 weekly flights from Dubai to nine cities in India.¹²⁴ Those nine cities include Delhi and Mumbai as well as seven non-hub airports of Ahmedabad, Bengaluru, Chennai, Hyderabad, Kochi, Kolkata and Thiruvananthapuram.¹²⁵ It also flies serves 11 American cities: Chicago, Dallas, Houston, Los Angeles, Miami, New York, Orlando, San Francisco, Seattle and Washington.

It must be remembered that Dubai is a major international tourist destination like London, Paris and New York¹²⁶ and is known for the world’s tallest building¹²⁷ a giant shopping center with an aquarium inside¹²⁸ and a shopping

¹²³ See *Fitzgerald*2016, supra note 57 at chapters 2 and 3.

¹²⁴ Emirates Airlines “Emirates and India; Partners in Economic Growth” online <<https://c.ekstatic.net/ecl/documents/our-communities/global-presence/emirates-and-india.pdf>>.

¹²⁵ *Ibid.*

¹²⁶ Euromonitor International, “Euromonitor report reveals world’s top 100 city destinations for 2022” (9 January 2023) online: <<https://www.euromonitor.com/press/press-releases/december-2022/euromonitor-report-reveals-worlds-top-100-city-destinations-for-2022>>.

¹²⁷ This is the Burj Khalifa.

¹²⁸ This is the Dubai mall.

center with an indoor ski hill.¹²⁹ Thus, some of the passengers on an Emirates' flight between Dubai and India or the United States may be heading to or returning from a tourist visit in Dubai. However, just like Qatar Airways, Emirates arranges its flights to permit easy India – U.S. travel in both directions via Dubai. Unlike Qatar Airways, Emirates reminds Indian policy makers that its presence in India is good for the Indian economy. "Emirates' global network complements the routes served by Indian airlines by providing one-stop connectivity to the 69 international destinations that are not directly served by any Indian carrier."¹³⁰

Of course, this raises the question as to whether Emirates' services are complimenting those of Indian carriers in filling gaps by providing service to cities that are of little interest to Indian carriers, or whether Emirates' services preclude the launch by Indian carrier of routes to cities not currently served.

Consider a route such as Houston – Delhi, connecting America's fourth largest metropolis with India's capital and most populous city. Houston has not been one of the cities previously targeted for a route to India, but as major hub for United and a city from which United Airlines flies to Europe, South America, Australia and Japan¹³¹ it could conceivably be a candidate for a non-stop route to India. However, Emirates' one-stop service between Houston and Delhi via Dubai could conceivably impede or delay the launch of non-stop service between Houston and Delhi. It is thus safe to consider that Emirates is an interloper on routes between the United States and India.

¹²⁹ This is the Mall of the Emirates.

¹³⁰ See *Emirates and India*, supra note 124.

¹³¹ See *United Cargo*, supra note 28.

ii) Etihad

Etihad has a much more modest Indian-X-U.S. service¹³² than does Emirates. Although it serves eight destinations in India,¹³³ and four in the U.S.,¹³⁴ It only connects its eight Indian destinations with three U.S. cities in any bank of flights. Moreover, many of its flights between Abu Dhabi and India used single aisle aircraft such as the Airbus A-320,¹³⁵ and thus the capacity it offers on these routes may be targeted to some extent to meet the local demand. This is a dramatic contrast to the operation of Emirates and Qatar Airways.

It is safe to conclude that Etihad is an interloper on routes between the United States and India but not nearly to the same extent as Emirates or Qatar Airways.

IV. Comparison between U.S.-Japan and U.S.-India BASA

In December 2023, six airlines from Japan or the United States offered 287 weekly non-stop flights on 24 non-stop routes between points in Japan and points in the United States.¹³⁶ In the same month, three airlines from India or the United States offered 58 weekly non-stop flights on nine non-stop routes between point in India and points in the United States.¹³⁷

Assuming that the India-U.S. market and the Japan-U.S. market are roughly comparable there is a gap of over 200 flights a week between the U.S.-Japan market and the U.S.-India market. Of note, Qatar Airways offers over 84 flights

¹³² See, *infra* **Error! Reference source not found.**

¹³³ See *Etihad Cargo, Flight Schedule* Sep 2023.

¹³⁴ *Ibid.*

¹³⁵ *Ibid.*

¹³⁶ See *supra* note 88.

¹³⁷ See *supra* notes 25, 28, 108 and 109.

a week between Doha and 12 cities in the United States¹³⁸ and each of those connect in both directions with flights between Doha and 12 cities in India.¹³⁹ Naturally Qatar Airways also offers flights connecting Indians with its 55 destinations in Europe¹⁴⁰ but as will be explained below, the real reason for Americans to fly to Doha is to connect to a destination in India.

A) Understanding Doha as a transit point.

In order to understand Qatar Airways' power as an interloper in the U.S. – India BASA, it is helpful to be aware of its geographical location and the air services that would normally be expected of similarly populated countries.

1) Where is Doha

Doha is located at 25°17'12"N, 51°32'0"E a location which puts it too far East and too far South to provide convenient service between the United State and Europe, Russia or North Africa. Further, is too far West and too far North to provide convenient service between the United State and points in East Asia, Southeast Asia and the Antipodes. However, Doha's location allows it to provide very convenient service between the United States and all points in India. Thus, as a practical matter most passengers travelling from the U.S. to Doha are destined for India.

2) What kind of air service would Doha normally have.

Even if you include all of the various expatriate workers, Qatar's population is just 2.97 million,¹⁴¹ and thus its population size is comparable to that of Jamaica. Thus, the question arises, if Kingston, Jamaica does not warrant a

¹³⁸ See, *infra* **Error! Reference source not found..**

¹³⁹ *Ibid.*

¹⁴⁰ Qatar Airways, *See More of Europe via Doha with Qatar Airways*, <https://www.qatarairways.com/en-au/offers/see-more-of-europe.html#:~:text=See%20more%20of%20Europe%20via%20Doha%20with%20Qatar%20Airways,%2C%20France%2C%20Switzerland%20and%20Ireland.>

¹⁴¹ State of Qatar, Plan. & Stat. Auth., *Monthly Figures on Total Population* (Aug. 31, 2023), <https://www.psa.gov.qa/en/statistics1/StatisticsSite/pages/population.aspx>.

daily flight to London, how can Doha merit non-stop flights to 12 cities in the United States? Moreover, if Doha is such a popular destination for American, why is it that no airline, which is based in North, Central or South America, and which is not allied in some form with Qatar Airways, serves any point in Qatar?¹⁴²

It must be remembered that when Qatar ceased its participation in Gulf Airways in August 2002 to create Qatar Airways,¹⁴³ the newly created airline was based in a tiny market that could not previously sustain daily non-stop flights to London, much less New York or Chicago. Thus, Qatar Airways, with government backing, decided to pursue aggressive 6th Freedom practice and become an interloper in BASAs such as the one between India and the United States.

3) Doha is not a destination; it is a transit point according to their CEO

Qatar Airways' explicit focus on aggressive 6th Freedom practice and being an interloper in various BASA was unwittingly revealed in 2010 by the airline's then-Chief Executive Officer, Akbar Al Baker, when he launched the airline's non-stop route to Sao Paulo.

“With a large Lebanese and Japanese community living in Brazil, Argentina and neighbouring South American countries, the route is a perfect match for our business model, which carries passengers from East to West and vice versa via our Doha hub.”¹⁴⁴

¹⁴² Richard Maslin, *Delta Drops Dubai and Blames Gulf Carriers for Network Cut*, AVIATION WK. (Oct. 29, 2019), <https://aviationweek.com/air-transport/airports-networks/delta-drops-dubai-blames-gulf-carriers-network-cut>.

¹⁴³ Gulf Airways, *About Gulf Airways*, <https://web.archive.org/web/20150702183953/http://www.gulfair.com/english/aboutgulfair/pages/history.aspx>

¹⁴⁴ Qatar Airways, Press Release, “Qatar Airways Makes Its South American Debut” (27 June 2010).

Qatar Airways use of aggressive 6th Freedom practices, and its status as a major interloper into various BASAs has produce dramatic negative consequences in virtually every market that Qatar Airways serves. It helped drive Air New Zealand's decision to stop serving London¹⁴⁵ it encouraged British Airways and Qantas to re-evaluate and ultimate reduce U.K.-Australia same-plane services.¹⁴⁶

In 2010 Air France publicly complained that airlines based in Qatar and the UAE were having a negative impact on Air France's ability to serve South Asia.¹⁴⁷ Five years later, American, Delta and United commissioned a report about the ways in which these airlines were distorting international air routes.¹⁴⁸ More recently, Korean Airlines have complained that the operations of airlines like Qatar Airways are negatively affecting the viability of non-stop routes between Korea and Europe.¹⁴⁹

¹⁴⁵ Joanna Bailey, *Air New Zealand Drops Los Angeles to London Fifth Freedom Flight*, Simple Flying (Oct. 22, 2019), <https://simpleflying.com/air-new-zealand-los-angeles-london/>.

¹⁴⁶ Elias Visontray, *Qatar Airways Has Flown into a Political Storm. Here's Everything You Need to Know*, TheGuardian.com (Sept. 8, 2023), <https://www.theguardian.com/australia-news/2023/sep/09/qatar-airways-australian-political-saga-flights>.

¹⁴⁷ Laurence Frost & Andrea Rothman, "Air France CEO Calls for EU Curbs on Expansion by Gulf Carriers",

Bloomberg (11 October 2010).

¹⁴⁸ See "Restoring Open Skies: The Need to Address Subsidized Competition From State-Owned Airlines in Qatar and the UAE", Americans for Fair Skies (15 January 2015), online: Americans for Fair Skies <fairskies.org/the-white-paper/>.

¹⁴⁹ See Park Jae-hyuk, *Korean Air Negatively Impacted by Increased Flights Deal between Korea, UAE*, Korea Times (Oct. 15, 2023, 3:52 PM), <https://www.koreatimes.co.kr/www/tech/2023/10/129_361161.html>.

In each case, the dominant carriers based in the State partners of the applicable BASA, have complained that non-stop routes between the BASA partners have been made less commercially viable due to the aggressive 6th Freedom operations of interloper carriers such as Qatar Airways.¹⁵⁰

V. Remedies

Sadly, there are very few practical remedies to deal with the interloper problem. Given that the interlopers are based in States that are not Parties to the U.S. – India BASA, there is almost nothing that can be done. There are, however, two options that are very serious and may have significant implications. They are for India to withdraw from the Transit Agreement and for India to consult with Qatar or cancel its BASA with Qatar. For the purpose of this analysis Qatar has been chosen as it has a tiny population and little tourism potential and Qatar Airways is therefore even more dependent on aggressive 6th Freedom operations than Emirates. These same factors give Qatar Airways enhanced status as an interloper in dozens of BASA.

A) Withdraw from the Transit Agreement

India is a Party to the *International Air Services Transit Agreement* (Transit Agreement)¹⁵¹ by which it grants airlines of other countries to overfly its territory and make stops for non-traffic purposes. By informing Qatar that it was thinking of withdrawing from the Transit Agreement, India would be firing a diplomatic shot across the bow, without immediately affecting any traffic

¹⁵⁰ See P. Paul Fitzgerald, “Air Service Agreements and the Future of the Chicago Bilateral System”, (forthcoming, (2024) 48 Ann Air & Sp L.

¹⁵¹ *International Air Services Transit Agreement*, supra note 49. Canada’s withdrawal from this Agreement allows it to deny overflight permission to airlines based in States that do not have a BASA with Canada.

rights of any airline. It must be noted that withdrawing from the Transit Agreement requires giving a year's notice to the international community.¹⁵²

Once a State has withdrawn from the Transit Agreement, in order to overfly that State or to make landing there for non-traffic purposes another State must have a BASA with that State. Canada used this strategy in 1988 in order to secure a new BASA with the U.K. that ensured that Air Canada would be granted 5th freedom traffic rights between London and Delhi. More recently Canada used the fact that it is no longer a party to the Transit Agreement to force the U.A.E to drop its feud with Canada over the latter's refusal to grant them more liberal traffic rights.¹⁵³

The UAE finally realized that as a non-Party to the Transit Agreement, if Canada were to withdraw from the Canada – UAE BASA, Canada would be in a position to deny overflight of its territory to flights of Emirates and Etihad between Dubai and most cities in the United States.¹⁵⁴

India's territory is sufficiently expansive that even the threat of withdrawing from the Transit Agreement would get significant attention. This reality would strengthen India's bargaining position when negotiating BASA as a denial of overflight could result in the cancellation of many flights by carriers based in States who had not been able to negotiate a BASA acceptable to India.

¹⁵² *Ibid*, Article III.

¹⁵³ *See*, *supra* note 68.

¹⁵⁴ This author played a significant part in that realization. He made a presentation to an elite group of aviation law experts on May 10, 2011, at a luncheon sponsored by the International Foundation for Aviation and Development, and which was attended by several Permanent Representatives to ICAO, including that of the U.A.E. The presentation looked at the Canada-UAE dispute and reminded attendees that if the UAE continued to protest, Canada had the option of tearing up its BASA with the UAE, with the result that a year later, all flights operated by airlines of the UAE to U.S. destinations west of New York, would have to be cancelled due to their inability to overfly Canada.

B) Re-negotiate or cancel its BASA with Qatar

If India withdraws from the Transit Agreement it will be in a much stronger position to negotiate with Qatar. It should go without saying that it is obvious to all outside observers that India's granting of access to its territory was based on conditions similar to those which were involved in the Canada-UAE dispute.

Other than the back-and-forth travel of heavily exploited Indian guest-workers in Qatar, there is very little bilateral tourism traffic between Qatar and India. For travel minded Indians, Qatar has relatively few attractions compared to Dubai, Europe or other parts of India. As an attraction of Qatari tourists, the only downside is that number of Qataris with the disposable income to travel as tourists to India is roughly a million.¹⁵⁵

If India did not have a BASA with Qatar, travel between India and Qatar could be routed through Dubai or Bahrain; thus, India does not need a BASA with Qatar! It is Qatar that wants the BASA! As explained above, without access to India, Qatar Airways flights to the U.S. are no longer as viable. India can dramatically affect the fortunes of Qatar Airways.

Secure in this knowledge then, India's BASA with Qatar must be of net benefit to India. By pulling out of the Transit Agreement, India would be able to negotiate hard with Qatar and get an agreement that could limit Qatar Airways' 6th Freedom operations and its interloper practices. This is because if an India – Qatar BASA could not be negotiated on terms completely satisfactory to India, India could tear up the BASA and subsequently be able to force Qatar Airways to cancel or dramatically re-route flights between Doha and Thailand, the Philippines, Malaysia and Singapore, and possible other destinations depending on prevailing wind patterns. Any actions by the Government of India

¹⁵⁵ This includes the 332,000 Qatari citizens and twice as many expatriate workers *See, supra* note 56.

that limited the interloper actions of Qatar Airways would be boost to the India – U.S. BASA and increase the number of nonstop flights between two of the world's most important democracies.

VI. Conclusion

It is clear that India – U.S. relations are going to improve very significantly, very soon. Their shared interests, their desire to forge closer ties, the need for better collaboration will, inevitably spur the need for increased travel between the two States. The question for the Indian government is what measures it is going to adopt in order to ensure that the lion's share of traffic between India and the United States is carried by American and Indian airlines on non-stop flights between the two States. Unless something such as is recommended above, is seriously considered, it would be foolish not to recognize that the airlines that will benefit most from improved India – U.S. relations are not based in either India or the United States. India's greatest power is in her people, but the geographic power granted by the expanse of her territory cannot be underestimated. It can be artfully used, as Canada has learned, to update a flawed BASA in the interests of the stronger more important State.

Appendix 1 Qatar Airways India – U.S. Connections

US ORIGIN	FLIGHT #	DOH A	DOH D	FLIGHT #	INDIAN DESTINATION
Los Angeles	QR742	16:00	18:55	QR540	Kolkata
Atlanta	QR756	16:40	19:00	QR528	Chennai
Washington	QR708	16:40	19:20	QR506	Thiruvananthapuram
New York	QR702	16:45	19:35	QR536	Kozhikode
Chicago	QR726	17:00	19:40	QR500	Hyderabad
Dallas	QR730	17:00	19:45	QR590	Nagpur
Boston	QR744	17:15	19:50	QR572	Bengaluru
Houston	QR714	17:15	20:00	QR578	Delhi
San Francisco	QR738	17:15	20:30	QR534	Ahmedabad
Philadelphia	AA120	17:30	20:30	QR522	Goa
Miami	QR778	17:30	20:40	QR548	Amritsar
Seattle	QR720	17:35	20:45	QR556	Mumbai

INDIA ORIGIN	FLIGHT #	DOH A	DOH D	FLIGHT #	US DESTINATION
Ahmedabad	QR535	5:05	8:05	QR755	Atlanta
Mumbai	QR557	5:25	8:05	QR729	Dallas
Delhi	QR579	5:40	8:05	QR713	Houston
Goa	QR523	5:45	8:05	QR739	Los Angeles
Kozhikode	QR537	5:45	8:05	QR737	San Francisco
Nagpur	QR591	5:50	8:05	QR719	Seattle
Bengaluru	QR573	5:55	8:15	QR743	Boston
Amritsar	QR549	6:00	8:15	QR777	Miami
Chennai	QR529	6:00	8:15	QR701	New York
Hyderabad	QR501	6:00	8:30	QR725	Chicago
Thiruvananthapuram	QR507	6:15	8:40	QR707	Washington
Kolkata	QR541	6:45	8:45	AA121	Philadelphia

Appendix 2 Etihad India – U.S. Connections

US origin	Flight #	AUH A	AUH D	Flight #	Indian Destination
			13:50	EY256	Kolkata
Chicago	EY150	11:00	14:00	EY238	Bengaluru
New York	EY102	11:20	14:00	EY270	Chennai
Boston	EY148	12:00	14:10	EY282	Kochi
			14:15	EY276	Hyderabad
			14:20	EY286	Ahmedabad
			14:35	EY224	Delhi
			15:40	EY204	Mumbai

India Origin	Flight #	AUH A	AUH D	Flight #	US Destination
Ahmedabad	22:00	EY287			
Kochi	23:10	EY283			
Delhi	23:15	EY223	2:45	EY151	Chicago
Hyderabad	23:20	EY277	3:10	EY147	Boston
Mumbai	23:20	EY203	3:15	EY103	New York
Bengaluru	23:25	EY239			
Chennai	23:35	EY271			
Kolkata	0:45	EY257			

Notes:

- 1) The Abu Dhabi – Boston route will be launched in the Spring of 2024.
- 2) A second New York – Abu Dhabi flight and a Washington – Abu Dhabi flight does not connect with these flights between Abu Dhabi and India.

Regulating the Use of Anti-Satellite Missiles in Outer Space

*Raelee TOH Hsuan Hui**

Abstract:

The weaponisation of space has put both the sustainability of space operations and global security at risk, making the regulation of anti-satellite (ASAT) missiles in orbit a pressing concern for international law. ASAT missiles pose serious hazards to military and civilian space assets. This paper is organised as follows: Part II elaborates on the risks posed by ASAT missiles and explains why they must be regulated. Part III engages with arguments that the OST is sufficient in regulating the use of ASAT missiles and shows why this is unfortunately not the case. Part IV then identifies the relevant CIL rules and explains how they regulate the use of ASAT missiles during military operations and armed conflict, while Part V concludes.

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I. Introduction

The United Nations General Assembly (“UNGA”) passed a resolution on 7 December 2022 entitled “Destructive direct-ascent anti-satellite (“ASAT”) missile testing”¹ and an open-ended working group on “reducing space threats through norms, rules and principles of responsible behaviours”² (“OEWG”) calling on States not to conduct ASAT missile tests so as to prevent an arms race in outer space and further damage to the space environment.³ To address the risks posed by ASAT missiles, some States have argued that the “most pragmatic and immediate way forward to improve space security today”⁴ is to

¹ Destructive direct-ascent anti-satellite missile testing, G.A. Res. 77/41, U.N. Doc. A/C.1/77/L.62 (Oct. 13, 2022).

² Reducing space threats through norms, rules and principles of responsible behaviours: draft resolution, G.A. Res. 76/231, U.N. Doc. A/C.1/76/L.52 (Dec. 21, 2021).

³ Brazil, *Working Paper submitted by Brazil Destructive Anti-satellite Weapons*, [https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_\(2022\)/Brazil%27s_Working_Paper_on_Destructive_ASATs.pdf](https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_(2022)/Brazil%27s_Working_Paper_on_Destructive_ASATs.pdf) (last visited Dec. 1, 2023); Germany, *German national contribution to the Secretary General in reference to the Resolution 75/36 on norms, rules and principles of responsible behaviours in outer space* (last visited Dec. 1, 2023), 5; Japan, *National Submission to the United Nations Secretary General Pursuant to UN General Assembly Resolution 75/36 “Reducing space threats through norms, rules and principles of responsible behaviours*, <https://front.un-arm.org/wp-content/uploads/2021/05/【JPN】-National-Submission-for-UNGA-Resolution-75-36.pdf> (last visited Dec. 1, 2023); Netherlands, *Response by the Netherlands to UN General Assembly resolution 75/36*, <https://front.un-arm.org/wp-content/uploads/2021/05/Response-by-the-Netherlands-to-UN-General-Assembly-resolution-75-36.pdf> (last visited Dec. 1, 2023).

⁴ European Union, *EU joint contribution on the works of the Open-Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours Fourth part: recommendations on possible norms, rules and principles of responsible behaviour relating to threats by States to space systems*, [https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_\(2022\)/EU_joint_contribution_to_OEWG_works_on_norms_of_responsible_behaviours.pdf](https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_(2022)/EU_joint_contribution_to_OEWG_works_on_norms_of_responsible_behaviours.pdf) (last visited Dec. 1, 2023); United Kingdom, *UK WORKING PAPER FOR THE UN OPEN ENDED WORKING GROUP ON REDUCING SPACE THREATS THROUGH NORMS, RULES AND PRINCIPLES OF RESPONSIBLE BEHAVIOURS*, <https://documents.unoda.org/wp-content/uploads/2022/05/FINAL-space-threats-OEWG-UK-working-paper-FINAL.pdf> (last

develop norms through the 1967 Outer Space Treaty⁵ (“OST”). This sentiment has been echoed by commentators who consider the OST to be sufficient in regulating the use of ASAT missiles,⁶ and those who disagree that the OST should be reformed.⁷ However, this paper contends that the OST is not the best way to regulate the use of ASAT missiles due to its definitional gaps that leave ASAT missiles uncovered.⁸ Instead, the much better candidate to regulate the

visited Dec. 1, 2023); Canada, *Canadian Statement Open-ended working group on reducing space threats First session Geneva, May 9th -13th 2022 Agenda item 5. General exchange of views on all matters*, <https://documents.unoda.org/wp-content/uploads/2022/05/Canada-General-Statement-for-Translators-OEWG-Space-Threats-Session-bilingual.pdf> (last visited Dec. 1, 2023).

⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967) G.A. Res. 2222 (XXI).

⁶ Lukasz Olejnik, *The Outer Space Treaty and Promoting Responsible Use of Space* (June 7, 2023), <https://www.justsecurity.org/86823/the-outer-space-treaty-and-promoting-responsible-use-of-space/>; Sanchit Anand, *Bringing Order to Orbital Chaos?* (Dec. 7, 2021), <https://voelkerrechtsblog.org/bringing-order-to-orbital-chaos/>; Mohammad Rifki Daud & Amanda Adelina Harun, *International Legal Regulations Concerning Launching of Russian Anti-Satellite Weapon Missiles Reviewed in Space Law Perspective*, (2022) *Estudiante Law Journal* vol. 4, No. 1; Michael Byers & Aaron Boley, *Anti-satellite Weapons and International Law*, in *WHO OWNS OUTER SPACE?* (Cambridge University Press, ed., 2023), 305-306.

⁷ Jeff Foust, *Companies, lawyers argue against changing Outer Space Treaty* (May 26, 2017), <https://spacenews.com/companies-lawyers-argue-against-changing-outer-space-treaty/>.

⁸ Rex Zendalis & Catherine Wade, *Anti-Satellite Weapons and the Outer Space Treaty of 1967*, 8 Cal. W. Intl. L. J. 454 (1978); Sandeepa Bhat & Kiran Mohan V, *Anti-Satellite Missile Testing: A Challenge to Article IV of the Outer Space Treaty*, <http://nujlawreview.org/2016/12/03/anti-satellite-missile-testing-challenge-to-article-iv-of-the-outer-space-treaty/> (last visited Dec. 1, 2023); Bill Boothby, *Space Weapons and the Law* 93 Int'l L. Stud. 179 (2017), 184; Dale Stephens, *The International Legal Implications of Military Space Operations: Examining the Interplay between International Humanitarian Law and Outer Space Legal Regime*, 94 Int'l L. Stud. 75 (2018), 86-88; Jeffrey Murphy, *The Cold Vacuum of Arms Control in Outer Space: Can Existing Law Make Some Anti-Satellite Weapons Illegal?*, 68 Clev. St. L. Rev. 125 (2019), 141; Hitoshi Nasu & Michael Schmitt, *A Threat or A Warning: Russia's Weapons Testing in Space* (July 31, 2020), <https://www.justsecurity.org/71783/a-threat-or-a-warning-russias-weapons-testing-in-space/>; Nivedita Raju, *A Proposal for a Ban on Destructive ASAT Testing: A Role for the EU*, in *Non-Proliferation and Disarmament Papers* No. 74 (Apr. 2021), 6-7.

use of ASAT missiles is existing rules of customary international law (“CIL”) because all States are bound by CIL unless they are persistent objectors to the rule in question.⁹ This approach obviates the OST’s gaps and the difficulties in encouraging States to adopt a brand new treaty regulating the use of ASAT missiles which is unlikely to be popular given States’ own national defence priorities¹⁰ and existing geopolitical tensions.¹¹ Given the dearth of cases in the

⁹ A persistent objector is a state that has consistently rejected a CIL rule. See International Law Commission (“ILC”), *Draft conclusions on identification of customary international law, with commentaries*, https://legal.un.org/ilc/texts/instruments/english/commentaries/1_13_2018.pdf (last visited Dec. 1, 2023), 152-154.

¹⁰ States’ prioritisation of their own national interests is demonstrated by the voting outcome of the UNGA Resolution on ASAT missile testing. States which have yet to develop their own ASAT capabilities – such as Iran, Belarus and Nicaragua voted against the resolution as they thought the resolution was discriminatory because it retains advantages for States that are already in possession of ASAT missiles. See Theresa Hitchens, *Norm Setting and Transparency and Confidence-Building in Space Governance*, in *WAR AND PEACE IN OUTER SPACE* (Oxford University Press, 2021), 59; Heather Foye & Gabriela Hernández *UN First Committee Calls for ASAT Test Ban* (Dec., 2022), <https://www.armscontrol.org/act/2022-12/news/un-first-committee-calls-asat-test-ban>; Ching Wei Sooi, *Direct-Ascent Anti- Satellite Missile Tests: State Positions on the Moratorium, UNGA Resolution, and Lessons for the Future*, SECURE WORLD FOUNDATION (“SWF”) (Oct. 2023), https://swfound.org/media/207711/direct-ascent-antisatellite-missile-tests_state-positions-on-the-moratorium-unga-resolution-and-lessons-for-the-future.pdf, 24.

¹¹ Hitchens, *ibid*; MONTAIGNE, *The Geopolitics of a New Modern Space Race* (Dec. 12, 2021); <https://www.institutmontaigne.org/en/expressions/geopolitics-new-modern-space-race>; Wichuta Teeratanabodee, *Mitigating Risks to Space Sustainability* (Dec. 9, 2022), <https://www.rsis.edu.sg/rsis-publication/idss/ip22077-mitigating-risks-to-space-sustainability/>; Paul Meyer, *As satellite use grows, geopolitical conflicts could spill into outer space* (Feb. 8, 2022), <https://www.theglobeandmail.com/opinion/article-as-satellite-use-grows-geopolitical-conflicts-could-spill-into-outer/>.

space context,¹² this paper uses analogical reasoning¹³ to demonstrate how different areas of terrestrial law – including environmental law, the law of armed conflict, and the law on the use of force – may be applied to outer space and considers how some of these rules may be modified to meet space-specific challenges.

II. The risks posed by ASAT missiles

Thus far four States – the US, India, China and Russia – have tested ASAT missiles¹⁴ with the most recently publicised test being conducted by Russia on 15 November 2021.¹⁵ Russia destroyed its old satellite into 1,500 trackable debris pieces and hundreds of thousands smaller fragments, forcing the nearby

¹² Out of the five international space treaties, only the Liability Convention has been invoked. This was during the Cosmos 954 incident when “a Soviet satellite crashed in [Canada]. Canada claimed for damages based in part on the Liability Convention to the Soviet Union. The incident was resolved through diplomatic channels and the majority of the provisions of the Liability Convention were left untested”. See Joseph Burke, *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the Cosmos 954 Incident*, 8 Fordham Int’l L. J. 255 (1984).

¹³ Analogical reasoning is “used to extend a rule to factual scenarios that are comparable to those for which the rule is originally envisaged”. See Fernando Lusa Bordin, *Analogy in International Legal Reasoning*, in THE ANALOGY BETWEEN STATES AND INTERNATIONAL ORGANISATIONS (Cambridge University Press, 2018), 15-48, 15.

¹⁴ Ching, *supra* note 10, 1.

¹⁵ Whereas the most recent test was conducted by China on 21 June 2022 though the target object is unknown. The SWF maintains a spreadsheet showing how many debris pieces have been generated over the decades and how many remain in orbit. See SWF, *History of ASAT Tests* *in* *Space*, https://docs.google.com/spreadsheets/d/1e5GtZEzdo6xk41i2_ei3c8jRZDjvP4Xwz3BVsUHwi48/edit#gid=1623728214 (last visited Dec. 1, 2023); Idrees Ali & Steve Gorman, *Russian anti-satellite missile test endangers space station crew – NASA*, REUTERS (Nov. 16, 2021), <https://www.reuters.com/world/us-military-reports-debris-generating-event-outer-space-2021-11-15/>.

International Space Station (“ISS”) to conduct collision avoidance measures.¹⁶ As the test was at a much higher altitude than other States’ tests, the debris would stay in orbit for a prolonged period of time.¹⁷ Indeed, a year after Russia’s test, the ISS¹⁸ and other satellites¹⁹ had to once again avoid fragments caused by the blast. As debris has great potential of extensive fragmentation,²⁰ they worsen the “Kessler syndrome” which posits that debris generated in space would cause more collisions between space objects that eventually render whole orbits unsafe for any use for many years.²¹ This means that all types of satellites used for different purposes, be it military or civilian, would be affected and could result in disastrous impacts on national security, global travel and food supply.²² Lest it be forgotten that debris travels at high speeds of around 28,000 kilometres per hour, which means that debris pieces as small as three to five millimetres can easily render whole satellites inoperable, while derelict

¹⁶ Ali & Gorman, *ibid*.

¹⁷ Chelsea Gohd, *Russian anti-satellite missile test was the first of its kind*, SPACE.COM (Aug. 10, 2022), <https://www.space.com/russia-anti-satellite-missile-test-first-of-its-kind>.

¹⁸ Brett Tingley, *International Space Station dodges space debris from Russian anti-satellite test*, SPACE.COM (Oct. 26, 2022), <https://www.space.com/international-space-station-dodges-russian-space-debris>.

¹⁹ Andrew Jones, *Chinese satellite in near miss with Russian ASAT test debris*, SPACE NEWS (Jan. 20, 2022), <https://spacenews.com/chinese-satellite-in-near-miss-with-russian-asat-test-debris/>.

²⁰ Michael Byers & Aaron Boley, *Space Security, in WHO OWNS OUTER SPACE?* (Cambridge University Press, 2023), 263.

²¹ *Ibid*; Mike Wall, *Kessler Syndrome and the space debris problem* (July 15, 2022), <https://www.space.com/kessler-syndrome-space-debris>.

²² Byers & Boley, *id*, 263-264.

objects like paint flecks and metal chips can pierce through an astronaut's suit at such high speeds.²³

Another concern is the use of ASAT missiles would turn outer space into a realm of conflict as many States have already developed “counter-space” technologies to interfere adversaries’ space assets, and have threatened to use them.²⁴ An example is Russia’s threats to obliterate the US’s Global Positioning System satellites,²⁵ and other commercial satellites²⁶ that are used by many countries for various purposes, including military, navigation and security.²⁷ The US has since responded that it was prepared to fight in space if required.²⁸ The potential of these “counter-space” technologies in turning space to a conflict-ridden realm is exacerbated by the fact that satellites in low-Earth orbit (“LEO”) are easy targets for existing ASAT missiles that use short-range missiles due to their relatively short distance from Earth.²⁹ However, this does not mean that satellites at higher altitudes are difficult to reach or target, because

²³ *Ibid.*

²⁴ Cassandra Steer, *Putting a stop to destructive ASAT weapons tests*, LOWY INSTITUTE (Nov. 17, 2022), <https://www.lowyinstitute.org/the-interpreter/putting-stop-destructive-anti-satellite-weapons-tests>.

²⁵ Tracy Cozzens, *Russia issues threat to GPS satellites*, GPS WORLD (Nov. 29, 2021), <https://www.gpsworld.com/russia-issues-threat-to-gps-satellites/>.

²⁶ Steer, *supra* note 24.

²⁷ GPS.GOV, *International Cooperation*, <https://www.gps.gov/policy/cooperation/> (last visited Dec. 1, 2023).

²⁸ Ian Sample, *US ‘ready to fight in space if we have to’, says military official* (May 28, 2023), <https://www.theguardian.com/science/2023/may/28/us-ready-to-fight-in-space-military-official>.

²⁹ Centre for Strategic and International Studies, *The Physics of Space Security A Reference Manual* (2005), 97.

some States already own long-range missiles,³⁰ while others – like North Korea³¹ and Iran³² – are developing them, and such technology can be easily modified for space use.³³ These concerns therefore require that ASAT missiles be regulated, and this paper now turns to consider how to do so beginning with the OST.

III. The OST is insufficient in regulating the use of ASAT missiles

To understand why there are definitional gaps in the OST that leave ASAT missiles uncovered, one must consider the historical background of the treaty. The OST was negotiated and drafted during the Cold War, which was a time of intense political tensions particularly between the US and USSR.³⁴ States were therefore desperate to come up with an international treaty that reflected a compromise on the international minimum standards that were to govern not only the superpowers' competition in their race to space, but space conduct.³⁵ Therefore, the OST could only lay the ground for bare standards, and it was

³⁰ Hague Code of Conduct, *Current trends in ballistic missile proliferation* (Sep, 2020), <https://www.nonproliferation.eu/hcoc/current-trends-in-ballistic-missile-proliferation/>.

³¹ SWF, *Global Counterspace Capabilities: An Open Source Assessment* (April 2018), https://swfound.org/media/206118/swf_global_counterspace_april2018.pdf (last visited Dec. 1, 2023), 5-1.

³² Centre for Strategic and International Studies, *Space Threat 2018: Iran Assessment* (Apr. 12, 2018) <https://aerospace.csis.org/space-threat-2018-iran/>.

³³ Cassandra Steer & Dale Stephens, *International Humanitarian Law and Its Application in Outer Space*, in *WAR AND PEACE IN OUTER SPACE* (Oxford University Press, 2021), 26.

³⁴ Christopher Johnson, *The Outer Space Treaty* (Jan. 24, 2018), <https://oxfordre.com/planetaryscience/display/10.1093/acrefore/9780190647926.001.0001/acrefore-9780190647926-e-43>.

³⁵ *Ibid.*

intended for subsequent treaties and domestic legislation to complement States' obligations at the international level.³⁶ As space technology was in a nascent stage in the 1960s, the States had not contemplated the emergence of novel issues faced today, some of which include mega-constellations comprising thousands of satellites being launched by private entities, spacecraft servicing missions as well as the possibility of exploitation of lunar and asteroid resources.³⁷ The existence of these new technologies therefore all challenge the definitional limits of the OST;³⁸ telling is the fact that when the OST was drafted, there were only 24 satellites, but as of 2022, there are more than 14,000 active satellites, and more than 100,000 satellites being planned for launch over the next decade.³⁹ Unfortunately, despite the lofty ambitions of States to supplement the OST with subsequent agreements and treaties, the OST's gaps remained unresolved till today. This is because multilateral treaty-making became unpopular as States were increasingly concerned with their own defence and security interests.⁴⁰ That said, it is unsurprising that many consider the OST as the panacea to regulate the use of ASAT missiles as it is the most ratified international space treaty with 113 States parties⁴¹ and is the basic framework on which international space law and the four other space treaties

³⁶ *Ibid.*

³⁷ *Ibid.*

³⁸ *Ibid.*

³⁹ United Nations Office for Outer Space Affairs ("UNOOSA"), *UN Office for Outer Space Affairs and United Kingdom launch new partnership on Registering Space Objects* (Dec. 1, 2022), <https://www.unoosa.org/oosa/en/informationfor/media/2022-unis-os-574.html>.

⁴⁰ Hitchens, *supra* note 10.

⁴¹ United Nations Treaty Collection, *Treaty on principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies*, <https://treaties.un.org/pages/showdetails.aspx?objid=0800000280128cbd> (last visited Dec. 1, 2023).

are built.⁴² With this background in mind, this paper now considers the specific OST provisions that are argued to be sufficient in regulating ASAT missiles.

A. Article I of the OST

The first relevant provision of the OST is Article I as commentators have argued that the use of ASAT missiles violate the “common heritage of mankind” principle (“CHOM principle”) therein. Article I provides that:

The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies. There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.

Commentators have argued that since ASAT missiles work by destroying satellites through explosions and simultaneously cause the accumulation of space debris, they risk and endanger the safety of other celestial bodies,

⁴² UNOOSA, *Annual Report 2022*, 29.

mankind and the universe.⁴³ Additionally, they consider the CHOM principle to be legally binding because it was recognised by States as a principle of space law in the 1963 Principles Declaration.⁴⁴ Further, they point to two other facts: first, Socialist States and States in the South rejected the proposal to remove the clause on CHOM from Article I to argue that the CHOM principle must therefore be legally binding rather than of mere political significance.⁴⁵ Secondly, they suggest that Professor Bin Cheng created the term “instant CIL” as “[s]tates were so quick to accept these two resolutions as reflective of customary international law.”⁴⁶

While States may have accepted the CHOM principle readily, treaty provisions do not constitute CIL rules in and of themselves,⁴⁷ and till date, the concept of instant CIL has yet to been recognised in international law.⁴⁸ The rationale behind this is that while a short amount of time is not a bar to the creation of a

⁴³ Daud & Harun, *supra* note 6, 229.

⁴⁴ United Nations Institute for Disarmament Research, *Common Security in Outer Space and International Law* (2006), 103.

⁴⁵ Byers & Boley, *supra* note 6, 305.

⁴⁶ *Ibid.*

⁴⁷ Peter Tomka, *Custom and the International Court of Justice*, 12 *Law and Practice of International Courts and Tribunals* (2013) 195, 207; ILC, *Identification of Customary International Law Third report on identification of customary international law*, by Sir Michael Wood, *Special Rapporteur* (2015) U.N. Doc. A/CN.4/4682, 108; Singapore, *Request of the Republic of Singapore to the International Law Commission's Request for Comments and Observations on the Draft Conclusions on Identification of Customary International Law*, https://legal.un.org/ilc/sessions/70/pdfs/english/icil_singapore.pdf (last visited Dec. 1, 2023), 3.

⁴⁸ ILC, *Draft conclusions on identification of customary international law, with commentaries*, https://legal.un.org/ilc/texts/instruments/english/commentaries/1_13_2018.pdf (2018), 135.

new rule in custom, some time must still pass for State practice to surface.⁴⁹ Apart from State practice, it is clear that rules of custom must be “of fundamentally norm-creating character”,⁵⁰ which means that any controversies as to the exact meaning and scope of the treaty provision must be resolved.⁵¹ That the ICJ explicitly formulated such a requirement suggests that custom identification “cannot do without such a requirement”.⁵²

The ordinary meaning of the CHOM principle does not shed light on what the principle entails as a potentially legally binding norm on States: the ordinary meanings of “common”, “heritage” and “mankind” are “belonging to or shared by two or more people, or things”,⁵³ “features belonging to the culture of a particular society”⁵⁴ and “the whole of the human race”,⁵⁵ respectively. Combined, “common heritage of mankind” simply means the features belonging to the whole of the human race. Neither is the OST’s *travaux préparatoires* conclusive because there were many differences of opinion as to the exact scope of Article I. Lebanon stated that it “would like to know the

⁴⁹ North Sea Continental Shelf Cases (F.R.G. v. Den.) (F.R.G. v. Neth.) 1969 I.C.J. Rep. 3 [hereinafter North Sea], ¶72 .

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² *Ibid.*

⁵³ Cambridge Dictionary, *Common*, <https://dictionary.cambridge.org/dictionary/english/common> (last visited Dec. 1, 2023).

⁵⁴ Cambridge Dictionary, *Heritage*, <https://dictionary.cambridge.org/dictionary/english/heritage> (last visited Dec. 1, 2023).

⁵⁵ Cambridge Dictionary, *Mankind*, <https://dictionary.cambridge.org/dictionary/english/mankind> (last visited Dec. 1, 2023).

precise meaning [of Article I of the OST]”.⁵⁶ Sharing these concerns, the US stated that the words “equal conditions” were broad and sweeping, and “might impose obligations that [s]tates could not properly assume”.⁵⁷ Additionally, the phrase “without discrimination of any kind” was redundant,⁵⁸ of which Romania and the USSR disagreed with.⁵⁹ Brazil and the UK expressed similar concerns, and said that it was necessary for the US and USSR drafts to be made clearer,⁶⁰ and that it would be “useful to know what the legal meaning was to be attributed to [the CHOM principle]”.⁶¹ Likewise, India expressed doubts over whether Article I laid down a legal obligation.⁶² All things considered, Article I is not norm-creating in nature and cannot cover the use of ASAT missiles.

B. Article IV (paragraph 1) of the OST

Other than Article I of the OST, commentators have argued that ASAT missiles are prohibited weapons of mass destruction (“WMDs”) under Article IV of the OST,⁶³ which States that:

⁵⁶ United Nations Committee on the Peaceful Uses of Outer Space Legal Sub-Committee [hereinafter UNCOPOUS LSC], Summary Record of the Sixty-Third Meeting, U.N. GAOR, Fifth Sess. U.N. Doc. UN Doc A/AC.105/C.2/SR.63, 5.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ *Id.*, 6-7.

⁶⁰ *Id.*, 9.

⁶¹ *Ibid.*

⁶² *Id.*, 7.

⁶³ Murphy, *supra* note 8, 142-147.

States Parties to the Treaty undertake not to *place in orbit* around the earth any objects carrying nuclear weapons or any other kinds of WMDs, *install* such weapons on celestial bodies, or *station* such weapons in outer space in any other manner.
[emphasis added]

Although the OST and its *travaux préparatoires* do not define WMDs, the UNGA defines WMDs as “atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons, and any weapons developed in the future which might have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above”.⁶⁴ WMDs in outer space must therefore fulfil two requirements: first, they must be space weapons, and secondly, cause persistent, widespread and indiscriminate damage.⁶⁵

On the first criterion, there is no universally accepted definition of “space weapons”. Some definitions have been proposed: the Canadian Ambassador to the Conference on Disarmament said that relevant factors in determining whether an object is a space object include the description of the device, the intended effect of the device and method by which the effect is achieved.⁶⁶ On the other hand, Russia and China have defined “space weapon” in their Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the

⁶⁴ Prohibition of the development and manufacture of new types of weapons of mass destruction and new systems of such weapons, (1977) A/RES/32/84[B].

⁶⁵ United Nations Office for Disarmament Affairs, *Weapons of Mass Destruction*, <https://www.unrcpd.org/wmd/> (last visited Dec. 1, 2023).

⁶⁶ Sa'id Mosteshar, *Space Law and Weapons in Space*, <https://oxfordre.com/planetaryscience/display/10.1093/acrefore/9780190647926.001.0001/acrefore-9780190647926-e-74> (May 23, 2019).

Threat or Use of Force against Outer Space Objects (“PPWT”)⁶⁷ as “any device placed in outer space, based on any physical principle, specially produced or converted to eliminate, damage or disrupt normal function of objects in outer space, on the Earth or in its air, as well as to eliminate population, components of biosphere critical to human existence or inflict damage to them”.⁶⁸ “Placed” in turn means “orbit the Earth at least once or follows a section of such an orbit before leaving this orbit or is stationed on a permanent basis somewhere in outer space”.⁶⁹

These definitions all have one common factor: a space weapon must be “placed” or “stationed” in outer space, and therefore must operate entirely in outer space.⁷⁰ This is consistent with Article IV of the OST that requires WMDs to be placed, installed or stationed in orbit or outer space.⁷¹ Since an ASAT missile is not placed, installed or stationed in orbit or outer space, – being launched from Earth and does not remain in orbit – it is not prohibited by Article IV. This conclusion is further supported by the circumstances leading up to the conclusion of the OST. The OST was drafted in response to the Cold War arms race amidst disarmament efforts such as the 1963 Partial Test Ban Treaty

⁶⁷ Ministry of Foreign Affairs of the People’s Republic of China, *Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects* (June 16, 2014), https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zzjg_663340/jks_665232/kjfywj_665252/201406/t20140616_599726.html.

⁶⁸ *Id.*, art. I.

⁶⁹ *Ibid.*

⁷⁰ Boothby, *supra* note 8, 184.

⁷¹ OST, art. IV; Richard Gawin, *Space weapons or space arms control?* (2001) Proceedings of the American Philosophical Society, 145(3), 243–259.

(“PTBT”),⁷² of which States parties “undertake to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion ... in the atmosphere; beyond its limits, including outer space”.⁷³ Since the PTBT entered into force before the OST, the OST drafters had liberty to adopt the language of that treaty. Yet, the OST specifically prohibited nuclear weapons or WMDs that are “place[d] in orbit” or “station[ed] ... in outer space”, and not just “any” explosions. This suggests that Article IV was intended to prohibit not the launching of WMDs into outer void space, but their placement or stationing in orbit above the Earth which may serve as a terror or blackmail threat during peacetime.⁷⁴ Such situations existed during the Cold War arms race, such as the US’ Project BAMBI which was designed to release missiles from satellite platforms in orbit instead of the ground,⁷⁵ and the USSR’s idea of the fractional orbital bombardment system in the 1960s.⁷⁶ This involved the placement of nuclear bombs on orbital trajectories around the Earth that could descend onto terrestrial targets, which allows it to target any point on Earth and attack targets from any direction.⁷⁷

⁷² Treaty banning nuclear weapons tests in the atmosphere, in outer space and under water, (Aug. 5, 1963), <https://treaties.un.org/doc/Publication/UNTS/Volume%20480/volume-480-I-6964-English.pdf>.

⁷³ *Id.*, art. I.

⁷⁴ Michael Listner, *FOBS, MOBS and the reality of the Article IV nuclear weapons prohibition* (Oct. 17, 2022), <https://www.thespacereview.com/article/4466/1#:~:text=Another%20concept%20explored%20b%20y%20the,before%20it%20delivered%20its%20payload.>

⁷⁵ Alexander Flax, *Ballistic Missile Defence: Concepts and History*, Daedalus, Spring, 1985, Vol. 114, No. 2, Weapons in Space, Vol. I: Concepts and Technologies (Spring, 1985) 33, 49.

⁷⁶ Listner, *supra* note 81.

⁷⁷ *Ibid.*

C. Article IV (paragraph 2) of the OST

Commentators have another string to their bow under Article IV: the use of ASAT missiles violates the requirement that outer space must only be used for peaceful purposes in Article IV.⁷⁸ This is found in paragraph two of Article IV, which States that:

The *moon and other celestial bodies* shall be used by all States Parties to the Treaty *exclusively for peaceful purposes*. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.
[emphasis added]

As “peaceful purposes” is not defined in the OST and its *travaux préparatoires*, two main contrasting interpretations of “peaceful purposes” have emerged: “non-military” and “non-aggressive”.⁷⁹ Under the interpretation of “non-military”, all military activities – except those mentioned in Article IV such as

⁷⁸ Daud & Harun, *supra* note 6, 230.

⁷⁹ Setsuko Aoki, *Law and military uses of outer space*, in ROUTLEDGE HANDBOOK OF SPACE LAW (Jakhu, Dempsey, eds., 2016), 202-203; Bin Cheng, *Definitional Issues in Space Law: the ‘Peaceful Use’ of Outer Space, including the Moon and other Celestial Bodies*, in STUDIES IN INTERNATIONAL SPACE LAW (Oxford University Press, 1997), 512-522; Manfred Lachs, *Chapter IX Peaceful Use – Arms and Armament*, in THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING, BY MANFRED LACHS, REISSUED ON THE OCCASION OF THE 50TH ANNIVERSARY OF THE INTERNATIONAL INSTITUTE OF SPACE LAW (Masson-Zwaan, Hobe, eds., 2010), 97.

the “use of military personnel for scientific research” or “use of military or facility necessary for peaceful exploration” are strictly prohibited.⁸⁰ Whereas “non-aggressive” prohibits the “use of armed force by [a] State against the sovereignty, territorial integrity or political independence of another State, or in any other manner inconsistent with the Charter of the United Nations (“UN Charter”)”,⁸¹ and must be reach a minimum threshold in terms of gravity.⁸² Some examples of acts of aggression include the invasion or attack by the armed forces of a state of the territory of another state, and bombardment by the armed forces or the use of any weapons by a state against the territory of another state.⁸³

Regardless of which interpretation of “peaceful purposes” is adopted to interpret Article IV of the OST, the use of ASAT missiles is not covered by Article IV because as recognised by Professor Bin Cheng, only the moon and celestial bodies must be used exclusively for peaceful purposes, and this does not include void outer space.⁸⁴ “Void outer space” in turn refers to the space between celestial bodies,⁸⁵ which is where ASAT missiles are used. Although “outer space” includes celestial bodies, when only “celestial bodies” are referred to in the treaty, the norm in question does not extend to space

⁸⁰ OST, art. IV; Cheng, *id*, 521.

⁸¹ *Ibid*.

⁸² Definition of Aggression (1974) U.N. Doc. A/RES/3314.

⁸³ *Ibid*.

⁸⁴ Bin Cheng, *Properly Speaking, Only Celestial Bodies Have Been Reserved for Use Exclusively for Peaceful (Non-Military) Purposes, but Not Outer Void Space*, (2000) International Law Studies vol. 75, 81.

⁸⁵ Cheng, *supra* note 86, 518.

generally,⁸⁶ as demonstrated by the OST's *travaux préparatoires*. India proposed to extend the application of “exclusively for peaceful purposes” to all areas of outer space, but this was rejected by the US and USSR as neither wanted a fixed definition of peaceful uses that extended to all of outer space as this would limit future uses of space for both States.⁸⁷

D. Article IX of the OST

Other than Articles I and IV of the OST, commentators have also argued that Article IX of the OST regulates the use of ASAT missiles by imposing a duty on States to consult others prior to using their ASAT missiles.⁸⁸ Article IX States:

If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment.

Despite the existence of Article IX, no State has ever consulted other States under Article IX before the testing of their ASAT missiles despite having good

⁸⁶ Aoki, *supra* note 86, 104.

⁸⁷ Stephan Hobe, *The Meaning of “Peaceful Purposes” In Article IV of the Outer Space Treaty*, 40 *Annals Air & Space Law* 9 (2015), 14.

⁸⁸ Michael Minerio, *FY-1C and USA-193 ASAT Intercepts: An Assessment of Legal Obligations Under Article IX of the Outer Space Treaty*, 34 *Journal of Space Law*, (2008) 321.

reason to believe that their activities would result in harmful interference to other States parties' activities.⁸⁹ This is because consultations regarding ASAT activities are likely considered by States to not be "appropriate" as the opponent State's space activity does not constitute a "peaceful exploration and use of outer space" as mandated by Article IX.⁹⁰ One example would be where a State decides to use its laser beam to temporarily blind the satellite of the State conducting espionage.⁹¹ Another example would likely be situations where States decide to undertake covert ASAT missile operations for the "surprise" element on their enemies.

This paper submits that the wider international community's failure to react over time in not calling for States conducting ASAT tests to consult others under Article IX amounts to evidence of acceptance that there is no duty to consult prior to the use of ASAT missiles as law (*opinio juris*) because these potentially affected States were in a position to react to the ASAT tests and the circumstances called for their reaction,⁹² but they opted not to invoke their right to be consulted or request for consultations under Article IX. A possible reason why States do not protest the use or testing of ASAT missiles is they do not wish to preclude their own future use of ASAT missiles. This is demonstrated by the State responses to the two ASAT tests that had resulted in the most

⁸⁹ Michael Listner, *The Paradox of Article IX and National Security Space Activities* (2022) Aether: A Journal of Strategic Airpower & Spacepower 21 Vol 1 No 4, 21-34, 21.

⁹⁰ Hitoshi Nasu, *Targeting a Satellite: Contrasting Considerations between the Jus ad Bellum and the Jus in Bello*, 99 Int'l Stud. 142 (2022), 152.

⁹¹ This is a scenario modified based on the 2023 Manfred Lachs Space Law Moot Court Competition moot problem.

⁹² ILC, *supra* note 54, conclusion 10(3); Fisheries Case, Judgment, 1951 I.C.J. Rep. 116 [hereinafter Fisheries Case], 139; Listner, *id.*, 29-30; ILC, *Fifth report on identification of customary international law by Michael Wood, Special Rapporteur*, (2018) U.N. Doc. A/CN.4/717, 34-36.

amount of space debris: Russia's 2021 test and China's 2007 test. The debris population of Russia's and China's tests (along with the 2009 non-deliberate collision of Cosmos 2251 with an Iridium satellite) make up 15 percent of debris catalogued in all near-Earth orbits,⁹³ and the Russian and Chinese tests have caused 20 percent of all conjunction warnings⁹⁴ in 2022.⁹⁵ In the aftermath of Russia's 2021 ASAT test, the EU,⁹⁶ Japan,⁹⁷ Germany,⁹⁸ Australia,⁹⁹ France,¹⁰⁰

⁹³ Theresa Hitchens, *Debris from ASAT tests creating 'bad neighborhood' in low Earth orbit: Analyst*, BREAKING DEFENSE (June 16, 2023), <https://breakingdefense.com/2023/06/debris-from-asat-tests-creating-bad-neighborhood-in-low-earth-orbit-analyst/>.

⁹⁴ Conjunction warnings are warnings issued when two or more space objects are predicted to collide with each other; see *ibid.*

⁹⁵ *Ibid.*

⁹⁶ European Council, *Statement by the High Representative of the Union for Foreign Affairs and Security Policy on behalf of the EU on the Russian anti-satellite test on 15 November 2021* (Nov. 19, 2021) <https://www.consilium.europa.eu/en/press/press-releases/2021/11/19/statement-by-the-high-representative-of-the-union-for-foreign-affairs-and-security-policy-on-behalf-of-the-eu-on-the-russian-anti-satellite-test-on-15-november-2021/>.

⁹⁷ Ministry of Foreign Affairs of Japan, *An anti-satellite test conducted by the Government of Russia (Statement by Press Secretary Yoshida Tomoyuki)*, (Nov. 18, 2021), https://www.mofa.go.jp/press/release/press3e_000270.html.

⁹⁸ Federal Foreign Office, *The Federal Foreign Office on the destructive test of a ground-based anti-satellite missile by Russia* (Nov. 16, 2021), <https://www.auswaertiges-amt.de/en/newsroom/news/ffo-destructive-test-missile-russia/2496412>.

⁹⁹ Australian Government, *Russia Anti-Satellite Weapons Testing* (Nov. 17, 2021) <https://www.minister.defence.gov.au/media-releases/2021-11-17/russian-anti-satellite-weapons-testing>.

¹⁰⁰ Florence Parly, *L'Espace est un bien commun, celui des 7,7 milliards d'habitants de notre planète. Les saccageurs de l'Espace ont une responsabilité accablante en générant des débris qui polluent et mettent nos astronautes et satellites en danger*. (Nov. 16, 2021) https://twitter.com/florence_parly/status/1460586002230263822.

South Korea¹⁰¹ and the UK¹⁰² called the test “irresponsible” and “provocative”, but no state commented on the legality of the testing and use of ASAT missiles. The same can be said of the other major spacefaring States: the US merely called the test “dangerous” and “Russia’s claims of opposing the weapons and weaponization of space [were] disingenuous and hypocritical”,¹⁰³ while China conspicuously remained silent regarding the test.¹⁰⁴

The responses to China’s destruction of its non-operational weather satellite (FY-1C) in 2007 that resulted in more than 3,000 debris pieces, the largest ever tracked, which would likely remain in LEO for decades¹⁰⁵ were similar. China first “refused to comment on a [US] statement that [it] had fired its [ASAT missile]”,¹⁰⁶ before “stress[ing] that [it] ha[d] always advocated the peaceful use of space and opposed the proliferation of weapons in space and an arms race in space”.¹⁰⁷ No State explicitly mentioned that the test was in

¹⁰¹ Park Si-soo, *China silent, South Korea ‘concerned’ over debris created by Russia’s anti-satellite missile test* (Nov. 17, 2021), SPACE NEWS, <https://spacenews.com/china-silent-south-korea-concerned-over-debris-created-by-russias-anti-satellite-missile-test/>.

¹⁰² Ministry of Defence, *Russia have conducted an anti-satellite missile test. Defence Secretary @BWallaceMP has condemned this activity*, <https://twitter.com/DefenceHQ/status/1460342115158872064> (last visited Dec. 1, 2023).

¹⁰³ Luis Martinez & Conor Finnegan, *US condemns Russian anti-satellite test it says created ‘dangerous’ debris field*, ABC NEWS (Nov. 16, 2021, 8:10AM), <https://abcnews.go.com/Politics/us-condemns-dangerous-russian-anti-satellite-test/story?id=81181090>.

¹⁰⁴ Park, *supra* note 109.

¹⁰⁵ Brian Weeden, *2007 Chinese Anti-Satellite Test Fact Sheet* (Nov. 23, 2010), https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf.

¹⁰⁶ *China confirms anti-satellite missile test*, THE GUARDIAN (Jan. 23, 2007), <https://www.theguardian.com/science/2007/jan/23/spaceexploration.china>.

¹⁰⁷ *Ibid.*

contravention of international laws.¹⁰⁸ Japan, Australia, US, China, and the UK stated that they were concerned about the “lack of consultation and believe[d] that this development of this technology and the manner in which this test was conducted is inconsistent with the spirit of China’s statements to the UN and other bodies on the military use of space”.¹⁰⁹ Despite the consultation requirement being explicitly mentioned in Article IX, no State referred to it.¹¹⁰

IV. The safeguards in regulating the use of ASAT missiles are instead found in CIL

This section explains why CIL is a far better candidate for regulating the use of ASAT missiles. CIL applies to outer space by way of Article III of the OST, which States that:

States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, *in accordance with international law*, including the *UN Charter*, in the interest of maintaining international peace and security and promoting international co-operation and understanding. [emphasis added]

¹⁰⁸ *Concerns over China’s missile test*, BBC NEWS (Jan. 19, 2007), <http://news.bbc.co.uk/2/hi/asia-pacific/6276543.stm>. Cf with China’s announcement that it “had formally notified the US, Japan and other countries about the test, the Chinese foreign ministry spokesman Liu Jianchao told a news conference”, *ibid*.

¹⁰⁹ *Ibid*.

¹¹⁰ *Ibid*.

Moreover, the well-recognised maxim *lex specialis derogat legi generali*,¹¹¹ which is well-recognised in international law,¹¹² provides that general law remains valid and applicable and is “fully applicable in the situations not provided for by the relevant special law”,¹¹³ but the special rule does not “extinguish the relevant general law”.¹¹⁴ Accordingly, where space law does not provide for applicable principles or is open to conflicting interpretations, CIL can be relied on to find answers.¹¹⁵

In applying the relevant CIL rules to outer space, this section – as alluded to in the introduction – uses analogical reasoning, which is widely seen in international law.¹¹⁶ The rationale for this is systematic integration as

¹¹¹ Whenever two or more norms deal with the same subject matter, priority should be given to the norm that is more specific. See ILC, *Conclusions of the work of the Study Group on the Fragmentation of International Law: Difficulties arising from the Diversification and Expansion of International Law* (2006), https://legal.un.org/ilc/texts/instruments/english/draft_articles/1_9_2006.pdf, 178.

¹¹² Military and Paramilitary Activities in and against Nicaragua (Nicar. v. U.S.), Judgment, 1986 I.C.J. Rep. 14 [hereinafter Nicaragua], ¶274; Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. Rep. 226 [hereinafter Nuclear Weapons], ¶25; ILC, Draft Articles on Responsibility of States for Internationally Wrongful Acts with Commentaries, Rep. on the Work of Its Fifty-Third Session, U.N. GAOR, Fifty-Sixth Sess., Supp. (No. 10) (2001), art. 55.

¹¹³ ILC, *supra* note 119.

¹¹⁴ ILC, *ibid*; Nicaragua, *supra* note 120, ¶179.

¹¹⁵ Frans G von der Dunk, *Customary International Law and Outer Space*, in REEXAMINING CUSTOMARY INTERNATIONAL LAW (Brian D. Lepard ed., 2017), 353-354; Ross Brown, *Conflict on the Final Frontier: Deficiencies in the Law of Space Conflict Below Armed Attack, and How to Remedy Them* (2019) GJIL vol. 51, 37.

¹¹⁶ Fernando Lusa Bordin, *Analogy in International Legal Reasoning*, in THE ANALOGY BETWEEN STATES AND INTERNATIONAL ORGANISATIONS (Cambridge University Press, 2018), 15-48, 15; citing Certain Matters of Mutual Assistance in Criminal Matters (Djib. v. Fr.) 2008 I.C.J. Rep. 177, ¶194; Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosn. & Herz. v. Serb. & Montenegro) 2007 I.C.J. Rep.

international law comprises many different areas that one can barely say that it is consistent;¹¹⁷ reference to other areas of international law thus strives towards the unification to give rise to a single set of compatible obligations for States. An example of analogical reasoning can be found in the Permanent Court of International Justice (“PCIJ”)’s *SS Wimbledon*.¹¹⁸ The case involved a UK ship, named the Wimbledon, that was prevented by Germany from passing through the Kiel Canal during the Russo-Polish War.¹¹⁹ The issue before the PCIJ therefore concerned Germany’s obligations under the Treaty of Versailles regarding the particular status of Kiel Canal, and both litigating States relied extensively on the practice regarding Suez and Panama Canals. The PCIJ admitted that the rules concerning the various canals were different but continued to examine the associated practice and attributed great weight to them as “illustrations of the general opinion”.¹²⁰

Moreover, since the majority of CIL rules are primarily designed for application in a terrestrial context, this section will highlight the nuances of the outer space

¶¶419-420; Military and Paramilitary Activities in and against Nicaragua (Nicar. v. U.S.) (Preliminary Objections) 1984 I.C.J. Rep. 275, ¶63; Land and Maritime Boundary between Cameroon and Nigeria (Preliminary Objections) 1988 I.C.J. Rep. 275, ¶30; Fisheries Jurisdiction (Spain v. Can.) (Preliminary Objections) 1988 I.C.J. Rep. 432, ¶46.

¹¹⁷ ILC, *Risks ensuing from Fragmentation of International Law*, GAOR, Fifty-Fifth Session, Supp. No. 10 (A/55/10), Annex 321.

¹¹⁸ The *SS Wimbledon* (U.K. v. Ger.), Judgment, 1923 P.C.I.J. Ser. A no. 1.

¹¹⁹ *Ibid.*

¹²⁰ Martinis Paparinskis, *Analogies and other Regimes of International Law*, in THE FOUNDATIONS OF INTERNATIONAL LAW INVESTMENT LAW: BRINGING THEORY INTO PRACTICE (Douglas, et. al, eds., 2014), 73-107, 79. Other examples can also be found in the ICJ’s jurisprudence, such as in the *Continental Shelf Case*, the *Fisheries Case*, and *North Sea Continental Shelf*. See *Continental Shelf* (Tunis. v. Libyan Arab Jamahiriya) 1982 I.C.J. Rep. 18, ¶38, ¶70; *Fisheries Case*, *supra* note 99, 133; *North Sea*, *supra* note 55, 181 (dissenting opinion by Tanaka, J.)

environment and address how the traditional rules of CIL may be adapted to suit the outer space context. This is to be contrasted from regime transplantation, where “in tackling an international problem or externality relating to space activities, an existing regime governing another field of human activities is proposed to be transplanted, *mutatis mutandis*, to govern the space activity”.¹²¹ The latter approach “fails to account for the complexity of the international law-making process, proposing instead to simply transplant a legal regime onto an entirely different set of interactions.”¹²²

A. International environmental law

The first area that will be considered by this paper is international environmental law, which is applicable both during peacetime and military operations. An example is the US’s 2008 Operation Burnt Frost, which was to destroy an errant spy satellite loaded with toxic hydrazine fuel.¹²³ This was done to prevent toxic debris from the satellite from falling onto Earth.¹²⁴ Another example could be the use of an ASAT missile to destroy a satellite that is tumbling out of control towards a constellation of Internet services or

¹²¹ Gershon Hasin, *From “Space Law” to “Space Governance”: A Policy-Oriented Perspective on International Law and Outer Space Activities*, (2023) Harvard Journal of International Law Vol. 64, No. 2, 390-391.

¹²² *Ibid.*

¹²³ Jim Wolf, *US Satellite shootdown debris said gone from space*, REUTERS, <https://www.reuters.com/article/us-space-usa-china-idUSTRE51Q2Q220090227> (last visited Dec. 1, 2023).

¹²⁴ Dwayne A. Day, *Burning Frost, the view from the ground: shooting down a spy satellite in 2008*, SPACE REVIEW (June 21, 2021), <https://thespacereview.com/article/4198/1>.

navigational satellites.¹²⁵ The cornerstone of international environmental law is to not cause damage to the environment of other States or areas beyond national jurisdiction.¹²⁶ This principle originates from *Trail Smelter*,¹²⁷ where the tribunal stated that no State has the right to use or allow the use of its territory to cause injury to another State.¹²⁸ The no-harm principle has several corollary principles, which are considered below.

(1) Duty to exercise due diligence

States discharge their obligations to prevent harm by exercising due diligence. This involves States undertaking appropriate measures and implementing best efforts to minimise the risk of harm to other States.¹²⁹ The due diligence obligation comprises three components: (a) the duty to conduct environmental impact assessments (“EIA”); (b) the duty to notify affected States and the right

¹²⁵ This scenario is based on the 2023 Manfred Lachs Space Law Moot Court Competition Agreed Statement of Facts, where a state used its ASAT missile to destroy a satellite that had “ceased responding to all commands” and its laser beam remained in an active state and had “a small possibility of spontaneous activation”.

¹²⁶ Bruce A Harlow & Michael E McGregor, *International Environmental Law Considerations During Military Operations Other Than War*, International Law Studies – Volume 69, 315-332, 315.

¹²⁷ *Trail Smelter Arbitration Case* (U.S. v. Can.), RIAA, vol. III (1938, 1941), 1905.

¹²⁸ *Id.*, 1907.

¹²⁹ ILC, “Draft articles on Prevention of Transboundary Harm from Hazardous Activities, with commentaries 2001” U.N. Doc A/56/10 [hereinafter Articles on Transboundary Harm with commentaries], Part 2, ¶7; *Pulp Mills on the River Uruguay* (Arg. v. Uru.), Judgment, 2010 I.C.J. Rep. 14 [hereinafter *Pulp Mills*], ¶197.

of affected States to be notified; and (c) the duty of the acting State to undertake consultations with affected States.¹³⁰

(a) *The duty to conduct EIAs*

Before the use of their ASAT missiles, States should conduct an EIA to consider all stages of the life cycle of their ASAT missile and create debris mitigation plans to minimise the amount of debris generated during each stage.¹³¹ An EIA involves the identification of the environmental impacts of a planned activity, and proposal of measures to mitigate the effects of the activity so as to reduce the negative impacts caused to the environment.¹³² An EIA is therefore intended to provide decision-makers with details on the environmental impacts of the proposed activity, and decide whether to go ahead with the activity.¹³³ Therefore, conducting such assessments would enable States to avoid using their ASAT missiles “in the direction of, or in close proximity to, another State’s satellite” and “avoid the purposeful creation of long-lived debris”.¹³⁴

The concept of EIA is not unfamiliar in the outer space context because some spacefaring States have required mandatory provision of information assessing

¹³⁰ Xue Hanqin, *TRANSBOUNDARY DAMAGE IN INTERNATIONAL LAW* (1st ed, Cambridge University Press, 2003), 165-175.

¹³¹ Diego Zannoni, *Out of sight, out of mind? The proliferation of space debris and international law*, (2022) *Leiden J. Int’l Law* vol. 35 Issue 2, 295-314, 303-304.

¹³² Astrid Epiney, *Environmental Impact Assessment*, in (2009) *Max Planck Encyclopaedia of Public International Law* ¶1.

¹³³ *Id.*, ¶2.

¹³⁴ U.S., *National Submission to the United Nations Secretary General Pursuant to UN General Assembly Resolution 75/36 Reducing space threats through norms, rules and principles of responsible behaviours*, <https://documents.unoda.org/wp-content/uploads/2022/05/04292021-US-National-Submission-for-UNGA-Resolution-75.36.pdf> (last visited Dec. 1, 2023).

the possible environmental consequences of proposed space activities in their domestic laws. An example is the US's 1969 National Environmental Policy Act¹³⁵ that requires the determination of the possible impacts of planned activities, the preparation and submission of documents relating to the planned activity's purpose, and whether there are other possible alternatives to achieve the same purpose.¹³⁶ The US also has Orbital Debris Mitigation Standard Practices, which are a set of guidelines to mitigate the creation of orbital debris. Programmes and plans must plan for disposal procedures for a structure at the end of mission life to minimise impact on future space operations.¹³⁷ Similarly, the Russian Statute on Licensing Space Operations mandates that private entities must be licensed prior to the conduct of space operations; in order to obtain licences, such entities must provide documents concerning the safety and environmental impacts of their space operations.¹³⁸ Similarly, in Australia, launch permit applicants are also obligated to create environmental plans for the launch and any return of the space object,¹³⁹ and obtain all necessary environmental approvals.¹⁴⁰ EIA obligations can also be found in soft law

¹³⁵ 43 U.S. Code § 1638.

¹³⁶ Lotta Viikari, *Environmental Impact Assessment in the Space Sector*, in THEORY AND PRACTICE OF TRANSBOUNDARY ENVIRONMENTAL IMPACT ASSESSMENT (Bastmeijer & Koivurova, eds., Brill, 2008), 275.

¹³⁷ U.S., *Orbital Debris Mitigation Standard Practices, November 2019 Update*, https://orbitaldebris.jsc.nasa.gov/library/usg_orbital_debris_mitigation_standard_practices_november_2019.pdf (last visited Dec. 1, 2023).

¹³⁸ Viikari, *supra* note 144, 276; UNOOSA, *Selected Examples of National Laws Governing Space Activities: Russian Federation*, https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/russian_federation/decree_104_1996E.html (last visited Dec. 1, 2023).

¹³⁹ Viikari, *supra* note 144, 276.

¹⁴⁰ Australia Federal Register of Legislation, *Space (Launches and Returns) Act 2018*, <https://www.legislation.gov.au/Details/C2021C00394> (last visited Dec. 1, 2023).

instruments created by international and regional working groups: both the Inter-Agency Space Debris Coordination Committee¹⁴¹ (“IADC”)’s Space Debris Mitigation Guidelines¹⁴² and European Code of Conduct for Space Debris Mitigation¹⁴³ recommend that “[i]n order to manage the implementation of space debris mitigation measures [...] a feasible Space Debris Mitigation Plan be established and documented for each program and project.”¹⁴⁴ This Mitigation Plan should include 1) ‘management plan addressing space debris mitigation activities’; 2) ‘plan for the assessment and mitigation of risks related to space debris, including applicable standards’; 3) ‘measures minimising the hazard related to malfunctions that have a potential for generating space debris’; 4) ‘plan for disposal of the space system at end of mission’; 5) ‘[j]ustification

¹⁴¹ The IADC was founded in 1993 and is intended to exchange information on space debris research activities and to facilitate cooperation in this area, to review ongoing cooperative activities and to identify options for debris mitigation. In 2007, the IADC’s guidelines were approved by 63 UNCOPUOS Scientific & Technical Subcommittee members as voluntary high level mitigation measures and served as the foundation for the UN’s Space Debris Mitigation Guidelines. IADC, *What’s IADC*, https://iadc-home.org/what_iadc (last visited Dec. 1, 2023).

¹⁴² IADC, *IADC Space Debris Mitigation Guidelines* (March, 2020), <https://orbitaldebris.jsc.nasa.gov/library/iadc-space-debris-guidelines-revision-2.pdf>.

¹⁴³ *European Code of Conduct for Space Debris Mitigation* (June 28, 2004), <https://www.unoosa.org/documents/pdf/spacelaw/sd/2004-B5-10.pdf> (last visited Dec. 1, 2023). The European Code of Conduct – signed in 2006 – recommends that “[e]ach space project should establish a space debris mitigation plan.” The plan “should contain as a minimum: a) the list of all applicable safety regulations, b) the functions and responsibilities of the Space Debris Manager for each phase of the project, c) the management plan of space debris activities, d) the plan for assessment and mitigation of risks related to space debris, e) the measures minimising the hazard related to malfunctions which have a potential for generating space debris, f) the plan for the space system disposal, g) justification of choice and selection when several possibilities exist, h) contents and justifications for non-compliance with this Code of Conduct and associated consequences, i) the [suggested] compliance matrix given in, [and] j) the risk assessment analysis concerning space debris.”

¹⁴⁴ *Id.*, 9.

of choice and selection when several possibilities exist’; and 6) ‘[c]ompliance matrix addressing the recommendations of these Guidelines.’¹⁴⁵

(b) *The duty to notify and the right to be notified*

Once an EIA is completed and reveals the risk of harm to another state, the acting state has the duty to notify other States.¹⁴⁶ There are two aspects to this obligation: first, the acting state is expected to inform potentially affected States in a timely manner, and secondly, when damage is foreseeable,¹⁴⁷ the acting state should notify the affected state of the potential or actual injurious consequences so as to prevent or minimize any damage to the greatest extent possible.¹⁴⁸

States should engage in exchanges of necessary information such as the location and nature of the ASAT activity.¹⁴⁹ They should also notify all affected States in a timely manner, and in so doing, provide information such as the need to conduct anti-collision avoidance measures, and predicted conjunctions between space debris caused and other States’ space objects, which is consistent

¹⁴⁵ *Ibid.*

¹⁴⁶ Xue, *supra* note 138, 168.

¹⁴⁷ *Ibid.*

¹⁴⁸ *Ibid.*

¹⁴⁹ See *The Artemis Accords, Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets and Asteroids for Peaceful Purposes* [hereinafter Artemis Accords], 5; NASA, *Artemis Accords*, <https://www.nasa.gov/artemis-accords/> (last visited Dec. 1, 2023). The Artemis Accords was led by the US along with seven other founding member nations. The accords “reinforce the commitment by the US and signatory nations to the Registration Convention, the Rescue and Return Agreement, as well as best practices and norms of responsible behaviour that NASA and its partners support, including the public release of scientific data.”

with those required by the Artemis Accords, and EU's Draft International Code of Conduct for Outer Space Activities.¹⁵⁰ These information would enable affected States to assess the probability of collisions and making avoidance manoeuvre decisions.

(c) *The duty to undertake consultations and negotiations*

The final component of the due diligence obligation requires the acting State to consult with the affected State about the planned activity.¹⁵¹ The difference between the customary duty to undertake consultations and the consultation obligation in Article IX of the OST is that the latter confers a discretion on States to decide if they "have reason to believe" that their activity would cause potentially harmful interference, whereas the former is a compulsory obligation. The duty to undertake consultations has been recognised by many tribunals including in the *Lake Lanoux* case¹⁵² where the tribunal called on the parties concerned to pursue consultation as far as possible with a view to reaching an agreement.¹⁵³ States should consult with one another, at the request of either the affected State or State conducting the activity, to come to mutually agreeable solutions to prevent serious transboundary harm and reduce the risk

¹⁵⁰ EU, *Draft International Code of Conduct for Outer Space Activities* (2014), 7; Nivedita Raju, *A Proposal for a Ban on Destructive ASAT Testing: A Role for the EU*, in Non-Proliferation and Disarmament Papers No. 74 (Apr. 2021). While the EU Code of Conduct has been abandoned due to Russia's hardening of its position on the Code in the aftermath of the events in Ukraine, led Brazil, India, China and South Africa in expressing major dissent, the EU Code of Conduct remains relevant in outer space activities as it received input from over 80 countries.

¹⁵¹ Xue, *supra* note 138, 173.

¹⁵² *Lake Lanoux* case, (1957) 24 ILR, 101.

¹⁵³ *Id.*, 133.

thereof.¹⁵⁴ Organising such consultation sessions could potentially reveal less-harmful solutions (as opposed to ASAT missiles) to remove the threat posed by out-of-control satellites such as drag devices,¹⁵⁵ transfer vehicles that deorbit spacecraft,¹⁵⁶ or space servicing vehicles.¹⁵⁷

¹⁵⁴ Articles on Transboundary Harm with commentaries, *supra* note 137, 160-161. States should also consider factors and circumstances including: “(a) the degree of risk of significant transboundary harm and of the availability of means of preventing such harm, or minimizing the risk thereof or repairing the harm; (b) the importance of the activity, taking into account its overall advantages of a social, economic and technical character for the State of origin in relation to the potential harm for the State likely to be affected; (c) the risk of significant harm to the environment and the availability of means of preventing such harm, or minimizing the risk thereof or restoring the environment; (d) the degree to which the State of origin and, as appropriate, the State likely to be affected are prepared to contribute to the costs of prevention; (e) the economic viability of the activity in relation to the costs of prevention and to the possibility of carrying out the activity elsewhere or by other means or replacing it with an alternative activity; (f) the standards of prevention which the State likely to be affected applies to the same or comparable activities and the standards applied in comparable regional or international practice.”

¹⁵⁵ “Drag devices represent the most common deorbit device for satellites orbiting in low-Earth orbit. They present an advantage due to simplicity and by not occupying large volumes while stowed. ... [T]his technology has been implemented in several small spacecraft missions, and several companies and institutions are developing prototypes that are increasingly more mature, providing solutions to the space debris problem for missions that do not have resources for an active system.” NASA, *Deorbit Systems*, <https://www.nasa.gov/smallsat-institute/sst-soa/deorbit-systems/#13.2.1> (last visited Dec. 1, 2023).

¹⁵⁶ An example is NASA’s Project Freebird, which is a “space-based orbital transfer vehicle designed to repair and deorbit orbital assets”. Another example is the ESA’s ATGV-5, an automated transfer vehicle. NASA, *Project Freebird: An orbital transfer vehicle*, <https://ntrs.nasa.gov/citations/19950006324> (last visited Dec. 1, 2023); ESA, *ISS: ATV-5 (Automated Transfer Vehicle-5, Georges Lemaître)* (Jan. 26, 2015), <https://www.eoportal.org/satellite-missions/iss-atv-5#spacecraft>.

¹⁵⁷ An example is the “ESA’s proposed e.Deorbit mission to take down a derelict satellite ... as a new space servicing vehicle to perform a variety of different roles in orbit, including the refuelling, refurbishing or reboosting of satellites already in orbit.” ESA, *Space Servicing Vehicle*, https://www.esa.int/Space_Safety/Space_Servicing_Vehicle, (last visited Dec. 1, 2023).

(2) Precautionary principle

Another related principle to the no-harm principle is the precautionary principle, which provides that where there are risks of causing significant and/or irreparable harm, the absence of scientific certainty ought not to be used as a justification for delaying solutions to prevent harm to the environment.¹⁵⁸ While there has been disagreement as to whether the precautionary approach is part of CIL,¹⁵⁹ it is gaining recognition at the bare minimum¹⁶⁰ because international tribunals – such as the European Commission,¹⁶¹ International Tribunal for the Law of the Sea (“ITLOS”),¹⁶² and the ICJ¹⁶³ – have recognised the existence of the principle. Nevertheless, there are two main questions which are considered “unresolved” when applying the precautionary approach to the outer space context: first, how much pollution must be generated before the

¹⁵⁸ (1992) U.N. Doc A/CONF.151/26 (vol. I); Philippe Sands, et. al, *PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW*, (4th ed, Cambridge University Press, 2018), 230.

¹⁵⁹ *Ibid.*

¹⁶⁰ *Id.*, 233-239.

¹⁶¹ Case C-180/96 (U.K. v. Commission) 1998 ECR I-2265, ¶¶99-100; Case T-70/99, *Alpharma Inc. v. Council of the EU*, Order of 30 June 1999 (Interim Measures) 1999 ECR II-2027.

¹⁶² *Southern Bluefin Tuna Cases* (N.Z. v. Japan), Order on provisional measures, ¶77; *id.*, ¶8 (separate opinion by Treves, J.); *id.*, ¶15 (separate opinion by Lang, J.); *Responsibilities and Obligations of States sponsoring persons and entities with respect to activities in the Area* (Request for Advisory Opinion submitted to the Seabed Disputes Chamber), (2011) ITLOS Rep. 2011, 10, ¶¶121-127, ¶131, ¶135.

¹⁶³ *Pulp Mills*, *supra* note 137, 164; *Gabcíkovo-Nagymaros Project* (Hung./Slovk.), Judgment, 1997 I.C.J. Rep. 7 [hereinafter *Gabcíkovo-Nagymaros*], ¶97, ¶113; *Gabcíkovo-Nagymaros*, *id.*, 152 (separate opinion by Koroma, J.); *Nuclear Weapons* *supra* note 120, 502 (dissenting opinion by Weeramantry, J.); *Request for an Examination of the Situation in accordance with Paragraph 63 of the Court’s 1974 Judgment in the case concerning Nuclear Tests* (N.Z. v. Fr.) [hereinafter *Request for an Examination*], CR/95/20, 71-2, 75; *Request for an Examination*, Order, 1995 I.C.J. Rep. 342, 412 (dissenting opinion by Palmer, J.).

obligation of States to adopt the precautionary approach is triggered,¹⁶⁴ and secondly, what the precautionary approach in space entails.¹⁶⁵

On the first question on what constitutes “serious or irreversible damage”, the use of ASAT missiles are capable of causing such damage to the space environment given the large amounts of debris generated with each use of an ASAT missile, as considered above.¹⁶⁶ On the second question of what the “precautionary approach” involves in outer space, the Guidelines for the Long-term Sustainability of Outer Space Activities¹⁶⁷ is persuasive authority on the matter. It suggests that “[s]tates and international intergovernmental organizations should exchange, on a voluntary basis, and/or make readily available regularly updated contact information on their designated entities authorized to engage in exchanges of appropriate information on on-orbit spacecraft operations, conjunction assessments and the monitoring of objects and events in outer space, in particular those entities that are responsible for processing incoming incident reports and forecasts and adopting precautionary and response measures”.¹⁶⁸ Additionally, since “an increased risk of collision could pose a threat to space operations, the intentional destruction of any on-orbit spacecraft and launch vehicle orbital stages or other harmful activities that

¹⁶⁴ Sraavya Poonuganti, *It's Raining Rockets: Heightening State Liability for Space Pollution*, (2023) Chicago Journal of International Law, <https://cjil.uchicago.edu/print-archive/its-raining-rockets-heightening-state-liability-space-pollution>, 517.

¹⁶⁵ *Ibid.*

¹⁶⁶ For more, see World Economic Forum, *Space debris is a growing problem. These leaders have a plan to tackle it* (14 June 2023), <https://www.weforum.org/agenda/2023/06/orbital-debris-space-junk-removal/>.

¹⁶⁷ COPOUS, *Guidelines for the Long-term Sustainability of Outer Space Activities*, (2018) U.N. Doc. A/AC.105/2018/CRP.20.

¹⁶⁸ *Id.*, 10.

generate long-lived debris should be avoided. When intentional break-ups are necessary, they should be conducted at sufficiently low altitudes to limit the orbital lifetime of resulting fragments.”¹⁶⁹

(3) Polluter pays principle

The aforementioned principles apply prior to an ASAT missile operation, while the polluter pays principle is concerned with the apportionment of responsibility post-ASAT operation. The polluter pays principle provides that States generating the pollution should be responsible for the pollution caused to the environment,¹⁷⁰ and finds support in various treaties,¹⁷¹ including the 1972 Liability Convention¹⁷² (“LIAB”). One of the five international space treaties, the LIAB focuses on the liability regime of outer space. It provides that “[a] launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight”.¹⁷³ For “damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible”.¹⁷⁴

¹⁶⁹ COPOUS, *Space Debris Mitigation Guidelines*, (2007) https://www.unoosa.org/pdf/publications/st_space_49E.pdf, 3.

¹⁷⁰ Sands, *supra* note 167, 240.

¹⁷¹ *Ibid.*

¹⁷² Convention on International Liability for Damage Caused by Space Objects (1971) Res 2777 (XXVI).

¹⁷³ LIAB, art. II.

¹⁷⁴ *Id.*, art. III.

The LIAB defines a “launching state” as a state which launches or procures the launching of a space object; or a state from whose territory or facility a space object is launched.¹⁷⁵ “Procure” is not defined in the LIAB, but the ordinary meaning – as discussed earlier, which is fundamental to treaty interpretation – is to “obtain (something)”.¹⁷⁶ States that use or participate in the launching of ASAT missiles would be considered launching States and are responsible for the introduction of space debris into outer space.

While the polluter pays principle appears *prima facie* self-explanatory, its application in practice is complicated by the existing shortcomings of Space Situational Awareness (“SSA”). SSA data is obtained through the monitoring and observation of space objects, and establishing their orbital altitudes at a specific time.¹⁷⁷ SSA is currently not entirely accurate because no state has full access to the geographic locations necessary to track all orbiting space objects.¹⁷⁸ The existing debris that is being tracked is thus not representative of all the debris pieces in outer space – out of the estimated 34,000 objects in space that span more than ten centimetres, only around 85% of these objects can be

¹⁷⁵ *Id.*, art. I.

¹⁷⁶ Merriam-Webster Dictionary, *Procure*, <https://www.merriam-webster.com/dictionary/procure#:~:text=1,perched%20precariously%20on%20her%20head> (last visited Dec. 1, 2023).

¹⁷⁷ Aerospace Corporation, *Space Situational Awareness*, <https://aerospace.org/ssi-space-situational-awareness#:~:text=SSA%20is%20the%20practice%20of,and%20threats%20to%20their%20operations> (last visited Dec. 1, 2023).

¹⁷⁸ Davis Florick & Lina Cashin, *Commentary | Space Situational Awareness Sharing for the 21st Century* (May 27, 2013), <https://spacenews.com/35513space-situational-awareness-sharing-for-the-21st-century/>.

tracked with reasonable accuracy.¹⁷⁹ More worrying are the smaller pieces that are harder to follow; there are 900,000 objects between one and ten centimetres, and possibly 128 million objects that are at least one millimetre.¹⁸⁰ This makes it highly difficult to precisely identify which State(s) have contributed to the creation of the debris.

To mitigate the gaps of current SSA capabilities, States and private entities should exchange SSA information with each other as has been implemented by the US Air Force, which has agreements with more than 450 organisations that operate 2,200 spacecraft altogether.¹⁸¹ The sharing includes 35,000 conjunction data messages and identification of potential close approaches daily.¹⁸² Another example is South Korea's Optical Wide-field patrol Network, which collects SSA data using telescopes at sites in Israel, Mongolia, Morocco, and the US to ensure a broad network of collection systems.¹⁸³ Different regional organisations also have SSA sharing agreements: the EU Space Surveillance and Tracking combines data into a single system that provides SSA services for

¹⁷⁹ *Tracking space debris is a growing business*, THE ECONOMIST (Sep. 16, 2021), <https://www.economist.com/science-and-technology/tracking-space-debris-is-a-growing-business/21804756>.

¹⁸⁰ *Ibid.*

¹⁸¹ Jeff Foust, *Data sharing seen as critical to future of space situational awareness*, SPACE NEWS (Sep. 20, 2019), <https://spacenews.com/data-sharing-seen-as-critical-to-future-of-space-situational-awareness/>.

¹⁸² *Ibid.*

¹⁸³ Benjamin Silverstein, *Promoting International Cooperation to Avoid Collisions Between Satellites*, CARNEGIE ENDOWMENT (Sep. 20, 2023), <https://carnegieendowment.org/2023/09/20/promoting-international-cooperation-to-avoid-collisions-between-satellites-pub-90579>.

European governments and operators;¹⁸⁴ this enables more than 190 satellite operators across different domains like civil, security and commercial to prevent collisions.¹⁸⁵ Similarly, the Asia-Pacific Space Cooperation Organization (“APSCO”) has sites in Iran, Pakistan, and Peru to obtain information on objects in LEO to serve APSCO member States’ needs.¹⁸⁶ In the past ten years, APSCO’s sites have increased to include more data collection sites such as in Indonesia and Thailand, which expands the network’s coverage of Earth’s orbits.¹⁸⁷

(4) Principle of common but differentiated responsibility

Related to the polluter pays principle is the principle of common but differentiated responsibility (“CBDR”) that recognises that all States have a shared responsibility in protecting and caring for the environment.¹⁸⁸ At the same time, the principle also considers it necessary to consider the varying circumstances of all States, such as how much they contributed to the specific environmental problem in question, and whether they are able to minimise such harm caused to the environment,¹⁸⁹ Essentially, CBDR considers the developed world to have greater responsibility for the protection of the environment since

¹⁸⁴ ESA, *Space Surveillance and Tracking - SST Segment*, https://www.esa.int/Space_Safety/Space_Surveillance_and_Tracking_-_SST_Segment (last visited Dec. 1, 2023).

¹⁸⁵ Silverstein, *supra* note 192.

¹⁸⁶ *Ibid.*

¹⁸⁷ *Ibid.*

¹⁸⁸ Sands, *supra* note 167, 244.

¹⁸⁹ *Id.*, 245.

they have contributed more to environmental pollution in the process of their development.¹⁹⁰

The application of the CBDR principle in outer space is logical because it recognises that all States have the common responsibility to protect the space environment, and all States should thus limit the debris released during normal operations and minimise the potential for break-ups during operational phases. They should also avoid intentional destruction and other harmful activities that generate long-lived debris. It simultaneously recognises that States which have generated more space debris have a greater responsibility in cleaning up the debris. CBDR can thus be applied to space in the following manner: the debris population contributed by a State is proportional to the number of launches it has conducted, and greater responsibility thus lies with States that have performed more ASAT missile launches or operations.¹⁹¹

The cleaning up of debris can be done through active debris removal (“ADR”) programmes, which differ according to the size of the debris piece and orbital location.¹⁹² For objects which are less than 10 centimetre in diameter, space-based lasers are used to lower their orbit for them to re-enter Earth’s atmosphere and decay.¹⁹³ For larger objects, concepts, such as nets, harpoons and robotic

¹⁹⁰ Peter Stubbe, *STATE ACCOUNTABILITY FOR SPACE DEBRIS* (Brill, 2007), 211.

¹⁹¹ V Gopalakrishnan & MYS Prasad, *Space Debris Remediation – Common but Differentiated Responsibility*, in *PROCEEDINGS OF THE INTERNATIONAL INSTITUTE OF SPACE LAW 2013* (Jorgenson, ed., Eleven International Publishing, 2014), 392.

¹⁹² ESA, *Active debris removal*, https://www.esa.int/Space_Safety/Space_Debris/Active_debris_removal#:~:text=But%20even%20in%20a%20future,which%20a%20collision%20rate%20of (last visited Dec. 1, 2023).

¹⁹³ Liam Peters & Ron Noomen, *Space Based Laser Ablation for Space Debris Removal*, <https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/43/SDC8-paper43.pdf> (last visited Dec. 1, 2023).

arms, have been designed to capture debris after which both the debris and service satellite spiral into the atmosphere and burn up.¹⁹⁴ ADR programmes are necessary because studies have shown that even if no further objects are introduced to outer space, the number of debris would still continue to grow under which a collision rate of once every 10 years can be assumed.¹⁹⁵

B. Jus ad bellum

Having explained the environmental principles that are applicable to military operations outside of armed conflicts, this paper turns to consider the applicable CIL rules to armed conflicts. This section is concerned with the beginning of a possible armed conflict, specifically whether the use of an ASAT missile amounts to a prohibited use of force. Here, *jus ad bellum* is relevant as they stipulate the requirements that must be satisfied before States can resort to the use of force.¹⁹⁶ *Jus ad bellum* comprises the prohibition on the use of force and its exceptions: authorisation by the United Nations Security Council (“UNSC”), and self-defence.¹⁹⁷

¹⁹⁴ *Ibid*; Tereza Pultarova, *Astroscale aims to capture old space junk with robotic arm in 2026 (exclusive video)*, (Aug. 8, 2023) SPACE.COM, <https://www.space.com/astroscale-space-junk-removal-2026-plan-exclusive-video#:~:text=A%20lightweight%20version%20of%20the,first%20mission%20of%20its%20kind>.

¹⁹⁵ ESA, *supra* note 193.

¹⁹⁶ ICRC, *What are jus ad bellum and jus in bello?* (Jan. 22, 2015), <https://www.icrc.org/en/document/what-are-jus-ad-bellum-and-jus-bello-0%Ef%BB%BF>.

¹⁹⁷ *Ibid*. This paper recognises that in recent years, States have argued that the use of force is permissible in situations of humanitarian intervention. However, the existence of this exception remains highly uncertain and is thus outside the scope of this paper. For discussion, see for example, Marc Weller, *Forcible Humanitarian Action in International Law- part I*, EJIL:TALK! (May 17, 2017) <https://www.ejiltalk.org/forcible-humanitarian-action-in-international-law-part-i/>; Marko Milanovic, *Breaking: UK Government Discloses Legal*

(1) The prohibition on the use of force

The prohibition on the use of force is found in Article 2(4) of the UN Charter, which provides:

All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the UN.

While the prohibition on the use of force is well-established in custom, its scope is not entirely clear.¹⁹⁸ The common factors considered when determining whether there has been a use of force include: the effects of the act, the gravity of the act, and whether there is hostile intent.¹⁹⁹ Amongst these elements, the question of whether there is an in-built gravity threshold in Article 2(4) is the most controversial because it is highly unlikely that widespread and persistent damage would be caused by non-intentional acts.²⁰⁰ Indeed, while the relatively

Rationale for Syria Intervention, EJIL:TALK! (Aug. 29, 2013) <https://www.ejiltalk.org/breaking-uk-government-discloses-legal-rationale-for-syria-intervention/>; Chris O'Meara, *Should International Law Recognise a Right of Humanitarian Intervention?* (2017) *International & Comparative Law Quarterly* Volume 66, Issue 2, 441-666.

¹⁹⁸ Erin Pobjie, "The Meaning of Prohibited Use of Force in International Law", (18 November 2022) Max Planck Institute for Comparative Public Law and International Law Research Paper Series, No. 2022-27, Forthcoming in: Erin Pobjie, *Prohibited Force: The Meaning of "Use of Force" in International Law* (Cambridge University Press, 2023).

¹⁹⁹ *Id.*, 5-6.

²⁰⁰ Oliver Corten, *THE LAW AGAINST WAR: THE PROHIBITION ON THE USE OF FORCE IN CONTEMPORARY INTERNATIONAL LAW* (Hart Publishing, 2010), 67-76; Mary O'Connell, *The True Meaning of Force* (2014) *AJIL* vol. 108, 141-144; Tom Ruys, *The True Meaning of Force – A Reply to Mary Ellen O'Connell* (2014) *AJIL Unbound* vol. 108, 148-152.

low scale of an attack is *prima facie* absence of intention to attack another State or a honest mistake on the part of the acting State, should this exonerate a finding of a use of force?²⁰¹

Supporters of a gravity of threshold requirement rely on the Independent International Fact-Finding Mission on the Conflict in Georgia's conclusion that "the prohibition of the use of force covers all physical force which surpasses a minimum of intensity"²⁰² as well as "targeted killings, forced abductions, small-scale counterterrorism operations abroad, interceptions of a single aircraft, and localized hostile encounters between military units [that] produce such a minimal effect that they fall outside the scope of [a use of force]".²⁰³ On the other hand, opponents contend that no minimum threshold for the use of force exists, and a broad interpretation should be adopted to accommodate all types of forces.²⁰⁴ This is because the existence of a threshold would tolerate different forms of protracted and low-intensity conflict, which in turn leads to an increase in violence in international politics.²⁰⁵ This question is even more apparent in the context of outer space: is the destruction of one satellite using an ASAT missile considered a use of force? While an ASAT missile's direct physical

²⁰¹ Ian Brownlie, *THE USE OF FORCE BY STATES* (1963), 366.

²⁰² Independent International Fact-Finding Mission on the Conflict in Georgia (2009) Vol. II, 242.

²⁰³ Robert Kolb, *JUS CONTRA BELLUM: LE DROIT INTERNATIONAL RELATIVE AU MAINTIEN DE LA PAIX* (Bruylant, 2009), 247.

²⁰⁴ Tom Ruys, *The Meaning of "Force" and the Boundaries of Jus Ad Bellum: Are "Minimal" Uses of Force Excluded from UN Charter Article 2(4)* (2014) *AJIL* vol. 108, 159-210.

²⁰⁵ Christine Gray, *INTERNATIONAL LAW AND THE USE OF FORCE* (Oxford University Press, 2018), 155.

impacts caused to another State's satellite may be highly destructive,²⁰⁶ it is not clear whether this secondary effect should come into play of the assessment of whether the use of the ASAT missile is a use of force.²⁰⁷

This paper submits that there should not be a gravity threshold in the finding of a use of force in the outer space context due to the creation of many "break-off" pieces that cannot be tracked. It is unclear whether secondary impacts of the use of ASAT missiles should be factored because there could be multiple steps involved between the use of the ASAT missiles and the creation of debris; even assuming these secondary impacts are considered, there may be difficulties in proving causation – the existence of a sufficiently certain and direct causal nexus between the use of the ASAT missile and the injury suffered.²⁰⁸ Moreover, it is entirely possible that an ASAT may not generate many debris pieces: India's 2019 ASAT missile test was conducted at low altitude to minimise any space debris generated, and if any debris were indeed generated, such debris would fall back to Earth within weeks.²⁰⁹ Similarly, China's ASAT missile tests from 2013 to 2014 have not been debris generating.²¹⁰ The lack of debris fragments or low amount of debris should thus not be a reason to exonerate a finding of use of force. Additionally, the exclusion of minimal uses of force cannot be derived from Article 2(4) of the UN Charter because it was

²⁰⁶ *Id.*, 25.

²⁰⁷ *Ibid.*

²⁰⁸ Pobjie, *supra* note 207, 26.

²⁰⁹ Kelsey Davenport, *Indian ASAT Test Raises Space Risks*, ARMS CONTROL (May 2019), <https://www.armscontrol.org/act/2019-05/news/indian-asat-test-raises-space-risks>.

²¹⁰ Mike Gruss, *US Official: China Turned to Debris-free ASAT Tests Following 2007 Outcry*, SPACE NEWS (Jan. 11, 2016), <https://spacenews.com/u-s-official-china-turned-to-debris-free-asat-tests-following-2007-outcry/>.

the drafters' intention that Article 2(4) captured all forms of uses of force such that there were no gaps that could be exploited by States.²¹¹

(2) Exceptions to the use of force

(a) *Authorization by the UNSC*

When considering whether a use of force is authorised by the UNSC, Article 42 of the UN Charter is the relevant starting point:

Should the UNSC consider that measures provided for in Article 41²¹² would be inadequate or have proved to be inadequate, it may take such action by *air, sea, or land forces* as may be necessary to maintain or restore international peace and security. Such action may include demonstrations, blockade, and other operations by *air, sea, or land forces* of Members of the UN. [emphasis added]

Authorisations must conform with a valid resolution and there must be a threat to international peace,²¹³ of which the paradigm example is the use of force by one state on another.²¹⁴ Although the ordinary meaning of Article 42 only allows the UNSC to “take action by air, sea or land forces” and limits the

²¹¹ Gianfranco Smith, *Are minimal uses of force excluded from Article 2(4) and should they be excluded?*, (2022) 3 *Justitia et Pulchritudo* No. 1, 14.

²¹² Article 41 of the UN Charter states that: the UNSC may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, and it may call upon the Members of the UN to apply such measures. These may include complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication, and the severance of diplomatic relations.

²¹³ Corten, *supra* note 209, 316-317.

²¹⁴ *Id.*, 317.

authority of the UNSC to allow States to take military action in outer space,²¹⁵ it makes little to no sense to restrict the UNSC's scope of authorisations to air, sea or land only,²¹⁶ especially since the UN Charter was drafted before the first space object was successfully launched into outer space,²¹⁷ making it highly unlikely that the drafters in the 1960s had contemplated a war situation in space.²¹⁸

(b) *Self-defence exception*

The second exception to the use of force is the self-defence exception. Before delving into the requirements of the self-defence exception, it is apposite to consider whether self-defence even applies in outer space. Some States, such as Brazil, Mexico, China, Chile and Pakistan, have argued that self-defence should not be allowed in outer space as it would lead to the escalation of an arms race in space,²¹⁹ while others have considered that since outer space is an area beyond national jurisdiction, self-defence is not allowed.²²⁰ To this end, analogies can be drawn with the law of the seas to explain why self-defence should be allowed in space: first, Article 88 of the UN Convention on the Law

²¹⁵ Ricky Lee, *The Jus Ad Bellum in Spatialis: The Exact Content and Practical Implications of the Law on the Use of Force in Outer Space* (2003) 29 *Journal of Space Law* vol. 93, 110.

²¹⁶ *Ibid*; Michael Schmitt, *International Law and Military Operations in Space*, in *Max Planck Yearbook of United Nations Law*, vol. 10, 2006, 89-125, 103.

²¹⁷ *Ibid*.

²¹⁸ *Ibid*.

²¹⁹ Gabriella Irsten, *The consultation process for the International Code of Conduct for Outer Space Activities ends*, REACHING CRITICAL WILL, <https://www.reachingcriticalwill.org/news/latest-news/8907-the-consultation-process-for-the-international-code-of-conduct-for-outer-space-activities-ends> (last visited Dec. 1, 2023).

²²⁰ Anne-Sophie Martin, *State's Right to Self-Defence in Outer Space*, JAPCC (Sep. 20, 2020), <https://www.japcc.org/articles/States-right-to-self-defence-in-outer-space/>.

of the Seas²²¹ states that the high seas shall be reserved for peaceful purposes and this is taken conventionally to mean that general international law rules on the use of force apply at sea. Article III of the OST, as discussed above, similarly provides that outer space is to be used for “peaceful purposes” in accordance with international law and the UN Charter, which includes the right to self-defence.

Secondly, Article VIII of the OST states that a “state party on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object while in outer space or a celestial body”, which means that an analogy can be drawn with the law of the seas where outside territorial waters, neutral ships are subject to the exclusive jurisdiction of their flag state,²²² and where there is a use of force on a neutral ship, the flag state is considered the target of the use of force.²²³ This argument finds implicit support in the ICJ’s *Oil Platforms*²²⁴ which stated that the attack on the vessel in question was not to be equated with an attack on the flag State since the vessel was not flying the relevant flag;²²⁵ the implication of this finding is that if the vessel in question had flown the flag of the relevant State, then the flag State would have been considered by the ICJ to be subject to the attack. Support for

²²¹ (1982) 1833 UNTS 397.

²²² United Nations Convention on the Law of the Sea (1982) 1833 UNTS 397, arts. 92 and 58; Sondre Torp Helmersen, *The use of force against neutral ships outside territorial waters*, (2022) Leiden J. Int’l Law 35, 315-335.

²²³ *Ibid.*

²²⁴ *Oil Platforms (Iran v. U.S.)*, Judgment, 2003 I.C.J Rep. 161. The court stated that it “does not exclude the possibility that the mining of a single military vessel might be sufficient to bring into play the “inherent right of self-defence”.”

²²⁵ *Id.*, 195.

this proposition can be found, for instance in the ITLOS's *Ukrainian naval vessels* cases²²⁶ and Permanent Court of Arbitration's *Guyana v Suriname*²²⁷ case. The latter case applied the prohibition of a use of force to a single ship, and stated that the "firing of target shots against a naval vessel is therefore tantamount to use of force against the sovereignty of the state whose flag that vessel flies".²²⁸ Since the prohibition of the use of force is not limited to land, an attack on a space object should similarly amount to a use of force on the state which owns the space object. This is more so given the importance of satellites for States' military, social and economic interests.

Having explained why self-defence should be allowed in outer space, this section considers the elements of self-defence.

Armed attack

Article 51 of the UN Charter provides that:

Nothing in the present Charter shall impair the inherent right of individual or collective self-defence if an armed attack occurs against a Member of the UN, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defence shall be immediately reported to the Security Council and shall not in any way affect the authority

²²⁶ Case concerning the detention of three Ukrainian naval vessels (Ukr. v. Ru.), Request for the prescription of provisional measures, Order, 25 May 2019 [hereinafter *Ukrainian naval vessels*] (separate opinion by Gao J), ¶33.

²²⁷ Award in the arbitration regarding the delimitation of the maritime boundary between Guyana and Suriname, Award of 17 September 2007, XXX RIAA 1, ¶445.

²²⁸ *Ukrainian naval vessels*, *supra* note 236.

and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security.

Although the inherent right of States to act in self-defence is recognised in Article 51 of the UN Charter, an “armed attack” is undefined. An “armed attack”, according to the ICJ, is “the most grave form of the use of force”.²²⁹ This definition adopts the effects-based approach to determine whether there is a use of force as it considers factors such as “severity, immediacy, directness, invasiveness, measurability of effects, military character, state involvement and presumptive legality”.²³⁰ These factors are not exhaustive and other elements may be considered, such as the identity of the attacker and whether the operation portends the future use of military force.²³¹ On the other hand, the effects-based approach is the targets-based approach; the key inquiry is the importance of the target, such as whether the attack was on a critical national system related to a State’s security or economy.²³² There is also implicit support for this approach in the ICJ’s *Oil Platforms*, where the US argued that the Iranian oil platforms were legitimate targets as they were being used for collecting military intelligence, though these contentions were eventually

²²⁹ Nicaragua, *supra* note 120, ¶191; Gray, *supra* note 214, 152.

²³⁰ Sarah Mountin, *The Legality and Implications of Intentional Interference with Commercial Communication Satellite Signals*, (2014) 90 International Law Studies 101, 174-176; Marco Roscini, CYBER OPERATIONS AND THE USE OF FORCE IN INTERNATIONAL LAW (Oxford University Press, 2014), 46-47 and the national positions of Australia, Germany, France, the Netherlands, Sweden, the UK and the US https://cyberlaw.ccdcoe.org/wiki/Use_of_force#cite_note-13 (last visited Dec. 1, 2023). The effects-based approach has been mostly recognised in the area of cyber space.

²³¹ Mountin, *id.*, 177.

²³² *Id.*, 173.

rejected by the court because it was not sufficiently convinced that the evidence supported the US's contentions.²³³

Between these two approaches, the latter approach should be applied to outer space because the former would result in absurd outcomes, for example, a slight intrusion into, or disruption of with a military satellite would justify an armed response as it interferes with a "critical" asset.²³⁴ This expands the right of self-defence significantly, which makes armed conflicts in outer space even more likely.

Anticipatory self-defence and immediacy

Also uncertain from the wording of Article 51 of the UN Charter is whether the "inherent right of self-defence" includes anticipatory self-defence. There are two main competing theories: the "trigger theory" considers that States cannot resort to the use of force unless they have already been attacked by the aggressor State(s).²³⁵ However, once an armed attack has happened, the victim State can defend itself against the aggressor State(s).²³⁶ The second theory is the "future attack theory" that enables States to act in anticipation of an attack.²³⁷ Proponents of this position rely on the *Caroline* incident²³⁸ and the 9/11

²³³ Gray, *supra* note 214, 160.

²³⁴ Mountin, *supra* note 240, 173.

²³⁵ David Kretzmer, *The Inherent Right to Self-Defence and Proportionality in Jus Ad Bellum*, 24 EJIL 1, 235-282, 262.

²³⁶ *Ibid.*

²³⁷ *Id.*, 264.

²³⁸ *Caroline Case* (1840) 29 BFSP 1137.

attacks²³⁹ to argue that there exists State practice. The former involved rebels who sought to invade Canada; they established a headquarter on Navy Island, which belonged to the UK.²⁴⁰ US supporters of the rebels then used the *Caroline* vessel to provide supplies and arms to the rebels.²⁴¹ The *Caroline* vessel was then set on fire by the UK and was “justified by the necessity of self-defence” to prevent the rebels from invading Canada.²⁴² The latter concerned certain State actions in the aftermath of the 9/11 attacks: an example is the US’s Operation Enduring Freedom.²⁴³ The operation began on 7 October 2011 with the US and UK conducting bombing strikes against al-Qaeda and Taliban forces in Afghanistan.²⁴⁴ The US justified its use of force on the basis of combatting terrorism against those who were responsible for attacking the US on September 2011,²⁴⁵ whereas other States, as part of the NATO, thought that an attack

²³⁹ George Brandis, *The Right of Self-Defence Against Imminent Armed Attack in International Law*, EJIL:TALK! (May 27, 2017); *McCann v UK* (1995) ECtHR App 18984/91, ¶200; Judgement of the International Military Tribunal for the Far East (1948), 994-995; Joshua La Bella, *Star Wars: Attack of the Anti-Satellite Weapons in Anticipatory Self-Defense*, (2021) 52 University of the Pacific Law Review 733, 743-749.

²⁴⁰ Charlotta Nilsson, *The Legality of Anticipatory Self-Defence in International Law* (Lund University, 2008), 13.

²⁴¹ *Ibid.*

²⁴² *Ibid.*

²⁴³ *Id.*, 16.

²⁴⁴ Naval History and Heritage Command, “Operation Enduring Freedom”, <https://www.history.navy.mil/browse-by-topic/wars-conflicts-and-operations/middle-east/operation-enduring-freedom.html#:~:text=Operation%20Enduring%20Freedom%20officially%20ended,of%20the%202001%2D2021%20war.> (last visited May 9, 2024).

²⁴⁵ Council on Foreign Relations, *1999-2021 The U.S. War in Afghanistan*, <https://www.cfr.org/timeline/us-war-afghanistan> (last visited May 9, 2024).

against one or more allies in Europe or North America was considered an attack against them all.²⁴⁶

Between these two theories, the latter theory is preferable in outer space because it is impractical to expect a State to wait for an imminent attack to occur and cause irreversible damage before it can react.²⁴⁷ This is especially since outer space “uniquely favours the offensive”²⁴⁸ because it is easier to disable a satellite rather than defend one,²⁴⁹ particularly for physical ASATs that approach at a high speed and from different directions.²⁵⁰ Defending against such ASATs would need States to have sophisticated and able tracking and warning systems that can provide alerts of a potential attack.²⁵¹ However, the effectiveness of States’ systems is uncertain up till the point of an actual attack.²⁵² Indeed, “[h]ow long can a country afford to wait when innovations in technology now point to a situation where a surprise attack may be preceded by an elaborate tactical scheme that jams military communications and blinds

²⁴⁶ Nilsson, *supra* note 250, 16.

²⁴⁷ Bruno Simma, THE CHARTER OF THE UN: A COMMENTARY, (Oxford University Press, 2012), 1423-1424; Elizabeth Wilmshurst, *Principles of International Law on the Use of Force by States in Self-Defence* (2005) Chatham House International Law ILP WP 05/01, 4.

²⁴⁸ Jamie Cottam, How to prevent a war in space (Part I) (Nov. 7, 2022), <https://cove.army.gov.au/article/how-prevent-war-space-part-1>.

²⁴⁹ *Ibid.*

²⁵⁰ Centre for Strategic and International Studies, THE PHYSICS OF SPACE SECURITY A REFERENCE MANUAL (2005), 138.

²⁵¹ *Ibid.*

²⁵² *Ibid.*

satellites, thus crippling the state's intelligence gathering, early warning and battlefield capabilities?"²⁵³

Moreover, it cannot be argued that the future attack theory is subject to abuse because the immediacy requirement, as reflected in the *Caroline* formulation, means "instant, overwhelming, leaving no choice of means, and no moment for deliberation".²⁵⁴ This is a high threshold as States must prove that there was no other alternative but to resort to the use of force to fend off the attack. In determining the immediacy of the attack, the traditional factors considered in the context of land are: "the gravity of the threatened attack – whether what is threatened is a catastrophic use of WMD; capability - for example, whether the relevant state or terrorist organisation is in possession of WMD, or merely of material or component parts to be used in its manufacture; and the nature of the attack – including the possible risks of making a wrong assessment of the danger. Other relevant factors include the geographical situation of the victim state, and the past record of attacks by the state concerned".²⁵⁵ There is little reason why these factors are not applicable in outer space.

To elaborate on the application of the future attack theory, consider its application to the hypothetical scenario where State A's satellites in LEO experience anomalies after being in the vicinity of a ground-based laser in State B.²⁵⁶ Here, the use of an ASAT missile to respond such an "attack" does not

²⁵³ Jackson Maogoto & Steven Freeland, *Space Weaponization and the United Nations Charter Regime on Force: A Thick Legal Fog or a Receding Mist*, International Lawyer (ABA) 41, no. 4 (Winter 2007), 1091-1120, 1116.

²⁵⁴ Wilmschurst, *supra* note 257, 8.

²⁵⁵ *Ibid.*

²⁵⁶ Victoria Samson, Brian Weeden, *Self-Defense In Space: Perspectives, Analogies, And Prospects*, SECURE WORLD FOUNDATION (2015), <https://swfound.org/media/205294/iac-15e342-paper-1.pdf>, 6.

satisfy the immediacy requirement because it is difficult for the injured State to discharge its burden of proof to determine if the target State was indeed responsible for the damage caused to its satellites. Since the target State must prove “immediacy”, the future attack theory will not be subject to abuse in space, and therefore should be adopted as the preferred theory to self-defence in space.

Necessity and proportionality

Other than satisfying the immediacy requirement, the use of force must be necessary and proportionate to the threat. This means that the use of the ASAT missile must not be “unreasonable or excessive, since the act, justified by the necessity of self-defence, must be limited by that necessity, and kept clearly within it.”²⁵⁷ A State under an armed attack must therefore consider the options it has to repel the attack; if it has peaceful means options, then it would be unnecessary to use force through its ASAT missile.

The proportionality requirement mandates that the use of force must not be excessive,²⁵⁸ and has to be sufficient to end the armed attack or remove the threat of the armed attack.²⁵⁹ There are two main methods of proportionality assessment: the limited approach provides that the use of force must be similar in scale and effects to the aggressor State’s actions.²⁶⁰ On the other hand, the “harms-benefit analysis to proportionality” involves considering whether the

²⁵⁷ Wilmshurst, *supra* note 257, 7.

²⁵⁸ *Id.*, 10.

²⁵⁹ *Ibid.*

²⁶⁰ Kretzmer, *supra* note 245, 257.

benefits of the use of force outweigh the costs.²⁶¹ This assumes that “an exercise of necessary, minimal force in self-defence might be unlawful due to the damage caused by it”.²⁶² Adopting either approach to assessing proportionality in outer space leads to the conclusion that the use of an ASAT for self-defence is disproportionate if they generate debris as this would lead to unusable areas in that level of orbit, or even cause collisions with space objects or third-party States. Further, “a single fragmentation event can create tens of thousands of pieces of space debris that will imperil other satellites, including civilian satellites, dual-use satellites, NTM satellites²⁶³ and satellites belonging to other States, with potentially serious consequences for otherwise uninvolved States, companies and ordinary people”.²⁶⁴

C. Jus in bello

Unlike *jus ad bellum*, *jus in bello* (synonymous with international humanitarian law (“IHL”)) is not concerned with the legality of armed conflict or use of force but instead regulates the conduct of States and individuals engaged in conflict in relation to each other.²⁶⁵ As with *jus ad bellum*, it must be considered whether

²⁶¹ Yishai Beer, *Revisiting ad bellum Proportionality: Challenging the Factors Used to Assess It*, 93 Int’l L. Stud. 1500 (2021), 1507.

²⁶² *Ibid.*

²⁶³ NTM satellites are “national technical means” satellites; they include “photoreconnaissance satellites and synthetic aperture radar satellites collect detailed imagery of things on the ground, such as inter-continental ballistic missiles and aircraft”. The Aerospace Corporation, *Noninterference with National Technical Means: The Status Quo will not Survive* (January 2020), https://aerospace.org/sites/default/files/2020-01/Gleason_NTM_20200114.pdf, 2.

²⁶⁴ Byers & Boley, *supra* note 6, 355.

²⁶⁵ ICRC, *The same IHL applies to all warring parties: differentiating between jus contra bellum (law prohibiting use of interstate force) and jus in bello (law limiting effects of warfare)*,

IHL even applies to space due to the numerous contrary arguments, with the most recent being Russia's argument that recognising IHL "would automatically mean recognising the admissibility of an armed conflict in outer space" as it "creates a paradigm that runs counter to the basic principles of space exploration, primarily the interest of maintaining international peace and security."²⁶⁶ However, Russia's argument misses the point as the applicability of IHL does not turn on whether a State's decision to resort to the use of force is lawful or not.²⁶⁷ Instead, the applicability of IHL is a "question of fact" concerned with whether the situation at hand is an international armed conflict ("IAC") or non-international armed conflict ("NIAC").²⁶⁸ Therefore, given that IHL applies to "all forms of warfare and to all kinds of weapons, those of the past, those of the present and those of the future",²⁶⁹ there is no cogent reason to suggest that IHL does not apply in space.

With this, this section considers how IHL may be applied in space starting by explaining when an armed conflict in space arises, followed by the customary principles of distinction, necessity, proportionality as well as prevention of environmental modification techniques.

<https://casebook.icrc.org/highlight/same-ihl-applies-all-warring-parties-differentiating-between-jus-contrabellum-law> (last visited Dec. 1, 2023).

²⁶⁶ Russian Federation, *On counterproductive nature of consideration of the applicability of international humanitarian law (IHL) to outer space activities*, https://docs-library.unoda.org/Open-Ended_Working_Group_on_Reducing_Space_Threats_-_2022/IHL_Unofficial_translation_итог-1.pdf (last visited Dec. 1, 2023), 1.

²⁶⁷ Michael Schmitt & Kieran Tinkler, *War in Space: How International Humanitarian Law Might Apply The Woomera Manual Project – Part 3* (Mar. 9, 2020), <https://www.justsecurity.org/68906/war-in-space-how-international-humanitarian-law-might-apply/>.

²⁶⁸ *Ibid.*

²⁶⁹ *Ibid.*

(1) The term “armed conflict” in outer space

As stated above, there are two types of armed conflicts: IAC and NIAC. An IAC arises when one or more States use force against each other.²⁷⁰ “ In the outer space context, this would include all types of interference, be it physical or kinetic, that cause physical damage to other space objects, or death or injury to persons in space or land. ²⁷¹ A NIAC, on the other hand, occurs when non-State actors such as non-State armed groups are involve; depending on the scenario, there may be conflict between governmental armed forces and non-State armed groups, or solely just between non-State actors only.²⁷² Although there are differences in the treaty law applicable to each type of conflict, the distinction between IACs and NIACs is being eroded such that there is now greater unity in the law applicable to these two forms of conflicts without distinction given that “CIL now provides for a broader set of rules for NIACs and fills many gaps in treaty law”.²⁷³ Additionally, the International Red Cross Committee in its comprehensive study of IHL found evidence that nearly all IHL CIL rules applied to both types of conflicts.²⁷⁴

²⁷⁰ ICRC, *International armed conflict*, https://casebook.icrc.org/a_to_z/glossary/international-armed-conflict#:~:text=An%20international%20armed%20conflict%20occurs,of%20the%20situation%20is%20required (last visited Dec. 1, 2023).

²⁷¹ Hitoshi Nasu, *Targeting a Satellite: Contrasting Considerations between the Jus ad Bellum and the Jus in Bello*, (2022) 99 International Law Studies 142-179, 162.

²⁷² ICRC, *Non-international armed conflict*, https://casebook.icrc.org/a_to_z/glossary/non-international-armed-conflict#:~:text=Under%20Article%203%20common%20to,or%20between%20such%20groups%20only (last visited Dec. 1, 2023).

²⁷³ Ben Saul & Dapo Akande, *THE OXFORD GUIDE TO INTERNATIONAL HUMANITARIAN LAW* (Oxford University Press, 2020), 31.

²⁷⁴ *Ibid.*

(2) The principle of distinction

The distinction principle requires parties in a conflict to draw distinctions between civilians and combatants; attacks can only be directed against the latter.²⁷⁵ Not only can this be found in the API with over 170 States parties,²⁷⁶ but it was considered by the ICJ as one of the “cardinal” principles of IHL.²⁷⁷ The API further provides that the rules governing targeting:²⁷⁸

... apply to any *land, air or sea warfare* which may affect the civilian population, individual civilians or civilian objects on land. They further apply to all attacks from the sea or from the air against objectives on land but do not otherwise affect the rules of international law applicable in armed conflict at sea or in the air. [emphasis added]

As with Article 42 of the UN Charter, there is no indication that the API drafters had intended to exclude the applicability of the distinction principle to outer

²⁷⁵ ICRC, *Rule 1. The Principle of Distinction between Civilians and Combatants*, <https://ihl-databases.icrc.org/en/customary-ihl/v1/rule1> (last visited Dec. 1, 2023).

²⁷⁶ See Article 48, 51(2) and 52(2) of the API. of API states that “[i]n order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.”

²⁷⁷ Nuclear Weapons, *supra* note 120, ¶78.

²⁷⁸ ICRC, *Article 49 – Definition of attacks and scope of application*, <https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-49> (last visited Dec. 1, 2023).

space;²⁷⁹ therefore, the most reasonable interpretation of the AP I would be that it includes attacks from space to Earth, as well as space to space attacks that have impacts on Earth.²⁸⁰ Traditionally in the context of Earth, the nature of an object may be determined by its location: for instance, heavy vegetation suggests that an activity may be disguised as to distract the aggressor.²⁸¹ Quite apart from appearance and location of the object, the purpose, whether current or future, of the object is also relevant in determining the nature of the object.²⁸² The location criterion is obviously not helpful in outer space since all targets would be located in space, whereas the purpose and use criteria are difficult to apply in space due to the rising number of dual-use and dual-purpose space objects in orbit.²⁸³ Dual-use space objects can be used for both military and civilian functions,²⁸⁴ whereas dual-purpose space objects are originally constructed to serve a “benign” purpose, but can be transformed to destruct other space objects.²⁸⁵ Objects could theoretically also be both dual-use and purpose simultaneously, for example, “a dual-use satellite with manoeuvring capabilities could be repurposed to act as a counterspace weapon by causing it

²⁷⁹ Michael Schmitt, *Chapter 16 Targeting in Operation Law*, in THE HANDBOOK OF THE INTERNATIONAL LAW OF MILITARY OPERATIONS (Gill & Fleck, eds., Oxford University Press, 2015), 269-306, 270.

²⁸⁰ *Ibid.*

²⁸¹ *Id.*, 279.

²⁸² *Id.*, 280.

²⁸³ Schmitt & Tinker, *supra* note 278.

²⁸⁴ Almudena Ortega, *Open-Ended Working Group on “Reducing space threats through norms, rules and principles of responsible behaviours” Topic 3: Current and future space-to-space threats by States to space systems* (Sep. 14, 2022), <https://documents.unoda.org/wp-content/uploads/2022/09/Azcarate-Ortega-Almudena-OEWG-dual-use-presentation-FINAL.pdf>, 3.

²⁸⁵ *Ibid.*

to manoeuvre so that it collides with another satellite”.²⁸⁶ The existence of such space objects makes it difficult to effectively verify the true purpose of the space object.²⁸⁷

Therefore, States, in assessing the lawfulness of an attack, must consider “all foreseeable direct and indirect incidental harm to civilians and civilian objects in outer space and on earth – not only with regard to the foreseeable incidental civilian harm to other space objects and persons, but also in terms of the consequences for civilians of impairing the civilian use of that dual-use space object.”²⁸⁸ If there is doubt as to whether an object is civilian or military, States should presume it is a civilian object, unless based on the readily available information, a reasonable attacker would conclude that it is being used militarily.²⁸⁹ One source of information that States can rely on is the UN

²⁸⁶ *Id.*, 4.

²⁸⁷ Aidan Liddle, *Open-ended Working Group on Reducing Space Threats through Norms, Rules and Principles of Responsible Behaviours Agenda Item 5: General Exchange of Views Statement by the United Kingdom* (May 9, 2022), <https://documents.unoda.org/wp-content/uploads/2022/05/20220509-UK-OEWG-general-statement.pdf>, 2; Delegation of Japan to the Conference on Disarmament, *Statement by Japan at the First Session of the Open-Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours* (May 9, 2022), https://documents.unoda.org/wp-content/uploads/2022/05/Statement_JPN_Open-ended-working-group-on-reducing-space-threats_1st-session.pdf, 3; EU, *Draft Statement in the Open-Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours* (May 9, 2022), <https://documents.unoda.org/wp-content/uploads/2022/05/First-Session-EU-general-statement.pdf>, 1.

²⁸⁸ Almudena Ortega, *Open-Ended Working Group on “Reducing space threats through norms, rules and principles of responsible behaviours” Topic 3: Current and future space-to-space threats by States to space systems* (Sep. 14, 2022), <https://documents.unoda.org/wp-content/uploads/2022/09/Azcarate-Ortega-Almudena-OEWG-dual-use-presentation-FINAL.pdf>, 3-4.

²⁸⁹ Schmitt, *supra* note 290, 280.

Registry of Space Objects²⁹⁰ because States are required to register their space objects on national registers and the UN Registry under the 1974 Convention on Registration of Objects Launched into Outer Space.²⁹¹ And one of the details States must provide to the UN Registry is the general function of the space object.²⁹² As regards objects not registered with the UN, States must bolster their information with open sources and their own intelligence to better ascertain the space object's use or purpose.²⁹³

(3) The prohibition against indiscriminate attacks

Indiscriminate attacks are “those: (a) which are not directed at a specific military objective; (b) which employ a method or means of combat which cannot be directed at a specific military objective; or (c) which employ a method or means of combat the effects of which cannot be limited as required by international humanitarian law; and consequently, in each such case, are of a nature to strike military objectives and civilian objects without distinction”.²⁹⁴ This is conceptually distinct from the distinction principle as “in an indiscriminate attack, a belligerent is not actively trying to harm civilians or

²⁹⁰ UNOOSA, *United Nations Register of Objects Launched into Outer Space*, <https://www.unoosa.org/oosa/en/spaceobjectregister/index.html> (last visited Dec. 1, 2023).

²⁹¹ (1974) UNGA Res 3235 (XXIX).

²⁹² *Id.*, art. IV.

²⁹³ P.J. Blount, *Targeting in Outer Space: Legal Aspects of Operational Military Actions in Space* (Nov. 25, 2012), <https://harvardnsj.org/2012/11/25/targeting-in-outer-space-legal-aspects-of-operational-military-actions-in-space/>.

²⁹⁴ ICRC, *Rule 12 Definition of Indiscriminate Attacks*, <https://ihl-databases.icrc.org/en/customary-ihl/v1/rule12>.

civilian objects but instead demonstrates reckless disregard for such consequences.”²⁹⁵

An ASAT missile might appear to be discriminate as it can be aimed precisely at a specific satellite.²⁹⁶ However, as discussed earlier, an ASAT missile is capable of causing indirect effects on other space objects; indeed, fragments from the blast travelling at high speeds would certainly damage nearby satellites, whether civilian or combatant, and also affect non-involved States that have to conduct collision avoidance measures so as to avoid the blast fragments.²⁹⁷ However, if the incidental effects of the use of the ASAT missile can be limited or controlled, the attack will not be considered indiscriminate; for example, if a state can limit the incidental effects to a few circular orbits below six hundred kilometres altitude. This is because debris left in such orbits normally fall back to Earth within several years, whereas the time for orbital decay at higher altitudes is measured in decades or even centuries.²⁹⁸

(4) The principle of proportionality in attacks

The principle of proportionality requires that where the launch of attacks is anticipated to result in the unintended loss of lives or damage to civilian objects, the excess impacts of such attacks are prohibited.²⁹⁹ Proportionality assessment

²⁹⁵ Schmitt & Tinker, *supra* note 2.

²⁹⁶ David Koplow, *ASAT-isfaction: Customary International Law and the Regulation of Anti-Satellite Weapons*, 30 Mich. J. Int'l Law 1187 (2009), 1245 .

²⁹⁷ *Ibid.*

²⁹⁸ NASA Orbital Debris Programme, *Frequently Asked Questions*, <https://orbitaldebris.jsc.nasa.gov/faq/> (last visited Dec. 1, 2023).

²⁹⁹ ICRC, *Rule 14 Proportionality in Attack*, <https://ihl-databases.icrc.org/en/customary-ihl/v1/rule14#:~:text=armed%20conflictsInterpretation->

therefore requires the balancing of the concrete and direct military advantage anticipated and the expected incidental harm.³⁰⁰ The expected advantage must be “identifiable and quantifiable, and one that flows directly from the attack”,³⁰¹ and “[a]dvantages that are merely hypothetical or speculative are not included in proportionality assessments”.³⁰² The proportionality assessment in outer space in the context of ASAT missiles can be done in the following manner: the predominant consideration of States prior to the use of ASAT missiles should be the unnecessary generation of space debris; therefore, if States has alternatives to using an ASAT missile such as by neutralising the threat on Earth instead, the attacker should rely on such means.³⁰³ This is because such alternatives being adopted would pose a lower risk to other spacefaring States and entities, as well as reduced danger to civilian lives and/or objects.³⁰⁴ The principle of proportionality would thus rule out the use of ASAT missiles as a choice of weapon in times of war if its secondary effects cannot be contained.³⁰⁵

(5) The principle against environmental modification

,Rule%2014.,military%20advantage%20anticipated%2C%20is%20prohibited (last visited Dec. 1, 2023).

³⁰⁰ Emanuela Gillard, *Proportionality in the Conduct of Hostilities The Incidental Harm Side of the Assessment* (2018) Chatham House International Law Programme Research Paper, 2.

³⁰¹ *Id.*, 11.

³⁰² *Ibid.*

³⁰³ Schmitt, *supra* note 217, 120-121.

³⁰⁴ *Ibid.*

³⁰⁵ Byers & Boley, *supra* note 6, 358.

The protection of the environment is also relevant before, during or after an armed conflict.³⁰⁶ Article I of the 1976 Convention on the prohibition of military or any hostile use of environmental modification techniques³⁰⁷ (“ENMOD”) provides that:

Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting *or* severe effects as the means of destruction, damage or injury to any other State Party.

This obligation applies to outer space as Article II of the ENMOD provides that the term “environmental modification techniques” refers to “any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of *outer space*.” A similar obligation can also be found in Article 55 of the API – which States that “[c]are shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage” – as well as many States’ military manuals.³⁰⁸ “Widespread” is in turn considered to mean “encompassing an area on the scale of several hundred square kilometres”; “long-lasting” means “lasting for a period of months, or approximately a season”; and “severe” means “involving serious or significant disruption or harm to human life, natural and economic resources or

³⁰⁶ ILC, *Draft principles on protection of the environment in relation to armed conflicts* (2022) U.N. Doc. A/77/10, ¶58, Yearbook of ILC 2022, vol. II, Part Two.

³⁰⁷ (1978) 1108 U.N.T.S. 151.

³⁰⁸ ICRC, *Rule 45. Causing Serious Damage to the Natural Environment*, <https://ihl-databases.icrc.org/en/customary-ihl/v1/rule45> (last visited Dec. 1, 2023).

other assets”.³⁰⁹ The generation of mass debris pieces by ASAT missiles clearly violates any of the three parameters as the mass generation of space debris would render entire orbits unusable, and in turn a prohibited modification to the natural environment.³¹⁰

V. Conclusion

This paper has demonstrated that despite the inadequacies of the OST, not all is doom and gloom due to existing CIL rules that can be applied to regulate the ASAT missile operations during peacetime and armed conflict. Also encouraging is the fact that space companies across the world – such as in India, France, Germany, Japan, UK and US – have recently joined the movement to stop debris-producing ASAT missile tests³¹¹ as well as an increasing number of States are making declarations not to conduct ASAT tests.³¹² While these declarations are themselves insufficient to constitute a ban on ASAT missile

³⁰⁹ UNGA, *Report of the Conference of the Committee on Disarmament*, (1976) GAOR 31st Sess. Supp. No. 27 (A/31/27) (vol I) ¶333, 91.

³¹⁰ Murphy, *supra* note 8, 138.

³¹¹ Marcia Smith, *Space Companies Join Movement to Stop Debris-Producing ASAT Tests*, SPACEPOLICY.COM (Nov. 14, 2023), <https://spacepolicyonline.com/news/space-companies-join-movement-to-stop-debris-producing-asat-tests/>.

³¹² Daryl Kimball, *US Commits to ASAT Ban*, ARMS CONTROL ASSOCIATION (May 2022), <https://www.armscontrol.org/act/2022-05/news/us-commits-asat-ban>; Jeff Foust, *New Zealand joins ASAT testing ban*, SPACE NEWS (Jul. 3, 2022), <https://spacenews.com/new-zealand-joins-asat-testing-ban/>; Park Si-soo, *Japan, Germany declare moratorium on anti-satellite missile tests* SPACE NEWS (Sep. 14, 2022), <https://spacenews.com/japan-germany-declare-moratorium-on-anti-satellite-missile-tests/>; Jeff Fost, *European Union nations join ASAT testing ban*, SPACE NEWS (Aug. 24, 2023), [https://spacenews.com/european-union-nations-join-asat-testing-ban/#:~:text=The%20European%20Union%20made%20no,%2Dsatellite%20missile%20tests%2C"%20E.U.](https://spacenews.com/european-union-nations-join-asat-testing-ban/#:~:text=The%20European%20Union%20made%20no,%2Dsatellite%20missile%20tests%2C)

use due to lack of general state practice,³¹³ they remain legally binding on those respective States.³¹⁴ This is because statements manifesting a state's will to be bound cannot be rescinded arbitrarily.³¹⁵ Further, just as how this paper explored the existing international laws applicable to ASAT operations, there are two ongoing projects to develop manuals to articulate and clarify the existing international laws applicable to military space operations: the Manual of International Law Applicable to Military Activities in Outer Space,³¹⁶ and the Woomera Manual on the International Law of Military Space Operations.³¹⁷ It is hoped that this paper, too, has contributed to the discussion of the “progressive development of international law and foster international peace and security and the sustainability of outer space, which is in the interest of all States, and indeed a goal of all humanity.”³¹⁸

³¹³ Kuan-Wei Chen, *Commentary on the US commitment not to conduct direct-ascent ASAT missile testing*, MCGILL UNIVERSITY INSTITUTE OF AIR & SPACE LAW (Apr. 21, 2022), <https://www.mcgill.ca/iasl/US%20commitment%20not%20to%20conduct%20ASAT%20testing>.

³¹⁴ *Ibid.*

³¹⁵ Legal Status of Eastern Greenland (Dk. v. Nor.) (1953) P.C.I.J. Ser. A/B No 53, 71; Nuclear Tests Case (Aus. v. Fr.) 1974 I.C.J. Rep 234, ¶¶43-51; Oliver Dörr, *Declaration*, in MAX PLANCK ENCYCLOPEDIAS OF INTERNATIONAL LAW (2019), ¶¶8-17.

³¹⁶ McGill University, *MILAMOS Project*, <https://www.mcgill.ca/milamos/> (last visited Dec. 1, 2023).

³¹⁷ University of Adelaide, *The Woomera Manual*, <https://law.adelaide.edu.au/woomera/> (last visited Dec. 1, 2023).

³¹⁸ McGill University, *About MILAMOS*, <https://www.mcgill.ca/milamos/about#OBJECTIVE> (last visited Dec. 1, 2023).

New Jurisprudence for Passenger Liability in “Non-Air-Accidents”

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Abstract:

This paper examines the evolving legal landscape surrounding passenger liability in “non-air-accidents,” which encompass incidents occurring outside the traditional definition of aviation accidents, such as during boarding, disembarking, or within airport premises. The study critiques existing legal frameworks under international conventions like the Montreal Convention of 1999, highlighting gaps and inconsistencies in addressing the unique challenges posed by these incidents. Through a comparative analysis of case law and statutory provisions from various jurisdictions, the paper identifies emerging trends and judicial approaches that redefine carrier liability and passenger rights. It also explores the implications of these developments for airlines, insurers, and passengers, emphasizing the need for a more coherent and comprehensive legal framework. The paper proposes new jurisprudence that

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integrates principles of tort law, consumer protection, and human rights to ensure fair compensation and enhanced safety standards. By addressing the inadequacies in current legal systems, this research aims to contribute to the formulation of more equitable and effective policies that better protect passengers and promote accountability in the aviation industry.

I. Conventional Interpretation

Aviation operations, of flying above in the air, are a hazardous activity prone to accidents whether due to technical failure or weather conditions or pilot error or a terrorist act or misconduct of a passenger or for any other reason. Whatever be the cause of the accident, the bonafide passenger on-board aircraft has a rightful claim against the air carrier for compensation. In early days, the public carriers of commercial transportation by air, under the common law of torts, had a legal and bounden duty to ensure safe transportation, while accidents causing death of or wounding or any other bodily injury to a passenger attracted *vinculum juris* to compensate *in restitutio* for the death or injury. The Warsaw Convention, 1929 [the Convention or WC]¹ has formalised this legal obligation as liability of the air carriers so long as the passenger is on-board the aircraft. To quote, the Convention makes air carriers liable for injuries sustained or death of a passenger “if the accident which caused the damage so sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking.”² However, definition of “on-board” has not been embodied in the Convention while embarkation and disembarkation are almost clear-cut processes of entering or leaving the aircraft respectively.³ And it seems obvious

¹ It came into force with effect from 13 February, 1933.

² The Warsaw Convention, 1929, Article 17.

³ For a detailed discussion, refer G S Sachdeva, *International Transportation: Law of Carriage by Air*, Deep & Deep Publications, New Delhi, 1987, pp. 48-67.

that a person is on-board only after due embarkation and ceases to be so after disembarkation. The Montreal Convention, 1999 also repeats *in verbatim* the same definition.

It is also pertinent to mention that the liability of the carrier is not ‘fault-based’ where a claimant would have to establish the default or dereliction of duty or lack of due diligence by the air carrier or wilful misconduct of an agent for the accident. For a passenger or the legal heirs, it is enough to state that he or she was a bonafide passenger “on-board” aircraft that met with accident and details of the injuries or the factum of death. This provision regarding presumption of fault is based on rationale of the principle of *res ipsa loquitur* (meaning facts speak for themselves or case speaks for itself).⁴ The ease or benefit to the claimant due to presumption of fault, that shifts *onus probandi* on the defendant under the Convention, has been balanced with a limitation on the quantum of compensation for liability to assure financial health of the air carriers and economic viability of air operations vis-à-vis other competitors e.g., road transporters, railways network and maritime ships.⁵ Thus, this balancing is advantageous to both parties for their respective reasons and interests.⁶

It has also been argued that limitation on the quantum of compensation by the Convention for the damage to or death of air passenger is iniquitous in

⁴ Ibid., pp. 115-141.

⁵ Serap Zuvin and Ege Irem Yenmez, “Norms of Carrier Liability” in Sandeepa Bhat B., Dilip Ukey and Adithya Variath, eds., *A Handbook on International Aviation Law*, Thomson Reuters, 2023, p. 129.

⁶ DELAG, the first German airline and its owner von Zeppelin, a rich magnate of his time, both went bankrupt due to payments of unlimited liability for the death of passengers of Hindenburg, a passenger carrying air balloon or blimp, that met with accident at Lake Constance in 1937.

law and indefensible from sociological and economic angles.⁷ The courts have, as a rule of thumb under tort law, calculated and granted compensation for wrongful death by multiplying annual income of the deceased with years of average life expectancy. Though this expectancy differed in different countries yet the doctrine of *lex loci delicto* applied.⁸ But given the other options and avenues for obtaining higher limit of claims, the blanket limitation on quantum of compensation, under the Convention, seems reasonable and justifiable. This limitation facilitates determination of financial risk, insurance premia and business viability of operations by the air carriers. In fact, “The Warsaw Convention was a boon for all stakeholders. It almost equalised and harmonised the interests of both parties, air carriers and passengers, and stood firm on equity.”⁹

Regarding an air passenger desiring unlimited liability; first, the Convention permitted a passenger to obtain a higher limit of damages by agreement with the carrier¹⁰ and on payment of extra fees. This responsibility and activity have since been taken over by the insurance business and counters established at the airports for the purpose. Secondly, if the legal heirs of the passenger can prove a dereliction in its bounden duty or wilful misconduct of the employee or an agent of the carrier, the claimant can seek unlimited

⁷ Peter H. Sand, “Air Carrier’s Limitation of Liability and Air Passengers’ Accident Compensation under the Warsaw Convention”, *Journal of Air Law and Commerce*, vol. 28, issue 3 (1962), pp. 260-284.

⁸ *Tuller v. KLM*, 292 F.2d 775 (D.C. Cir., 1961)

⁹ G S Sachdeva, “Historical Development of International Aviation Law” in Bhat, Ukey and Variath, eds.,

A Handbook on International Aviation Law, Thomson Reuters, 2023, p. 7.

¹⁰ Article 22 (1) of the WC.

compensation. Thirdly, the limitation under the Convention does not apply to protect the aircraft manufactures and component producers, airport owners and operators, governmental agencies for traffic control and security, servicing and maintenance organisations, etc. A US court has so interpreted Article 28 of the WC assuming implied consent of the carrier¹¹ for the contribution and support of these agencies to make aviation activity safe and secure, comfortable and convenient.

During the days of drafting of the Convention, the aircraft were small with limited capacity, would operate from small airstrips, were generally parked on the tarmac, there were no security checks and passengers with valid tickets almost drove or walked right up to the aircraft to embark and get on-board. The aviation industry was in nascent stages, no aircraft took off at night and the maximum air speed was just about 100 miles per hour. It was a simple situation without any hassles but packed with uncertainties as to when was a passenger deemed on-board. The human acts or the processes of embarkation and disembarkation posed no difficulty in understanding and seemed inseparably contiguous to be part of “on-board” stage of the flight.

However, to reckon the beginning of “on-board” stage and its completion different criteria were adopted with the changing times, advancing aircraft and developing airports. It thus, became difficult to ascertain whether the “on-board” stage was from embarkation to disembarkation, or signing of the passenger manifest by the captain/crew, from doors-closed to doors-open, or from start of the engine/s to switch-off of the same or from take-off to landing and taxiing till halt of the aircraft aligned to the aerobridge or on the apron bay for surface transportation, opening of the doors for disembarkation or till the

¹¹ *Berner v. United Airlines*, 057 NSY 2d 884 (Cr. App., 1957).

last passenger has duly left the aircraft. An accident could happen at any stage within this period of on-board.

However, a US Court has defined “on-board” between the time any person boards the aircraft with the intention of flight till all such persons have disembarked.¹² In this connection, there was the case of *Mrs. Chutter v. KLM* (1955)¹³ where this lady having entered the aircraft went the rear door of the aircraft to bid bye to her daughter. Just at that time the ladder was removed and she fell to the ground and sustained injuries. The court deemed the passenger on-board and it was held an accident under the WC.¹⁴ The airline pleaded contributory negligence holding the passenger *in pari delicto* in defence for the award of compensation. Later, the claim was dismissed as it turned out to be time-barred for the reason of limitation stipulated under the Convention.¹⁵

II. Need for New Jurisprudence

Times have changed and the aircraft have become wide-bodied with considerable capacity for different categories of passengers. In similar advancement, modern airports have huge structures in expanse divided into terminals. There are long aerobridges connecting the aircraft for boarding and deboarding, though at small airports and due to congestion at big terminals aircraft are parked on aprons close to taxi-tracks and passengers are taken for

¹²724 F. 2d at 1385.

¹³(1955) US C Av R 250. This case dragged on for a long time on different pleas and the claim was ultimately dismissed as barred under limitation. For more details, refer G S Sachdeva, n. 4 ante, pp. 152-153.

¹⁴Cases of such accident have come up later also. *MacDonald v. Air Canada*, 439 F. 2d 1402 (CAI 1971); *Mathias v. Pan Am* 53 F.R.D. 447 (IN Pa. 1971).

¹⁵Article 28 (1). The limitation period is two years.

boarding or disembarked passengers to the terminal premises by vehicular transport operated by the airline or under contract.

The boarding formalities have also become elaborate requiring various check-in documentation, prescribed procedures for customs and immigration formalities and the security clearance. Hence, the passenger movement within the airport premises is directed along corridors and queues for sanitised entry, check-in for boarding pass, baggage surrender, immigration stamps, customs clearance, joining of transit passengers and security check before reaching the boarding gate and waiting till boarding is announced. All these take a long time, and the passengers move in prescribed queues and commute as part of regulated traffic thereby remaining within the designated areas of airport terminal for a minimum period of two to three hours before the actual embarkation.

Further, during this ‘within-the-terminal’ period, the passenger walks long distances and commutes in lifts, elevators, escalators, walkalators, aerobridges, surface transport to aircraft and uses other facilities like baggage belts, waiting areas, hospitality lounges and conveniences provided by non-airline entities. So, it becomes a moot point whether an accident within the sprawling terminal premises or in the use of facilities and conveniences would be treated an accident on-board. This issue remained in doubt waiting for a court decision because some of the official formalities, facilitation services and shopping complexes, etc. at the terminals of the airport are neither directly serviced nor within the control of the air carriers. In fact, the airlines themselves are just fee-paying-users of the shared airport facilities, including even the use of the runway and ATC services.

III. Accidents within the Terminal

Accidents have occurred in the terminal areas where bonafide air passengers, in the process of boarding, have been injured or have died. Three instances are cited to exemplify this assertion. First, the case of roof collapsing in the terminal area of Mehrabad International Airport at Teheran on 5 December 1974. Larry Upton, an American national waiting for an international flight died in this accident at the terminal and a compensation claim was filed against the air carrier as *Upton vs. Iran National Airlines Corporation* in the United States.¹⁶ In a similar case of wrongful death of a passenger named Day and injuries to other passengers by a bomb blast in the terminal area. Liability was claimed in *Day v. Trans World Airlines*.¹⁷ The passenger was in the transit lounge at Ellinikon International airport¹⁸ at Athens standing in the queue to board the plane, on 5 August 1973, when a terrorist attack occurred and two passengers, including Day, were killed and many injured.¹⁹ In another case of claim, *Evangelinos* was injured resulting from firing by terrorists upon a group of passengers going through pre-boarding procedures.²⁰

In view of the vast expanse, long distances, third-party security sanitisation, agency regulated curbs on the movement and the long time spent by the passenger at the airport terminal, with scant freedom of personal movement and no easy exit or escape, the US Supreme Court considered the situation in detail.²¹ It was convinced that the passenger had literally no liberty

¹⁶ 450 F Supp 176 (1975).

¹⁷ *Day v. TWA Incorporated* 393 f supp 217, 220 (SDNY), 2d Ct., (1975).

¹⁸ In 2001, this airport was named as Eleftherios Venizelos International Airport.

¹⁹ 45 Fordham L Rev. 369 (1976).

²⁰ 550 F. 2d. at 152.

²¹ *Eastern Airlines v. Floyd*, 499 U. S. 530, 533, (1991). For a more detailed treatment on the subject, refer Abdulla Hassan Mohamed, "Recovery for Emotional Distress Under International

of independent movement or choice of location or to select a waiting area. Once the passenger entered the secured terminal premises, the movement was regulated and controlled. It was thus, maintained by the Court that even “pre-on-board stage” at the airport terminal carries risks predicated to the air travel because the passenger has very little option of free movement, with restricted exits and is precluded from unchecked escape from the terminal. The Court further mulled on the aspects of passenger safety, premises sanitisation and ambient security. In conclusion, it was deemed that a risk within the terminal premises was attendant, predicative and consequent to the factum of air travel and as such an inescapable part of the journey contracted by the air carrier. In other words, a person with a valid ticket and intention to travel is deemed “on-board aircraft” from the time of entering the airport terminal till leaving such premises after collection of checked-in baggage.

In elaboration, to determine liability for accidents inside the airport terminal and confirm the validity of the case for attribution of liability and admissibility of compensation for injury to or death of a bonafide passenger to be treated as on-board, the Supreme Court laid down a triple test and devised three elements as causation for liability in such cases viz., activity, control and location.²² The first test is that the passenger was doing what activity, i.e., the imminent purpose of the passenger in the designated area e.g., check-in, immigration stamping, customs formalities, security check. Waiting for boarding or collection of baggage from the conveyor belt, etc. The second test is that the passenger was under whose control or which authority or agency regulated or directed the movement in queue or imposed passage restrictions in

Air Transportation as Developed by the Common Law Courts”, *Louisiana Law Review*, vol. 82, no. 4, Summer 2022, pp. 1143-1180.

²² The case at note *ibid*.

the area. The third test questions that the passenger was at which location within the terminal and whether it was sanitised for security, regulated for entry, was exclusive for such passengers and availability of exits or escape routes.²³ This triple-test approach heralds a new thinking consequent to changed circumstances and new compulsions of air travel and consequent risks, thus, expanding the interpretation of “on-board aircraft” to adjust to and accommodate new realities of the time spent in the terminal before boarding till exit and the attendant imperilments involved.

IV. Interpretation by Indian Court

There also occurred a case in India where a girl of seven years returning from Dubai by Air India flight on 13 December 1999 got sucked into the escalator and died at Indira Gandhi International Airport, Delhi. A claim was preferred against the airline where the court permitted that Airport Authority of India (AAI), the party responsible for providing such facilities, could be impleaded for liability. From the affidavits and during the hearings, the Indian Court was not convinced by the defences put up by AAI and the manufacturer of the faulty escalator. Incidentally, it could even be made into a case of unlimited liability for dereliction in maintenance or product default, ergo, beyond the limitation stipulated under the Warsaw Convention (WC).

The matter was then taken up before the National Consumer Dispute Redressal Commission (NCDRC) who held it as a deficiency in service for lack of proper maintenance. Accordingly, NCDRC in 2004, directed AAI to pay to the mother of the deceased, French Francs 250,000 as compensation for the death of the child, Jyotsna Jethani. The compensation awarded was as per the limit defined under Warsaw Convention for an accident “on-board.” However,

²³ Based on judgment in the case of *Day v. TWA*. *Supra* n. 18.

the matter went to the Supreme Court in appeal and was contested. The Supreme Court, too, was dissatisfied with defendants and made a strong rebuke to the AAI for poor maintenance and for the cussed attitude lacking of empathy. Accordingly, the Supreme Court, on 1 February 2008, ordered payment of compensation as already decided with interest from 1 January 2000. This worked out to Rs. 38.4 lakhs and was duly paid. This judgment has since changed the jurisprudence on compensation in air accidents as also humanised Indian legal mindset on liability matters to make awards more empathetic and humane, and payments prompt.

V. Non-Accidents Deemed as Air Accidents

On 6 September 1970, a passenger by name Husserl boarded a direct flight to New York from Zurich. Shortly after take-off, an Arabian terrorist group hijacked the airplane and made it force-land near Amman, Jordan. The passengers were held captive for over a day and then permitted to proceed. A claim was made in the case of *Husserl v. Swiss Air*²⁴ for trauma, mental suffering, anxiety and anguish. The airline defended the liability by asserting that hijacking is not an accident and that no “bodily injury” has been caused to the passenger due to this incident. *Ejusdem generis*, both parties could validate their arguments, yet this cause of action revealed a vacuum in the Warsaw Convention.

The Judge harked back to the legislative history of the Convention to find any direct reference but only could construe that possibly the framers clubbed undefined redundancies under “any other bodily injury suffered by a passenger”²⁵ and nuances of this clause could not be ignored. The Judge

²⁴ 388 F. Supp. 1238 (SDNY, 1975).

²⁵ The Warsaw Convention, 1929, Article 17.

considered that personal injuries should relate to organic functioning of a human being and brain being a vital part of the body, could rightly imply mental and psychosomatic injuries. He also argued that such injuries were not specifically and explicitly excluded either and were consequential to this carriage by air and the discomfiture of being hostage at Amman. Hence, by allowing the claim, the Judge felt that he was upholding the spirit of the Convention and promoting its intent and purpose.

In another case, an act of terrorism occurred on 30 May 1972 at Lod International Airport, Tel Aviv, Israel. In this event, three Japanese, acting as proxy and in service of Palestinian Terrorist Organisation opened fire in the baggage claim area of the terminal causing deaths and injuries to passengers picking up baggage from the conveyer belt.²⁶ In bundled claims for this incident, the court held that the passengers were still in the process of a bonafide and necessary activity as an adjunct and incident of air travel and within the airport. Thus, technically disembarkation was not complete and would have ended only as the passengers leave the terminal premises.²⁷

There are other cases of terrorist acts at airports on record to vindicate abdication of conservative interpretation of Article 17 of the WC and its verbatim reiteration in Montreal Convention. The rule requires totality of circumstances approach and consideration of overall injuries to the “body organic” rather than restrict to the physical injuries or their physical manifestation in a superficial measure. The pertinent causative factor is the unusual and unexpected event inflicted by a third party on unsuspecting, peaceful passengers who become the victims. The overall picture of events

²⁶ *Matinez Hernandez, et al v. Air France*, 545 F.2d 279 (1st Cir., 1976).

²⁷ Other cases from the incident mentioned *ibid*. *Klein v. KLM*, 46 A.D.2d 679, 360 NYS2d 60 (1974), *Felismina v. TWA*, 13 Av. Cas. 17, 145 (SDNY, 1974). Also refer 430 U.S. 950 (1976).

emanates empathy for the victimised and aggrieved passengers and calls for due and rightful compensation.

In nutshell, different courts have defined terms related to air accident and their types. An accident is “a fortuitous, unexpected, unusual or unintended event.”²⁸ Or it is “An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and till all such persons have disembarked...”²⁹ In another case of *Evangelions v. Trans World Airlines*, the court announced that hijackings, terrorist attacks and bombings are accidents within the meaning of Article 17 of the Warsaw Convention.³⁰ Again, in *Husserl v. Swiss Air*, the court held that hijacking be treated as an accident on the logic that the carrier to be liable to “innocent victims of wilful acts of others”, and the judge allowed the claim.³¹

VI. Compensation for Delayed Operations

Delays are endemic in aviation operations for different causes; whether due to weather conditions, technical snags, safety considerations, diversion of flight *ex contractu*, additional security checks or for operational reasons of delayed clearance for landing or take-off in rush hours. Delays for technical and operational reasons are mostly insulated against compensation but facilitation, as appropriate and necessary, is generally provided. Whereas, delays due to commercial reasons are compensable monetarily as also with other

²⁸ *Saks v. Air France*, 105 S. Ct. 1343, (1985).

²⁹ Case *ibid*, p. 1338.

³⁰ 550 f. 2d 31 (2d Cir, 1975).

³¹ *Husserl v. Swiss Air*, 351 F Supp., at 707.

compensatory benefits and facilitation services. “But the term ‘delay’ has only relative connotation and no absolute meaning in itself.”³²

The Warsaw Convention, 1929 holds the air carrier liable for damage occasioned by delay in the carriage of passengers³³ but it does not bind the airline to accomplish any particular leg of carriage within a fixed time or the scheduled time. Thus, the expression delay assumes ambiguity and its reasonableness has to be determined in relation to cognate circumstances, whether of technical necessity or to ensure passenger security or for safety considerations but not as a garb for commercial indulgence, deliberate acts, operational inefficiency or negligence of staff.³⁴ Ergo, uncertainties and delays are inherent hazards of aerial transportation despite high ‘on-time’ achievement by a few air carriers e.g., Indigo Airlines.

Interestingly, Turkish domestic law is stricter on the contractual obligation of carriage and obligates “air carriers to perform the transportation as necessary and on time.”³⁵ This clause covers both, flight cancellations and delays; and contends that the connotation of delay should cover both the time of arrival and the time of departure because the term postponement relates to departures. Similarly, cancellation is construed as non-performance of a flight by the air carrier and obligates the carrier for full refund or offer appropriate substitute flights. The only relief to the carrier is either for delays caused in-flight or extra-ordinary circumstances deemed as *force majeure* or responses *ad*

³² Sachdeva, *supra* n. 4, p. 122.

³³ Article 29 (1) of the Warsaw Convention, 1929.

³⁴ *Ibid.*

³⁵ *Supra* n. 6, p. 136. Refer *Turkish Civil Aviation Law*, 1983, Article 122.

impossibilia. In a similar analysis, “Spanish Law on this point appears quite elaborate and equitable”³⁶ and can be helpful in evolving general principles for universal application.

Nevertheless, delays are compensable where the staff or agents of the carrier can be accused of negligence or a wrongful act or wilful misconduct.³⁷ In a contested case, the servants of a carrier ejected a passenger from the aircraft at an intermediate stopping place and wrongly refused to allow him to enter or re-enter the aircraft. The carrier was held liable for the delay so caused, its consequences and any incidental loss or expenses.³⁸ However, Montreal Convention 1999 (Article 19) is more explicit and “provides for a cause of action for damages due to delays”³⁹ as well as determinate in the quantum of compensation payable therefor.

In a major disruption of air operations at IGI Airport, New Delhi in January 2024 over 600 flights were delayed and 76 cancelled due to worst fog of the season. Hardly any advance information was passed on to the passengers for delay or cancellation resulting in an unprecedented and unmanageable rush at the airport for security and airline counters to handle. Added to the confusion was that the airline staff was hardly clear as to what compensatory sops to offer based on the longevity of an uncertain delay or the cancellation of flight.⁴⁰ The situation was iniquitous in offers and could have led to riots. Civil Aviation

³⁶ Sachdeva, *supra* n. 4, pp. 172-3. Also refer *Air Navigation Law of Spain*, 1960, Article 94.

³⁷ Article 25, of the WC.

³⁸ *Wanderer v. SABENA and PANAM*, (1949), US Av R 25.

³⁹ *Supra* n. 6, p. 132.

⁴⁰ “Stranded, Grounded, Locked in”, *The Times of India*, 16 January, 2024, supplement p. 3.

Minister has acknowledged the problem and has instructed DGCA to issue clear Standard Operating Procedures (SOPs) for such exigencies of delay or cancellation. It shows that in India also rights of the air passenger are not yet fully addressed from all angles and deserve serious attention to evolutionise the existing regulations.⁴¹

It happened on Air Canada flight from Quebec to Toronto on 24 June 2019. A passenger named Tiffany Adams fell asleep during the flight and when she woke up, she was freezing cold and buckled to the seat. The aircraft was pitch-dark and seemed parked with no crew-members on board. It was a terrifying experience that induced panic but she kept her wits about and reached the cabin to find a searchlight. With this she unlocked the door and signalled to a passing trolley that rescued her. She said that she has since been experiencing recurring night tremors. Air Canada has accepted responsibility for the incident as a multiple failure by the concerned staff.⁴² Compensation, as claimed, would be, of course, honoured for delay and in solatium for the woman's ordeal of mental distress due to the harrowing experience and its aftermath.

In another instance, a woman was left alone locked on an airplane after landing at Philadelphia International Airport. The passenger, Ginger McGuire, was travelling in a late-night flight (also known as red-eye flight) and fell asleep during the travel and failed to get up when the aircraft touched down. She woke up four hours after the landing and has sued the United Airlines.⁴³ A similar case happened in India on 5 February 2010. A passenger on Air India flight

⁴¹ "DGCA norms on flyers' rights don't address some core issues", *The Times of India*, 3 April, 2024, p. 5.

⁴² Aleksandra Sagan reported for the Canadian Press, 25 June, 2019.

⁴³ *The Times of India*, 29 May, 2010.

from Riyadh to Kochi with a stop-over, overslept in the aircraft and failed to deplane at his destination of Kochi. The crew mistook him as a passenger from stop-over and bound for Riyadh. He woke up as the plane was taxiing for the return flight to Riyadh. After checking up the credentials of the passenger, the aircraft was brought back and the passenger disembarked at the terminal.⁴⁴ No details of his claim, whether for delay or the shock of being carried back to Riyadh, against the airline have been found.

VII. Liability for Flying Hazard without Accident

The Warsaw Convention admits of only physical or bodily injuries and does not admit of physical pain, mental suffering, psychological distress, adverse effect on health and other intangible causes and consequences of aircraft accidents or incidents. Despite a clear provision to the contrary, in the Convention, the US courts have entertained cases on germane matters. For example, TWA passenger jet aircraft, while in flight, plunged almost 10km before the pilots regained control and normal flight continued. The passengers were awe-struck, traumatised and terrified by the experience. The matter went to the Hennepin County District Court (Minneapolis) and was decided by a Jury in January 1984. The court “awarded damages between 30,000 and 50,000 dollars to three passengers for relatively minor injuries and emotional distress.”⁴⁵

Another interesting case of new interpretation of air carrier’s liability for a cause “on-board” but without an accident seems pertinent and deserves a mention. In this case Valerie Saks, a passenger on Air France jetliner on 16 November 1980, complained of severe pressure and pain in the left ear while

⁴⁴ *The Times of India*, 5 February, 2010.

⁴⁵ Sachdeva, *supra*, n. 4, p. 120.

landing at Los Angeles airport; which continued after the landing also. Shortly thereafter, the passenger consulted a doctor, who concluded that she had become permanently deaf in her left ear. A suit was filed alleging that the hearing loss was caused by negligent maintenance and operation of the cabin pressurization system of the jetliner.

Based on the post-flight reports, pilot's affidavit and passenger testimony, which all reported normal operations, the Court held that the injury here was not caused by an "accident", which is an "unusual and unexpected" happening,⁴⁶ within the meaning of Article 17 of the WC. It further held that the cause was a risk inherent in air travel and did not qualify as an accident even within the definition in Annex 13 to the Chicago Convention on International Civil Aviation (1944). The case went in for appeal which considered the connotation of the word accident as formulated in Article 17 applying to passengers. It cogitated on the differentiation between cause and effect as also on the event of injury and the cause of injury. The Court, after deliberation, held that the WC imposes absolute liability on airlines for injuries proximately caused by risks inherent in air travel.⁴⁷ The liberalism here is obvious. New jurisprudence has been ushered.

VIII. A Point to Ponder: Air Carrier's Liability

Lately several offences have been committed by co-passengers on peaceful, unsuspecting or even on passengers fast asleep. The reference is made to instances where a passenger molested a female passenger on an adjoining seat or ostensibly drunk passenger urinated on a female passenger in an aisle

⁴⁶Refer *De Marines v. KLM*, 580 F. 2d 1193, 1196 (CA3 1978).

⁴⁷*Air France v. Saks*, 470 US 3922 (1985).

seat or an unruly passenger created a mid-air scare,⁴⁸ or acts of indiscipline or against the rules that jeopardise flight safety.⁴⁹ Many more similar instances can be cited. To deal with such offensive cases, the airlines have taken an easy way out to hand over the offenders to the police with a report of the alleged act at the next landing for investigation, arraignment and adjudication.⁵⁰

Having mentioned of the unruly passengers and their acts, it seems pertinent to list some such case to vindicate the assertion. To begin with, an inebriated male passenger urinated on a female passenger in business class on Air India flight (AI-102) from New York to New Delhi in January 2023. The aggrieved passenger, a lady in seventies, complained to the crew that her clothes, shoes and bag were soaked with urine and reeked with smelly odour.⁵¹ The air hostess smelled and disinfected the seat and the airline staff conciliated the incident between the parties. No action was taken against the offender, Shankar Mishra, under Civil Aviation Requirements (CAR) 2017 pertaining to

⁴⁸ A passenger continuously stared at a lady passenger on the back seat who felt uncomfortable and reported to the crew. When told to sit properly, he slapped the hostess and became violent. The aircraft had to make a priority landing at Delhi to hand over the passenger to Police custody. "Mid-air scare as man turns violent on Mum-Delhi flight", The Times of India, 8 November 2012.

⁴⁹ A drunk passenger urinated in a coffee mug due to delay in deplaning at Sydney Airport. The incident occurred in December, 2023 and the passenger has been fined A\$600 by the court for his offensive act in February, 2024. "Flyer fined in Sydney for urinating in a cup on plane", The Times of India, 6 April 2024, Times Global page.

⁵⁰ The charges generally levied are based on nature of the offence. Some of the relevant section under the Indian Penal Code are intent to outrage modesty (Sec 354), obscene gestures or words etc., (sec 294), words, gestures or act intended to insult the modesty of a woman (sec 509), misconduct in public by a drunken person (sec 510) or Sections 21 (Dangerous flying), 22 (Assault and other acts of interference), 23 (Indiscipline, etc.) and 25 (No smoking) of Aircraft Rules, 1937.

⁵¹ "Drunk man pees on woman in biz class of US flight, goes home", The Times of India. 4 January, 2023, p. 8.

the handling of unruly passengers.⁵² The victim later made a complaint to the airline and the offender was apprehended and the erring crew de-rostered. Air India has put Shankar Mishra on No-Fly list maintained by DGCA for four months while the airline has been fined Rs. 30 lakhs for the default in not reporting the case as per procedures.

In a case of indiscipline contra to the rules and unruly behaviour, a South Korean on an Asiana Airlines flight opened an emergency exit door during mid-flight. This caused gushing in of air blast into the cabin terrifying passengers to scream and cry while a few passengers suffered severe ear ache to due to sudden depressurisation. In total, twelve passengers were slightly injured but many more terribly scared and mentally scarred. Liability may be invoked against the airline. The offender has been arrested and faces ten years in jail for the criminal act.⁵³

An NRI passenger was found smoking in the lavatory of Air India flight from London to Mumbai. When confronted, he became violent and assaulted a fellow flyer. He had to be given two shots to calm him down.⁵⁴ Again, on a Thai Airlines flight to Kolkata on 27 December 2022, an Indian passenger refused to straighten his reclined seat before take-off. The stewardess repeated that this was as per rules for safety but the passenger was adamant. In the meanwhile, fellow passengers intervened to explain but the argument escalated and it turned into a full-blown assault. A video of this incident went viral while Thai Airline

⁵² Article 6 of the Tokyo Convention grants the Commander of the aircraft powers to restrain an unruly passenger in order to protect safety of the on-board passengers and the aircraft.

⁵³ “S Korean faces 10 years in jail for opening plane door mid-flight”, *The Times of India*, 29 April 2023, p. 4.

⁵⁴ V Narayan, “NRI caught smoking on flight arrested for unruly behaviour”, *The Times of India*, 13 March 2023, p. 14.

reported the matter to Bureau of Civil Aviation Security for police proceedings.⁵⁵ More cases can be adduced; but in all these cases, third party was involved to cause injuries, physical and mental for which airline could be held liable as per settled law.

However, each act of gross indiscipline or criminality not only affects the safety and security of the co-passengers and the aircraft, it also disturbs peace and calm for the occupants by creating scare and angst for limb or life. One may call it by any lexicon, it does cause trauma, mental distress and psychological stress to mention the least. Any such event, its impact and reaction, shakes the entire organic body system of a passenger to create visible manifestations of the body, mental and physical, in symptoms like shaking or trembling of the body, temporary hysterical behaviour or long-term symptoms of nightmares, recall of the unfortunate incident or sleeplessness or other allied disorders. Therefore, consequences in physical bodily behaviour, accompanying reactions or causal mental impairment cannot be denied or dismissed; and this constitutes injury by all counts, legal or medical. Hence, liability arises and should be respected while the two Conventions are not static or frigid documents but dynamic *grundnorms* that may evolutionise to adapt to the incumbent challenges of the times.

Drawing analogies from the decided cases of terrorist attacks, the following commonalities may be reiterated. First, that the cause of action invoked for liability may not technically be an air accident. Secondly, that offences on-board, against the unsuspecting, unwary and peaceful passengers, are caused by third-party actions beyond redress and control of the victimised passenger/s. Thirdly, that there is generally suddenness in the act or adverse

⁵⁵ “Flyer fights on Thai flight to Kolkata; BCAS starts probe”, *The Times of India*, 30 December, 2022, p. 1. Saurabh.Sinha@timesgroup.com

event which was unusual and unexpected as also external to the passenger during the contracted carriage by air. Fourthly, the alleged act caused physical or bodily injury to the passenger or bodily inconvenience in different ways. Fifthly, the injury need not be restricted to the category of physical or bodily human injury. In fact, the body as an entity should be considered as an organic whole, including the brain and its manifestations. Sixthly, the long-term causations of the trauma and attendant mental stress and psychic distress deserve due consideration as part of the original injury and its incidental repercussions.

It may also be taken into account that the aviation industry has since stabilised, operationally and economically, along with advanced aircraft that are much safer with reasonable premia for insurance cover. Ergo, the need to liberalise the interpretation of Article 17 of both germane Conventions to construe the bodily injury more realistically and as a comprehensive term is a challenge of the times and the changing milieu of air travel. As a result, the suggested liberalisation of air liability, though would not economically harm the air carriers yet would certainly provide equity and justice to the innocent, harmed and aggrieved passengers. Further, as a result, the airlines would behave more responsibly in handling such cases and take necessary measures to deter and prevent such incidents by making “No-Fly” lists⁵⁶ more effective with reciprocal compliance of the unified listing by DGCA. Further, if deemed prudent and feasible, to consider accommodating Provost Marshal on flights prone to repeats of such incidents and more effective exercise of the powers of the commander on-board aircraft.

⁵⁶ A unified No-Fly List is maintained by DGCA and since 2000, 149 persons have put on this list by various airlines for varying periods of time. “Since 2000, 149 put on no-fly list: Minister”, *The Times of India*, 14 March 2023, p. 9.

IX. Conclusion

The liability for the death of or bodily injury to a passenger in an accident on-board an aircraft as per Article 17 of the Warsaw Convention 1929, and as repeated in the Montreal Convention 1999, has generally been granted by the courts. However, the courts have interpreted the term bodily injury as physical injury examinable externally or within the body, by the doctors. And no other type of injuries that were not positively diagnosable by trained human faculties, were, understandably, reckoned or considered for carrier's liability.

However, diagnostic technologies have since advanced to detect and monitor any adverse changes to the organics of human body exposed to an accident and can holistically determine the physiological and psychological impact of the accident. Accordingly, the courts have started acknowledging that the body is an organic whole and gets noticeably effected physically and mentally by the impact of air accidents and incidents of non-accidents. Suffering from pain of injury and subsequent surgical treatment, if any, are common human experience and naturally understandable. But the psychological impact of a harrowing experience of being a hostage or trauma of hijacking as well as attendant shock and mental suffering cannot be ignored or dismissed summarily. Thus, mental stress, psychological distress, emotional disturbance and their long-term repercussions deserve to be considered and compensated, howsoever, inadequately determined or inefficiently quantified by the medical experts.

These conclusions have gained vindication from court judgments. In the case of *Burnett v. Trans World Airlines*, the aircraft was hijacked. Judge Steel construed that though mental anguish alone was not comprehended to be compensable yet "emotional distress directly precipitated by bodily injury

[would be] considered as a part of the bodily injury itself.”⁵⁷ In companion cases in the same incident, Judge Rabin of the New York Appeal of Courts, in his majority judgment interpreted to accept “objective bodily injuries, including those caused by the psychic trauma of the hijacking...” and further emphasised, “...mental injury alone should be compensable, if the otherwise substantive law provides an appropriate cause of action.”⁵⁸ Thus, he was emphatic that to hold otherwise would limit the effectiveness of the Warsaw Convention in achieving its purpose.

The concerned judgments in the US and India show of an open understanding and a liberal interpretation that appears realistic and empathetic to the aggrieved passenger. This heralds a new jurisprudence in aviation liability beyond the limits of the Warsaw Convention and the Montreal Convention regime.⁵⁹ It is also worth consideration if passengers inconvenienced and victimised by co-passengers by molestation or urination or unruly behaviour can also raise claims of liability for third-party acts against the carrier in parallel with terrorist cases. At the same time, this suggestion puts greater onus of responsibility on the passengers to travel peacefully and behave amicably while “on-board” in the wider connotation.

In fact, the discussed views enlarge the scope and meaning of “accidents on-board aircraft” to more practical threshold of passenger’s travails and judicial acceptance without needing an amendment to the respective treaties regulating accident liability in commercial aviation operations. This pragmatic

⁵⁷ 386 F. Supp. 1152, 1158 (D.N.M. 1973). Words in brackets added.

⁵⁸ *Herman v. TWA and Rosman in TWA*, 34 N.Y. 2d 385 and 358 N.Y.S. 2d. 97 and 110, 314 N.E. 2d 848 (1974).

⁵⁹ The Montreal Convention, 1999.

activism by the progressive-minded judges is indeed commendable and in the correct direction while the extra burden of liability will also be bearable by the air carriers with advanced aircraft, safety norms and insurance coverage. This trend should be welcomed in the right sense of equity and the true spirit of justice by concerned stakeholders in the aviation industry till another Convention regularises the pronouncements of liberal limits of the various judgments.

Artemis Accord: An Affront or Extension of Space and Celestial Bodies as Common Heritage

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Abstract:

A man walked into a notary public office at Pittsburgh in 1936 and declared that all the property known as planet, islands-of-space and other matter, supposedly known as A.D Lindsay Archapellago, to belong to him. In 1976, Kenya, Colombia, Uganda, Ecuador, Indonesia, Brazil, Zaire and Congo through a Bogoto Declaration, and while perceiving outer space to begin after the geostationary orbit, claimed ownership and sovereignty over the geostationary orbit (GSO) part of Outer Space above their territory at a distance of 35,871km (i.e.22,300 miles) from the earth surface. This is done pursuant to the United Nations Charter on Economic Rights and Duties of

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States Resolution 3281 (XXIV). Again, 20th July 1969 marked the beginning of raising and displaying American flag on the Moon with Apollo 11 by Neil Armstrong. Res Communis as a popular concept of Outer space regimes is regularly threatened by acts of man, many of which are through series of Instruments or Agreements with intent, quite inconsistent with the provision of the Outer Space Treaty 1967. Currently, the most controversial threat, despite its claim to affirming the importance of complying with the Outer Space Treaty 1967, is the Artemis Accord, steered and championed by the United States. It is the intention of this paper to analyse and examine the provisions of the Artemis accord vis-à-vis the Outer Space Treaty on the acclaimed compliance to determine if it is indeed in compliance or an affront to the principles already enshrined in the Outer Space Treaty concerning exploration and exploitation of Outer space, the Moon and its celestial bodies.

I. Introduction

The founding principle of international law, favored customarily as far as the use of outer space, moon and its celestial bodies is concerned; is that the environment and its resources be explored and harnessed to foster the growth and development of mankind.¹ Therefore, Outer space and its resources are that of common heritage to which not an individual or state can lay claim to

¹Art. I ‘The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind. Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies. There shall be freedom of scientific investigation in outer space, including the Moon and other celestial bodies, and States shall facilitate and encourage international cooperation in such investigation’

the ownership of the environment and its resources.² It would not be wrong to presume that the intention of the world community towards the development of space laws, particularly the Outer space Treaty, is that since *fingers are not equal* with regards to the ability and capability of States to engage in the exploitation of outer space, the fair point is to score a situation where the *Haves* make available space resources to the *Have nots*, thereby making outer space the province and Heritage of mankind; and the exploration of its resources for the benefits and use of mankind.³

In 1988, the subject of the “*consideration of the legal aspect related to the application of the principle that the exploration and utilisation of outer space should be carried out for the benefit and in the interest of all states, taking into particular account the needs of the developing countries*”⁴ was considered by the United Nations which was later adopted by the General Assembly as the ‘*Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All-State, Taking Into Particular Account the Needs of Developing Countries*’⁵ and ‘The recognition that there are discrepancies in the degree of development of all parties,⁶ appeals to the conscience of Space actors to engage “in international

² Art II ‘Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means’

³See Preamble ‘Believing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development’

⁴ See UN Doc AAC.105/411. See also the “European Political Cooperation Documentation Bulletin.” Vol 4, No.2, 1989< Archive of European Integration (AEI) <<https://aei.pitt.edu/37316>> accessed 23 February 2024.

⁵ See UN Doc. A/RES/51/122 Plenary Meeting 13 December 1996< <https://www.unoosa.org> >accessed 7 January 2024.

⁶ Ibid. See Article 1 of the Declaration

cooperation in the exploration and use of Outer Space for the benefit and in the interest of all parties, with such international cooperative venture taking into particular account the need of the developing Nations.”⁷

This is reaffirmed in article I and II of the Outer Space Treaty⁸ to the extent that firstly; outer space and its resources is not subject to any form of appropriation and secondly; that the exploitation and exploration must be in the interest of mankind and must be utilised and benefited by all mankind. Thus a State or States that mines or harness space resources must do so with the intention that it will not be used solely by it but the outcome must benefit the world at large.

The Artemis Accords, a multilateral agreement championed by the United State of America seems to deviate or preach otherwise. As would be seen afterwards in this article, its provision tilts more against the customary international law principle of *res communis* which finds its way into the space Treaty. It is interesting to note that this would not be the first attempt at dishonoring the Common Heritage (CH) mandate of the space treaties. The Bogota Declaration of 1976 comes to mind here; where some equatorial State⁹ decides to claim ownership and sovereignty over the geostationary orbit (GSO) part of Outer Space above their territory at a distance of 35,871km¹⁰ (i.e. 22,300 miles) from the earth surface. This part of outer space is quite

⁷ Ibid.

⁸ As at February 2024 (No of states that are parties to the treaty)

⁹ The Bogota Declarants are the Equatorial States i.e. Kenya, Colombia, Uganda, Ecuador, Indonesia, Brazil, Zaire and Congo. Accordingly, these signatories perceive outer space to begin after the geostationary orbit and do not include the orbit. Though the relationship between an object over a state cannot be discarded and this can be said to lend a support to the declaration.

¹⁰ Article 1, Bogota Declaration 1976

resourceful in the performance of satellite telecommunication, a state can have a viable commercial coverage globally with just a few satellites.¹¹ Therefore other portions of outer space is subject to the principle of *res communis*, that is, free for all but the particular geostationary orbit (GSO) which the Bogota Declaration covers belong to them and any States that intend launching satellite or perform space activities on the orbit need the express permission of the states to which the orbit fall under its territory above the earth.¹² Article 2 & 3 (d) of the Declaration states the-

These parties asserts “the right of the peoples and of nations to permanent sovereignty over their wealth and natural resources that must be exercised in the interest of their national development and of the welfare of the people of the nation concerned as it is set forth in Resolution 2692 (XXV) of the United Nations General Assembly entitled permanent sovereignty over the natural resources of developing countries and expansion of internal accumulation sources for economic developments.

The United Nations Charter on Economic Rights and Duties of States,¹³ supports the assertion of a sovereign claim of states on their natural resources. Article 2 (I), states that “All states have and freely exercise full and permanent sovereignty, including possession, use and disposal of all their wealth, natural resource and economic activities.” The combined effect of these provisions can be said to inform the assertions of the equatorial states that the synchronous geostationary orbit, being a natural resource, is under their

¹¹ Jimoh. L.V. *Legal Problems in the Delimitation of Air Space and Outer Space*. A Critical Appraisal. A seminar paper delivered at the LL.M class of Aviation and Communication Law at Faculty of Law Obafemi Awolowo University Ile-Ife, Oct.2005

¹² Ibid. Pg. 16

¹³ Resolution 3281 (XXIV)

sovereignty. Accordingly, 'Devices to be placed permanently on the segment of a geostationary orbit of an equatorial state shall require previous and expressed authorisation on the part of the concerned state and the operation of the device should conform with the National Law of that territorial country over which it is placed'

II. The Artemis Accord

The Artemis Accords stems from NASA's Artemis mission¹⁴, which seeks to return humans to the Moon by 2024 and establish a sustainable presence there by 2028. The agreements were announced in May 2020, and NASA stated that they will serve as a platform for international cooperation in lunar exploration. This endeavor emulated the pace of the Outer Space Treaty of 1967, which established the framework for managing human operations in space. The Artemis Accords are made of ten fundamental principles¹⁵, each of which aims at promoting peaceful, cooperative, and long-term lunar exploration.¹⁶ One of the major concepts of the Artemis Accords is the commitment to the peaceful utilisation of outer space. All signatories pledge to conduct their space activities for the benefit of all and undertake not to station any weapons of mass destruction on it¹⁷.

The Accord emphasises the significance of openness and transparency in space activity. Participating Countries commit to share scientific data about their

¹⁴ Michael E. Evans, Lee D Graham, 'A Flexible Lunar Architecture for Exploration (FLARE) supporting NASA's Artemis Program', 2020, Vol 177, pg 351-372 <<https://doi.org/10.1016/j.actaastro.2020.07.032>, Google scholar> accessed 14 November 2023.

¹⁵ The Artemis Accords

¹⁶ Sign Artemis Accords, 'Signatories of the US-Led Artemis Accords Meet in Person for the First Time', 2023, Vol 117, pp.133-139 <<https://doi.org/10.1017/ajil.2022.88>, Google scholar> accessed 14 November 2023.

¹⁷ Ibid.S. 3.

lunar activities with the public in order to avoid misconceptions and undesired meddling¹⁸. It promotes collaboration and interoperability among space agencies. This includes the use of comparable technologies and standards, which might be critical for mutual support in space missions'.¹⁹ Signatories also agree to reduce their impact on celestial bodies and to conserve historic sites, and preserving space heritage²⁰. The Accords encourage governments to help astronauts in danger and coordinate rescue efforts²¹ while Countries agree to register their lunar assets with the UN, increasing transparency in space activity.²² Scientific data collected on the Moon will be released and made available to the international community, enabling global scientific collaboration²³. Countries pledge to preserving lunar historical sites and artifacts, recognising the moon's historical and cultural significance.²⁴ It encourages the use of space resources, emphasising the significance of a stable and predictable regulatory framework²⁵. Furthermore, Signatories commit to coordinate their lunar activities in order to avoid interference and reduce the formation of space debris.²⁶ The Artemis Accords are congruent with the Outer

¹⁸Ibid .S.4.

¹⁹Ibid. S.5.

²⁰Ibid. S.9.

²¹Ibid. S.6

²²Ibid. S.7

²³Ibid. S.8.

²⁴Ibid. S.9.

²⁵Ibid. S.10.

²⁶Ibid. S.11.

Space Treaty and other international space agreements, upholding the rule of law in space exploration²⁷.

III.The Outer Space Treaty Vs Artemis Accord

The 1967 Outer Space Treaty is regarded as the cornerstone document of international space law. Over 100 countries have signed it, including important space faring states like the United States, Russia, China, Japan, United Kingdom, South Africa and Nigeria²⁸. Several interesting concepts are established under this Treaty e.g., it declares Outer Space to be the domain of all humanity, outlawing any states acquisition of the province of celestial bodies thereby declaring the province a Common Heritage (CH)²⁹. This idea is intended to preclude territorial claims on celestial bodies, ensuring that space remains a global commons³⁰.

The Artemis Accords, on the other hand, are a series of agreements and principles proposed by the United States in 2020 to promote the long-term exploration and use of the Moon and other celestial bodies with the intention of advancing the Artemis program³¹. They have received widely spread acceptance from various states and are viewed as crucial step toward shaping

²⁷Ibid. S.1.

²⁸Treaties on Principles Governing the Activities of States in the Exploration and use of Outer Space, including the moon and other celestial Bodies, Art.I.

²⁹ Ibid.

³⁰ Ibid.

³¹ The Artemis Accords,S.1

the future of space governance³². The idea of non-appropriation is a fundamental source of conflict between the two. The Outer Space Treaty expressly prohibits any claims of sovereignty over celestial bodies³³, whereas the Artemis Accords make no such guarantee or is silent as regards that area. The Accords requires the use of space resources in a way that is consistent with international law, which a few view as a loophole for potential future claims.

The conflict between the Artemis Accords and the Outer Space Treaty exemplifies the contrast between the old space law norms and the changing interests of spacefaring government. It also emphasises the importance of international collaboration and diplomacy in navigating these problems. The gap between the Artemis Accords and the Outer Space Treaty is a complicated and diverse topic centered on the values, legal systems, and interests involved with human operations in outer space. The Artemis Accords, signed by the United States in 2020, indicate a new approach to space exploration, whereas the Outer Space Treaty, signed in 1967, is a core international pact governing space activity. This conflict has far-reaching consequences for the future of space exploration and cooperation³⁴

The Outer Space Treaty, signed by over 110 countries, defines a set of fundamental principles that have long guided space exploration. Among these

³² Michal Matusiak, 'Artemis Accords-A New Era of Space Law or An Initiative of the World's Superpower', 2023, pg.168-184 <<https://doi.org/10.31338/2544-3135.si.2023-97.11>, Google Scholar>accessed 11 February 2024.

³³ Ibid, S.1.

³⁴ Rossana Deplano, The Artemis Accords: Evolution or Revolution in International Space Law? International & Comparative Law Quarterly, 2021, Vol.70, pp799-819<<https://doi.org/10.1017/S0020589321000142>, Google Scholar>accessed 12 November 2023.

ideas are the concepts of the peaceful use of outer space, the ban of nuclear weapons installation, and the recognition that outer space is a global commons not subject to national appropriation. The treaty's overarching goal is to prevent the militarisation and weaponisation of outer space, and to ensure that space is used for the benefit of all mankind.

The Artemis Accords and the Outer Space Treaty are two major international agreements that control space exploration and use. While the two agreement share common goals of promoting peaceful and cooperative activities in outer space, there are distinct areas of conflict between the two agreements, primarily due to the fact that the Artemis Accords are a more recent initiative that does not fully comply with the principles enshrined in the Outer Space Treaty³⁵.

On the other hand, the Artemis Accords, launched as part of NASA's Artemis mission to return humans to the Moon³⁶, propose a set of principles that diverge significantly from the Outer Space Treaty. The Accords aim to foster international collaboration³⁷ and coordination in space exploration while simultaneously emphasising resource utilisation and commercial possibilities. The emphasis on lunar and asteroid resource extraction³⁸ is one of the most problematic components of the Artemis Accords, raising concerns about property rights and the potential for resource-driven wars.

³⁵ Ibid.S.5

³⁶NASA,Artemis Plan-NASA's Lunar Exploration Program Overview(September 2020)<https://www.nasa.gov/wp-content/uploads/2020/12/artemis_plan-20200921.pdf,google search>accessed 14 November 2023.

³⁷Ibid

³⁸NASA Press release 20-107(27 October 2020)<<https://www.nasa.gov/news-release/nasa-european-space-agency-formalize-artemis-gateway-partnership>,google search> accessed 14 November 2023.

The Artemis Accords encourage both governmental and commercial entities to harvest and use lunar and asteroid resources³⁹. This directly contradicts the concept of the Outer Space Treaty's that outer space and celestial bodies are not subject to national appropriation.⁴⁰ The Accords do not clearly address property rights, ambiguities and potential disputes over ownership of extracted resources exist. This goes against the Outer Space Treaty's limitation on national claims of sovereignty over celestial bodies. While the Outer Space Treaty restricts the deployment of nuclear weapons and other military activity in outer space⁴¹, the Artemis Accords do not address these issues adequately, raising concerns about potential militarisation of the outer space and beyond. The Artemis Accords promote cooperation between the United States and other countries, but they have been criticised for not allowing nations equal access to lunar exploration. This calls into question the notion of Outer Space as a global commons established by the Outer Space Treaty. The Artemis Accords are not legally binding international treaties⁴². This uncertainty can lead to disagreement over interpretation, compliance, and dispute settlement, especially when combined with the existing Outer Space Treaty.

Another key distinction is the dispute resolution systems. The Outer Space Treaty sets the premise that any conflicts resulting from its interpretation or

³⁹ Ibid

⁴⁰ Ibid. Art II.

⁴¹ Ibid. Art, IV.

⁴² Balazs Bartoki-Gonczy & Boldizsar Nagy, 'The Importance of the Accords' 2023, pg 888-893, <<https://doi.org/10.31338/2544-3135.si.2023-97.11>, GoogleScholar> accessed 14 November 2023.

application shall be settled peacefully⁴³. It allows for the resolution of conflicts through the United Nations or other international bodies. In contrast, Artemis Accords promote bilateral dispute settlement, which means that government participating in the Accords would be responsible for resolving among themselves, potentially diminishing the role of international entities⁴⁴.

Prevention of Harmful Contamination of Celestial Bodies: Furthermore, the Outer Space Treaty emphasises the protection of hazardous pollution of celestial bodies, especially in order to protect possible extraterrestrial life and habitats⁴⁵. The Accords mention it, although they are less precise on contamination prevention methods. This disparity has sparked concerns about the environmental implications of future lunar and planetary exploration efforts. The Accords also emphasise the development of safe zones around lunar and other exploration sites to protect ongoing missions⁴⁶. This strategy may be viewed as intruding on other nations' freedom to access lunar and planetary resources and ecosystems. It has sparked fears that some countries, particularly the United States, may acquire an unfair advantage in asserting claims to lunar resources. Hence, Artemis Accords and the Outer Space Treaty opposing viewpoints show the changing environment of space governance. While the outer space treaty was drafted during the cold war era and reflects the concerns of that time, the Artemis Accords are a response to the changing dynamics of modern space travel. These disparities in approach, notably with regard to non-appropriation, dispute settlement, and environmental protection,

⁴³ Ibid. Art XII.

⁴⁴ Ibid. S.12

⁴⁵ Ibid. Art IX

⁴⁶ Ibid. S.11

illustrate the difficulty in classical space law to the demands of a fast evolving space sector. Finding a balance between the two paradigms is critical for the peaceful and equitable development of space for the benefit of mankind.

Moreover, the United States introduction of the Artemis Accord in May 2020, have prompted major debate and discussion in the global space community. These accords are a set of principles and norms designed to regulate lunar exploration and beyond, with a focus on international cooperation. Many critics say that, while promoted as a collaborative framework, the Artemis Accords are, in reality, a self-serving ploy by the United States to further its own interests in space exploration. The Artemis Accords are principally led by the United States and are intended to direct future missions to the Moon and beyond⁴⁷. While it is not entirely accurate to describe them as “US self-service,” because they involve multiple countries and significant international collaboration, it is pertinent at this point to examine the in-depth of the Artemis Accords, their background, goals, and the extent to which they serve American interests.

The part on space resource utilisation is one of the primary and pertinent elements of the Artemis Accords that has received criticism. The agreement states that signatory governments shall harvest space resources in accordance with international law⁴⁸, including the 1967 Outer Space Treaty. However, the United State has been chastised for claiming the right to use lunar resources for its own profit without adopting precise norms to govern such efforts. Some states in the world are concerned about this approach because it appears to

⁴⁷InesaKostenko, 'Artemis Accords and the Future of Space Governance: Intentions and Realities', 2021, Vol 8, 40-50 <<https://doi.org/10.29202/as1/8/4>, google scholar> accessed 14 November 2023.

⁴⁸Ibid. S.3.

prioritise American interests in space resource exploration, perhaps giving the US an advantage in exploiting these resources. Critics believe that the United State is attempting to position itself as the principal recipient of space resources.

While the Artemis Accords are intended to be inclusive, there are parts that could be interpreted as indirectly promoting American interests. It is crucial to realise that the United States, as a pioneer in space exploration with large investments in the Artemis program, benefits naturally from a space governance framework that corresponds with its goals and priorities. Here are a few aspects of the Artemis Accords provisions that can be interpreted as supporting US interests:

The US enjoys a significant advantage in lunar exploration endeavors, with NASA at the forefront. The US can influence the development of international standards and practices in lunar exploration to fit with its interests by promoting the Artemis Accords.⁴⁹ The Artemis Accords acknowledge the right to use space resources, such as water ice on the Moon. This is consistent with the interests of American companies and agencies that seek to extract and use these resources for future missions, both on the Moon and beyond. By encouraging other countries to join under the Artemis Accords⁵⁰, the United States can forge greater relationships in space exploration, boosting its potential to attain lunar and interplanetary ambition.

⁴⁹Ibid. Olatinwo Khafayat Yetunde, 'Outer Space: A Possible Safe Haven and Jurisdictional Scores on Extradition' 2022 Coventry Law Journal. 27(1):ISSN1758-2512: 55-66. Coventry University, <<https://publications.coventry.ac.uk/index.php/clj/index>> or <<https://kwasuspace.kwasu.edu.ng/handle/123456789/812>> accessed 14 November 2023

⁵⁰Ibid .S.13 (3).

Space endeavors, notably lunar exploration, offer tremendous economic potential. The US may position itself to benefit economically from a developing space industry by influencing the rules through the Artemis Accords.⁵¹ American business and institutions have made significant expenditures in space technology and innovation. The Artemis Accords have potential to protect American technical superiority while also opening up prospects for technology transfer to other member countries. The international community has had a mixed reaction to the Artemis Accord. While some countries have embraced them and showed enthusiasm in becoming signatories, others have expressed misgivings and stated concerns. It is crucial to consider both perspectives:

Canada, has been an active participant in advancing international collaboration for lunar exploration through its support of the Artemis Accords. The Artemis Accords are sets of principles and guidelines established by space faring nations, including Canada, with the aim of promoting peaceful and sustainable lunar exploration of the Moon, Mars, and other celestial bodies⁵². This commitment to cooperation reflects Canada's longstanding interest in space exploration and its dedication to fostering global partnership in the realm of space science and technology.

Canada officially endorsed the Artemis Accords in February 2021, joining other nations such as Australia, Italy, the United Kingdom, Luxembourg and the United Arab Emirates. This move signaled Canada's commitment to

⁵¹Ibid

⁵²InesaKostenko,'Artemis Accords and the Future of Space Governance: Intentions and Realities', 2021, Vol 8, 40-50 <<http://doi.org/10.29202/as1/8/4>,google scholar> accessed 16 Feburary 2024.

playing a significant role in the international efforts to return Moon and pave way for future exploration missions.

One of the key aspects of Canada's support for the Artemis Accords is its commitment to the principles outlined in the document. The principles include ensuring the peaceful use of Outer space, promoting transparency in space activities, providing assistance to astronauts in distress, and avoiding harmful interference with other space activities. By endorsing these principles, Canada aligns itself with a framework that encourages responsible and cooperative behavior in lunar exploration.

Canada's involvement in the Artemis program, led by NASA in collaboration with international partners, extends beyond a mere endorsement of the Accords. The Canadian Space Agency (CSA) has actively contributed to various components of the Artemis program, particularly in lunar Gateway project. The Lunar Gateway is a space station intended to orbit the Moon and serve as a staging point for crewed missions to the Lunar surface.⁵³ One of the Canada's major contributions to the lunar Gateway is the Canadarm3 robotic system, which builds upon Canada's legacy of developing innovative robotic technology for space applications. The Canadarm3 will play a crucial role in the assembly and maintenance of the Lunar Gateway, showcasing Canada's technological capabilities and reinforcing its commitment to collaborative lunar exploration.

⁵³Michal Matusiak, 'Artemis Accords-A New Era of Space Law or An Initiative of the World's Superpower', 2023, pg.168-184<<https://doi.org/10.31338/2544-3135.si.2023-97.11>, GoogleScholar>accessed 16 February 2024.

Furthermore, Canada's involvement in the Lunar Gateway extends to the development of the Gateway External Robotic Interfaces (GERIs), designed to provide docking capabilities and support for robotic systems on the exterior of the Lunar Gateway. These interfaces will facilitate the integration of various payloads and instruments, allowing for a versatile and dynamic platform for scientific research and exploration. Its expertise in space robotics is not limited to the Lunar Gateway. The country has a strong history of contributing systems to space missions, including the iconic Canadarm2 on the international Space Station (ISS). The experience gained from these previous projects positions Canada as a key player in the development and deployment of robotic systems for future Lunar exploration missions.

In addition to technological contributions, Canada has also demonstrated its commitment to international collaboration through partnerships with other space agencies. For example, Canada and NASA have a long-standing history of collaboration, dating back to the early days of the Space Shuttle program. This collaboration has continued with Canada's involvement in the ISS and now extends to the Artemis program. Moreover, Canada's participation in the lunar Gateway aligns with its broader goals in space exploration and scientific research. The Lunar Gateway provides a unique platform for conducting experiments and observations in vicinity of the Moon, offering new opportunities for Canadian scientists and researchers to contribute to our understanding of the Lunar environment and beyond⁵⁴.

⁵⁴Rossana Deplano, *The Artemis Accords: Evolution or Revolution in International Space Law?* International & Comparative Law Quarterly, 2021, Vol.70, pp799-819 <<https://doi.org/10.1017/S0020589321000142>, Google Scholar> accessed 12 November 2023. Olatinwo Khafayat Yetunde, 'Outer Space: A Possible Safe Haven and Jurisdictional Scores on Extradition.2022 Coventry Law Journal. 27(1):ISSN1758-2512: 55-66. Published by Coventry University.<<https://publications.coventry.ac.uk/index.php/clj/index>> <<https://kwasuspace.kwasu.edu.ng/handle/123456789/812>> accessed 12 November 2023

Canada's commitment to the Artemis Accords and the Lunar exploration is not only a testament to its technological capabilities but also reflects a broader dedication to advancing humanity's understanding of the cosmos. By actively participating in international initiatives like the Artemis program, Canada positions itself as a key partner in the global efforts to explore and utilise outer space for the benefits of all humankind.

In conclusion, Canada's support for the Artemis Accords and its contribution to Lunar exploration through the Lunar Gateway project underscore the country's commitment to peaceful and collaborative efforts in outer space. With its technological expertise in space robotics and a history of successful collaborations with international partners, Canada plays a vital role in shaping the future of Lunar exploration and contributing to the broader goals of humanity exploration of the cosmos.

Japan has been an enthusiastic supporter of the Artemis Accords, contributing both technological expertise and commitment to international collaboration in the realm of Lunar exploration. Japan officially endorsed the Artemis, solidifying its commitment to fostering global cooperation in space exploration. This endorsement, made in November 2020, reflects Japan's dedication to contributing to the Artemis program led by NASA, which aims to return humans to the Moon by the mid-2020 and establish sustainable lunar exploration.⁵⁵ One of Japan's significant contributions to Lunar exploration under the Artemis program is its participation in the Lunar Gateway project. Japan Aerospace Exploration Agency (JAXA) has actively engaged in this

⁵⁵Salmeri, Antonio, One Size to Fit them All: Interoperability, the Artemis Accords and the Future of Space Exploration, 2021, pg 1-4 <<https://spacewatch.global/2020/11/spacewatchgl-opinion-one-size-to-fit-them-all-interoperability-the-artemis-accords-and-the-future-of-space-exploration>> accessed 16 February 2024.

project, showcasing the nation's commitment to collaborative space endeavors.

In a statement by JAXA, the agency expressed its intent to contribute the Japanese Experiment module (JEM) known as “Kibo” to the Lunar Gateway. Kibo, which has been a part of International Space Station (ISS), is a multi-functional module designed for various scientific experiments and research. Its inclusions in the Lunar Gateway emphasises Japan's role in providing essential infrastructure for scientific exploration beyond Earth's orbit⁵⁶.

Japan's expertise in space robotics also plays a crucial role in supporting Lunar exploration. The country has a rich history of developing advanced robotic systems, including the renowned Hayabusa missions, which successfully returned samples from asteroids building on this legacy, Japan contributes to the Artemis program with its robotic technology, aligning with the program's emphasis on using robotics for Lunar surface activities and exploration.⁵⁷ Furthermore, Japan's collaboration with NASA extends beyond robotic technology. The Japanese government, through JAXA, has been a key partner in the Gateway External Robotic Interfaces (GERIs), which provide docking capabilities and support for robotic systems on the Lunar Gateway. This collaboration reinforces Japan's commitment to actively participating in the development and deployment of essential infrastructure for lunar exploration. In a joint statement by NASA and JAXA, both agencies emphasised their commitment to strengthening international partnership for lunar exploration. The statement highlighted Japan's role in contributing to the

⁵⁶ *ibid*

⁵⁷ *Ibid*

Artemis program's success and fostering a global alliance to achieve sustainable lunar exploration.⁵⁸

Japan involvement in the Artemis Accords is not only a technological contribution but also a reflection of its broader space exploration goals. Japan has consistently demonstrated its commitment to peaceful and collaborative efforts in space, aligning with the principles outlined in the Artemis Accords. By endorsing and actively participating in the Artemis program, Japan positions itself as a key player in shaping the future of Lunar exploration and contributing to the broader advancement of human space exploration.⁵⁹

Australia has actively supported the Artemis Accords and Lunar exploration through various initiatives and collaborations. The Artemis Accords, established by NASA in 2020, aim to create a framework for international cooperation in Lunar exploration, outlining principles for the responsible and sustainable use of outer space.⁶⁰ Australia's engagement in these accords reflects its commitment to advancing scientific discovery, technological innovation, and international collaboration. Australia's involvement is evident in its partnership with NASA, as the country has contributed expertise, resources, and infrastructure to support the Artemis program. The Australian Space Agency (ASA), established in 2018, plays a pivotal role in coordinating these efforts. The ASA has been actively engaged with NASA and other international space agencies to contribute scientific expertise, technological

⁵⁸Melissa de Zwart, The Impact of the Artemis Accords on Resources Extraction, In-Space Manufacturing and Resources:Earth and Planetary Exploration Applications,351-368, 2022 <<https://doi.org/10.1002/9783527830909.ch19>,google scholar>accessed 4 March 2024.

⁵⁹Yutaka Osada, Governance of Space Resources Activities: In the Wake of the Artemis Accords, 2021, <<https://heinonline.org/HOL/LandingPage>, google scholar>accessed 4 March 2024.

⁶⁰ ibid

capabilities, and logistical support. This collaboration enhances Australia's standing in the global space community and fosters innovation and knowledge exchange⁶¹.

Furthermore, Australia's geographical advantage, with ground stations such as the Canberra Deep Space Communication Complex, provides critical support for Lunar missions. These ground stations facilitate communication with spacecraft, ensuring seamless data transmission and enhancing the success of Lunar exploration missions. Australia's commitment to the Artemis Accords is also evident in its investment in space research and technology development. By fostering a robust space industry and encouraging private-sector involvement, Australia contributes to the broader goals of sustainable lunar exploration outlined in the accords.⁶² The Country's support for the Artemis Accords and lunar exploration is multifaceted, encompassing diplomatic engagement, scientific collaboration, technological contributions, and infrastructure support. This active participation underscores Australia's dedication to advancing space exploration within a framework of international cooperation and responsible practices.⁶³

The United Kingdom welcomed the Accords and stated its intention to join the project, emphasising its objectives in space exploration. The UK government, has demonstrated strong for the Artemis Accords, contributing to international efforts in Lunar exploration through various means. The UK government,

⁶¹ *ibid*

⁶² *ibid*

⁶³ Melissa de Zwart, The Impact of the Artemis Accords on Resources Extraction, In-Space Manufacturing and Resources: Earth and Planetary Exploration Applications, 351-368, 2022 <<https://doi.org/10.1002/9783527830909.ch19>, google scholar> accessed 4 March 2024.

recognising the significance of space exploration and its potential benefits, has actively engaged in promoting the principles outlined in the accords.

One notable aspect of the United Kingdom's involvement is through its collaboration with NASA. The UK Space Agency (UKSA) has established partnerships with international space agencies, including NASA, to contribute scientific expertise, technological advancements, and financial support to lunar exploration missions. This collaboration enhances the UK's position as a key player in the global space community. In terms of financial commitment, the UK government has allocated funding to support Lunar exploration initiatives. This includes investments in research and development, as well as support for private companies involved in space exploration activities. These financial contributions reinforce the UK's commitment to advancing space exploration within the framework of the Artemis Accords⁶⁴.

Moreover, UK space industry has played a crucial role in supporting lunar exploration. British companies have been actively involved in developing cutting-edge technologies, such as space robotics and satellite communication systems, which contribute to the success of lunar missions. This technological expertise positions UK as a valuable partner in the international pursuit of Lunar exploration goals. UK's commitment to sustainable space activities aligns with the principles outlined in the Artemis Accords. By emphasising the responsible use of space resources and promoting transparency in lunar exploration, UK actively contributes to shaping the future of space exploration in a collaborative and ethical manner.⁶⁵ Its support for the Artemis Accords

⁶⁴Balazs Bartoki-Gonczy & Boldizsar Nagy, 'The Importance of the Accords' 2023, Pg. 888-893, <<https://doi.org/10.31338/2544-3135.si.2023-97.11>, GoogleScholar>accessed 14 November 2023.

⁶⁵ *ibid*

and Lunar exploration is characterised by diplomatic engagement, financial investment, technological contributions and active participation in international collaborations. This multifaceted approach underscores the UK's commitment to advancing humanity's exploration of the Moon while adhering to principles of responsible and inclusive space activities.

However, Russia has expressed significant concerns about the Artemis Accords, particularly regarding exclusion of some states during their creation. One of the primary issues raised by Russia is the perception of a lack of inclusivity in the accord's drafting process⁶⁶. The creation of the accords, led by NASA has raised concerns about the participation and input of other nations, leading to a sense of exclusion among some space-faring nations. Russia has argued that decisions about the future of lunar exploration should involve a broader international collaboration, with more nations having a say in shaping the principles that govern space activities. The exclusionary nature of the initial discussions has fueled Russia's apprehensions about the accords being primarily centered on the interests of the United States⁶⁷.

Furthermore, Russia has expressed reservations about the potential militarisation of space. The Artemis Accords emphasise peaceful exploration, but concerns have been raised about the possibility of dual-use technologies and the potential weaponisation of lunar activities. Russia, historically a major

⁶⁶ Fabio Tronchetti & Hao Liu, 'Australia's signing of the Artemis Accords: a positive development or a controversial choice?' 2021, Pg. 243-251, <<https://doi.org/10.1080/10357718.2021.1893268>> google scholar accessed 4 March 2024.

⁶⁷ Rossana Deplano, 'The Artemis Accords: Evolution or Revolution in International Space Law?' *International & Comparative Law Quarterly*, 2021, Vol. 70, pp 799-819 <<https://doi.org/10.1017/S0020589321000142>> Google Scholar accessed 12 November 2023.

player in space exploration, is keen on ensuring that international agreements prevent the weaponisation of outer space and promote the use of space for peaceful purposes. To address these concerns, Russia advocated for a more inclusive and collaborative approach to space governance. They argue that decisions affecting the future of lunar exploration should be made collectively, with the involvement of a wider range of nations to ensure diverse perspectives and prevent the dominance of any single country's interests.⁶⁸

Summarily, Russia's concerns about the Artemis Accords revolve around the perceived exclusion of some states during their creation and the assumption that these accords are primarily centered on the United States. The call for greater inclusivity and a collective approach to space governance reflects Russia's commitment to maintaining a peaceful and collaborative environment in outer space.⁶⁹

China a major player in space exploration, has expressed reservation about the Artemis Accords, emphasising issues related to compatibility with international space law and the principles of justice and non-discrimination. China asserts that any framework governing Lunar exploration should align with existing international space law, such as the Outer Space Treaty, which advocates for the peaceful use of outer space and prevents any national

⁶⁸Fabio Tronchetti & Hao Liu, 'Australia's signing of the Artemis Accords: a positive development or a controversial choice?' 2021, Pg. 243-251, <<https://doi.org/10.1080/10357718.2021.1893268>> google scholar> accessed 4 March 2024.

⁶⁹Melissa de Zwart, The Impact of the Artemis Accords on Resources Extraction, In-Space Manufacturing and Resources: Earth and Planetary Exploration Applications, 351-368, 2022 <<https://doi.org/10.1002/9783527830909.ch19>>, google scholar> accessed 4 March 2024.

appropriation of celestial bodies.⁷⁰China also highlights the importance of justice and non-discrimination in international collaboration. The concern revolves around the perception that the Artemis Accords may create a framework that could favor certain nations over others in terms of Lunar exploration opportunities and resource utilisation. China emphasises the need for equitable access and opportunities for all nations, irrespective of their space capabilities or geopolitical standing⁷¹.

By raising these concerns, China aims to ensure that any international agreement on lunar exploration upholds the principles of fairness, inclusivity, and adherence to established international space law, fostering a cooperative and just environment for the peaceful use of outer space.

IV. The Way Forward

The Artemis Accords are a novel framework, and its impact on the future of lunar exploration and space administration is unknown. As the world grapples with the problems' and opportunities given by space exploration, many critical concerns emerge as explained earlier in the body of this article and more.⁷²The Accords success and acceptance will be determined by how inclusive they become, particularly by establishing dialogue and international forums thereby allowing nations to voice concerns and collectively refine the Artemis Accords. This inclusive approach acknowledges diverse perspectives and facilitates consensus-building, crucial for overcoming challenges and minimizing the perception of the Accords as an affront. Increasing the number

⁷⁰ *ibid*

⁷¹ *ibid*

⁷² *Ibid.*

of signatory countries⁷³ and addressing concerns raised by countries such as Russia and China will be critical to their validity.⁷⁴As the use of space resources becomes more possible, international cooperation in defining clear laws and standards for responsible resource extraction will be crucial to avoiding disagreements and conflicts⁷⁵.

In summary, the way forward involves refining the Artemis Accords by enhancing transparency, promoting responsible resource utilisation and streamlining planetary protection measures. A collaborative, inclusive approach that values international dialogue will contribute to a framework that aligns more closely with the principles of the Outer Space Treaty while advancing the shared goals of lunar exploration.

V. Conclusion

In conclusion, the evolution of the Artemis Accords has positioned it as an affront to the Outer Space Treaty, marking a pivotal shift in the landscape of international space law and lunar exploration. The Accords, introduced by NASA, have navigated towards a stance that, in certain aspects, challenges and extends beyond the parameters set by the Outer Space Treaty of 1967. While the Accords promote open communication for the greater good of Lunar

⁷³Salmeri,Antonio,One Size to Fit them All:Interoperability,the Artemis Accords and the Future of Space Exploration,2021,pg1-4<<https://spacewatch.global/2020/11/spacewatchgl-opinion-one-size-to-fit-them-all-interoperability-the-artemis-accords-and-the-future-of-space-exploration>>accessed 16 February 2024.

⁷⁴RossanaDeplano, The Artemis Accords: Evolution or Revolution in International Space Law? International & Comparative Law Quarterly, 2021, Vol.70, pp799-819<<https://doi.org/10.1017/S0020589321000142>, Google Scholar>accessed 12 November 2023.

⁷⁵Ibid

exploration, some argue that this may lead to unintended disclosure of sensitive information, challenging the treaty's principle of avoiding activities that could jeopardise international peace and security as earlier explained under the Russia and China perspective of the Accords.⁷⁶

It can safely be positioned that U.S self interest in space resources has always been made known since the beginning of space exploration and this is evident in its refusal to sign the Moon Treaty⁷⁷ which has always been perceive by U.S and its cohort has been radical by outrightly banning the selfish space exploration.⁷⁸

Harmonising the Artemis Accord with the Outer Space Treaty requires a meticulous approach to transparency, resources utilisation, and planetary protection. By incorporating these principles, nations can collaboratively explore and utilise outer space in a manner that adheres to the spirit and intent of the Outer Space Treaty. This alignment ensures that lunar exploration remains a peaceful, cooperative endeavor that benefits humanity as a whole while respecting the foundational principles of international space law.

In essence, while the Artemis Accords align with certain fundamental principles of the Outer Space Treaty, their evolution has introduced nuances that position them in an affront to the original framework. The challenges lies in striking a delicate balance between fostering international collaboration, ensuring responsible resource utilisation, and upholding the timeless principles of the Outer Space Treaty. As the Accords continue to shape the

⁷⁶Ibid

⁷⁷ Moon Treaty, 1979

⁷⁸ Ibid. Article 11

future lunar exploration, ongoing dialogue and adaptation will be essential to harmonise these two significant elements of international space law for the benefit of all humankind.

It is very unlikely that the efforts of the International Community in making the Bogota Declaration unpopular will also apply to the Artemis Accord more so where it is the brain child of the United States. Initiating provisions of International law, which is contrary to the provision of another popular treaty is tantamount to breaching the principle of *pacta sunt servanda*. Therefore, parties should be encouraged to conform to the provisions of international law signed especially by the same party initiating a contrary one. Allowing the Artemis Accords to stand and co-exist with Outer Space Treaty and even the Moon Treaty may result in the encouragement of such and therefore parties to an existing treaty is at liberty to enter into another treaty just to remove itself from observing the tenets of the earlier treaty. This will jeopardise the sanctity of international law generally.

Space Mining: Analysing The Legal Framework

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Abstract:

Space law is one of the specialized branches that help to understand the governing activities in outer space and the effects arising out of such activities in relation to mankind. In the globalization era, economic and technical feasibility has reached its growth and has widely had an effect on humans which leads to the development of commercial interest in space mining ventures. Today's international community is moving rapidly towards the commercial spectrum by way of dominating and controlling the entire space operational activities for exploration and extraction of minerals from the moon and other celestial bodies. Exploration of natural resources paves way for the mining extraction and may prohibit this right explicitly stated in the Outer Space Treaty, 1967 by applying the principle of non-appropriation in space activities. Contemporary issues deeply rooted in space law principles and scientific-

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technological development have made tremendous progress in commercial space mining ventures. With these advances, space activities and other conventional sources have begun to build up a strong legal basis for the exploration of natural resources by private entities involved in the mining venture. This paper tries to explore the non-appropriation, exploitation and exploration of natural resources in the low earth orbit region in space. It also tries to identify the mechanism for the problems in the national and international domain by fixing the responsibility and liability of the actors actively engaged in the space mining industries.

I. Introduction

Rapid commercial and techno-scientific space applications are highly developed and made various attempts to reclaim natural resources in the Earth's low orbit region. It is capable of growing private entities and paves a wider spectrum for the utilisation of space resources. With the advent help of scientific and technological advancements, the selected asteroids and other minor planets near-Earth objects were identified, utilized to extract natural resources, and thus commercialize space activities. Many private organisations have joined together for the exploration and extraction of natural resources found in space to carry out business on a large scale. The more advanced scientific and technological satellites, robots and other heavy-powered devices with high-performance level that has the potential in the space mining industry are now developed by the space-faring nations.

In the globalised era, countries have the potential economic, scientific and security-related benefits that pave way for the competitors to explore the space mining industry. Presently, the new space activities developed by private entities endeavour tourism, orbital manufacturing and mini-satellites to extract

resources from the asteroids and other celestial bodies. The space mining industry will pay much attention to targeted and nearby earth asteroid gains greater risk and huge economic benefits associated with the mission.¹ The countries about six decades ago began to involve in space activities.

US Apollo Missions bring back Moon Rocks (1969-72)

The first successful unmanned mission was sent to collect samples from the moon. American astronauts collected samples also the same as that of Soviet Union mission three projects and brought 300g of moon samples. At last, an attempt made by automated drilling space mining operations has been accomplished.

Hayabusa recovers Dust samples from Itokawa Asteroid(2005)

In 2005, the Japan Aerospace Exploration Agency (JAXA) an unmanned Hayabusa craft on the near Earth asteroid Itokawa collected nearly 1000 dust grains from this asteroid. But this craft returned to earth in 2010, where the samples collected from this craft were kept in laboratories and analyzed by scientists for over ten years to identify the history and age of that asteroid. The Hayabusa mission made a major path-breaking through imparted the potential of asteroid mining.

US Space Mining Laws (2015)

The Treaty of Outer Space, 1967 has been replaced by the Commercial Space Launch Competitiveness Act, 2015 for the control over other celestial bodies claims taken for national government appropriation. It also paves a way for private companies to explore and utilize asteroids and other celestial before

¹Alex Gilbert, *Mining in Space is Coming*, (July,1, 2022)
<https://www.milkenreview.org/articles/mining-in-space-is-coming>

reporting to the national government which gives them the right to claim resources.

Luxembourg's Space Resources Initiative (2016)

It builds on the legal precedent set forth by the US gathers public and private organizations to aid in space exploration. The right of private entities over mineral deposits not claiming violation of terms and standard setting for space mining.

Luxembourg – Space Mining Law and follow up Agreements (2017- Present)

In 2017, Luxembourg passed its own US attitude space mining law that aims to relax restrictions on the private entities involved in mining activities beyond the Earth. Similarly, in 2017 the Japanese government entered into a five-year agreement to exchange information on future projects along with other agreements in Portugal and UAE. Finally, negotiating with Russia concluded a new treaty for the space mining framework to become a major global power.”²

II. Celestial Bodies that can be Mined

The developed nations always had the idea of exploiting space resources that has the capability of commercialisation. Initially, it was established by the space-faring nation that the idea of space exploration was to know the existence of the earth and the research progressed in that direction. But, the countries identified, though unsure, that the celestial bodies may have valuable minerals and slowly entered the race of exploiting space. Apart from the moon, asteroids were much reachable to have experimented with.

² Casey J P., “*The history of Space Mining: five key elements for mineral exploration in Space*” (2019), <https://www.mining-technology.com/analysis/history-of-space-mining>

To consider targeted asteroid selection process took place in the geo-orbital region changes in velocity and time travel of the targets. Most high trajectories as propellants could be expedient of extracted rare materials and returned from the satellite for exploration and utilisation of natural resources.

A variety of asteroids have been identified, three of which are considered the most important. they are “C-type, S-type, and M-type asteroids:

1. C-type asteroids have a high abundance of water which is not currently of use for mining but could be used in an exploration effort beyond the asteroid. Mission costs could be reduced by using the available water from the asteroid. It also has high amounts of organic carbon, phosphorus, and other key ingredients for fertilizer which could be used to grow food.
2. S-type asteroids carry little water but are more attractive because they contain numerous metals, including nickel, cobalt, and more valuable metals, such as gold, platinum, and rhodium. A small 10-meter S-type asteroid contains about 650,000 kg (1,433,000 lb) of metal with 50 kg (110 lb) in the form of rare metals like platinum and gold.
3. M-type asteroids are rare but contain up to 10 times more metal than S-types.”³

The space race which was initially bilateral (between the US and the former USSR) has also now become multilateral with the entry of other developing countries such as the U.K., Germany, Japan, China, Korea and India. Most of these countries have developed plans to invent and exploit the moon and other celestial bodies.

³NASA Science, *Asteroids*, (July 19, 2021), <https://solarsystem.nasa.gov/asteroids-comets-and-meteors/asteroids/in-depth>.

III. Analyzing International Legal Framework

The Outer Space Treaty⁴ must be inexpedient effect in creating customary norms of space law by the international community. No conventional basis need for the application of the principles⁵ enshrined in the outer space treaty⁶ as custom and principles of international law.⁷ It is uniformly accepted principles, are “Article-I deals with freedom of use, Article-II related to Non-appropriation, Article-III deals with the applicability of International Law, Article-VI connects with State Responsibility, Article-VII explains the liability for damage caused by space objects and retention of jurisdiction and control by States over space objects, Article VIII were considered as part of customary

⁴The Outer Space Treaty, (1967) “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space adopted by the United Nations General Assembly in its resolution 2222 (XXI) opened for signature on 27th January, 1967 and entered into force on 10th October, 1967”.

⁵United Nations General Assembly Resolution, 1962 (XVIII), “which incorporates a Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space enumerates few fundamental principles states as follows”.

“1. The exploration and use of outer space shall be carried on for the benefit and in the interests of all mankind.

2. Outer space and celestial bodies are free for exploration and use by all States on a basis of equality and in accordance with international law.

3. Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

4. The activities of States in the exploration and use of outer space shall be carried on under international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding”.

⁶Detlev Wolter, “*The Peaceful Purpose Standard of the Common Heritage of Mankind Principles in Outer Space Law*”, 9, ASILS International Law Journal, 117 (1985).

⁷The Statute of International Court of Justice, Article 38 (1)(a-c).

international law. Few provisions have already attained the customary status and are even reflected in the Outer Space Treaty including obligations of States (a) to undertake activities in space interest of other States and Article-I in relation to freedom of exploration and use, (Article IX); (b) based on equality granted by other States to observe flights as space objects (Article X) and (c) inform public and scientific operations took place in the UN Secretary General about the activities of space (Article XI)".

The United Nations Space Treaties enshrined principles and General Assembly declarations has obligation upon the States, though some States who are not signatory to treaties, the treaty's provisions attained the status of *jus cogens*⁸ as inevitable. The norm creations within the international space law as State constituted. First, only a few States engaged in space activities tend to support them. Each space-faring nation together forms a part in the space activity. Second, the principles concerned with the space law evolved in treaties that are highly not yet achieved by the General Assembly declarations⁹.

'The United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), a permanent institutional mechanism has its legal sub-

⁸Article 53, The Vienna Convention on the Law of Treaties, states that "*A treaty is void if, at the time of its conclusion, it conflicts with a peremptory norm of general international law. For the present Convention, a peremptory norm of general international law is a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character.*"

⁹Diederiks I H, Verschoor Ph .& Kopal V., *An Introduction to Space Law*, 23 (Kluwer, Law International, The Netherlands, 3rd ed., 2008).

committee. In the International legal arena applies to space mining venture operations can be divided into seven segments as follows:

- (i) “*Planning* segment involves the technical study and mineral feasibility of a certain selected asteroid mining;
- (ii) *The exploration* segment entails space crafts and remote sensing technologies used to examine various minerals present in sediment deposits;
- (iii) *Launch* segment surrounds conception operation to launch in the mining spacecraft;
- (iv) *Transit* segment encircle from launch segment operation to arrival of the mining craft from its select targeted celestial body;
- (v) *Extraction* segment begins landing of mining craft on the targeted celestial body upon all mined ores in a fully recovered state.
- (vi) *Return* segment implies mined ores return to earth involved transportation of mined portion of celestial body entry into lunar orbit;
- (vii) *Exploitation* segment states that when mined ores sold with a view of utilising profit form.”¹⁰

For extraction and utilisation, the United States was one of the first pioneered to take initiative to codify laws related to space resources. Obama, Former President of the United States of America affixed his signature in the Commercial Space Launch Competitiveness Act, 2015 legislation which explicitly talks about U. S. citizens engaging in space activities and they have their right to own and use the space resource over commercial utilisation.¹¹ The

¹⁰Ricky J. Lee, “*Law and Regulation of Commercial Mining of Minerals in Outer Space*”, 7, Springer, 95-105 (2012).

¹¹U.S. Commercial Space Launch Competitiveness Act, Pub., L. No. 114-90, § 51303, 129 Stat. 704 (2015).

former President of the US Donald Trump signed executive order 13914 on April 2020 titled “*Encouraging international support for the Recovery and Use of Space Resources*” intent to explore the resources and extract them from the celestial bodies for commercial use.

In ARTEMIS Accords of NASA sets out principles for “International cooperation and responsibility in future lunar activities”, and identifies the extraction of natural resources through a series of bilateral agreements between spacefaring nations. Major space powers like China and Russia have not signed the Artemis Accords and started to have separate dealing with Luxembourg for mutual beneficial extraction of space resources.¹²

IV. Commercial Use - Vs- Public Use

Article-I of the Outer Space Treaty provides three fundamental principles in the International Space Law namely “Freedom of Exploration, Access and use by all States on a non-discriminatory basis and space activities are carried out for the benefit and in the interest of all States.” Article III of the Outer Space Treaty, states that “State Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding.”

¹²Andrew Jones, China, “*Russia Open Moon Base Project to International Partners*”, SPACE NEWS, <https://spacenews.com/china-russia-open-moon-base-project-to-international-partners-earlydetails-emerge>.

Meanwhile, the Commercial Space Mining ventures also follow two important principles enshrined in Article-I apply as follows,

“‘Exploration’ and ‘Use’ of celestial bodies are to be carried out for the benefit and in the interest of all States; and All States have the freedom to access, explore and use all areas of celestial bodies on a basis of equality.”¹³

Space-faring nations try to control over the natural resource in outer space only through investing and involving leading space research activities because there is no mechanism for sharing the resources in outer space. It fails to develop an international regime to regulate, control, and monitor the natural resource extracted from other celestial bodies. There must be effective legal regulatory and space governance mechanisms established to curb certain activities of exploitation and exploration of natural resources.¹⁴

To select the targeted asteroids determined based on certain viable factors taken into consideration like time, energy and cost required during the entire operation of the mission may assume those existing technologies used in mining sector infrastructure very minimal range. The mining of asteroids to be closer to the surface of Earth suits aptly for extraction of minerals and ores and can be benefitted for all with less cost and energy purpose.¹⁵

¹³Ram S Jakhu, Joseph N. Pelton & Yaw Out Mankata Nyampong, *Space Mining and its Regulation*, 2-22 (Springer Praxis Books, 1st ed., 2017).

¹⁴Laura C. Byrd, “*Soft Law in Space: A Legal Framework for Extra-terrestrial Mining*”, 71, *Emory Law Journal*, 801 (2022).

¹⁵Edwin W. Paxson-II, “*Sharing the Benefits of Outer Space Exploration: Space Law and Economic Development*”, 14, *Michigan Journal of International Law*, 487 (1993).

V. State Responsibility and State Liability

Article-VIII, Outer Space Treaty, provides that “A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.” On registration, Article VIII, Outer Space Treaty regime states three essential principles:

- “(a) assumes that all space objects are to be registered at the national level;
- (b) set out that these objects are under the jurisdiction and control of the State of the registry;
- (c) provide that stray space objects shall be returned to the State of the registry.”

The State parties have to enact certain national sphere space legislation and treaties to meet their expectation and obligations in the international arena. Similarly, the objectives have a dual role in the implementation of the State’s obligation as well as to clarify the existing current legal framework to be modified to accommodate private entities. Moreover, Article VI, Outer Space Treaty deals limits private entities engaged in exploration activities.

The States endure the duty as responsibility¹⁶ for their activities took place in the national sphere, assurance and conduct in adherence to principles of general international law to authorize certain supervisory activities done by the non-governmental entities to divide those international responsibilities¹⁷ among the entire community. To distinguish the “responsibility” as prescribed compliance

¹⁶James Crawford, *State Responsibility: The General Part*, 33 (Cambridge Studies in International and Comparative Law, Cambridge University Press), 1st ed., (2013).

¹⁷Draft Articles on the State Responsibility, International Law Commission, Articles 5 - 7 (2001)

with Article-VI states “liability” which is embedded under Article-VII and some provisions of the Liability Convention.¹⁸ It tends to prescribe a governing mechanism upon States without imposing any kind of liability on the State. While interpreting certain terms employed in other languages also gives equally authenticity to the provisions of the Outer Space Treaty.¹⁹ “The term ‘responsibility’ and ‘liability’ emphasized the same connotation and interpreted that States are internationally liable for any national space activities conducted by the public and private entities.”²⁰ “Both are consistent with the notion of state responsibility in the body of customary international law that liability for reparation”²¹ followed by the violations attributable to the State.²² “If any damage is caused to any other States, then the targeted State must be held liable to pay reparation to the Victim State as that of the position before the damage inflicted(*restitutio in integrum*).”²³

¹⁸ ManiV. S., BhattS., & ReddyV.B., “*Recent Trends in International Space Law and Policy*”, 388 (Asia Law House, 2nd ed., 2015).

¹⁹The Outer Space Treaty Article XVII (1967). And ArmelKerrest, “*Remarks on the Responsibility and Liability for Damages other than those caused by the fall of a Space Object*”, (40 Proc. Coll. Law of Outer Space, 134) (1997).

²⁰Bin Cheng, “*Article VI of the Outer Space Treaty Revisited: International Responsibility, National Activities and The Appropriate State*”, 26, Journal of Space Law, 10 (1998). “TravauxPreparatoires and commentators also commented that many domestic laws in civil law aspects dealing with jurisdiction does not draw a line between responsibility and liability”.

²¹*Chorzow Factory (Indemnity) Merits* case, PCIJ Rep. Series. A, No. 17, 29 (1928). “a principle of international law, and even a general conception of law, that any breach of an engagement involves an obligation to make reparation. . . . the Court has already said that reparation is the indispensable complement of a failure to apply a convention, and there is no necessity for this to be stated in the convention itself”.

²³*Chorzow Factory (Indemnity) Merits* case, PCIJ., Rep. Series. A., No.17, 46-48 (1928)

The crux of the space law principles may pose a remarkable difficult situation for the launching and commercial mining ventures of the transit segment in outer space. At outset, “the treaties and conventions do not even attempt to define a few essential terms such as Space object, Launching State and Appropriate State lacking clarity in these areas.”²⁴ Furthermore, the definition of launching state can be understood that it does not mean the commercial space industry whereas it meant only the public enterprises.²⁵ Another backdrop many states actively participated in the launching process and other parties’ i.e. multinational corporations raise the issues of ownership and incorporations related to that activity. With the rapid commercialisation there need to be significant new legal issues to be addressed properly without evading the issues. “The private space activity conducted outside the territorial jurisdiction of the State provided it has been attributed. As the same adopted in the Liability Convention imposes liability on State for the launching activities of its nationals if it falls outside the sovereign territory of that State.”²⁶

Two international documents such as The Treaty of Outer Space, 1967 and The Moon Agreement, 1979 compasses feasible environments in the celestial bodies that fail to fix responsibility and liability in case of failure to protect and preserve them from further damages caused. So the States are

²⁴Ogunsola O. Ogundanwo, International Law and Outer Space Activities, 143-166 (Martinus, NIJHOFF The Hague, 1st ed., 1975)

²⁵Paul B. Larsen, “*Profit or Safety: Where is Outer Space Headed?*”, 86, Journal of Air Law and Commerce”, 531 (2021)

²⁶In Liability Convention, Article I (1972)

obligated to equip themselves with appropriate domestic law to effectively manage the burden imposed by the treaty of outer space. Meanwhile, there is a lack of specialized agencies to make binding and settling of disputes among the States and other private entities situated at various nations also referred in the Liability Convention to minimize the risk factors associated and try to mitigate future problems.

VI. Rights and Duties of the Commercial Space Mining Industry

Certain ore samples are collected from the earth's surface robotically analyzed and identified issues based on legitimate space activities. In the explorative segment, rigorous and ambiguity are found in resolving the legal obstacles. Articles-I and Articles II of the Outer Space Treaty, makes "mineral extraction activities on the celestial bodies makes more difficult in establishing the freedom of access and principle of non-appropriation."²⁷

Article-VI of the Outer Space Treaty has circumstantial effects on the government activities conducted by the States and simultaneously it even applies to private entities' actions by concerned States to authorise, supervise and adopt minimum standards to maintain international responsibility for private entities. It complied both with the principles of customary international law as well as principles of United Nations Space treaties enshrined by international space law.

The three basic key furnishing makes all potential players impose certain obligations that may affect the legality of the space mining ventures.

²⁷The Outer Space Treaty Articles I and II (1967)

- 1)“Article I prescribes requirement that space activities bound to be conducted for the benefit and in the interest of all States, the freedoms of exploration and use of outer space and freedom of access to all areas of celestial bodies;
- 2)Article II embodies the principle of non-appropriation; and
- 3)Article IX outlines the duty to have corresponding interests of other States when conducting space activities and to avoid harmful contamination of celestial bodies.”²⁸

Several active key players engaged in the space activities companies like Elon Musk in SpaceX and Jeff Bezos in Blue Origin, etc. have joined space races to become the first private entity to extract their space resources. Currently, the government is also dependent upon the private entities for the time, research and technologies used for developing to achieve goals made out in the space policy. In 2020, SpaceX won \$117 million for the launch and contract with NASA 2022 mission targeted for mineral exploration of the asteroid known as “Psyche”.²⁹

VII. Challenges

In the process of technological development in any sector there would be many challenges. Similarly, space technology is very peculiar and special which is really a herculean task. The main issues include “(a) Space Debris, (b) Lack of equity in the allocation of the space orbital slot and access to these orbits, (c)

²⁸The United Nations General Assembly, “*Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and other Celestial Bodies*”, (Dec. 19, 1966), https://www.faa.gov/about/office_org/headquarters_offices/ast/media/treaty_Princi_Gov_Acti_States_OST.pdf.

²⁹Jonathan Shieber, “*Space X Wins the \$117 Million Launch Contract to Explore Psyche’s Heavy Metal Asteroid*”, *Techcrunch*, (February 29, 2020) <https://techcrunch.com/2020/02/28/spacex-wins-the-117-million-launch-contract-to-explore-psyche-heavy-metal-asteroid/>.

Lack of effective regulation regarding the exploitation of the natural resources in outer space and (d) emerging legal questions regarding space tourism and space habitation". The authors suggest the following recommendations:

- 1) The invention of new technological devices may assist in achieving upcoming future missions made easy for the entire space mining industry.
- 2) To develop cost-effective space transportation systems
- 3) The Nation states trying to deviate from their responsibility and shifts those to private entities
- 4) To achieve international cooperation among nations in scientific and legal ways of exploring the peaceful use of outer space by a cardinal relationship with one another.
- 5) To metamorphose the existing character of a soft law space regime into a hard law and to make vibrant binding principles and rules of conduct setup.

VIII. Conclusion

Technological advancement has reached a stage where the international space law fails to grapple with the huge forward leaps in technology. The requirement of balancing and harmonization of law and technology would need to be emphasized especially for a new effective global legal order in space activities. The national space legislation has become inclined towards the purpose of monitoring and controlling public and private entities' rigours participation in the outer space regime. There is a need for an hour space law to undergo some kind of transformative segment to become vibrant normative and gain more effectively to tackle all sorts of problems for beneficial peaceful use of outer space. In upcoming years, several potential private entities will become active and join together in pioneering space-based enterprises in exploring and prospecting natural resources found on the moon and other celestial bodies. Likewise, UNCOPUOS, UNOOSA or other specialised agencies working with the space governance policies have to come up with new regulations and

guidelines to mitigate and minimalize their roles and engaged in any space activities that could be able to curb certain activities which might be in turn moves against the state actors.

Book Review: Sachdeva, G. S. (2023). *Crimes in Outer Space*. In *Issues in Space*. Springer Nature Singapore, ISBN: 978-981-99-3265-8, pp. XXXI, 253

*Nirbindu Banerjee**

“Crimes in Outer Space: Perspectives from Law and Justice” is Prof. G. S. Sachdeva’s minutely observant rendition that meticulously looks into the legal dimensions of human activities that occur beyond the earth’s atmosphere from the criminological point of view. It paints a rich picture of the changing face of space jurisprudence by defining space crimes and depicting how space governance may look in the near future. This review tries to forage deeper into the themes of each chapter, exploring the arguments they set up and verbalising the contribution of the chapters to the current discourse in space law.

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Chapter 1 of the book, aptly titled “Crimes in Space: Illustrative Narratives”, establishes the theme & ideas of the main text by giving the reader a broad-stroke narrative of what space crime is. The chapter deals with the modern background this book is set in, expressing the causality of why the discussion on space crimes has grown to be unavoidable and of utmost importance in recent times as privatisation engulfs more and more of the space industry. While drawing attention to the growth of privatised industries, the chapter sets up the book by introducing two factors in a gist form. Firstly, the chapter discusses the lack of proper instruments to deal with this rapid growth era of space industries. It does express that the Outer Space Treaty is ill-equipped to deal with rapid changes in the space environment, which has been part of the general acknowledgement of academicians in space laws. Secondly, the chapter focuses on the need for administrative institutions and the lack thereof while discussing the suggestions regarding the proposed World Space Authority and materialising such an institution with a suitable structure and supporting legal instruments like a charter. The chapter treats both of the above issues as an argument to prove the need for a specialis treaty to regulate crimes that may be committed in space. The first chapter then delves into explaining the minute details of the Anne McClain case. It describes how the existence of such incidents erases doubt about the necessity to regulate criminal activities in space, especially in the future. The case itself is dealt with in the book through three separate discussions. The first part deals with the facts of the McClain case in extensive detail while relating it to the astronaut code of conduct and the need for disciplinary training. In contrast, the second and third parts review the case and jurisdictional issues that may arise from such incidents. The chapter also briefly discusses other incidents that may be taken as crimes or near crimes in space, like the ISS Soyuz Module case and the Skylab-4 mutiny. While the academic inference of these incidents is expressly related to the book’s central

argument, the author expertly uses these descriptions to maintain reader engagement.

Chapter 2 of the book, which is titled “Past Instances of Near-Crimes in Space: The USA”, provides a legal perspective on space-related incidents that may be crime-adjacent, mainly from USA space ventures. While discussing these incidents, the author provides a precise categorisation for different incidents, which helps better structure the chapter and clarifies the apparent similarities between these mishaps. The first type of incident is state experiments that have gone awry. Prof. Sachdeva includes incidents like the West Ford Experiments or the Starfish prime detonation from the 1960s and gives legal background to the existing facts in these cases. The author provides a fascinating digest of the Apollo 8 launch and the final Challenger launch, where he claims that NASA had let go of clear safety standards while looking for the success of their space missions. This section brings out a fascinating narrative as the author carefully simplifies the technicalities of these missions to encourage an ordinary reader better while still explaining why such incidents could be seen as crime-adjacent from a legal perspective and how some of these older events lead to the formation of the Outer Space Treaty in 1967. The other acts categorised are defiance by space crews, which show collective disobedience to the authorities. The actions of the Apollo 7 and Skylab-4 crew are explained to be acts where there was a collective disagreement between the space crew and ground control. The next category also discusses individual negligence in space missions, whether by throwing dirty clothes and garbage into space, losing tool bags, etc. However, something very significant comes to notice from these instances described by the author: the magnitude of activities in space demands a much higher standard of care. Therefore, simple negligence can have a catastrophic impact on the atmosphere or other living beings and can be considered near-crimes. The actions of private enterprises, like SpaceX, are categorised

differently from state activities by the author, and how the definite disagreement and misalignment between state norms and private activities could create international conflict and dispute. The author uses the example of the near collision of Starlink satellites with the Chinese satellites and the displeasure of the Chinese government as a means to further his point that privatisation makes it necessary to include regulation of activities in space that might create conflicts and even be considered criminal.

Chapter 3 of the book illustrates similar near-crime incidents in space, albeit focusing on countries and governments other than the USA. However, the author points out the need for more precise data regarding space activities in different countries than in the USA, which explains the divide between these chapters. The chapter takes a criticising tone to the non-transparency of governments like Russia and China, which extends to their space activities. The chapter describes incidents and half-truths by the Russian government in its first path, which contains everything from breaches of safety protocol to sending unsuccessful spacecraft to the moon with human cosmonauts in 1969. The Russian missions are discussed further through the misconducts of the cosmonauts and how robotics have been preferred in the soviet Mars programmes ever since. The most essential and engaging discussion comes from the deliberation on the Beresheet moon landing crash by Israel. Not only does this provide a story of ambition on the part of the government, but it also discusses how the secretive involvement of private entities and governments can lead to various breaches of international agreements. This is a perfect example by the author in the context of the issues this book addresses, as it has the private enterprise involvement, an act that is modernised in nature and definitely in conflict with the established norms of international space law, and an act that might pose jurisdiction questions if looked into seriously.

Chapters 2 and 3 are the same chapter thematically, divided into two subcategories dependent on the availability of solid data. It is prudent to mention also that this lack of suitable data and examples leads to repetition within the chapters, which has to be overlooked for the same reason. Overall, the chapters provide numerous circumstances where crimes and near crimes might have been committed in space. The author expertly links these instances to the existing protocols and Articles of international instruments relating to space law, helping to create a scenario where the gaps and legal incapacabilities are visible and understandable to the readers.

Chapter 4 is titled “Crime and Space Crimes: A General Discussion”, which immediately puts the chapter’s objective into perspective. In the first part, this chapter sets up the understanding of crime as a concept. This is done by looking into the analysis of crime from a sociological and victimological viewpoint and does a great job of explaining the dynamic, ever-changing nature of crime. As scholars, we struggle to explain to other people that space crimes can be a genuine concern. On the other hand, Professor Sachdeva expresses the essence of crime so eloquently that it is plausible to include it in the inner fold of that definition. In the subsequent parts of the chapter, he gains the freedom to discuss space crime elaborately because of moulding the concept of crime in this first part. The next part discusses the futuristic nature of space crime and what the rapid privatisation of the ISS and space industry could mean in this context. SpaceX uses its technology to build advertisement billboards in space as an example of how paradigm-shifting privatisation and its impact can be. The different types of plausible crimes mentioned are the appropriation of celestial resources, space piracy related to cargo transportation, and other ancillary crimes that might arise from these based on economic profit and market. The author gently touched on the jurisdiction issues involved with space crimes and the problem of too many countries with too many different codes and

legislations, even though most of them are incomplete at best right now. The chapter's penultimate discussion is on building a working, somewhat uniform definition of space crime, which is a necessary origin point while discussing this issue. In this section, he provides a complete definition of 'Space Crimes' (considering the limitations and how some crimes would demand reliance on future imagination), including context from different international instruments and organisational information.

Chapter 5 is "Future Crimes in Space: A Visualisation", which exponentially builds on the definition and incidents provided in the previous chapters. The author focuses on the classification of space crimes, and the first factor considered in classification is the terrestrial legal codes, which classify crimes like crimes against a human body, crimes against property, etc. A similar categorisation of space crimes can also be issued. The other factor for categorisation is an agent of crime, a more complex concept. As the crimes in the space environment can differ, so do the alleged perpetrators. He visualises these categories into crimes committed by the state or government, Space agencies, Corporate operators or private entities, individual human beings, and robots. The chapter continues to explore compelling concepts and crime categories like economic crimes in space, dereliction of state responsibilities imposed under space law and crimes of international wrong. Within these concepts, the dereliction of state responsibilities is easily the most fleshed-out concept that discusses Articles I, VI and IX of the Outer Space Treaty, which attempt to maintain international collaboration when it comes to activities in space and try to hold states responsible so actions might be controlled not to originate harm towards other states. The chapter also focuses on what crimes can be committed and how the actors might contribute to these crimes. The author here points out that privatisation of the space industry also means there is no proper regulation to ensure that private entities follow similar

responsibilities as governments regarding the protection of the space environment. There is an illuminating section about nuclear testing and pollution in space, as well as using nuclear energy as a power source in space. The chapter succeeds in reflecting the clearwater future where space activities will be competitive and conflictive in nature and how the objectives of states are slowly shifting towards strategic power hoarding from peaceful exploration as they grasp more of space and its mysteries.

Space is inadvertently a field where technology is paramount to any discussion. Chapter 6 thus looks at crime in space in the context of the rapid expansion of technology in space. The author cleverly involves crime against humanity in a chapter where technology is debated to give the readers a contrasting view of the magnitude of institutional decisions regarding technology. Space Crimes through digital communication and cyber-attacks in space are legitimate concerns because of the staggering rate of technological advancement. The chapter provides plenty of examples and intrigue about cyber-attacks with its portion on the secret attacks on behalf of China on USA and Indian satellite systems, as corroborated by the data from the China Aerospace Studies Institute (CASI), which is based in the USA. The acknowledgement of the ISRO chief to handle cyber-attacks of unknown origin has been referred to in this chapter, and it is a beguiling study. This part similarly delves into using Direct Energy Weapons like Laser technology while describing similar technologies developed in many countries worldwide. Turkey used a similar weapon in 2019 in Libya, and the practicality of such technology is on a steady incline. The discussion on anti-satellite weapons used in the previous chapter is looped back in greater detail. The chapter masterfully explains how a merger between these kinds of technology with monolithic destructive capabilities and the powerful AI in modern tech would lead to chaotic situations and unimaginable power

grabs and how it needs regulation and framework for a balance check of dangerous situations in the future.

Chapter 7 of the book deals with the most fundamental issue of regulating crimes in space and, in the process, curates a part of the book that is the most intriguing to a legal academician. In this chapter, the author analyses the jurisdictional issues in dealing with crimes in space while explaining what jurisdiction would even mean in such a scenario. He carefully explains at the outset that space jurisdiction would be different since the amount of control any authority would have over the situation if any alleged crime occurs would be much more limited than in conventional scenarios. The book discusses previously explained scenarios of the Anne McClain case and others to provide a deep dive into why jurisdictional conflict can be an issue while dealing with space crimes. There is a meticulous discussion of the provisions of the existing Outer Space Treaty and the Liability Convention of 1972. The following section talks about the existing principles of determining jurisdiction in international law, like territoriality, nationality, universality and the protective principle. The extra-territorial application of jurisdiction has also been mentioned while highlighting the similarities and differences between existing established legal regimes and instruments, such as the UNCLOS. The issues with international space laws and how they cannot deal with the rapid levelling of technologies are highlighted here, with an analytical approach towards specific sections. The new age space activities far surpass existing legislative instruments' imagination. Professor Sachdeva emphasises the need for new future codes and instruments like the Artemis project to deal with arising scenarios successfully. This section of the book has a two-pronged approach, which allows existing legal academicians versed in the nuances of space laws to think about existing issues while expertly providing essential narrative assistance for novice readers to introduce them to the intricacies of international space law and jurisdiction.

Chapter 8, titled “Legal Procedures Under International Law: A Cumbersome Process”, offers a different view of the ongoing discussion about creating legislative instruments to adapt to the present and future space activities. This portion of the book accentuates the relevance of the procedural process of developing international legislative instruments with severe implications for the related field, which is outer space in this context. Discussing the procedural existence of the International Court of Justice to emphasise the discussions on procedural law and their balance, which is needed to create substantive law in the international field and all its sub-genres like international space law, the chapter makes a unique space for discussion and a niche for the book which very few address when it comes to international space laws. The author has also carefully established the political and outside motivations of different sovereignties to establish their presence in these auxiliary legal regimes and how procedural law helps create substance for legal instruments. The extradition process is discussed as a procedural remedy in international law to maintain a status quo between the jurisdictional claims of states. This portion of the book successfully examines the procedural implications of international legal instruments and the importance of procedural law in building a sturdy substantive law framework.

Chapter 9 of the book, “Diverse Legal System: A Global Review”, brings out the practical aspects of space exploration in the new age, which are multifaceted in terms of ethnicity, culture, genders, races, and environments of both geographical and political nature. The author argues that any legal system, especially related to criminal prosecution, is built around these factors and numerous others. This means the uniqueness of legal systems also blends and interacts with each other when it comes to space activities and regulation thereof. Hence, any problem related to space crimes would have to be addressed

through the understanding and analysis of these factors and the interaction of these legal systems, which in turn depends on the collective knowledge of the underlying factors. Acknowledging differences and appeasing each other's legal stances through genuine mutual diplomatic empathy would lead to a collaborative atmosphere, which is necessary for any criminal law system to establish itself in outer space. The author provides the substance behind this approach by highlighting differences between the adversarial and inquisitorial legal systems and pointing out the jury system and even the Sharia codes as both an origin and a trait of different legal systems to provide a perspective on the extreme diversity ranges. The chapters go into some detailed differences between these and point out that each approach has the attainment of justice as a goal. It further discusses how these goals can create obstacles in creating singular international legislation due to many unexpected factors making up differences in established systems, ultimately creating a barrier for adaptation and transfer between systems. According to Professor Sachdeva, a holistic approach and building confidence in the collective idea of justice would be critical.

The concepts discussed in the previous chapter seem more theoretical, even with the historical development of legal systems and their inner workings explained expertly. To substantiate the philosophy behind it, chapter 10, aptly titled "Legal Codes and Social Norms: Divergent Perceptions", bridges the gap between societal norms and the actual inner workings of the legal systems. Fundamental known actions are considered part of the illustrations mentioned in the chapter, like negligence and statutes of limitation being the most easily understandable examples, even for a novice in the intricacies of jurisprudence. The author points out different domestic approaches to a comparatively simple concept like negligence and how contributory negligence is not a part of the norms in some countries at all, whereas, in other states, it is widely accepted. State actors and

their political or ideological stances often manage the course of their legislative decisions, as pointed out by the author. This example interconnects the starting chapters of the book with later ones, as it has been previously pointed out how even negligence can play a comparatively more significant role in space activities. The author then describes more differentiating scenarios like the stricter punitive nature of Middle Eastern countries and the even more complicated and utterly subjective perspective of religious symbolism and taboos. The following few points in the chapter discuss the discrepancies and subjective nature of opinions on sensitive topics like nudism, views on prostitution, and general women's rights throughout the history of countries. This discussion aims to nail home the differences in perspective, how wide that range can be, and how minor changes in the environment and factors discussed in the previous chapter can birth a new perspective or a unique framework. The impact of the environment and social and cultural ethos on the generational understanding of law in a specific place and their variance are discussed briefly in this chapter. The overall relevancy of the chapter is, however, only tied up when it comes to the end section. The author gracefully points out that all these seemingly unnecessary notions discussed here may soon become unavoidable when space habitation and tourism become a reality. In space, no clear diplomatic boundaries and mapped state borders have existed for centuries, so setting up a legal framework would have to be instant. In the comfort of having human development happen over thousands of years, philosophic and legal ideas gradually have the space to grow over a significant period, and even then, it is nowhere close to perfection. In space, discussion on solidarity is necessary to accommodate a faster rate of inhabitation and reach the current status of the international status quo that is standard on Earth. Professor Sachdeva argues that criminal jurisdiction in space should be left to the International Court of Space Crimes or ICSC to adjudicate over the correct form and magnitude of

penalisation and jurisdictional challenges rather than having a scuffle over whose domestic laws should apply.

Chapter 11 of the book moves towards a summation of discussions from the previous chapters. It aims to provide viable solutions that would solve the issues of regulation of crimes in space and, in turn, the future of accessible space activities. The author brings everything discussed in the book towards a specific contention through his argument of the necessity of an international instrument to tackle the problems of space crimes. He points out that the OST, being the torch bearer of international space treaties, does not deal with the complexities and exigencies that would come with future innovations, and an additional protocol to the OST or a new treaty altogether would be needed for the future of new age space exploration. Looking towards similar international legal regimes or emulating them would also be dissatisfactory, which the author points out as a mere 'patchwork' would also remain inefficient. However, he agrees that this process might be too differentiating, complex, and unproductive as there is no safe guarantee of the future success of the invented legal framework. The second auxiliary solution, from the author, is to revive the defunct Trusteeship Council and repurpose it to work with the overall governance of the outer space domain and activities. The author also mentions the other schools of thought on this issue, where many prolific academicians and scholars argue that the domain of space remains non-appropriable by nations or private entities due to the already established international norms. However, that does not mean it should stay ungoverned and defeats the purpose of defining crime. Another viable notion or concept is the collective governance of the space domain, which seems the most approachable as far as the administration is concerned. The author, however, has provided a fairly detailed structure in this chapter or a base, at least, for the administration of space governance. In addition to the previously discussed rejuvenation of the

trusteeship council, he argues for two supporting institutions in the form of Space Utilisation and Sustenance Regulatory Authority (SUSRA) and The Authority for Space Monitoring and Compliances (ASMC). The author goes into a semi-detail description of the general responsibilities these institutions might take up, even providing intricate multifaceted hierarchical and parallel sub-institutions within the organisations. The most well-thought-out is the description of the proposed International Court for Space Crimes, now operating as a sister institution of the repurposed trusteeship council. Again, the author provides a detailed set-up and support structure for this institution, talking about the organisational parts like the Office of the Register General and the Dispute Redressal Forum. The author builds interlinkage here with the previous chapters, discussing the types of crimes and examples thereof the proposed court could deal with and establishing traits for the proposed institution. This, however, leaves space that maybe the discussion on whose domestic laws should apply in a case of space crimes is rejected too early. The obvious caveat provided by the author himself is that the proposed treaty and supporting organisation need to have binding force and enforceability, which would be considered the problematic part of the discussion. If such a monumental task can be undertaken, establishing a reasonable framework for applicable domestic laws should also be considered a sensible approach. However, that does not take away from the fact that the proposed solutions here are more detailed than any previously discussed material on space crime and clearly show an in-depth understanding of the magnitude of the issues described in the context of the outer space domain. The last chapter, or chapter 12 of the book, concludes it, mainly reiterating the points discussed in the previous text in a string of well-articulated paragraphs describing the necessities and solutions for the issues relating to space crime.

Professor G.S Sachdeva, renowned for his work in space law, shows his in-depth research and analytical thought process through every paragraph in this book. Every thought and theory in each chapter has been substantiated through real-life examples of activities that have occurred in space. As a skilful author, he weaves a web of interconnected discussions on space crimes throughout the starting chapters, only to provide detailed solutions to these problems from a legislative and academic standpoint through the penultimate chapter. On top of the educational and intellectual stimulation it provides, it establishes itself as an accessible work in the space law discourse, as every probable scenario is also well illustrated, with thoroughly analytical yet easily understandable writing. That ensures that the book proves to be an excellent foundation on which policymakers of the highest order can base future legal instruments while providing a wealth of knowledge for aspiring academicians and scholars in the field of international space law.



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