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The Use of Force in Response to Cyber-Attack on Commercial Space Systems - Reexamining Self-Defense in Outer Space in Light of the Convergence of U.S. Military and Commercial Space Activities

Christopher M. Petras

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THE USE OF FORCE IN RESPONSE TO CYBER-ATTACK ON COMMERCIAL SPACE SYSTEMS—REEXAMINING "SELF-DEFENSE" IN OUTER SPACE IN LIGHT OF THE CONVERGENCE OF U.S. MILITARY AND COMMERCIAL SPACE ACTIVITIES

Christopher M. Petras, Major, USAF*

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* Major Petras (B.A., University of Dayton; J.D., Samford University; LL.M. (Air & Space Law), McGill University) is the Chief of Operations Law, Headquarters United States Space Command, Peterson AFB, Colorado. He is a member of the Bar in the state of Alabama.

† The opinions and conclusions expressed herein are those of the author. They are not intended to and should not be thought to represent official ideas, attitudes, or policies of the Air Force, the Department of Defense, or any agency of the United States Government. The author has not employed any material not otherwise releasable to the public and available to any writer on this subject.
PREFACE

IN JANUARY 2001, the Commission to Assess U.S. National Security Space Management and Organization (or “the Space Commission”) released its report on the organization and management of space activities supporting national security interests. In the report, the Commission observed: “The U.S. Government is increasingly dependent on the commercial space sector to provide essential services for national security operations... includ[ing] satellite communications as well as images of the earth useful to government officials, intelligence analysts and military commanders.” While the military use of commercial space systems is not in-and-of-itself a new phenomenon, the Commissioners’ remarks serve to highlight the unprecedented convergence of U.S. military and commercial space activities that has taken place over the past decade and is indeed likely to continue. In fact, published figures show that the U.S. Department of Defense (DoD) spent approximately $600 million on commercial satellite services during this period, and will spend up to $2.2 billion more for commercial satellite services over the

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2 Id. at viii.

3 Military and commercial space capabilities first shared the same satellite in 1973, when the Navy entered into a contract with the Communications Satellite (COMSAT) Corporation for “gapfiller” service pending the completion of its Fleet Satellite Communications (FLTSATCOM) system. David N. Spies, Beyond Horizons: A Half Century of Air Force Space Leadership 139 n.8 (rev. ed. 1998).

4 Current Department of Defense policy states that civil and commercial space capabilities are to be used “to the maximum extent feasible and practical.” Department of Defense Directive 3100.10, Space Policy, at 8, ¶ 4 (Jul. 9, 1999) [hereinafter DoDD 3100.10]; see also U.S. Space Command, Vision for 2020 7 (1997) (“Military use of civil, commercial, and international space systems will continue to increase.”) [hereinafter USSPACECOM 2020]; USAF Scientific Advisory Bd., New World Vistas: Air and Space Power for the 21st Century, Summary Volume iii (1995) (“The crucial importance of detailed and timely knowledge and rapid communications to the successful pursuit of our new missions will demand creative use of commercial systems and technologies. This will produce an intimate intertwining of commercial and military applications to an extent not yet encountered.”) [hereinafter New World Vistas].
next ten years.\(^5\) DoD’s open recognition and extensive utilization of the military capabilities of commercial space systems represents a dramatic shift away from the overt separation of military and civilian programs that for decades characterized U.S. activities in space.

As the space age dawned amidst the shadows of the Cold War, President Eisenhower believed it was imperative that the first artificial satellite be “civilian” in order to establish the principle of “freedom of space” and the corresponding right of unimpeded overflight in outer space for the first-generation military reconnaissance satellites, which were then being secretly developed to defend against the possibility of a surprise nuclear attack by the Soviet Union.\(^6\) Consequently, the establishment of dual military and civilian space programs was a key element of the “open sky” policy that guided the nation’s effort at an initial foray into space in the mid-1950s.\(^7\) Of course, with the launch of Sputnik I by the Soviet Union in October 1957, the assumption that the United States would be the first to launch a satellite and thereby create a precedent for the freedom of overflight in space proved to be mistaken. Nevertheless, the outward separation of America’s military and civilian space programs was steadfastly preserved,\(^8\) and thereafter became the basis for organization of the National Space Program under the National Aeronautics and Space Act of 1958.\(^9\)


\(^9\) National Aeronautics and Space Act of 1958, Pub. L. No. 85-568, 72 Stat. 426 (1958) (unamended) (codified as amended at 42 U.S.C. §§ 2451 et seq. (2000)); see Spies, *supra* note 3, at 56-67. The Act required that responsibility and control over U.S. space activities be vested in “a civilian agency” and created the National Aeronautics and Space Administration (NASA) to fill that role; however, activities “peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States (including the research and development necessary to make effective provision for the defense of the United States)” remained within the purview of the Department of Defense (DoD). National Aeronautics and Space Act of 1958 §§ 102, 202.
The air of separation between U.S. military and civilian space activities was maintained by the Kennedy administration, which, like its predecessor, appreciated the need to downplay U.S. military space activities while it sought to gain international acceptance of the right of overflight in space for reconnaissance purposes.10 As the Cold War confrontation between the United States and the Soviet Union grew in intensity, the U.S. was increasingly dependent on satellite reconnaissance as "a means of penetrating Soviet secretiveness."11 So, to curtail international criticism of American satellite reconnaissance and avoid encouraging Soviet countermeasures, subsequent administrations adhered to a veritable code of silence concerning military space activities, which perpetuated the split personality of the nation's space program.12

Such was the nature of the relationship between U.S. military and commercial space activities until three factors ultimately combined to move commercial space systems increasingly into the military lexicon. First, with heightened international recognition of the lawfulness of reconnaissance from space, evidenced by President Carter's public acknowledgement of U.S. reconnaissance satellites in 1978,13 the secrecy and sensitivity surrounding intelligence gathering from space eventually abated to the point that it became an express tenet of U.S. space

10 See STARES, supra note 6, at 59-71; see also SPIRES, supra note 3, at 108-12.
11 DEPT. OF STATE, PLANNING IMPLICATIONS FOR NATIONAL SECURITY OF OUTER SPACE IN THE 1970s, BASIC NATIONAL SECURITY POLICY PLANNING TASK I (Jan. 30, 1964), quoted in STARES, supra note 6, at 94; see also COLIN S. GRAY, AMERICAN MILITARY SPACE POLICY: INFORMATION SYSTEMS, WEAPON SYSTEMS AND ARMS CONTROL 26 (1982) ("[T]he different political characteristics of the two societies render the U.S. far more dependent upon photographic and electronic intelligence.").
12 On March 23, 1962, DoD imposed an information "blackout" on military space activities and, although restrictions on public references to some parts of the military space program were relaxed by later administrations, a moratorium on any acknowledgement of reconnaissance from space was essentially maintained until 1978, when President Carter admitted that the U.S. operated satellites for this purpose. STARES, supra note 6, at 65; see also Paul B. Stares, SPACE AND U.S. NATIONAL SECURITY, IN NATIONAL INTERESTS AND THE MILITARY USE OF SPACE 35, 38-39 (William J. Durrch ed., 1984) [hereinafter NATIONAL INTERESTS].
13 See STARES, supra note 6, at 186 ("Carter chose the Congressional Space Medal of Honor awards ceremony at the Kennedy Space Center, Florida on 1 October 1978, to remark that: ‘Photoreconnaissance satellites have become an important stabilizing factor in world affairs in the monitoring of arms control agreements. They make an immediate contribution to the security of all nations. We shall continue to develop them.’").
policy. Secondly, the surge of "space commercialization" in the 1980s, precipitated within the United States by President Reagan's 1982 National Space Policy, resulting in increased commercial exploitation of space by both "the government entrepreneur" and private industry, as well as the privatization of space technology. Finally, "the absence of a known 'enemy'" and "the reality of high costs" at the end of the Cold War (circa 1991) prompted the U.S. military to endeavor to produce more affordable space capabilities through the military application of commercial technologies.

For the first 25 years of the space age (1957-1982), however, space activities (including commercial space activities) were performed almost exclusively by governments, acting individually or in concert through intergovernmental agencies. Moreover,

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15 NSDD 42, supra note 14, at 1 (A basic goal of the 1982 policy was to "expand United States private sector investment and involvement in civil space and space-related activities."); see also George S. Robinson & Pamela L. Meredith, Domestic Commercialization of Space: The Current Political Atmosphere, in 1 AMERICAN ENTERPRISE, THE LAW, AND THE COMMERCIAL USE OF SPACE 1-4 (1986) ("President Reagan... made it clear that he wanted an aggressive and far-sighted space program that included a strong private sector involvement and capital investment.") [hereinafter AMERICAN ENTERPRISE].

16 See Robinson & Meredith, supra note 15, at 1-4; see also, Art Dula, Private Sector Activities in Outer Space, 19 INT'L LAW 159 (1985).

17 SPIRES, supra note 3, at 281.

18 See Lawrence D. Roberts, A Lost Connection: Geostationary Satellite Networks and the International Telecommunication Union, 15 BERKELEY TECH. L.J. 1095, 1096-1097 (2000) ("For most of its history, space activity has been the province of government... while the potential for commercial activity involving outer space was recognized relatively early on, and there were occasionally dramatic successes, commercial investments represented only a tiny portion of total space expenditures." (footnotes omitted)); see also Christian Roisse, The Roles of International Organizations in Privatization and Commercial Use of Outer Space, Discussion Paper presented at the Third United Nations Conference on the Exploration and
while the fact that many space systems intended for civil or commercial uses had simultaneous potential military usefulness did not go unnoticed, "the development and use of space technology for civil and military applications [generally] occurred in parallel" through separate military and civilian agencies.\textsuperscript{19} The body of international law governing outer space and space activities, or \textit{corpus juris spatialis}, was formulated in conjunction with this background; in fact, all five of the major international treaties relating to the use of outer space, including the 1963 Limited-Test-Ban Treaty,\textsuperscript{20} the 1967 Outer Space Treaty,\textsuperscript{21} the 1968 Rescue Agreement,\textsuperscript{22} the 1972 Liability Convention,\textsuperscript{23} and the 1976 Registration Convention,\textsuperscript{24} were concluded during this period, as was the 1979 Moon Treaty.\textsuperscript{25} Thus, the "intimate inter-


\textsuperscript{22} Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].


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twining” of military and commercial space applications26 was not a major consideration when the basic space law principles were being established. It is therefore reasonable to question the soundness of the legal framework pertaining to the use of space—particularly the military use of space—and, in certain instances, to military activities generally, in light of the current doctrinal and operational confluence of U.S. military and commercial space systems.

The object of this article is to shed light on some of the legal questions raised by the increasing convergence of military and commercial uses of space, and perhaps to highlight the inadequacies of the current law in dealing with this development, by examining one area wherein the convergence of military and commercial space activities plays a pivotal role. Specifically, this article will address the application of the principle of self-defense in space, focusing on the legality of the use of conventional force in response to cyber-attack on commercial space assets. Of course, this issue does not comprise the full panoply of complications generated by the convergence of military and commercial space activities; rather, it is merely a sample of the types of issues that are likely to rise to the forefront of debate in the immediate future.

I. INTRODUCTION

An attack on elements of U.S. space systems during a crisis or conflict should not be considered an improbable act. If the U.S. is to avoid a ‘Space Pearl Harbor’ it needs to take seriously the possibility of an attack on U.S. space systems. The nation’s leaders must assure that the vulnerability of the United States is reduced and that the consequences of a surprise attack on U.S. space assets are limited in their effects.27

26 See supra text accompanying note 4.
27 SPACE COMM’N REPORT, supra note 1, Executive Summary at 8-9.
The United States is detecting the probes and scans of "hackers" against DoD networks and computer systems with increasing frequency.28 In 1999 and 2000, U.S. military services reported more than 1,300 serious "cyber-attacks," and in May 2001, the National Security Agency disclosed that "a series of sophisticated attempts to break into Pentagon computers" originating from a Russian Internet address (code-named "Moonlight Maze"), continued for more than three years.29 Testifying before Congress, John Serabian, the U.S. Central Intelligence Agency's information operations issue manager, said that the United States had identified "several countries" that are "pursuing government-sponsored offensive cyber programs" and went on to describe the theory behind the cyber-threat, as follows:

[These countries] realize that, in conventional military confrontation with the United States, they will not prevail. . . [They] perceive that cyber attacks, launched from within or outside the U.S., represent the kind of asymmetric option they will need to level the playing field during an armed crisis against the U.S.30

"Cyber-attack" is an attack on or through "cyberspace"—i.e., the "Global Information Infrastructure."31 While the term "cyber-attack" may have slightly different meanings in different contexts, it is generally another word for what is described in military jargon as "Information Warfare" (IW) or "Information Operations"—

Those actions taken to affect an adversary's information and information systems while defending one's own information and information systems. Information operations also include actions taken in a noncombatant or ambiguous situation to protect one's own information and information systems as well as those taken to influence target information and information systems. . .

28 Space Comm'n Report, supra note 1, at 23 ("In 1999 the number of detected probes and scans against DoD systems was just over 22,000; in the first eleven months of 2000, the number had grown to 26,500.").
[T]he actions associated with information operations are wide-ranging—from physical destruction to psychological operations to computer network defense.\textsuperscript{32}

Although the 1996 National Space Policy directed that steps be taken to protect satellites from cyber-attacks, commercial satellite operators have generally not seen a need to do this, due to the high cost and the lack of demand from customers for protective measures.\textsuperscript{33} Hence, U.S. commercial satellites are vulnerable to cyber-attack, and "[t]he political, economic, and military value of space systems makes them attractive targets."\textsuperscript{34} The growing interdependence between U.S. civilian and military space systems further increases the likelihood that cyber-attacks might be launched against American commercial satellites, if for no other reason than military action directed against U.S. space capabilities will have to target the nation's broader space infrastructure to be successful.\textsuperscript{35} In addition, to potential foreign adversaries seeking to avoid a direct military confrontation with the U.S. forces, whether a traditional uniformed military or "non-traditional" adversary (such as a terrorist organization),\textsuperscript{36} the commercial sector represents the "soft underbelly" of American space power, which can be attacked through cyberspace in such a way as to make determining the origin of the attack very difficult.\textsuperscript{37}

Because the United States is more dependent on space for its security and well-being than any other nation,\textsuperscript{38} it is in the national interest to develop a strategy to deter and defend against cyber-attack on U.S. commercial space systems. Already, U.S. military analysts have called for new investments in technology


\textsuperscript{33} SPACE COMM'N REPORT, supra note 1, at 28.

\textsuperscript{34} Id. at xii.


\textsuperscript{36} JOINT VISION 2020, supra note 32, at 29 ("'Nontraditional' adversaries who engage in 'nontraditional' conflict are of particular importance in the information domain. . . The perpetrators of such attacks are not limited to the traditional concept of a uniformed military adversary.").


\textsuperscript{38} SPACE COMM’N REPORT, supra note 1, at 18.
to enable DoD to not only defend its systems against the increasing risks of cyber attack, but also to discern the origin of such attacks, so it can deliver a commensurate response. Yet, this is not the entirety of the issue; establishing a strategy for deterrence is not a purely technical question. It also requires a clearer understanding of the legal regime of self-defense with regard to cyber-attack, particularly when it comes to the notion of responding to cyber-attack with conventional force.

The balance of this article will address this issue, looking first at U.S. policy concerning the defense of commercial space systems and then at the legal norms governing States' use of force in self-defense as they apply to cyber-attack.

II. U.S. POLICY ON DEFENSE OF NATIONAL SPACE SYSTEMS

The policy of maintaining the outward separation of military and commercial space activities, which dominated the U.S. space program for the first twenty-five years of the space age, was aimed at obtaining political and legal international sanction for military space activities, primarily satellite reconnaissance. Nevertheless, throughout most of this same period, the United States showed restraint in the development of "space weapons" (i.e., weapons for use in or from space), specifically anti-satellite (ASAT) weapons. American self-restraint in this regard was based upon the belief that the United States was much more

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40 See Adams, supra note 37, at 110.

41 See DoD Tech Guide, supra note 37, at iv-xv.

42 The U.S. developed two "crude" ASAT systems during this time: Project 505 or "Nike Zeus" (1963-67), a modified Anti-Ballistic Missile (ABM), and Project 437 or "Thor" (1964-75), a converted Intermediate Range Ballistic Missile (IRBM); however, both had "limited capabilities with severe operational constraints." Most notably, both systems used nuclear warheads to destroy their targets, which meant that their use would have not only contravened the Limited-Test-Ban Treaty, supra note 20, but would have also threatened U.S. satellites in the vicinity of the explosion. These factors greatly reduced the usability of these systems and their credibility as deterrents as well. STARES, supra note 6, at 80-82, 117-128; see also SPIRES, supra note 3, at 188; William J. Perry et al., Anti-Satellite Weapons and U.S. Military Space Policy: An Introduction, in SEEKING STABILITY IN SPACE: ANTI-SATELLITE WEAPONS AND THE EVOLVING SPACE REGIME 1, 7-9 (Joseph S. Nye, Jr. & James A. Scheir, eds., 1987); cf. Michael Krepon, Lost in Space: The Misguided Drive Toward Anti-Satellite Weapons, 80 FOREIGN AFF. J. 2, 3-4 (2001).
dependent on reconnaissance from space than was its Cold War adversary, the Soviet Union, due to the "closed" nature of Soviet society, and that, as a consequence, the United States could not adequately deter Soviet interference with U.S. satellites by threat of reciprocal action. American policy-makers thus concluded that developing ASAT weapons would only serve to encourage the Soviets to do the same and thereby increase the risk of an attack on vital U.S. space assets. This was the essence of U.S. policy on the defense of its space systems until the late-1970s.

The U.S. policy toward defense of space systems and, in particular, toward anti-satellite weapons, began to change during the Ford administration. Although the Soviet Union had first begun testing a satellite interceptor or "killer satellite" against targets in space in 1968, the sudden cessation of those tests in 1971, and the climate of détente between the two superpowers that prevailed in the early 1970s lent support to the U.S. policy of restraint. Surely, with the United States and the Soviet Union signing both the Anti-Ballistic Missile Treaty and the first SALT (Strategic Arms Limitation Talks) agreement in May 1972, it would have been reasonable to conclude that the Soviets had accepted the U.S. approach in toto—the two treaties contain identical provisions which tacitly recognize the legality of reconnaissance satellites as a means of verifying treaty compliance, and prohibit any "interference" with their function.

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43 See Stares, supra note 6, at 51; see also sources cited supra notes 10-12.
44 See sources cited supra note 12.
45 See Stares, supra note 6, at 165, generally at 135-156 (discussing the Soviet's ASAT weapon program).
48 See ABM Treaty, supra note 46, at art. XII, ¶ 1 & 2; SALT I supra note 47, at art. V, ¶ 1 & 2. "The meaning of the non-interference clauses was never made explicit at the time." Stares, supra note 6, at 166-68. Stares notes two other notable agreements signed in the détente era, which are relevant to ASAT activities. First is the Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War between the USA and USSR, Sep. 30, 1971, U.S.-U.S.S.R., 22 U.S.T. 1590, or "Accident Measures" Agreement, which provides: "Parties undertake to notify each other immediately... in the event of signs of interference with [early missile warning] systems or with related communication facilities" (Article 3). Second is the Agreement between the United States of America and the Union of Soviet Socialist Republics on Measures to Improve the USA-USSR Direct Communica-
However, the suspicious “blinding” of three U.S. satellites by an intense beam of radiation emanating from the western part of the Soviet Union in the autumn of 1975, and the resumption of Soviet ASAT tests in February 1976 (after a four-year hiatus), abruptly dispelled the hope among U.S. leaders that America’s unilateral restraint in the development of anti-satellite weapons would be reciprocated. Accordingly, on January 18, 1977 (just two days before leaving office), President Ford signed National Security Decision Memorandum No. 345 (NSDM-345), directing DoD to develop an operational ASAT capability, while continuing to study arms control options for anti-satellite weapons. Though implementation of NSDM 345 was left for the incoming Carter administration, the decision nevertheless stands as “the primary enabling act for the current U.S. ASAT programme.”

The concept of developing a credible U.S. ASAT capability, while simultaneously pursuing limits on anti-satellite weapons, became the basis of the Carter administration’s “two-track” policy. The argument behind the policy was both logical and persuasive: the prospect of a U.S. ASAT capability would serve as a “bargaining chip” that would provide the Soviet Union with real incentive to negotiate and give the United States leverage once talks began, and, in the event negotiations failed, the United States would acquire the capability to deal with military threats in space. Yet despite an expressed willingness on the part of the U.S. to exchange further ASAT restraint in return for recip-

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49 See STARES, supra note 6, at 169, 178-79.

50 As of Oct. 1, 1970, DoD moved Program 437 to “stand-by” status as a cost saving measure, with most of the missiles and personnel being withdrawn from Johnson Island in the Pacific, to Vandenberg Air Force Base in California. As a result, the system’s reaction time went from 24-36 hours to 30 days, which was effectively the end of the system, although it technically remained “operational” until it was officially deactivated on Apr. 1, 1975. See CURTIS PEEBLES, GUARDIANS: STRATEGIC RECONNAISSANCE SATELLITES 92-94 (1987); see also STARES, supra note 6, at 127; and SPIRES, supra note 3, at 188.


52 STARES, supra note 6, at 179.

53 See generally id. at 180-200.

54 Id. at 183.
rocal action from the Soviet Union, tests of Soviet ASAT systems continued unabated throughout the Carter presidency.\textsuperscript{55} Not surprisingly, negotiations for comprehensive limits on ASAT weapons were futile, reflecting the varying levels of commitment of interested constituencies on both sides, and were eventually abandoned in the turmoil following the Soviet invasion of Afghanistan in December 1979.\textsuperscript{56}

President Carter’s reputation as a nuclear weapons “disarmer” notwithstanding, the changing perception of the Soviet threat compelled him to take measures to improve the U.S. defensive posture.\textsuperscript{57} On May 11, 1978, Carter issued a Presidential Directive (PD/NSC-37), which set out his National Space Policy.\textsuperscript{58} It included the following among the “basic principles” governing the conduct of the U.S. space program:

Rejection of any claims to sovereignty over outer space or over celestial bodies, or any portion thereof, and rejection of any limitations on the fundamental right to acquire data from space.

The space systems of any nation are national property and have the right of passage through and operations in space without interference. Purposeful interference with operational space systems shall be viewed as an infringement upon sovereign rights.

The United States will pursue activities in space in support of its right of self-defense.\textsuperscript{59}

PD/NSC-37 clearly comprised a firmer, more assertive approach toward national defense of space systems, as well as an unequivocal affirmation of the application of the right of self-defense in outer space.\textsuperscript{60} Furthermore, although details of the national security components of PD/NSC-37 are still classified,

\textsuperscript{55} See Announcement of Administrative Review, 1978 PUB. PAPERS 1137 (Jun. 20, 1978) (“The United States finds itself under increasing pressure to field an antisatellite capability of its own in response to Soviet activities in this area. By exercising mutual restraint, the United States and the Soviet Union have an opportunity at this early juncture to stop an unhealthy arms competition in space before the competition develops a momentum of its own.”) [hereinafter NSC Admin. Review]; see also Stares, supra note 6, at 181, 186-192; and Spies, supra note 3, at 190.

\textsuperscript{56} See Stares, supra note 6, at 192-200.

\textsuperscript{57} Spies, supra note 3, at 189.

\textsuperscript{58} PD/NSC-37, supra note 14, at Part 1 (portions of PD/NSC-37 are still classified); see also NSC Admin. Review, supra note 55, at 1136 (“The United States will pursue Activities in space in support of its right of self-defense and thereby strengthen national security, the deterrence of attack, and arms control agreements.” (emphasis added)), construed in Stares, supra note 6, at 185-86.

\textsuperscript{59} PD/NSC-37, supra note 14, at Part 1.

\textsuperscript{60} See discussion infra Part IV.A.
the public version of the Directive called for DoD to "[identify] and [integrate], as appropriate, civil and commercial resources into military operations during national emergencies," as a means of enhancing the survivability and redundancy of U.S. space systems.61 Therefore, while perhaps not intended as such, PD/NSC-37 can also be viewed as the genesis for the open recognition and extensive utilization of the military capabilities of commercial space systems that is seen today.62

In 1981, the first year of the Reagan presidency, the new administration initiated a comprehensive space policy review, the results of which were contained in National Security Decision Directive No. 42 (NSDD 42), issued on July 4, 1982.63 Although this Directive replaced a number of the previous administration’s space policy statements, including PD/NSC-37, its key declarations were basically the same:

The United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental right to acquire data from space.

The United States considers the space systems of any nation to be national property with the right of passage through the operations in space without interference. Purposeful interference with space systems shall be viewed as infringement upon sovereign rights.

* * *

The United States will pursue activities in space in support of its right of self-defense.64

Where Reagan’s space policy differed from Carter’s was on the question of arms control. Under the Reagan policy, the United States would “continue to study space arms control options” and “consider verifiable and equitable arms control measures that would ban or otherwise limit testing and deployment of specific weapons systems.”65 However, the nation would no longer actively seek an agreement with the Soviet Union for comprehensive limits on anti-satellite weapons, as was the case

61 NSC Admin. Review, supra note 55, at 1137; see also Stares, supra note 6, at 211.
62 See sources cited supra notes 4-5, and accompanying text.
63 NSDD 42, supra note 14 (portions of NSDD 42 are still classified).
64 Id. at Part 1.
65 Id. (emphasis added).
under Carter. In fact, the Reagan administration rejected outright any notion of the U.S. ASAT capability as a "bargaining chip," adopting, instead, the mantra of "ASAT deterrence"—i.e., "the belief that the threat of U.S. ASAT retaliation could deter the Soviet Union from using its own satellite interceptor." Just a few days after NSDD 42 was signed, "ASAT deterrence" made its way into U.S. military doctrine with the release of the 1982 DoD space policy, which heralded the development of an "ASAT capability" for the primary purpose of "[deterring] threats to [the] space systems of the United States and its allies." Nevertheless, the main weakness of the theory of "ASAT deterrence" remained, as it had always been, the fact that a "tit for tat with satellites" did not make sense from an American perspective "because of the great asymmetry in the value of the satellites to the two superpowers." Consequently, on February 4, 1987, DoD adopted a new space policy that theoretically sought to address this dilemma. Under this latest policy, DoD would "develop and deploy a robust and comprehensive antisatellite capability... at the earliest possible date." In addition, the policy set down a doctrine of "Space System Protection":

DoD space systems will be designed, developed and operated to ensure the survivability and endurability of their critical functions at designated levels of conflict. DoD will develop and oper-
ate space systems which balance capability and survivability to deter attacks by creating a dilemma for adversary attack planners by responding to these attacks with both space and terrestrial force responses.\(^72\)

The new DoD policy thus bolstered "ASAT deterrence" by substituting the "tit for tat with satellites" for an array of potential military responses to an attack on U.S. space systems, to include "terrestrial force," which could, for example, entail the use of conventional force against the attacker's satellite ground stations, command and communications nodes, or launch systems.\(^73\)

The Reagan philosophy of "ASAT deterrence," and the corresponding goal of developing and deploying an anti-satellite capability, were seemingly well entrenched as fixtures of U.S. space policy with the introduction of National Space Policy Directive No.1 (NSPD 1) in 1989:

The United States will conduct those activities in space that are necessary to national defense. Space activities will contribute to national security objectives by (1) deterring, or if necessary, defending against enemy attack; (2) assuring that forces of hostile nations cannot prevent our own use of space; (3) negating, if necessary, hostile space systems; and (4) enhancing operations of United States and Allied forces.

* * *

Space Control: The DoD will develop, operate, and maintain enduring space systems to ensure its freedom of action in space. This requires an integrated combination of anti-satellite, survivability, and surveillance capabilities. . . . The United States will develop and deploy a comprehensive [ASAT] capability with programs as required and with initial operations capability at the earliest possible date.\(^74\)

However, the force of NSPD 1 was severely diminished by the fact that, in 1988, concerns over cost overruns and the ongoing arms race with the Soviet Union prompted Congress to ban further testing of the Miniature Homing Vehicle (MHV)—an air-launched heat-seeking anti-satellite weapon, which had been in development since 1977 and was intended to provide the

\(^{72}\) Id.

\(^{73}\) "Terrestrial forces" include air, land, and sea forces. See Office of Technology Assessment, 99th Cong., Anti-Satellite Weapons, Countermeasures, and Arms Control, Summary 14 (1985).

\(^{74}\) NSPD 1, supra note 14.
United States with an operational ASAT capability. The U.S. Air Force subsequently cancelled the program, and thus the United States remained without a dedicated anti-satellite system in operation.

With the end of the Cold War and subsequent breakup of the Soviet Union, the Reagan-era rationale of pursuing an ASAT capability to deter Soviet ASAT attacks no longer applied. Even so, the Gulf War had provided U.S. leaders with a convincing demonstration of the value of satellite reconnaissance and the importance of denying it to one's enemies; hence, American ASAT weapons development continued. Still, there was considerable debate over the necessity, feasibility, and cost-effectiveness of such weapons; consequently, through the mid-1990s, the United States' anti-satellite program remained a "technology base" program only, with the limited objective of "developing technologies as security against potential future threats."

The nation's policy on space system defense exhibited a similar ambivalence during this period. Installed in 1996, the new "National Space Policy" dropped the express call for deployment of an anti-satellite system (and, indeed, any mention of the word anti-satellite altogether)—instead, DoD would simply "maintain the capability to execute . . . space control." The document further provided:

National security space activities shall contribute to U.S. national security by (a) providing support for the United States' inherent

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75 SPIRES, supra note 3, at 261; see also Paul B. Stares, The Threat to Space Systems, in The Search for Security in Space 38, 50-52 (Kenneth N. Luongo & W. Thomas Wander eds., 1989) ("For fiscal 1985, Congress mandated that no more than three tests against a target in space could take place, and then only after the president had certified that the United States was endeavoring in good faith to negotiate an ASAT arms control agreement with the Soviet Union. The next year it prohibited testing against objects in space, a ban it later extended into fiscal 1987.").

76 See Krepon, supra note 42, at 4-5 (discussing the Reagan administration's support of antisatellite weapons).

77 SPIRES, supra note 3, at 261; see also William B. Scott, ASAT Test Stalled by Funding Dispute, AVIATION WK. & SPACE TECH., Jul. 1, 1996, at 59 (discussing the Army's kinetic energy anti-satellite); William J. Broad, In Era of Satellites, Army Plots Way to Destroy Them, N.Y. TIMES, Mar. 4, 1997, at C1, C8 ("Congress has . . . financed the [Kinetic Energy Anti-Satellite Program] at a significant level for two years and is expected to continue to do so, citing a growing need for the military to be able to blind unfriendly eyes in orbit. . . . [S]aid Senator Robert C. Smith. . . 'If Saddam Hussein had [satellite reconnaissance] technology during the gulf war [sic], he could have done a lot of damage.'").

78 SPIRES, supra note 3, at 261-62.

right of self-defense and our defense commitments to allies and friends; (b) deterring, warning, and if necessary, defending against enemy attack; (c) assuring that hostile forces cannot prevent our own use of space; (d) countering, if necessary, space systems and services used for hostile purposes; and (e) enhancing operations of U.S. and allied forces.

* * *

The United States will develop, operate and maintain space control capabilities to ensure freedom of action in space and, if directed, deny such freedom of action to adversaries. These capabilities may also be enhanced by diplomatic, legal or military measures to preclude an adversary's hostile use of space systems and services. The U.S. will maintain and modernize space surveillance and associated battle management command, control, communications, computers, and intelligence to effectively detect, track, categorize, monitor, and characterize threats to U.S. and friendly space systems and contribute to the protection of U.S. military activities.

While the phrase "space control capabilities [and] military measures" is arguably a euphemism for "space and terrestrial force," the 1996 policy left the question of the use of force in response to an attack on U.S. space assets awash in verbiage. By the end of the decade, however, the expanded commercial use of space, and the growing dependence of the military on the commercial space sector to provide essential services, gave rise to renewed concern over the vulnerability of the nation's space systems to attack. So, in 1999, DoD promulgated its current space policy, which clarified the issue:

Space is a medium like the land, sea, and air within which military activities shall be conducted to achieve U.S. national security objectives. The ability to access and utilize space is a vital national interest because many of the activities conducted in the

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80 Id.

81 See SPACE COMM’N REPORT, supra note 1, Executive Summary, at 8 ("The relative dependence of the U.S. on space makes its space systems potentially attractive targets. Many foreign nations and non-state entities are pursuing space-related activities. Those hostile to the U.S. possess, or can acquire on the global market, the means to deny, disrupt or destroy U.S. space systems by attacking satellites in space."); see also JOINT VISION 2020, supra note 32, at 30 ("[O]ur ever-increasing dependence on information processes, systems, and technologies adds potential vulnerabilities that must be defended."); NDP REPORT, supra note 31, at 38 ("[A]s military competitors... seek ways to reduce our current advantages [in space]... business will turn to government for protection... [and] as the ‘flag follows trade,’ our military will be expected to protect U.S. commercial interests.").
medium are critical to U.S. national security and economic well-being. Ensuring the freedom of space and protecting U.S. national security interests in the medium are priorities for space and space-related activities. U.S. space systems are national property afforded the right of passage through and operations in space without interference, in accordance with [the National Space Policy (1996)]. Purposeful interference with U.S. space systems will be viewed as an infringement on our sovereign rights. The U.S. may take all appropriate self-defense measures, including . . . the use of force, to respond to such an infringement on U.S. rights.82

Thus, under the new DoD policy, it is now clear that the United States construes the “inherent right of self-defense” as not only allowing the use of military force in response to attacks on the nation’s military space systems, but in response to attacks against U.S. commercial interests and investments in space as well.83

The advent of the cyber-attack threat introduces a new dynamic to the concept of satellite defense that U.S. policymakers must now address. The concept of a deterrence regime is once more gaining currency, not just for outer space, but for “cyberspace” too.84 Military planners have advocated increased technology investments to give U.S. forces the ability to determine the nature and origin of a cyber-attack, so that they can take steps to mitigate its effect and attack the source.85 Yet, the legality of the use of force in response to a cyber-attack on commercial space systems remains open to question.86 Resolving this issue requires an evaluation of the cyber-attack threat within the context of the law governing resort to armed conflict generally—the *jus ad bellum*.

### III. THE LAW GOVERNING RESORT TO ARMED CONFLICT (*JUS AD BELLUM*)
#### A. HISTORICAL BACKGROUND

Modern *jus ad bellum*—which corresponds with the era of the Covenant of the League of Nations (1919) and the Charter of

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82 DoDD 3100.10, supra note 4, ¶ 4.1-4.2, at 6 (emphasis added).
83 See USSPACECOM 2020, supra note 4, at 4 (“[In the 21st century] . . . space forces will . . . protect military and commercial national interests and investment in the space medium due to their increasing importance.”).
84 Adams, supra note 37, at 104.
85 See NDP REPORT, supra note 31, at 38-41; see also sources cited supra note 39.
86 See Adams, supra note 37, at 110.
the United Nations (1945)—is distinguished by the establishment of the illegality of resort to war by States as “the basic norm.” Prior to this, the *jus ad bellum* was characterized by a strong presumption of the legality of war as “an instrument of self-interest, and as a form of self-help,” which dated back to antiquity. This is not to say that the resort to war was unregulated; to the contrary, virtually every advanced civilization has had rules governing the initiation of war. Indeed, “[a]s early as the Egyptian and Sumerian wars of the second millennium [sic] B.C., there were rules defining the circumstances under which war might be initiated.”

The advent of Christianity marked the beginning of an era in which the question of war was dealt with from a moral perspective, “[thus] there originated with St. Ambrose (A.D. 340-397) the conception of the Roman Empire as the basis of the just peace, and the first signs of the justice of war.” The notion that the “right of war” (*jus belli*) was limited, in so far as there were just and unjust wars and unjust wars were forbidden, was subsequently “elaborated and given authority in the Christian

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88 Id.
90 *Law of War*, supra note 89, at 3.
91 See Arend & Beck, supra note 89, at 14; see also Jose-Luis Fernandez-Flores, *Use of Force and International Community*, 111 Mil. L. Rev. 1, 3 (1986). In the late Roman Empire, Christian religious doctrine had become widespread and enmeshed with the secular power of Rome; therefore, Christian theologians and canonists were compelled to reconcile the pacifist and anti-militaristic principles of the early Church with the needs of the emerging Christian State. See Brownlie, supra note 87, at 5; see also Law of War, supra note 89, at 6; Arend & Beck, supra note 89, at 13; Fernandez-Flores, supra, at 3 (“On the one hand, authors like Tertullian [A.D. 160-240] and Lactantius [died c. A.D. 330] declared themselves in favor of absolute non-violence and accordingly stated that all wars were unjust. The former also maintained that the existence of armed forces was inconsistent with the Christian faith, and he was accused of heresy. On the other hand, no authoritative text rejected outright the possibility of Christians taking part in a war. In fact, many Christians served in the Roman legions and were nevertheless still considered saints.”); cf. Chris af Jochnick & Roger Normand, *The Legitimation of Violence: A Critical History of the Laws of War*, 35 Harv. Int’l L.J. 49, 60 n.39 (1994) (“As the Church grew to exercise state power in Europe, it abandoned its early commitment to pacifism.”).
92 Fernandez-Flores, supra note 91, at 4; see also Brownlie, supra note 87, at 5.
93 Fernandez-Flores, supra note 91, at 4.
world by St. Augustine (A.D. 354-430)."94 The just war doctrine (as it is known) would serve as the basis for jus ad bellum through the end of the Middle Ages.95

Later, as the feudal political structure owing allegiance to the Pope and Emperor began to give way to a system of sovereign national States,96 the laws of war were reexamined from a "juridical-secular" point of view, "shifting the main argument from the justice or injustice of war to the . . . lawfulness or unlawfulness of war."97 Prominent scholastics, jurists and theologians of this period concluded that, by virtue of the sovereign authority vested in the State, any sovereign nation could lawfully declare war. They further opined that the exclusive power of the sovereign ruler to decide on the necessity of war was such that war was justified, so long as the ruler, acting in good faith, judged it to be so—even if objectively justice lay with the other party!98 This "probabilist" theory99 was eventually woven into the doctrine of "positivism," which prevailed throughout the Age of Enlighten-

94 BROWNLIE, supra note 87, at 5. Underlying Augustine’s construct of the "just war" was the notion that three things were necessary for a war to be considered just: first, war could only be waged by authority of a sovereign; secondly, just cause was required (i.e., some fault on the part of those who were attacked); and thirdly, war had to be undertaken with rightful intentions (i.e., with a genuine desire for justice, as opposed to hate or revenge). See LAW OF WAR, supra note 89, at 6-7; see also BROWNLIE, supra note 87, at 6 (quoting St. Thomas Aquinas (c. 1225-74) in Summa Theologica, on the teachings of St. Augustine); AREND & BECK, supra note 89, at 14; cf. M.H. Keen, The Laws of War in the Late Middle Ages 66 (1965) (discussing the work of Raymond of Pennaforte, who applied the opinions of Augustine in Summa de Poenitentia (1603) and identified five prerequisites for a just war).

95 See BROWNLIE, supra note 87, at 5-18; AREND & BECK, supra note 89, at 15-19; see also LAW OF WAR, supra note 89, at 6-15; Fernandez-Flores, supra note 91, at 4 ("The doctrine of Saint Augustine basically shaped all of the medieval doctrines."); cf. af Jochnick & Normand, supra note 91, at 61 ("The laws of war remained tied to religious particularism until the Enlightenment.").

96 See BROWNLIE, supra note 87, at 10-13; see also AREND & BECK, supra note 89, at 15-17 (discussing the emergence of the state system and the doctrine of sovereignty).

97 Fernandez-Flores, supra note 91, at 5 ("[Publicists] detheologized the notion of just war."); see also LAW OF WAR, supra note 89, at 11; af Jochnick & Normand, supra note 91, at 61 ("[T]he ‘publicists’ helped shift the source of legal authority from God to reason"); 61 n.44 ("The early publicists... continued to use the ‘just war’ framework but universalized its principles.").

98 See generally BROWNLIE, supra note 87, at 7-13; Fernandez-Flores, supra note 91, at 5-6.

99 "This theory has been described as 'probabilism'... [because] of its relation to casuistic method." BROWNLIE, supra note 87, at 11.
and held that "since states could be bound by no higher law, the only law that could exist was that which they created by their consent... through treaties, customs, and general principles." In effect, this meant that under international law States enjoyed a sovereign right to go to war—a right that was essentially unrestricted—and the just war doctrine was thereby relegated to "the realms of morality and propaganda."

The "unbridled ferocity" of modern warfare and the increased risk posed to the civilian population of the "nation-arms" in the nineteenth century, led to the first international conferences aimed at codifying the laws and customs governing wartime conduct (jus in bello). But these early attempts to create laws governing the conduct of war could not overcome "the enduring power of military necessity," and the resulting regulations "inevitably collapsed into deliberate vagueness." Meanwhile, the jus ad bellum remained characterized by the unlimited right to wage war as an attribute of the sovereign State.

Finally, by the beginning of the twentieth century, new trends favoring peaceful settlement of disputes began to emerge, including the view of war as "a judicial procedure," wherein war was "a means of last resort" available only after recourse to

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100 See Brownlie, supra note 87, at 10-18; see also Arend & Beck, supra note 89, at 15-17.
101 Arend & Beck, supra note 89, at 16.
102 Id. at 17 ("The only real qualification of this right to institute war that was accepted by states during this period was the requirement that war be declared. Hence, a state simply declared war, and it was lawful." (footnotes omitted)); see also Brownlie, supra note 87, at 12; Fernandez-Flores, supra note 91, at 6 ("[W]ar was turned into a juridical institution in conformity with natural law but devoid of moral considerations... In short, there were no restrictions at all on war.").
103 Brownlie, supra note 87, at 14 ("[Between] 1648 to 1815... in deference to public opinion governments frequently took pains to advance reasons for declaring war which would give the action some colour of righteousness."); cf. Arend & Beck, supra note 89, at 16-17 (the "emergence of the state system" and "the doctrine of sovereignty" served to "supplant the just war concept as the predominant legal approach to the jus ad bellum.").
105 Af Jochnick & Normand, supra note 91, at 63, 66-68; see Declaration Renouncing the Use, in Time of War, of Explosive Projectiles under 400 Grams Weight (Saint Petersburg Declaration) (1868), and International Declaration Concerning the Laws and Customs of War (Brussels Conference) (1874), reprinted in The Laws of Armed Conflicts, at 25-34, 101-103 (Dietrich Schindler & Jirí Toman eds., 1988).
106 Af Jochnick & Normand, supra note 91, at 68.
107 See Brownlie, supra note 87, passim; see also Arend & Beck, supra note 89, at 17, 19.
peaceful means of settlement had failed. Attempts by the Hague Peace Conferences of 1899 and 1907 to restrict the freedom of States to resort to war reflected this view. Although while international diplomatic efforts reflected the increasing favor shown to peaceful means of settling disputes, as well as movement toward the modern view of war as not simply a private duel between States, but a matter of international concern, they did not alter the view of war as “a normal mode of enforcing a State’s legal rights.” Consequently, in the period prior to 1914, the State’s right to resort to war, as a form of self-help, remained unrestricted by customary international law. The drawbacks of this system became all too obvious with the onset of the First World War.

B. Modern Jus Ad Bellum

1. League of Nations Covenant (1919)

The First World War (1914-1918) wrought immense destruction, exacting a staggering toll on human life; in fact, twice as many people were killed during World War I than had been killed in all wars combined from 1790-1913. Not surprisingly, the goal of the delegates to the Paris Peace Conference assembled in Versailles in the spring of 1919 was to ensure that such a war could never happen again. Thus, the League of Nations

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108 BROWNLIE, supra note 87, at 19, 21 ("In state practice this sometimes appeared as a substantial though perhaps somewhat formal qualification of the right to resort to war.").


110 The Second International Peace Conference (1907) produced three more treaties: the Convention for the Pacific Settlement of International Disputes (Hague I), Oct. 18, 1907, 36 Stat. 2199, 1 Bevans 577, which revised the 1899 Convention by expounding upon the means and methods for the peaceful settlement of disputes; the Convention Respecting the Limitation of the Employment of Force for the Recovery of Contract Debts (Hague II) [also known as the Porter Convention], Oct. 18, 1907, 36 Stat. 2241, 1 Bevans 607, which sought to outlaw “forcible self-help” by means short of war; and the Convention Relative to the Opening of Hostilities (Hague III), Oct. 18, 1907, 36 Stat. 2259, 1 Bevans 619, which required that war not start without a warning.

111 See BROWNLIE, supra note 87, at 22.

112 See JULIUS STONE, LEGAL CONTROLS OF INTERNATIONAL CONFLICT 297 (Rinehart & Co. 1954).

113 See sources cited supra note 107.

114 AREND & BECK, supra note 89, at 19.

115 Id.
Covenant, established as part of the Treaty of Versailles (1919), represented the first serious attempt to restrain the right of States to resort to war.

Under the League of Nations Covenant, signatories agreed to submit any dispute that was likely to "rupture" international peace to arbitration or, alternatively, to the League Council for consideration. Members of the League further agreed that once a decision on the matter was issued, either in the form of an arbiter's award or the unanimous recommendations of the Council, they would not resort to war against any party that complied with the terms of the award decision or the recommendations in the Council's report. Even where a party did not comply with the decision or recommendations, the Covenant imposed a "cooling off" period whereby Members agreed not to resort to war for at least three months after the decision or report was issued. Resort to war by a Member in violation of the Covenant's provisions for the peaceful settlement of disputes subjected the violator to collective sanctions.

While not imposing an outright ban on war, the Covenant altered the jus ad bellum in two important ways. First, the imposition of procedural restraints on the liberty of State's to resort to

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116 Treaty of Peace with Germany (Treaty of Versailles), June 28, 1919, arts. I-XXVI, 2 Bevans 43 [hereinafter LEAGUE OF NATIONS COVENANT]. Entered into force as between the contracting parties on June 10, 1920 (the United States was not a party).

117 See STONE, supra note 112, at 299.

118 LEAGUE OF NATIONS COVENANT, supra note 114, art. XII & XV.

119 Id. art. XIII & XV. Under Article XII, decisions of arbiter's were to be issued within "a reasonable time," while the report of the Council was to be issued within six months after the submission of the dispute.

120 Id. art. XII.

121 Id. art. XVI.

122 Article X provided, in part: "Members of the League undertake to respect and preserve as against external aggression the territorial integrity and existing political independence of all Members of the League." While the provision appears to constitute a general prohibition of "aggression," the consensus among scholars is that such an interpretation was contradicted by other provisions which allowed recourse to war (e.g., Article XV) and that the Covenant did not outlaw war per se. See, e.g., STONE, supra note 112, at 299-300 ("[The Covenant] imposed on the liberty to resort to war certain restraints largely of a procedural nature. [It] was not, however, a complete prohibition."); BROWNLIE, supra note 87, at 56 ("[The Covenant] must be interpreted... on the assumption that the right to go to war recognized by the customary law still existed."); Id. at 66 ("The general presumption was that war was still a right of sovereign states although signatories to the Covenant were bound by that instrument to submit to certain procedures of peaceful settlement."); see also INGRID DETTER DE LUPIS, THE LAW OF WAR 54-55 (1987) ("[W]ar was not outlawed by the Covenant... [I]
war was itself a significant derogation from customary law, which had for centuries maintained the unrestricted right to wage war.\textsuperscript{123} Second, the notion that resort to war in contradiction of the Covenant's provisions would subject the violator to international sanction\textsuperscript{124} helped foster a presumption against the legality of war as a means of self-help.\textsuperscript{125}

At the same time, the practical force of the Covenant was diminished to the extent that there were "gaps" in its provisions, by which Members could continue to legally resort to war or employ forcible means short of war. For example, the Covenant left open the possibility of Members resorting to war against a party that did not comply with the decision once the three-month "cooling off" period had expired, and placed no restrictions on the Members resorting to war in situations where no decision on their case could be reached.\textsuperscript{126} Furthermore, since the Covenant's prescriptions referred only to "war," they arguably did not apply to the use of force outside the context of a formal "state of war."\textsuperscript{127}

2. \textit{Kellogg-Briand Pact (1928)}

Attempts to clarify and expand the \textit{jus ad bellum} continued in earnest in the period after the League of Nations Covenant was instituted. Almost immediately, League Members undertook to close the "gaps" in the provisions of the Covenant through supplementary agreements, such as the 1923 Draft Treaty of Mutual Assistance\textsuperscript{128} and the 1924 Protocol for the Pacific Settlement of

\begin{footnotesize}
\begin{enumerate}
\item[\textsuperscript{123}] See Brownlie, \textit{supra} note 87, at 56; see also \textit{supra} sec. III A.
\item[\textsuperscript{124}] \textit{League of Nations Covenant, supra} note 114, art. XVI.
\item[\textsuperscript{125}] See Brownlie, \textit{supra} note 87, at 57-58 ("[T]he Covenant nourished the view that the use of force was illegal not only when directed to conquest and unjustified acquisition but also as a means of enforcing rights. Self-help was restricted; war was no longer to be the "litigation of Nations.".")
\item[\textsuperscript{126}] \textit{League of Nations Covenant, supra} note 114, at art. XII, XV. In cases where a decision could be reached, "Members. . .reserve[d] to themselves the right to take such action as they shall consider necessary for the maintenance of right and justice." \textit{Id.} art. XV.
\item[\textsuperscript{127}] "Uses of force short of war would be regulated by the same regime that existed during the positivist period." \textit{Arend & Beck, supra} note 89, at 22; see also Brownlie, \textit{supra} note 87, at 38-40 (discussing the definition and significance of a "state of war").
\item[\textsuperscript{128}] Treaty of Mutual Assistance (Draft), \textit{League of Nations O.J.} Spec. Supp. 7, at 16 (1923). The treaty defined "aggressive war" as an international crime (art. 1), but did not place any restrictions on the resort to war beyond those imposed
\end{enumerate}
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International Disputes (the Geneva Protocol); however, neither of these treaties was successful. Similar efforts followed at both the regional and international levels, but these met with only minimal success. Finally, in 1928, there came a “decisive turning point in the development away from the freedom to wage war and towards a universal and general prohibition of war,” with the adoption of the Kellogg-Briand Pact for the Renunciation of War as an Instrument of National Policy.

The Kellogg-Briand Pact provided:

**Article I.** The High Contracting Parties solemnly declare in the names of their respective peoples that they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy in their relations with one another.

**Article II.** The High Contracting Parties agree that the settlement or solution of all disputes or conflicts of whatever nature or of whatever origin they may be, which may arise among them, shall never be sought except by pacific means.

by the Covenant. Rather, it clarified the fact that war could in fact be used to enforce settlement decisions reached in accordance with the term of Covenant, wherein it stated: “A war shall not be considered as a war of aggression if waged by a State which is a party to a dispute and has accepted [the decision]... against [a party] which has not accepted it.”


130 E.g., Locarno Treaties of 1925—The Treaties of Locarno were a series of agreements entered into by Belgium, Czechoslovakia, France, Germany, Britain, Italy, and Poland in Locarno, Switzerland, in 1925, which were intended to promote peace and security in Western Europe within the framework of the League of Nations. Under the first of the Locarno treaties, France, Germany, and Belgium agreed not to attack, invade, or resort to war against each other, subject to exceptions for self-defense, collective enforcement measures under Article XVI of the Covenant, and certain actions under Article XV, paragraph 7, of the Covenant. But the treaties involving Poland and Czechoslovakia did not offer the same assurances to the countries on Germany’s eastern borders. Plus, there was no Locarno treaty pertaining to Eastern Europe. See Brownlie, supra note 87, at 70-74 (discussing the 1925 Locarno Treaties and other developments).


As is clear from the text, unlike the League of Nations Covenant, which permitted recourse to war under certain circumstances, the Kellogg-Briand Pact was, on its face, an unqualified renunciation of war (Article I), coupled with an affirmative duty to resolve disputes by peaceful means (Article II). Moreover, unlike the other similar treaties that preceded it (e.g., the Geneva Protocol), the Kellogg-Briand Pact was accepted by virtually every State then in existence and incorporated into general customary international law.\(^{133}\) Thus, with the adoption of The Kellogg-Briand Pact there was, “for the first time, a general prohibition on war... subject only to the right of self-defense.”\(^{134}\)

This is not to suggest that the Kellogg-Briand Pact was a sort of panacea, for it also had its shortcomings. Perhaps the most glaring weakness of the Pact was that it outlawed only “war,” and thereby not only permitted unrestricted recourse to measures short of war, but also left room for States to circumvent application of the Pact by engaging in war-like activities under some other name.\(^{135}\) Beyond this, there were other deficiencies and ambiguities in the language of the Pact that also made its prohi-

\(^{133}\) *See Brownlie, supra note 87, at 75; see also Arend & Beck, supra note 89, at 23; Commentary, supra note 131, at 110-11 ("Only a number of Latin American States remained outside the Pact, but they became bound by the Saavedra-Lamas Treaty [of 1933] which... [was] worded almost identically to Art. I of the Kellogg-Briand Pact... [and] covered their relations with third states."); cf. Stone, supra note 112, at 300 (The Pact “came into force for virtually all States in the world, [but] still left the customary liberty to resort to war unaffected in [certain] respects."). The Kellogg-Briand Pact is still in force. *See Brownlie, supra note 87, at 75, 113-14; Arend & Beck, supra note 89, at 22; cf. Commentary, supra note 131, at 111 (the provisions of the Pact are still valid today as part of general customary international law).

\(^{134}\) *Commentary, supra note 131, at 110; see also Identic Notes of the Government of the United States to the Governments of Australia, Belgium, Canada, Czechoslovakia, France, Germany, Great Britain, India, the Irish Free State, Italy, Japan, New Zealand, Poland, South Africa (Jun. 23, 1928), reprinted in 22 Am. J. Int’l. L., Supp., 109 (1928) ("There is nothing in the [Kellogg-Briand Pact] which restricts or impairs in any way the right of self-defense. That right is inherent in every sovereign state and is implicit in every treaty"); Brownlie, supra note 87, at 81 (The treaty contained no reference to self-defense, but "signature was conditional on acceptance by signatories of reservations of the right of self-defense set out in the diplomatic exchanges prior to signature of the treaty"). The treaty was conspicuously silent with regard to what actions gave rise to the exercise of the right of self-defense.

\(^{135}\) *See Stone, supra note 112, at 300; see also Arend & Beck, supra note 89, at 23; Commentary, supra note 131, at 111; but see Brownlie, supra note 87, at 76-80, 84-88 (discussing the meaning of "war" as evidenced by state practice after adoption of the Pact, Prof. Brownlie cites several instances in which breaches of the Pact were alleged by various States in absence of a formal state of war).
bition of war less than complete. For example, under Article I, signatories to the Pact renounced war as “an instrument of national policy.” Hence, by implication, war carried out “in pursuit of religious, ideological, and similar (not strictly national) goals” might be deemed legal. War undertaken pursuant to the authority of an international organization (e.g., under Article XVI of the Covenant), or otherwise to enforce international obligations (e.g., a collective action taken against signatories violating the Pact), was also exempted from the prohibition—that is, “[i]nasmuch as Article I of the Pact forbade war only as an instrument of national policy, war remained lawful as an instrument of international policy.” In addition, since the signatories renounced war only “in their relations with one another,” resort to war was still lawful as an instrument of national policy in relations with non-signatories.

In the end, the Kellogg-Briand Pact did little, if anything, to prevent the spread of hostilities in the decade leading up to the Second World War. However, as has been the case throughout history, it seems that this had more to do with “the enduring power of military necessity,” than it did with any so-called “gaps” in the *jus ad bellum*. In any event, failure of the Pact to prevent war notwithstanding, it still had a considerable effect on State practice, and formed the basis for a rule of customary international law that prohibited the use of force as an instrument of national policy, except in cases of self-defense. This rule became “the heart” of the United Nations Charter.

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136 See AREND & BECK, supra note 89, at 23-24.
137 Although the Kellogg-Briand prohibition of war was not linked to a system of sanctions, *vis-à-vis* the League of Nations Covenant (art. XVI), the preamble to the Pact declared that any State that resorted to war in violation of its provisions would “be denied the benefits furnished by... [the] Treaty.” See STONE, supra note 112, at 300; BROWNLIE, supra note 87, at 89-91; COMMENTARY, supra note 131, at 111.
138 DINSTEIN, supra note 131, at 79 (emphasis added).
139 See STONE, supra note 112, at 300; DINSTEIN, supra note 131, at 80. In practice, however, the Pact effectively had universal application. See supra text accompanying note 133.
140 See STONE, supra note 112, at 300; AREND & BECK, supra note 89, at 24.
141 See BROWNLIE, supra note 87, at 75-80.
142 Id.
143 Id. at 110-11; see also AREND & BECK, supra note 89, at 24-25.
3. Charter of the United Nations (1945)

The United Nations Charter was adopted at the United Nations Conference of International Organization in San Francisco in June 1945.\textsuperscript{145} With the death toll of the Second World War surpassing that of the First World War by five-fold,\textsuperscript{146} delegates to the U.N. Conference gravely expressed their determination "to save succeeding generations from the scourge of war, which twice in [their] lifetime [had] brought untold sorrow to mankind."\textsuperscript{147} To this end, the Charter established the United Nations, the foremost purpose of which is set forth in Article 1(1), as follows:

To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace.\textsuperscript{148}

In addition to creating the organs of the United Nations, the Charter consolidates and reinforces certain customary norms related to "the behavior of States, especially with respect to the use of force."\textsuperscript{149} Two provisions of Article 2 stand out in this regard. The first is Article 2(3), which reaffirms the duty of States to resolve international disputes by peaceful means.\textsuperscript{150} But, by far, the most important provision of the Charter along these lines is the general prohibition on the use of force in Article 2(4), which states:

All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or politi-
cal independence of any state, or in any other manner inconsis-
tent with the Purposes of the United Nations.\textsuperscript{151}

Article 2(4) thus rectifies the major flaw of the Kellogg-Briand
Pact;\textsuperscript{152} it not only outlaws “war,” as did Kellogg-Briand, but any
use of \textit{armed force} (or even the threat of such force).\textsuperscript{153} Hence,
even uses of force “short of war” are prohibited.\textsuperscript{154} The Charter
also rejects Kellogg-Briand’s ambiguous “national policy”
formula, as well as any language limiting application of the pro-
hibition on the use of force to treaty signatories. Article 2(4)
forbids the use of force by U.N. Members against any State—
Member or non-Member—for whatever reason, \textit{unless} it falls
within one of two major exceptions explicitly granted by the
Charter: (1) enforcement actions authorized by the U.N. Secu-

\begin{footnotesize}
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\item[151] Id. \textsc{art. 2, ¶ 4.}
\item[152] “When the Charter of the United Nations was drafted in San Francisco, in
1945, one of its aims was redressing the shortcomings of the Kellogg-Briand
Pact.” DINSTEIN, \textit{supra} note 131, at 80.
\item[153] See \textsc{Commentary}, \textit{supra} note 131, at 112, and sources cited (“[T]he scope of
the fundamental notion of ‘force’ is not undisputed. The term does not cover
any possible kind of force, but is, according to the correct and prevailing view,
limited to \textit{armed force}.’’); \textsc{see also} DINSTEIN, \textit{supra} note 131, at 81 (“[S]tudied in
context, the term ‘force’ in Article 2(4) must denote \textit{armed force}.’’); Bert V.A.
Röling, \textit{The Ban on the Use of Force and the U.N. Charter, in The Current Legal
Regulation of the Use of Force 1}, 1 (A. Cassese ed., 1986) (“There are many
differences of opinion... [but] it seems obvious to the present writer that the
‘force’ referred to in Art. 2(4) is \textit{military force}.’’); \textsc{cf.} BROWNLE, \textit{supra} note 87,
at 361-62 (“There can be little doubt that ‘use of force’ is commonly understood to
imply... an ‘armed attack,’ by the organized military, naval, or air forces of a
state;... [or] a government act[ing] through ‘militia,’ ‘security forces,’ or ‘police
forces’... [or] by means of... ‘unofficial’ agents, including armed bands, and
‘volunteers,’ or... groups of insurgents on the territory of another state....
[Nevertheless] it is correct to assume that paragraph 4 applies to force \textit{other than
armed force}, [albeit] it is very doubtful if it applies to economic measures of a
coercive nature.” (footnotes omitted) (emphasis added)).
\item[154] \textsc{See} AREND & BECK, \textit{supra} note 89, at 51 and sources cited therein; \textsc{see also}
DINSTEIN, \textit{supra} note 131, at 81 (“The use of force in international relations, pro-
scribed in the Article, includes war. But the prohibition transcends war and cov-
ers also forcible measures short of war.”).
\item[155] \textsc{See} \textsc{Commentary}, \textit{supra} note 131, at 117-118; \textsc{see also} DINSTEIN, \textit{supra} note 131,
at 86. The Charter contains two additional exceptions to its prohibition of
the use of force that have been overcome by events since 1945, and are thus no
longer significant. First is the exception under Article 53 for measures against
“enemy states” of the Second World War pursuant to Article 107 or regional ar-
rangements directed against the renewal of aggressive policy by such states.
Since all former “enemy states” are today U.N. members and are, thus, characterized as
peace-loving per Article 4 of the Charter, this exception is obsolete. Second is
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The exception to the general prohibition of the use of force for Security Council enforcement actions has roots in three separate provisions, which are part of the Charter's system of collective sanctions. First, Article 24 gives the Security Council primary responsibility for maintaining international peace and security. Second, Article 39 grants the Security Council the corresponding power to "determine the existence of any threat to the peace, breach of the peace, or act of aggression," and decide what measures shall be taken "to maintain or restore power international peace and security." Finally, Article 42 provides that in certain cases, such "measures" may include the use of force.

However, Security Council decisions under Article 39 are subject to the veto of any one of the five permanent members, and, in practice, achieving unanimity among the permanent members on such issues has proven nearly impossible; consequently, this exception has rarely been invoked.

156 U.N. CHARTER, supra note 146, arts. 29-51; For a detailed discussion of the U.N. system for collective conciliation and peace enforcement, see STONE, supra note 112, at 185-200.

157 Forcible measures under this exception may be carried out by U.N. forces, or by those of some or all of its members. See U.N. CHARTER, supra note 146, arts. 25, 42, and 48.

158 U.N. CHARTER, supra note 146, art. 27, ¶ 3.

159 Prior to 1990, the only example of the Security Council authorizing the use of force was in 1966, when the Council decided that the situation in Rhodesia constituted a threat to peace, and authorized the government of the United Kingdom to use force to prevent ships carrying oil for Rhodesia (in violation of an embargo) from accessing ports in Mozambique. COMMENTARY, supra note 131, at 120, citing S.C. Res. 221 (Apr. 9, 1966), reprinted in 60 Am. J. Int'l. L. 925 (1966) (Resolution 221 was adopted by a 10 to 0 vote, with 5 abstentions: Bulgaria, France, Mali, U.S.S.R., and Uruguay). In 1990, the Council adopted Resolution 665, authorizing member states cooperating with the government of Kuwait "to use such measures... as may be necessary... to ensure strict implementation" of the U.N. embargo of Iraq, which the Council had ordered in response to Iraq's invasion of Kuwait (SC Res. 665 (Aug. 25, 1990), reprinted in 29 I.L.M. 1329, 1330 (1990) (adopted by a vote of 13 to 0 of the Security Council, with Cuba and Yemen abstaining)—"[t]his resolution was understood to authorize states to use naval force to halt the shipping in question." Oscar Schachter, United Nations Law in the Gulf Conflict, 85 Am. J. Int'l. L. 452, 454 (1991) [hereinafter Gulf Conflict]; compare S.C. Res. 678 (Nov. 29, 1990), reprinted in 29 I.L.M. 1565 (1990) (adopted by a vote of 12-2-1, with Cuba and Yemen opposed and China ab-
The second and more significant exception to the Charter’s prohibition of the use of force is the right of individual and collective self-defense embodied in Article 51, which states:

Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken the measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defense shall be immediately reported to the Security Council and shall not in any way affect the authority 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.\(^{160}\)

Notably, the language of Article 51 (safeguarding the right of self-defense “if an armed attack occurs”) does not coincide with the language of Article 2(4) (prohibiting “the threat or use of force”). So to the extent that the notion of “armed attack” is viewed as having a narrower meaning than the phrase “use or threat of force,”\(^{161}\) Article 51 may be strictly read as not merely barring States from resorting to self-defense to respond to mere threats of force, but as also forbidding States from exerting forcible self-defense in response to any other unlawful force directed against it by another State short of an actual armed attack.\(^{162}\) Under this interpretation, also known as the “restricting) (authorizing member states cooperating with the government of Kuwait "to use all necessary means... to restore international peace and security in the area," if Iraq did not unconditionally withdraw its forces from Kuwait on or before Jan. 15, 1991); Gulf Conflict, at 459 (“Resolution 678 was treated as the legal basis of the large-scale military action...that brought about the defeat of Iraq... and its withdrawal from Kuwait... [but] [t]he precise Charter basis of Resolution 678 was somewhat uncertain. The Resolution itself declared that the Council was acting under chapter VII, but it did not specify which article of chapter VII.”); see also Stone, supra note 112, at 303 (noting that concurrence of the permanent members of the Security Council necessary for decisions under Article 39 is rarely achieved).

\(^{160}\) U.N. Charter, supra note 146, art. 51.

\(^{161}\) See Commentary, supra note 131, at 669, 668 n.11 (“This represents the dominant view.”); see also Brownlie, supra note 87, at 365 (“It is not to be assumed... that every unlawful use of force will involve an armed attack in the tactical or military sense of the phrase.”); but compare supra note 153 and accompanying text.

\(^{162}\) See Military and Paramilitary Activities (Nicar. v. U.S.), 1986 I.C.J. 14, at 103, ¶ 195 (June 27, 1986) (the court suggests that “a mere frontier incident,” like the incursion of an armed patrol into another state’s territory, would not be classified as an armed attack) [hereinafter Nicaragua v. U.S.]; see also Commentary, supra note 131, at 663-64, 669; and Dinstein, supra note 131, at 167 (“Recourse to self
tionist” view, Article 51 of the Charter requires States to renounce forcible self-defense unless and until an armed attack actually occurs.  

However, the notion that Article 51 permits forcible self-defense only in cases of armed attack is highly contentious, particularly inasmuch as it prohibits “anticipatory self-defense.” For according to customary international law prior to the Charter, a State could lawfully take action to defend itself in anticipation of an imminent attack, provided two conditions were met: first, such forceful action had to be necessary—in other words, attack was imminent and there were no peaceful means to prevent it; and second, the force employed had to be proportionate to the threat. But under the restrictionist interpretation, Article 51 “supersedes and replaces the traditional right of self-defense” and, in effect, abolishes the State’s customary right to take anticipatory defensive action.

Yet the drafting history of the Charter lends strong support to the position that “the use of arms in legitimate self-defense [as it existed prior to the Charter] remains admitted and unimpaired” by Article 51. What’s more, State practice in the period since the Charter was adopted is clearly odds with the restrictionists’

defense under the article is not vindicated by any violation of international law short of an armed attack.”); contra C.H.M. Waldock, The Regulation of the Use of Force by Individual States in International Law, 81 RECUHEL DES COURS 451, 496-97 (1952) (“It would be a misreading of the whole intention of Article 51 to interpret it by mere implication as forbidding self-defense in resistance to an illegal use of force not constituting an ‘armed attack.’”).

Arend & Beck, supra note 89, at 72; see also Timothy L.H. McCormack, Self-Defense in International Law 138-139 (St. Martin’s Press 1996).

See D.W. Bowett, Self-Defense in International Law 188-89 (Manchester Univ. Press 1958) (“[T]he right [of self-defense] has, under traditional international law, always been ‘anticipatory,’ that is to say its exercise was valid against imminent as well as actual attacks and dangers.”); Arend & Beck, supra note 89, at 72.

Commentary, supra note 131, at 678; see also Brownlie, supra note 87, at 275; cf. Nicaragua v. U.S., supra note 162, at 102-04, ¶ 193-95 (the court recognized the existence of a right of self-defense under customary law, but deemed the content and scope of this right to correspond almost completely to the right of self-defense under Article 51 of the Charter); Dinstein, supra note 131, at 87 (“The liberty to venture into war, and generally to employ inter-State force, is obsolete. Nowadays, the prohibition on the use of inter-State force, as articulated in Article 2(4) of the Charter, has become an integral part of customary international law.”).

See Brownlie, supra note 87, at 278; Arend & Beck, supra note 89, at 73.

narrow reading of its provisions.\textsuperscript{168} In fact, in recent debates in the Security Council on this issue, delegates have referred to the 1842 formulation of the right of anticipatory self-defense by U.S. Secretary of State Daniel Webster, which requires a showing that “[the] necessity of self-defense is instant, overwhelming, and leaving no choice of means, and no moment for deliberation,” as an accepted statement of customary law.\textsuperscript{169} There is thus clear evidence of “the continued validity of an ‘inherent’ right to use armed force in self-defense \textit{prior} to an actual attack... where such attack is imminent ‘leaving no moment for deliberation.’”\textsuperscript{170} The view of the United States and others that the Charter reserves the customary right of self-defense—"this right being considerably broader than that stated in Article 51"\textsuperscript{171}—to include the right of anticipatory self-defense, is therefore quite well founded.\textsuperscript{172}

\footnotesize

\textsuperscript{168} See \textit{Commentary}, supra note 131, at 678 (“[S]tate practice... has so far prevented a narrow reading of... Article 51 from becoming established in customary international law.”); \textit{Arend & Beck}, \textit{supra} note 89, at 72-79.


\textsuperscript{170} Schachter, \textit{Use of Force}, \textit{supra} note 167, at 1635 (emphasis added); see also \textit{Commentary}, supra note 131, at 678; cf. \textit{Arend & Beck}, \textit{supra} note 89, at 79 (“[T]hough there may not be an established consensus in support of the permissibility of anticipatory self-defense... it would seem impossible to prove the existence of an authoritative and controlling norm prohibiting the use of force for preemptive self-defense.”).

\textsuperscript{171} \textit{Brownlie}, \textit{supra} note 87, at 272, 269-75 (discussing the relationship between Art. 51 and the customary right of self-defense), 298-301 (on the customary right of intervention and the U.N. Charter); see also \textit{Commentary}, supra note 131, at 666-667; \textit{Dinstein}, \textit{supra} note 131, at 172-76.

\textsuperscript{172} See Myres S. McDougal, Editorial Comment, \textit{The Soviet-Cuban Quarantine and Self-Defense}, 57 Am. J. Int’l L. 597, 600 (1963) (“[N]othing in the ‘plain and natural meaning’ of the words of the Charter requires an interpretation that Article 51 restricts the customary right of self-defense. The proponents of such an interpretation substitute for the words ‘if an armed attack occurs’ the very different words ‘if, and only if, an armed attack occurs.’”); \textit{Stone}, supra note 112, at 243-45 (“The form of Article 51 as a reservation rather than grant is critical. Within the limits of Article 51 the license of self-defense is reserved... Beyond these limits self-defense by all States still depends on customary international law.”); see also \textit{Nicaragua v. U.S.}, supra note 162, at 947-48, ¶ 173 (Schwebel, J., dissenting) (“I do not agree with a construction of the United Nations Charter which would read Article 51 as if it were worded... ‘if, and only if, an armed attack occurs...’ I do not agree that the terms or intent of Article 51 eliminate the right of self-defense under customary international law, or confine its entire scope to the express terms of Article 51.”); \textit{Use of Force}, \textit{supra} note 167, at 1634
In addition to the controversy that exists over the conditions precedent to the lawful exercise of the right of self-defense, there is also disagreement among legal scholars concerning what "measures," when taken by the Security Council, preempt the right of self-defense. Arguably, the main object of the United Nations Charter is to "render the unilateral use of force, even in self-defense, subject to control by the Organization."\(^{173}\)

To be sure, Article 51 expressly makes self-defense claims subject to the Security Council’s authority, reserving the right of States to act in self-defense only "until the Security Council has taken the measures necessary to maintain international peace and security."\(^{174}\) Accordingly, the Council may, at least in theory, order a claimant to cease military action even if the action was legitimate self-defense.\(^{175}\) The next logical question then, is whether the right of individual or collective self-defense ceases if the measures taken by the Council fall short of a resolution terminating or suspending the right of self-defense; for instance, if the Council fails to give its retrospective seal of approval to the exercise of self-defense.\(^{176}\)

Reason dictates that the foregoing question must be answered in the negative, for as Oscar Schachter so well articulated:

It does not make sense to conclude that failure of the Council to endorse action by a state should bar that action when it is otherwise permitted by the Charter and international law. A veto can obviously prevent a Council decision and therefore block the Council from prohibiting action. But a veto of a resolution that

\(^{173}\) U.N. CHARTER, supra note 146, at art. 51 (emphasis added).

\(^{174}\) U.N. CHARTER, supra note 146, at art. 51 (emphasis added).

\(^{175}\) See Schachter, Gulf Conflict, supra note 159, at 459 ("[A] decision of that character would need the unanimous concurrence of the permanent members; hence, it could not be adopted over the objection of one or more of those members"); cf. DINSTEIN, supra note 131, at 188 ("Once a Member State is instructed in a conclusive manner to refrain from any further use of force, it must comply with the Council’s directive." (emphasis added)).

\(^{176}\) See Mary Ellen O’Connell, Enforcing the Prohibition on the Use of Force: The U.N.’s Response to Iraq’s Invasion of Kuwait, 15 S. ILL. U. L.J. 453, 478 (1991) (suggesting that if a proposed resolution authorizing force such as Resolution 678—the legal basis of military action against Iraq in 1991—had been vetoed, collective self-defense action would have been barred).
would approve or authorize otherwise permissible action cannot have the legal effect of precluding that action.\textsuperscript{177}

Of course, the same must also hold true for all other “necessary measures” adopted by the Security Council in response to an armed attack on a State that do not conclusively terminate or suspend self-defensive measures.\textsuperscript{178} Otherwise, a Security Council decision ordering the invader to withdraw and cease hostilities (a necessary measure) would strip the victim of its right to defend itself even where the order is not complied with. As Schachter correctly points out, “[t]his would be an implausible—indeed, absurd—interpretation.”\textsuperscript{179}

All in all, mankind’s efforts to “chain the dog of war”\textsuperscript{180} have spanned the course of recorded time, but it was only with the adoption of the U.N. Charter in 1945, that the transformation of the “jus ad bellum” into the “jus contra bellum” was achieved.\textsuperscript{181} Under Article 2(4), States renounce the right to use force in their mutual relations—the “use of force becomes a delict,” exactly as it is under national law.\textsuperscript{182} Chapter VII of the Charter vests exclusive authority over the use of force in the U.N. organization, including the power, under Article 42, to use collective force in response to this delict, though the Charter’s promise of “collective security” has yet to be fully realized in practice.\textsuperscript{183} However, “Article 51 of the Charter clearly licenses at least one kind of resort to force by an individual member State: namely,

\begin{itemize}
  \item Schachter, \textit{Gulf Conflict, supra} note 159, at 459 n.23.
  \item “A reasonable construction of the provision in Article 51 would recognize that the Council has the authority to adopt a measure that would require armed action to cease even if that action was undertaken in self-defense. However, this would not mean that any measure would preempt self-defense.” Schachter, \textit{Gulf Conflict, supra} note 159, at 458 (emphasis added); see also Dinstein, \textit{supra} note 131, at 189 (“[I]t is clearly not enough (under Article 51) for the Security Council to adopt just any resolution, in order to divest Member States of the right to continue to resort to force in self-defense against armed attack. The only resolution that will engender that result is a legally binding decision, whereby the cessation of the (real or imagined) defensive action becomes imperative.”); but see Commentary, \textit{supra} note 131, at 676-77.
  \item Schachter, \textit{Gulf Conflict, supra} note 159, at 458.
  \item Adapted from Francis D. Wormuth & Edwin B. Firmage, \textit{To Chain the Dog of War} (2d ed., Univ. of Illinois Press 1989).
  \item Michael E. Howard, \textit{Temperamenta Belli: Can War Be Controlled?}, \textit{in Restraints on War: Studies in the Limitation of Armed Conflict} 1, 11 (Michael E. Howard ed., 1979).
  \item See U.N. Charter, \textit{supra} note 146, art. 51.; see also Arend & Beck, \textit{supra} note 89, at 73.
\end{itemize}
the use of armed force to repel an attack." Accordingly, the
lawfulness of the use of conventional force in response to cyber-
attack hinges, in part, on whether cyber-attack constitutes use of
force in violation of Article 2(4) of the Charter or, more pre-
cisely, an "armed-attack," as a matter of law.

IV. SELF-DEFENSE AND CYBER-ATTACK

A. APPLICATION OF SELF-DEFENSE IN OUTER SPACE AND THE
MEANING OF "PEACEFUL PURPOSES"

The 1967 Outer Space Treaty, sometimes referred to as "the
constitution of outer space," represents "the primary basis for legal order in the space environment." It provides in Article
III that:

States Parties to the Treaty shall carry on activities in the explora-
tion 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.

While it is universally agreed that the foregoing provision makes the general principles of international law (lex gener-
alis)—including rules of customary law—and the United Nations Charter applicable to outer space, it is not universally accepted that this includes the right to use force in self-de-
defense. Having said this, however, the dominant view is that the application of international law in outer space, in effect, means that States may exercise their right of self-defense against activities of other States. The United States has supported

184 Bert V.A. Röling, supra note 153, at 3.
185 Carl Q. Christol, The Modern International Law of Outer Space 20
(Pergamon Press 1982).
186 Outer Space Treaty, supra note 21, art. III.
187 See Ivan A. Vlasic, Space Law and the Military Applications of Space Technology,
in Perspectives on International Law 385, 394 (N. Jasentuliyana ed., 1995)
189 "Under present treaty rules and/or customary law, as demonstrated in practice, national statements, and United Nations resolutions... international law, including the United Nations Charter where appropriate, applies to acts in outer space. This expressly includes the right of self defence." S. Houston Lay & Howard J. Taubenfeld, The Law Relating to Activities of Man in Space 73
this view since the inception of the Outer Space Treaty, and it remains part of current U.S. space policy.

Precisely what measures States may take to defend their satellites consistent with the "corpus juris spatialis" is subject to controversy since, in so far as they entail projection of force in, through, or from space, they give rise to questions about the meaning and scope of Article IV of the Outer Space Treaty. Article IV states:

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

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 maneuvers 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

(1970); see also Hurwitz, supra note 25, at 72 (the Legal Sub-Committee of the U.N. Committee for the Peaceful Uses of Outer Space (COPUOS) has rejected the view that the right of self-defense is not applicable in regards to outer space); Gennadi Zhukov, International Space Law 89 (Progress Publishers 1976) (states can lawfully use force in or through outer space in the process of self-defense); J.E.S. Fawcett, International Law and the Use of Outer Space 39 (Manchester Univ. Press 1968) (No provision of the Charter or rule of customary law imposes "any upper limit above the surface of the Earth on the legitimate exercise of the right of self-defense.").

190 Christol, supra note 185, at 37.

191 See National Space Policy (1996), supra note 14 ("National security space activities shall contribute to U.S. national security by... providing support for the United States' inherent right of self-defense. ... The United States considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement on sovereign rights."); see also supra pp. 22 (quoting DoDD 3100.10, supra note 4, at 6, ¶ 4.1-4.2); Space Comm'n Report, supra note 1, at 37 ("It is important to note... that by specifically extending the principles of the U.N. Charter to space, the Outer Space Treaty (Article III) provides for the right of individual and collective self-defense, including "anticipatory self-defense.".")

facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.\(^{198}\)

While the adjective "peaceful" can be found in virtually all U.N. documents relating to outer space, the treaties that make up international space law fail to provide an authoritative definition of the term.\(^{194}\) The phrase "peaceful purposes" as used in the Outer Space Treaty was originally adapted from the 1959 Antarctic Treaty,\(^{195}\) which, to a considerable extent, served as the model for the 1967 treaty.\(^{196}\) Article I of the Antarctic Treaty reads as follows:

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, \textit{inter alia}, any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons.

2. The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

Because the Antarctic Treaty is credited with the "demilitarization" of the Antarctic,\(^{197}\) it is often cited as the most authoritative aid for the interpretation of the term "peaceful" in the outer space context,\(^{198}\) particularly by those who seek to equate "peaceful," as it pertains to outer space, with "non-military."\(^{199}\) However, in view of the fact that the Outer Space Treaty permits certain military activities in those areas reserved "exclusively for peaceful purposes" (i.e., the moon and other celestial bod-

\begin{footnotes}
\footnote{193}{\textit{Outer Space Treaty}, supra note 21, art. IV (emphasis added).}
\footnote{194}{Ivan A. Vlasic, \textit{The Legal Aspects of Peaceful and Non-Peaceful Uses of Outer Space}, in \textit{Peaceful and Non-Peaceful Uses of Space} 37, 37 (B. Jasani ed., 1991) [hereinafter \textit{Peaceful Uses of Space}]; \textit{see also} Bhupendra Jasani, \textit{Introduction} in \textit{Peaceful Uses of Space at} 7.}
\footnote{196}{REIJNEN, supra note 187, at 88.}
\footnote{197}{\textit{See} \textit{Peaceful Uses of Space}, supra note 194, at 41 n.12; \textit{see also} Aldo A. Cocca, \textit{Historical Precedents for Demilitarization}, in \textit{Peaceful Purposes}, supra note 192, at 29, 41-42.}
\footnote{198}{\textit{PEACEFUL USES OF SPACE}, supra note 194, at 41.}
\end{footnotes}
ies), and, at the same time, makes international law (including the right of self-defense) applicable to those same extraterrestrial regions, it is doubtful that the drafters of the treaty intended to attach such a definition to the term “peaceful.” Furthermore, the practice of States, at the time of the treaty’s adoption and since, plainly belies such an interpretation.

For its part, the United States has, from the very beginning of the space age up to the present day, maintained the official position that “peaceful” means “non-aggressive” and not “non-military.” Indeed, while some of the very earliest U.S. statements on the international control of space activities appear to support the proposition that outer space should be used exclusively for

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200 Outer Space Treaty, supra note 21, art. IV, ¶ 2 (“The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited.”).

203 Id. art. III; see also sources cited in note 188.

202 See Jasentuliyana, The Moon Treaty, in PEACEFUL PURPOSES, supra note 192, at 121, 128; Stephen Gorove, Article IV of the 1967 Outer Space Treaty and Some Alternatives for Further Arms Control, in PEACEFUL PURPOSES, supra note 192, at 77, 82 (asserting that the drafters intended to give “peaceful” a distinct meaning within the context of the treaty itself); compare CHENG, supra note 199, in STUDIES IN SPACE LAW, supra note 199, at 650 (arguing that Article I of the Antarctic Treaty, in which the word “peaceful” is used in contradistinction to “military,” was “very much in the minds of those who drew up the 1967 Space Treaty”). The argument that the Outer Space Treaty prohibits all military activities on the Moon and other celestial bodies, except those expressly permitted by the treaty is supported by the fact that at the time the treaty was adopted, military activities were not being carried out in these areas. See MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 106-08 (Sijthoff Leiden 1972).

nonmilitary purposes,\textsuperscript{205} by the spring of 1958 (less than a year after the launch of Sputnik I), the anticipation of the availability of reconnaissance satellites triggered a decisive shift in U.S. policy towards the view that space could and should be used for "peaceful," rather than "nonmilitary" purposes.\textsuperscript{206} Thus, the 1958 Space Act (the statutory basis for the national space program)\textsuperscript{207} requires that U.S. space activities be devoted to "peaceful purposes," while also mandating that these activities contribute to "national defense."\textsuperscript{208}

Once again, a main goal of U.S. space policy during the pre-outer space treaty era (1957-1967) was to gain international recognition of the legality of reconnaissance satellites, while simultaneously discouraging military space activities that threatened those assets.\textsuperscript{209} So it is hardly surprising that the U.S. interpretation of "peaceful" as synonymous with "non-aggressive" reflects and upholds that policy. The definition is a corollary to the meaning of the terms "peace" and "aggression" found in the U.N. Charter.\textsuperscript{210} "Essentially, nations have agreed in the Charter to act 'peacefully,' a term which the Charter then elaborates with specific examples, e.g., suppression of acts of aggression, no threats or use of force, save in the common interest or for (legitimate) self-defense."\textsuperscript{211} By the same token, "[t]he term 'peaceful purposes'... was interpreted by the United States to mean... [that] all military uses are permitted and lawful as long as they

\textsuperscript{205} E.g., National Security Council Action No. 1553 (Nov. 21, 1956) (outlining a U.S. disarmament proposal to prohibit "the production of objects designed for travel in or projection though outer space for military purposes," which would have ultimately banned ICBMs as well as military satellites), quoted in STARES, supra note 6, at 54 ("It is difficult to assess how sincere Eisenhower and his administration were with these proposals."); see also PERSPECTIVES ON INT’L L., supra note 188, at 39.

\textsuperscript{206} See NAT’L SECURITY COUNCIL, PRELIMINARY U.S. POLICY IN OUTER SPACE (NSC 5814/1) (Jun. 20, 1958), reprinted in ORGANIZING FOR EXPLORATION, supra note 7; quoted in STARES, supra note 6, at 55; cf. PEACEFUL USES OF SPACE, supra note 194, at 40 ("[A]s early as 1958-59, the legal position of the United States with respect to the meaning of the phrase “peaceful uses” became crystallized along lines quite dissimilar from the initial rhetoric.").


\textsuperscript{208} Id. §102.

\textsuperscript{209} See PEACEFUL USES OF SPACE, supra note 195, at vi-ix, 6-7.

\textsuperscript{210} Morgan, supra note 204, at 305.

\textsuperscript{211} Id. at 305 n.357.
remain ‘non-aggressive’ as per Article 2(4) of the U.N. Charter, which prohibits ‘the threat or use of force.’”

In contrast, as part of a diplomatic offensive to ban U.S. reconnaissance satellites, the Soviet Union (U.S.S.R.) initially took the view that “peaceful purposes” indeed meant “non-military,” and that all military activities in space were thus prohibited. However, although the Soviets consistently maintained that all of their activities in space were “peaceful” and “scientific,” the U.S.S.R.’s official line eventually softened as its military satellite programs came into their own, such that it can be said that the Soviets, at least, acquiesced to the U.S. interpretation. And, as Professor Vlasic notes:

[w]ith only the Soviet Union and the United States active in outer space before and for sometime after entry into force of the Outer Space Treaty, the ‘practice’ of even one space power, clearly a ‘specially affected’ state carried substantial weight in law. All the more so when supported by several other states with developing space capabilities.

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212 PEACEFUL USES OF SPACE, supra note 194, at 40; see also Paul G. Dembling & Daniel M. Arons, The Evolution of the Outer Space Treaty, 33 J. Air L. & Com. 419, 434 (1967). Commenting on the prospect of future efforts to address the non-incorporation of outer space into the Outer Space Treaty provision in Article IV(2), which confines all activities on the Moon and other celestial bodies to solely “peaceful purposes,” Dembling, then General Counsel of NASA, writes: “In the interim, one might conclude that any military use of outer space must be restricted to nonaggressive purposes in view of Article III, which makes applicable international law including the Charter of the United Nations” (emphasis added). But compare Cheng, supra note 199, in STUDIES IN SPACE LAW, supra note 199, at 651-52 (proposing that the U.S. interpretation of “peaceful” as meaning “non-aggressive” is due to “an initial misreading of the Treaty and the erroneous belief that the restriction of the use for ‘exclusively peaceful purposes’ . . . extends to the whole of outer space.”).

213 See Stares, supra note 6, at 69.

214 PEACEFUL USES OF SPACE, supra note 194, at 40. “For more than twenty years scholars of international law in the Soviet Union have unanimously stated that ‘use for peaceful purposes’ should be interpreted as ‘nonmilitary use.’” PERSPECTIVES ON INT’L L., supra note 188, at 40 n.11.

215 See Morgan, supra note 204, at 304; see also Cheng, supra note 199, in STUDIES IN SPACE LAW, supra note 199, at 650.

216 See Stares, supra note 6, at 71 (“Soviet diplomatic opposition to US satellite reconnaissance effectively ceased in September 1963.”); see also PEACEFUL USES OF SPACE, supra note 194, at 42; Morgan, supra note 204, at 304.

217 PEACEFUL USES OF SPACE, supra note 194, at 45 n.16 (noting that “[a] rule becomes a rule of customary international law when a significant majority of states, including those states whose interests are specifically affected, act in accordance with that rule because the believe it to be binding . . . [and] state practice. . . [is] both extensive and virtually uniform.” (citing The North Sea
In sum, while it can perhaps still be said that there are two competing definitions of "peaceful purposes" (one being "non-military" and the other "non-aggressive"), no State has ever formally protested the U.S. version of "peaceful" in the context of outer space activities. Hence, within the United Nations a consensus has developed that "peaceful," as employed in the Outer Space Treaty, more specifically equates to "non-aggressive." In practice, this has led to an understanding among the major space actors that all military activities in outer space are permissible, unless specifically prohibited by treaty or customary international law.

So, in a nutshell, application of Article 2(4) of the U.N. Charter in outer space makes it unlawful for any State to interfere in a hostile manner with the space assets of another State, and while Article IV of the Outer Space Treaty prohibits States from stationing weapons of mass destruction or nuclear weapons in outer space, or engaging in aggressive military activities on the Moon or celestial bodies, it does not, in any way, invalidate the inherent right of national self-defense pursuant to customary law and Article 51 of the U.N. Charter. Additionally, the Outer Space Treaty makes clear the fact that the State on whose national registry a satellite is carried retains "jurisdiction" over the satellite in space. Therefore, inasmuch as "jurisdiction" may be viewed as equivalent to "sovereignty" in this context, "[t]he right of a State to defend objects under its sovereignty on the Continental Shelf (F.R.G. v. Den. And Neth.), 1969 I.C.J. 3, 46, para. 73 (Feb. 20)).

This debate "has not been resolved and may never be." Morgan, supra note 204, at 241; see also Cheng, supra note 199, in Studies in Space Law, supra note 199, at 650-52.

Peaceful Uses of Space, supra note 194, at 45.

Morgan, supra note 204, at 303 (quoting Walter D. Reed & Robert W. Norris, Military Use of the Space Shuttle, 13 Akron L. Rev. 665, 678 (1979)).

Peaceful Uses of Space, supra note 194, at 38, 45.

See Perspectives on Int'l L., supra note 187, at 394; Philip D. O'Neill, Jr., The Development of International Law Governing the Military Use of Outer Space, in National Interests, supra note 12, at 169, 177; see also Manfred Lachs, Preserving the Space Environment (Opening Address to the Symposium on the Conditions Essential for Maintaining Outer Space for Peaceful Uses, Mar. 12, 1984), in Peaceful Purposes, supra note 192, at 5, 7.

See Christol, supra note 185, at 37; sources cited supra note 189.

Outer Space Treaty, supra note 21, art. VIII.

"Jurisdiction" is not synonymous with 'sovereignty,' since the latter is permanent while the former may change as, for example, in the case of a ship in a foreign port. However, in the unique case of outer space, where there are no "foreign ports," the difference between 'jurisdiction' and 'sovereignty' may, at
earth logically extends to outer space. In this way, the right of self-defense in space can be viewed as analogous to protection of vessels on the high seas, which Professor Brownlie aptly describes as follows:

In this way, the right of self-defense in space can be viewed as analogous to protection of vessels on the high seas, which Professor Brownlie aptly describes as follows:

[V]essels on the open sea may use force proportionate to the threat offered to repel attack by other vessels, or by aircraft. This right must rest on general principles whether the analogy of vessel and state territory is accepted or not. . . Nor can there be any doubt that the armed forces of the flag state may use reasonable force to defend vessels from attack whether by pirates or forces acting with or without the authority of any state.

And so, just as the right of the State to forcefully defend vessels attacked on the high seas extends to all vessels registered in the State (i.e., without regard to whether the vessel that is the target of the attack is a State or private instrumentality), so too must the State's right to defend satellites in space apply equally to all satellites carried on its national registry, including commercial satellites.

From the foregoing discussion, one can reasonably conclude that—pursuant to the inherent right of self-defense, which is affirmed under Article 51 of the U.N. Charter—the "flag state," or least as regards the right of self-defense, be insignificant." Hurwitz, supra note 25, at 74 n.84.


Brownlie, supra note 87, at 305 (emphasis added, footnotes omitted).

See Dinstein, supra note 131, at 186 (the use of force by a State against a private vessel or aircraft registered in another State but attacked beyond the national boundaries qualifies as an armed attack against the State of registry).
more appropriately in the case of satellites, the "State of registry,"\textsuperscript{230} may use armed force to defend those satellites carried on its national registry (including commercial satellites) against attack by another State.\textsuperscript{231} However, since the right of self-defense can only be exercised against an armed attack or its imminent threat, the question remains whether "cyber-attack" constitutes an "armed attack."

B. CYBER-ATTACK AS AN "ARMED ATTACK"

Once again, under Article 51 of the United Nations Charter, the inherent right of self-defense is expressly linked to an armed attack.\textsuperscript{232} Yet, as the International Court of Justice (ICJ) noted in the case of Nicaragua v. United States, "a definition of the 'armed attack' which, if found to exist, authorizes the exercise of the 'inherent right' of self-defense, is not provided in the Charter, and is not part of treaty law."\textsuperscript{233} Consequently, it is necessary to look elsewhere to determine whether cyber-attack constitutes an "armed attack" justifying self-defense within the framework of Article 51.

The dictionary definition of "armed" is "furnished with weapons" or "marked by the maintenance of armed [i.e., military] forces," while "attack" means "to set upon or work against forcefully," or "to affect or act on injuriously," or "to make an onslaught upon," or "an offensive [as opposed to defensive] action," or "belligerent or antagonistic."\textsuperscript{234} Armed attack thus clearly implies the use of arms or military force and has an offensive, destructive, and illegal nature.\textsuperscript{235} But particularly significant in this regard is the "Definition of Aggression" adopted by the U.N. General Assembly through Resolution 3314 (Article 1)—it provides:

Aggression is the use of armed force by a State against the sovereignty, territorial integrity or political independence of another

\textsuperscript{230} "A State Party to the Treaty on whose registry an object launched into outer space is carried." Outer Space Treaty, supra note 21, art. IV; see also Registration Convention, supra note 24, art. I(c).

\textsuperscript{231} Hurwitiz, supra note 25, at 75; see also PERSPECTIVES ON INT'L L., supra note 187, at 394.

\textsuperscript{232} See U.N. Charter, supra note 146, art. 51.

\textsuperscript{233} Nicaragua v. U.S., supra note 162, at 94, ¶ 176.

\textsuperscript{234} MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 63, 74 (10th ed. 1997).

\textsuperscript{235} See J.N. SINGH, USE OF FORCE UNDER INTERNATIONAL LAW 15 (Harnam Publ'ns 1984).
State, or in any other manner inconsistent with the Charter of the United Nations, as set out in this Definition.\textsuperscript{236}

Article 3 of Resolution 3314 is likewise noteworthy—it enumerates specific acts that amount to acts of aggression “regardless of a declaration of war,” which include:

(b) Bombardment by the armed forces of a State against the territory of another State or the use of any weapons by a State against the territory of another State; [and]

(g) The sending by or on behalf of a State of armed bands, groups, irregulars or mercenaries, which carry out acts of armed force against another State of such gravity as to amount to the acts listed above, or its substantial involvement therein.

Of course, the text of Resolution 3314 makes clear the fact that it is intended to serve as a guide to the Security Council in determining the existence of aggression under Article 39 and not as a definition of “armed attack.”\textsuperscript{237} Nevertheless, if armed attack is understood to be a type of aggression that justifies self-defense under Article 51 of the Charter, i.e., “une agression armée” (or “aggression which is armed”),\textsuperscript{238} then the resolution’s definition of aggression and the specific acts of aggression enumerated in Article 3 are at least illustrative of the types of circumstances wherein recourse to self-defense is vindicated.\textsuperscript{239} That is, insofar as a cyber-attack on a State’s commercial satellites is (1) commensurate with the use of armed force by a State against the sovereignty of another State\textsuperscript{240} (or perhaps, more specifically, with the use of weapons by a State against the territory of another State);\textsuperscript{241} (2) not justified as either self-defense or collective security;\textsuperscript{242} and (3) not \textit{de minimus} in scope or effect,\textsuperscript{243} it can reasonably be inferred that it will constitute an “armed attack” within the meaning of Article 51.


\textsuperscript{237} \textit{Id.} at Preamble, ¶ 2 and 4, \& art. 6; \textit{see also} \textit{Commentary, supra} note 131, at 668-69; \textit{Dinstein, supra} note 131, at 115.

\textsuperscript{238} \textit{Dinstein, supra} note 131, at 166.

\textsuperscript{239} \textit{Cf. Commentary, supra} note 131, at 668 (asserting that “aggression” as defined in Resolution 3314 does not coincide with the notion of “armed attack” under Article 51 of the Charter).

\textsuperscript{240} \textit{Definition of Aggression, supra} note 236, art. 1.

\textsuperscript{241} \textit{Id.} art. 3(b).

\textsuperscript{242} \textit{Id.} art. 6.

\textsuperscript{243} \textit{Id.} art. 2.
On the key issue of whether cyber-attack is commensurate with the use of armed force, Professor Brownlie’s discussion of the “use of weapons which do not involve any explosive effect” merits special consideration. Brownlie proposes that weapons (such as biological and chemical weapons), which do not employ the force of shock waves and heat associated with more orthodox weapons, may nevertheless be assimilated to the use of force on two grounds: “In the first place the agencies concerned are commonly referred to as ‘weapons’ and forms of ‘warfare’. . . [and] the second consideration [is] the fact that these weapons are employed for the destruction of life and property.” By analogy, “cyber-attack” is similarly viewed as a weapon in the arsenal of “Information Warfare.” What’s more, regardless of whether a satellite is struck by an ASAT weapon (be it a nuclear burst, kinetic weapon or high-energy particle beam) or a computer virus, the effect is the same—crippling of the satellite and/or its function. Under Brownlie’s formulation then, cyber-attack on a satellite does indeed equate to the use of armed force.

Yet, notwithstanding the fact that cyber-attack can be objectively likened to “armed force,” there is still no generally recognized definition of what constitutes an “armed attack.” Consequently, whenever the justification of self-defense is

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244 See Brownlie, supra note 87, at 362.
245 Id.
246 See Joint Vision 2020, supra note 32, at 29 (defining “Information Operations” as a “weapon”); see also NDP Report, supra note 31, at 90 (defining “Cyber Assault” as “an attack through cyberspace”).
248 Commentary, supra note 131, at 669 (“The Nicaragua judgment. . . has not brought any clarification in this respect.”); cf. Brownlie, supra note 87, at 366 (“A requirement stated by some writers is that the use of force must attain a certain gravity and that ‘frontier incidents’ are excluded.”); and Nicaragua v. U.S., supra note 162, ¶ 195 (“[t]here appears now to be general agreement on the nature of the acts which can be treated as constituting armed attacks. In particular, it may be considered to be agreed that an armed attack must be understood as including not merely action by regular armed forces across an international border, but also, ‘the sending by or on behalf of a State of armed bands, groups, irregulars or mercenaries, which carry out acts of armed force against another State of such gravity as to amount to’ (inter alia) an actual armed attack conducted by regular forces, ‘or its substantial involvement therein.’ This description, contained in. . . the Definition of Aggression annexed to Generally Assembly Resolution 3314 (XXIX), may be taken to reflect customary international law.”).
raised, the question becomes one of fact—i.e., are the measures taken in self-defense necessary and proportionate in relation to the apparent threat.²⁴⁹ And, in general, the determination of whether those conditions are met will, at least initially, be left to the State resorting to self-defense.²⁵⁰ That is not to say, however, that any unilateral use of force can be declared to occur in response to an armed attack and be de facto "justified" as self-defense pursuant to Article 51.²⁵¹ For, once again, the U.N. Security Council is empowered by the Charter to order termination of the self-defense measures, if it so decides.²⁵²

C. USE OF CONVENTIONAL FORCE IN RESPONSE TO CYBER-ATTACK

Once it is established that the right of self-defense is legally available, the challenge then becomes how to exercise self-defense. It has been argued that a coordinated U.S. national defense strategy for cyber-space must include effective deterrence, which in turn may need to embrace the use of conventional force in response to cyber-attack.²⁵³ International law does not dictate the particular type of action which has to be taken by a state exercising its right of self-defense; however, the choice of instrumentality, the degree with which it can be used, and the consequences of such use, will all be influenced by the law governing the means and methods of war—jus in bello or 'law of armed conflict.'²⁵⁴ Though this article will not attempt an extensive discussion of the law of armed conflict,²⁵⁵ a brief discussion of the basic legal requirements that must be complied with while exercising self-defense is important to understanding whether and to what extent conventional force may be used to respond to cyber-attack on commercial satellite systems.

²⁴⁹ Nicaragua v. U.S., supra note 162, at 103, ¶ 194 cited in Schachter, Gulf Conflict, supra note 159, at 458; see also Brownlie, supra note 87, at 366.
²⁵⁰ See Schachter, Gulf Conflict, supra note 159, at 458.
²⁵¹ See COMMENTARY, supra note 131, at 669.
²⁵² U.N. CHARTER, supra note 146, art. 39 & 41; see also Schachter, Gulf Conflict, supra note 159, at 458.
²⁵³ See Adams, supra note 37, at 108-10.
²⁵⁴ SINGH, supra note 230, at 21-22.
1. Necessity and Proportionality

As mentioned previously, a state exercising its right of self-defense must comply with the principles of necessity and proportionality.\footnote{See U.N. Charter, supra note 146, art. 51, see also, supra note 249; see also Schachter in Use of Force, supra note 167, at 1635-38; and Singh, supra note 230, at 22-23.} “Necessity” means just that—forceful action is necessary to defend against an attack.\footnote{Arend & Beck, supra note 89, at 72.} Though the requirement of necessity is not controversial as a general proposition:

Its application... calls for assessments of intentions and conditions bearing upon the likelihood of attack [in the case of ‘anticipatory’ self-defense] or, if an attack has already taken place, of the likelihood that peaceful means may be effective to restore peace and remove the attackers.\footnote{Schachter in Use of Force, supra note 167, at 1635; cf. Brownlie, supra note 87, at 259 (“[Anticipatory self-defense]... involves [the] determination of the certainty of attack which is extremely difficult to make and necessitates an attempt to ascertain the intention of a government.”).}

In this way, “necessity” relates back to the view of armed force “a means of last resort,” whereby the resort to force is to be considered legally available only after recourse to peaceful means of settlement have failed.\footnote{See Schachter in Use of Force, supra note 167, at 1635; see also supra p. 30-31 and sources cited.} Obviously, in the case where an attack has already occurred, the State being attacked must be considered under conditions of necessity, regardless of the possibilities for peaceful settlement, since to argue otherwise would, in effect, nullify the right of self-defense.\footnote{Id. at 1636; see also supra p. 43 and note 150.} Ergo, as a rule, when an attack occurs against a State, armed force may be used to repel the attack without further justification, and notwithstanding the State’s obligation to seek peaceful settlement under Article 2(3) of the U.N. Charter.\footnote{See Schachter in Use of Force, supra note 167, at 1637; see also Judith Gail Gardam, Proportionality and Force in International Law, 87 Am. J. Int’l L. 391, 403 (1993); D.W. Greig, Reciprocity, Proportionality, and the Law of Treaties, 34 Va. J. Int’l L. 293, 305 (1994).}

Closely linked to “necessity” as an element of self-defense is the concept of ‘proportionality.’\footnote{Schachter in Use of Force, supra note 167, at 1635; see supra note 30-31 and sources cited.} Proportionality reflects the ultimate purpose of self-defense, which is not punishment or reprisal, but rather to repel or prevent an armed attack or its im-
minent threat; therefore, so as not to be deemed illegally disproportionate, “[a]cts done in self defense must not exceed in manner or aim the necessity provoking them.” This construct is commonly demonstrated in governments’ responses to isolated frontier incursions or naval incidents—by and large, “[t]he ‘defending’ state under attack generally limits itself to force proportionate to the attack; it does not bomb cities or launch an invasion.”

Geography can likewise play a significant role in determining proportionality. For example, “an isolated attack in one place. . . would not normally warrant a defensive action deep into the territory of the attacking state.” However, the importance of geography to the proportionality of a defensive response greatly depends upon the specific circumstances of the situation occasioning the claim of self-defense; indeed, “a State subjected to an armed attack is entitled to resort to self-defense measures against the aggressor, regardless of the geographical point where the attack was delivered.” Hence, “when a series of attacks in one area leads to the conclusion that defense requires a counterattack against the ‘source’ of the attack on a scale that would deter future attacks,” the attacked State can legally respond “beyond the immediate area of the attack,” especially if the attacked State has reason to expect attacks from that source to continue. This is true even if the location of the attack is “beyond the boundaries of all States,” such as when “[the aggressor State’s] armed forces destroy a satellite put in orbit in outer space by [the defending State].”

263 SINGH, supra note 230, at 22.
264 Schachter in Use of Force, supra note 167, at 1637; see also Gardam, supra note 262, at 405 (“The legitimacy of. . . [military] actions. . . is a question of degree, with civilian casualties a particularly relevant factor in assessing proportionality.”).
265 Schachter in Use of Force, supra note 167, at 1637; see also Dinstein, supra note 131, at 176 (“[A]n armed attack-justifying self-defense as a response under Article 51-need not take the shape of a massive military operation. “[Low intensity” fighting, conducted on a relatively small scale, may also be deemed an armed attack.”) (citing Nicaragua v. U.S., supra note 162, at 103, ¶ 195).
266 Schachter in Use of Force, supra note 167, at 1637-38.
267 Dinstein, supra note 131, at 177.
268 Schachter in Use of Force, supra note 167, at 1638.
269 Dinstein, supra note 131, at 177.
2. The Rules of Warfare (Jus In Bello)

In addition to satisfying the threshold requirements for exercising the right of self-defense (necessity and proportionality), States are also bound to observe the laws of warfare, which are customary as well as conventional in nature.\textsuperscript{270} The basic notion underlying all such rules is that “the right of belligerents to adopt means of injuring the enemy is not unlimited.”\textsuperscript{271} From this basic maxim are derived the principles of “proportionality and discrimination.”\textsuperscript{272} In this context, proportionality can mean one of two things: (1) proportionality of a belligerent response to a grievance, or (2) proportionality in relation to the adversary’s military actions or the anticipated military value of one’s own actions.\textsuperscript{273} Discrimination, on the other hand, is about care in the selection of methods, weaponry, and targets, and includes the idea of the immunity of non-combatants.\textsuperscript{274}

In practice, military manuals on the laws of war generally emphasize three customary principles, which incorporate the overarching principles of “proportionality and discrimination”: (1) military necessity, (2) humanity, and (3) chivalry.\textsuperscript{275} These three principles have been defined as follows:

1. Only that degree and kind of force, not otherwise prohibited by the law of armed conflict, required for the partial or complete submission of the enemy with a minimum expenditure of time, life, and physical resources may be applied.

2. The employment of any kind or degree of force not required for the purpose of the partial or complete submission of the enemy with a minimum expenditure of time, life, and physical resources is prohibited.

\textsuperscript{270} “[S]ome of the most important instruments which contain such laws” include: “[t]he Declaration of Paris, 1856, the Geneva Convention, 1864, the Declaration of St. Petersburg, 1868, the Hague Conventions of 1899 and 1907, the Geneva Gas and Bacteriological Warfare Protocol, 1925, and the four Geneva Red Cross Conventions, 1949.” Singh, supra note 230, at 23; see also The Law of Armed Conflicts, supra note 270.

\textsuperscript{271} Documents on the Laws of War 9 (Adam Roberts & Richard Guelff eds., 2000).

\textsuperscript{272} Id. at 9-10.

\textsuperscript{273} Id. (Proportionality is “a link between jus ad bellum and jus in bello”); see also The Law of Armed Conflicts, supra note 270, at 79-82 and sources cited.

\textsuperscript{274} Documents on the Laws of War, supra note 271, at 9-10.

\textsuperscript{275} Id.
3. Dishonorable (treacherous) means, dishonorable expedients, and dishonorable conduct during armed conflict are forbidden.\textsuperscript{276}

This is obviously just a précis of some basic principles of the \textit{jus in bello}. Indeed, the body of law governing the weapons and methods of warfare is vast and includes not only customary international law and multilateral treaties on the laws of war, but also regional and bilateral agreements on the laws of war, various arms control and disarmament agreements, general human rights agreements, and unilateral declarations made by States, as well as national laws and regulations relating to the laws of war. Suffice it to say, these laws will be applicable to the State's defensive action in varying degrees, depending once again on the circumstances of the situation, and therefore must be taken into account when determining how to exercise self-defense.

3. Reporting to the Security Council

Apart from the practical restraints on the use of force in self-defense imposed by the laws of war, Article 51 of the Charter also prescribes the procedural requirement that "[m]easures taken by members in the exercise of [the] right of self-defense shall be immediately reported to the Security Council." What significance the reporting obligation has to the State's right of self-defense, if any, is not clear. In the \textit{Nicaragua} case, the ICJ essentially held that because the customary right of self-defense exists independent of the Charter, the failure to observe the reporting requirement did not breach any obligation governing States' exercise of the right.\textsuperscript{277} Yet, the Court simultaneously observed that failure to observe the requirement was inconsistent with a valid claim of self-defense.\textsuperscript{278} Suffice it to say, under the terms of the U.N. Charter, non-performance of the reporting obligation in no way prejudices a State's invocation of the right of self-defense; to read it otherwise has been deemed a "gross misinterpretation."\textsuperscript{279} So, in the end, perhaps the most that can be said about satisfying the Article 51 reporting requirement is

\textsuperscript{276} \textit{Id.} (quoting U.S. Dept. of the Navy, Office of the Chief of Naval Operations, The Commander's Handbook on the Law of Naval Operations, NWP-9, at 5-1 (1987)).

\textsuperscript{277} \textit{Nicaragua v. U.S.}, supra note 162, at 121, ¶ 235.

\textsuperscript{278} \textit{Id.} at 121-22, ¶ 235.

\textsuperscript{279} \textit{Dinstein}, supra note 131, at 191.
that it is but one of many factors bearing on the legitimacy of a States’ claim to self-defense.\textsuperscript{280}

\section{V. CONCLUSION}

The commercial use of outer space is growing rapidly, and on a global scale. In 1996, the annual number of commercial space launches surpassed the number of government launches for the first time. In 1997, the National Defense Panel noted that more than 1,000 satellites were expected to be launched in the decade between 1997 and 2006, representing a total investment of more than one-half trillion dollars.\textsuperscript{281} The ability of the United States’ military to operate in space is unquestionably seen as vital to the nation’s security. In fact, in the \textit{National Defense Authorization Act for Fiscal Year 2000}, the Congress asked the DoD to “identify the technologies and technology demonstrations needed... to take full advantage of use of space for national security purposes.”\textsuperscript{282} According to U.S. Space Command, this is likely to entail increased military use of civil, commercial, and international space systems.\textsuperscript{283}

At the same time, the strength of American conventional forces and the U.S. military’s already extensive and growing use of commercial space technology, makes the possibility of cyber-attack on U.S commercial space systems ever more likely,\textsuperscript{284} and protecting commercial space systems becomes more difficult as they continue their global expansion.\textsuperscript{285} Therefore, given the importance of commercial space activity and its ever-growing effect on U.S. national security, it is in the interests of the United States, and any other State similarly dependent on its space assets, to establish an effective deterrence regime for cyberspace.\textsuperscript{286}

Current U.S. policy provides for deterring and, if necessary, defending against purposeful interference with U.S. space systems using “all appropriate self-defense measures, including. . .

\begin{footnotesize}
\textsuperscript{280} \textit{Id.} (“[I]ntantaneous transmittal of a report is no guarantee that the Council will accept that claim. Conversely, the failure to file a report at an early stage should not prove an irremediable defect.”).

\textsuperscript{281} NDP REPORT, \textit{supra} note 31, at 38.


\textsuperscript{283} U.SSPACECOM 2020, \textit{supra} note 4, at 7.

\textsuperscript{284} See Adams, \textit{supra} note 37, at 99.

\textsuperscript{285} U.SSPACECOM 2020, \textit{supra} note 4, at 10.

\textsuperscript{286} See Adams, \textit{supra} note 37, \textit{passim.}
\end{footnotesize}
the use of force." However, when it comes to deterring cyber-attack against commercial space systems, the United States is arguably in a position similar to the one it was in at the beginning of the space age with regard to ASAT weapons. In other words, the asymmetry between U.S. dependence upon space and that of many potential adversaries is such that the U.S. may not be able to deter interference with U.S. commercial satellites by threat of reciprocal action.

The preceding analysis suggests that the "corpus juris spatialis" and the law governing resort to force in self-defense under Article 51 of the United Nations Charter allow for the measured and proportional use of conventional force response to cyber-attack on commercial satellites, provided such actions are carried out in accordance with the applicable rules of war. Within the bounds of international law, U.S. policy can therefore be understood to authorize conventional force as a self-defensive measure in response to a cyber-attack on U.S. commercial space systems. Such an approach enhances the credibility of the U.S. policy of deterrence by neutralizing the asymmetrical advantage an attacking State may enjoy by virtue of its lack of reliance on space.

Two other major space powers, namely China and Russia, have expressed interest in some form of international effort to place curbs on the use of cyber-attack. However, achieving effective arms control for cyber-attack would be extremely difficult, if not impossible, because of the problems associated with identifying the perpetrators of such attacks. For example, although the attacks on Pentagon computers in the "Moonlight Maze" case were traced to a Russian Internet address, investigators could not completely rule out the possibility that the attacks were coming from elsewhere and were simply being channeled through Russia. The problem is further complicated by the fact that the perpetrators of cyber-attacks are not limited to the traditional concept of uniformed military adversaries; therefore, an attack launched against an AT&T satellite from the territory of a "rogue state" (or "state of concern") may be an armed attack by a hostile government or terrorist group, or simply the work of a mischievous hacker. Indeed, it is not always

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287 DoDD 3100.10, supra note 4, at 6, ¶ 4.1-4.2.
288 See J. McCarthy, supra note 30.
289 See DoDD 3100.10, supra note 4, at 1-2.
290 See supra text accompanying note 36.
possible to determine that an attack has even taken place—"[h]ostile actions against space systems... can be explained as computer or software failure, even though either might be the result of malicious acts." Thus, given the stealthy nature of cyber-attack, it is doubtful that even a "No-First-Use" type of agreement among States would have any practical significance.

Multilateralism can certainly play an important role in curtailing the activities of "nontraditional adversaries," which likewise threaten international peace and security, and there is, in fact, movement in this direction. For instance, the Council of Europe has already tabled a Draft Convention on Cyber Crime; Russia too has made a formal proposal, via the Secretary General of the United Nations, for "the development of 'an international legal regime' to combat information crime and terrorism." However, there is a fine line between so-called "nontraditional adversaries" and armed bands that are actually acting on behalf of a hostile State—the latter being considered an armed attack. Therefore, while these multilateral measures should be applauded, they do not displace the need for a deterrence regime for cyber-space, which, because of the prob-

291 Space Comm'n Report, supra note 1, at 23.
292 See generally NAGENDRA SINGH & EDWARD MCWHINNEY, NUCLEAR WEAPONS AND CONTEMPORARY INTERNATIONAL LAW 318-319 (M. Nijhoff 1989) (discussing the development in the 1960s of a proposed "No-First-Use" rule for nuclear weapons).
294 See McCarthy, supra note 30.
295 See Dinstein, supra note 131, at 181-183; see also supra note 248 and accompanying text; compare Nicaragua v. U.S., supra note 162, at 543 (Jennings, J., dissenting) ("It may readily be agreed that the mere provisions of arms cannot be said to amount to an armed attack. But the provision of arms may, nevertheless, be a very important element in what might be thought to amount to armed attack, where it is coupled with other kinds of involvement. Accordingly, it seems to me to say that provision of arms, coupled with 'logistical and other support' is not armed attack is going much too far. Logistical support may itself be crucial. According to the dictionary, logistics covers the 'art of moving, lodging, and supplying troops and equipment.'... If there is added to all this 'other support,' it becomes difficult to understand what is, short of direct attack by a State's own forces, that may not be done apparently without a lawful response in the form of... self defense.").
lem of asymmetry, must include the threat of a conventional force response to be effective.

As a final point, it is important to note that the increased likelihood of “cyber-attack” on U.S. space systems is but one example of the type of legal issues that are raised as U.S. military and commercial space activities become increasingly interrelated. Many other issues directly related to the convergence of military and commercial space activities remain outstanding, including, for example, the permissibility of military use of civil and commercial space systems, and the legality of maintaining military “shutter control” over commercial remote sensing satellites. Resolving these questions through appropriate legal reforms and/or clarification of the existing legal regime is clearly essential if the principle of cooperation in the exploration and use of outer space, embodied in the Outer Space Treaty, is to be upheld.