

JUS IN BELLO SPATIALIS

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Abstract

This note analyses the need to enhance the security of astronauts and of national space assets. It is argued that security issues are a prerequisite for both space industrialisation and for the human settlement of space. The technological capacity to engage in acts of war in outer space presently exists. The control of space is now an important part of military doctrine. This note analyses how space dominance can be legally achieved by questioning the manner in which laws of war can be applied during an international armed conflict where the theatre of military operations is located in outer space. It is argued that the present regulatory matrix of international armed conflicts must be amended to properly manage this new reality. New treaties must also protect the space environment itself from being severely damaged during military operations. Humanitarian assistance in outer space during times of armed conflict must also be insured.

Introduction

Since the end of the cold war the United States remains the principal global military superpower. Due to this unipower geopolitical context the United States military establishment does not foresee the possibility of facing a global military peer competitor within the next two decades¹. Nonetheless we live in a period of rapid evolution where situations can change quickly.

We are presently witnessing a conflict in Yugoslavia where space military technology is playing an important role in the ability of the western democracies to act. Although the American military presence is by far the most important component of the alliance the fact remains that the strong international participation adds to the legitimacy of the operations. Although the United States is the now the main

superpower it does not stand alone in its quest for global security.

From a legal perspective this intervention in the affairs of a sovereign State can be justified either as a right of collective preemptive self defense, as the Balkans have been in the past at the origin of a global conflict, and this conflict must not spread to neighboring States, or as a humanitarian intervention for the prevention of genocide and ethnic cleansing, thus limiting the prerogatives of sovereignty and strengthening the rule of public international law. Although both legal justifications have different geo-political ramifications, this conflict offers an interesting perspective for the analysis of modern warfare technology and even space military capabilities. One cannot deny that space technology now plays an important role in military activities. If there is one general rule which can be deduced from the Balkan conflict and that of Operation Desert Storm, it is the following : ground superiority is contingent upon air superiority and that air superiority is now contingent upon space superiority. The pertinent issue to this note is to determine how space superiority through the use of military force can be legitimately obtained during times of international armed conflict.

Space assets are not only an important, if not fundamental, part of the military infrastructure but are now also an important part of civilian life. An international space station is presently being constructed. We can now foresee in the not to distant future the possibility of space manufacturing and even the human settlement of outer space.

Space technology is also an intrinsic component of modern economies. Indeed satellites play a crucial role in the information based world. This dependence on the space infrastructure is easily comparable to the importance of hydrocarbons and electricity during the 19th and 20th century. Oil and electric producing

facilities were not only an important sector of our economy but were also important targets during armed conflict. This fact remains true today. The destruction of the oil reserves and refineries of Yugoslavia are presently prime military objectives. As Alvin and Heidi Toffler wrote in « war and Anti-war « the way a nation makes wealth is the means by which it will choose to wage warfare ». Similarly satellites which are an integral part of the information pipeline may become prime military targets. In planning industrial and human development of space the security of these assets and of our future space pioneers thus becomes a primary issue of concern and even a prerequisite .

This note will analyze the interface between space law and laws governing the conduct of hostilities. We will then study the applicability of laws of armed conflict to the use of military force where the theatre of operations is located in outer space. In so doing this note compares the space law treaties and the laws of armed conflict (LOAC) in both their origins, purposes and applicability to a space war scenario. This note will then conclude with possible modifications to be made to laws of armed conflict (LOAC) in order to secure national space assets from aggression or acts of terrorism. We argue that the security of different national space assets is a fundamental prerequisite to industrial space development and the human settlement of space.

Space military technology

The use of force by the military either to space, in space or from space is presently technologically possible. The American military establishment has several programs whose purpose is the development of anti-satellite weapons . In an attempt to highlight the vulnerability of certain satellites an old USAF satellite was « illuminated » with a terrestrial laser from the White Sands Missile Range in New Mexico. A representative of the Pentagon, Lt. Col. Robert Potter had declared publicly that these tests were a success². It was a demonstration of « Miniature Sensor

Technology Integration » known under the acronym of MSTI-3. This is not the only program of its kind. Simply to name a few there is a program called « Kinetic Energy ASAT (KE-ASAT)^{3*}, there is the High Energy Research and Technology Facility (HERTF)^{4*} situated at the Kirtland Air Force base in New Mexico. Considerable investments were also made in the development of microwave weapons of « High-Energy Advanced Pulsed Power », Very-High-Energy Plasmas » and in the Mid-Infrared Advanced Chemical Laser (MIRACL).

Although these are all examples of very sophisticated weaponry it is nonetheless important to stress that the use of force in space does not necessarily presuppose such an advanced arsenal. According to Major-General Kenneth Hagemann (Director of the Nuclear Agency) a nuclear explosion of a 50 kiloton load at an altitude of 62 miles « would pump up the Van Allen belt with radiation to the extent that increased exposure would cause satellites to die in hours, days, even weeks. The effect would last for months ». The results of such an explosion would be catastrophic to the low earth orbit destroying telecommunication satellite constellations such as teledesic and Iridium.

LOAC and the corpus lex spatialis

There are two important legal systems composing the LOAC which regulate the conduct of hostilities between belligerents during international armed conflicts. First there is the so called Hague system which includes conventions of 1899 and 1907 that have been inspired in part by the Declaration of St-Petersburg of 1868.⁵ This system edicts norms establishing rights and obligations of belligerents for the conduct of military operations and the methods of warfare. From these conventions emerged a fundamental cornerstone principle of LOAC being that the ability to wage war is not an unlimited right.

The second system is the so called international humanitarian law. This second

system is composed mainly of six (6) multilateral treaties being the four Geneva Conventions and the two additional Protocols.⁶

These systems have a common thread uniting them being composed of the four following principles of customary international law. These are :

- 1) Military Necessity
- 2) Proportionality
- 3) Humanity
- 4) Chivalry

All norms found within these two systems can be explained as a specific application of one of these four principles.

Public international space law is principally composed of six multilateral treaties. These are

- 1) The Treaty on principles governing the activities of States in the exploration and use of outer space including the moon and other celestial bodies (Outer Space Treaty)⁷
- 2) The Agreement on the rescue of astronauts, the return of astronauts and the return of objects launched into outer space (Rescue Agreement)⁸
- 3) The Convention on the international liability for damage caused by space objects (Liability Convention)⁹
- 4) The Convention on registration of objects launched into outer space (Registration Convention)¹⁰
- 5) The Agreement governing the activities of states on the moon and other celestial bodies (Moon Agreement)¹¹
- 6) The Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water (Test Ban Treaty)¹²

Despite the fact that LOAC and space law evolved in two different epochs there is nevertheless a contemporary interface uniting these two legal systems.

First the present Geneva Conventions date back to 1949, that is roughly 8 years before the space age began. The additional Protocols are more recent dating back to 1977. Principles of LOAC evolved mainly in response to situations which had occurred during armed conflict which were deemed unacceptable by the

international community. Therefore, to a certain extent LOAC is the articulation of certain moral imperatives which emanate from a global homogeneous ethos. Certain norms edicted in the Geneva Conventions such as the common linear articles and the non linear common articles have reached a status of customary international law and have unquestionable universal application to armed conflicts. Indeed the moral imperative of reducing suffering during armed conflict is now an important part of our legal mores and an essential component of our international community. In other words this is part of our jus cogens, an important source of public international law.

The space law treaties date back to the 60s and 70s. These so called multilateral treaties were first negotiated bilaterally between the two superpowers of the epoch during the cold war, that is to say the United States and the ex-Soviet Union. These space treaties were negotiated in a very different climate that those composing the LOAC. Superpowers had to negotiate a minimum of public order governing State relations in outer space while preserving a maximum capacity of actions for their respective military forces. The multilateral attribute of these treaties permitted some of these norms to be elevated to international customary norms through universal acceptance during peace times of the treaties themselves. Therefore contrary to the LOAC treaties which were palliative in nature to prevent the repetition of past injustices, space law is a legal system which evolved along with the technology itself to ensure public liberty of action in outer space. Space laws are historical documents and represent a considerable achievement when one considers the climate of mistrust and systemic competition which permeated the epoch of their creation along with the volatile geopolitical context of the cold war.

This being said, nonetheless, the corpus juris spatialis does clearly edict that general principles of international law apply to the sidereal realm. Thus LOAC is present in outer space. We argue that the application of laws of armed conflict in

outer space strengthens the peaceful use of outer space concept which permeates the *corpus lex spatialis*.

Interface of LOAC and Space Law

Generally stated, the purpose of LOAC is to reduce suffering during armed conflicts. In so doing these treaties govern mainly but not exclusively the behavior of officers and soldiers. From this perspective one may view officers and soldiers as managers of the use of force during armed conflict. Thus LOAC establishes rules of management in the use of force. Similarly space law edicts certain rules pertaining to the peaceful uses which can be made of outer space. In order to manage a military conflict where the theatre of operations is located in outer space military officers and soldiers will have to be familiar with both of these legal systems.

Martens clause

LOAC also has a legal disposition transporting its application into outer space. Frederich von Martens was a delegate of Russia and Chairman of the second Subcommission of the Second Commission of the Hague Peace Conference of 1899 and 1907. Mr. Martens had shown great foresight in proposing the following clause « Until a more complete code of laws of war has been issued, the high contracting parties deem it expedient to declare that, in cases not included in the Regulations adopted by them, the inhabitants and the belligerents remain under the protection and the rule of the principles of the law of nations, as they result from the usages established among civilized peoples, from the laws of humanity, and the dictates of the public conscience » Similar clauses are now found in all LOAC treaties¹³.

This clause has several implications in the application of LOAC in outer space. First, Martens clauses reverses the customary international law principle which was enunciated within the Lotus case¹⁴. Briefly stated the Lotus case principle establishes a presumption of legality of State action. Therefore, State actions which are

not specifically prohibited are presumed to be legitimate. Negatively stated, States do not require permissions to act, but require specific prohibitions to legitimately restrict their latitude of actions. The Martens Clause reverses the Lotus principle in the application of international law for international armed conflicts. Thus the Martens Clause edicts the rule that “what is not expressly forbidden by the LOAC is not necessarily permitted”¹⁵. However in striking a balance between the two concepts, of the Lotus case and the Martens Clause, we argue that the Martens Clause premise creates a principle which is smaller in scope than its exception¹⁶. Nonetheless the Martens Clause serves as an important tool within the legal field in applying humanitarian principles to new areas of warfare, such as outer space.

Second this clause is dynamic in nature in the sense that it applies LOAC to new technologies which did not exist at the time it was formulated.

Third the clause does not only refer to the usual sources of international law but also to « principles of international law resulting from any one of these three sources or from their combined significance »¹⁷

Similar clauses have been included in all LOAC treaties. Most recently the First Additional Protocol of 1977 contains a similar disposition in its article 1(2). We argue that this clause can find direct application only under extreme conditions during armed conflicts. Nonetheless the Martens clause certainly adds humanitarian elements to space warfare. The Martens clause, however, cannot be interpreted as a general interdiction of space warfare itself.

Legitimacy of military activity in outer space

This note is uniquely concerned with the case of space military activity during an international armed conflict, this being a necessary prerequisite to the application of LOAC. Space treaties edict that outer space can only be used for peaceful purposes. We argue that the word « peaceful » describes the ends sought and

not the means used to seek these ends. Thus any military activity which is in conformity with Article 51 of the Charter of the United Nations, that is an act of self defense, be it collective or individual, or which is in conformity with a resolution of the United Nations Security Council according to chapter 7 are in fact peaceful acts. Furthermore we argue that the only true restrictions edicted by the space treaties are the prohibition of placing in orbit a nuclear weapon or a weapon of mass destruction. Aside from these restrictions we argue that all other military activity and use of force in outer space is legitimate, subject of course to the rules of LOAC.

Military Necessity in outer space

The concept of military necessity was initially defined for the United States Army in 1862 in General Orders No. 100 stating that « military necessity, as understood by modern civilized nations, consists in the necessity of those measures which are indispensable for securing the ends of war and which are lawful according to the modern law and usages of war »¹⁸ One of the aspects of military necessity is the obligation to distinguish between military objectives and civilian objectives during armed conflict. In other words when an object is attacked the officer ordering the use of force , or delivering the ordnates himself, must distinguish and properly identify the target as one which is military in nature. In other words, the attack on the said target must have a direct consequence on the goal of obtaining the surrender of the enemy by weakening its ability to wage war. It is important to stress that this principle cannot be used to justify a violation of a positive norm protecting certain assets or persons in situations of armed conflict.

Space military assets such as space based imagery, G.P.S. and the proposed Ground Mobile Target Indicator (GMTI) proposed for the RADARSAT-2 project) facilitate the proper identification of targets. Indeed the distinction between military and civilian targets is a fundamental tenet of LOAC. Article 52 (2) of Additional

Protocol I is a specific application of this premise. Furthermore attacks and reprisals against civil objects are prohibited by Article 52 (1) of the Additional Protocol I. Civilian objectives are negatively defined as being those which are not military objectives as defined in Article 52(2). This is not to say civil objectives may never be attacked. If a civil object is being used to support military activity it then becomes a legitimate target. These principles are applicable in outer space.

Military space technology allow for precise target distinction and quasi-surgical military operations. Thus collateral damages can be reduced to a minimum. This is not to say that collateral civilian damages do not occur. They regrettably do occur. The obligation in this case is one of means and not one of results.

From a legal perspective space technology gives military officers a greater capacity to respect LOAC obligations. Although the LOAC obligations in this case is one of means, and not one of results the means available in space technology to respect LOAC principles permit a more effective application

Belligerent identification in outer space

A fundamental principle of LOAC and a logical corollary to the previous norm is the rule of identification. Belligerents must wear a uniform with proper identification and carry their arms openly. Similarly vehicles, ships, and belligerent aircrafts must also be properly identified as such. The sanction for the violation of this rule is the denial of prisoner of war status when captured. In this way legitimate targets are more easily identifiable. All acts which are designed to confound belligerent forces with the civilian population are severe violations of LOAC and can be considered as acts of perfidy¹⁹.

The identification rule raises two issues in its application to outer space, These are first the identification of space objects as military space objects, and second the obligation of astronauts to wear military space uniforms.

The Convention on Registration of objects Launched Into Outer Space (registration Convention) obliges all States to register their space objects. This obligation to register applies to all space objects, that is those which are civilian and those which are military. According to Article IV (1) (e) registration must indicate the general function of the space object including

- 1) the name of the launching State
- 2) an appropriate designator of the space object or its registration number
- 3) date and territory or location of launch
- 4) basic orbital parameters, including nodal period, inclination, apogee, perigee

A space object can therefore clearly be identified as being civilian in function. The converse however does not apply, that is a military satellite may not necessarily be identified as such by its registration. This is because registration must occur as soon as practicable. Given the precise nature of the information required, military satellites may not be registered until after their missions are completed.

Space law therefore offers a unique registry allowing belligerents to clearly identify civilian space objects. From this fact we proffer that civilian space objects must benefit from the same protection terrestrial civilian object have.

The situation is however complicated by the fact that space technology bears the burden of its origins. That is the technology even in a civilian satellite can be used for military purpose. Indeed space technology possesses a hybrid nature in its dual use.

We argue that the hiding of a military space object, used to commit an act of force in outer space, behind a civil registration may easily be interpreted as a severe violation of LOAC akin to an act of perfidy. This being said the military use of a civilian space object is not necessarily illegal per se. In this case it is important to distinguish the nature of the use and the mission being accomplished. The use of a civilian telecommunication satellite within a legitimate military operation is certainly

acceptable. For example the Canadian military did use its civil telecommunication satellites during Operation Dessert Storm. Similarly the purchase of data by the military from a civilian remote sensing satellite is also acceptable.

We argue that the perfidious use of space objects seriously endangers all national space assets. To increase the security of space development and space colonization a specific disposition of law should be created to ensure the protection of civil space objects which are registered as such. This could be done either an amendment to additional Protocol I or by the formation of a third Additional Protocol specifically designed to be applied in military space activities.

Classification of civilian objects according to Article 52 (2) of Additional protocol I is contingent upon the use of the object itself and the context. LOAC therefore prevents attack against purely civilian space objects which do not contribute to the military efforts, prevents reprisals against these same objects, and outlaws indiscriminate use of force against satellites but does not outlaw collateral damages from occurring to these space objects as a result of legitimate military space activity. We therefore argue that legitimate space weapons must allow its user to properly distinguish civil and military targets.

As far as military space uniforms are concerned LOAC rules obliges combatants to be clearly identified. Thus an astronaut who executes by himself acts of force outside of the spaceship would be obliged to be clearly identified as a combattant.

Proportionality in outer space

Proportionality is both a conventional norm and a principle of customary international law. Briefly stated this principle allows belligerents to use only the forces necessary to weaken the military forces of the enemy to ensure victory. Thus the degree of force legitimately used is directly proportional to the military objectives sought.²⁰

It is important to note that space technology has modified the equilibrium in evaluating the human costs of direct military interventions within certain theatres of operations. Again the case in point is the present military intervention in Yugoslavia. Aerial attack without space age technology could cause an unacceptable amount of human suffering prohibiting humanitarian intervention.

During military operations in outer space a choice can be made by the commanders between what can be described as either a soft kill or a hard kill of a satellite. Satellites, and particularly those orbiting in low altitude are susceptible to attacks by scrambling of radio waves. This is a technique of soft kill. The functions of the satellite are reduced without any harm being done to the satellite itself. Other satellites can be attacked directly either by missiles, lasers, or by the use of kinetic weapons. This approach is called the hard kill of satellite.

The direct use of force against space assets of a nation has several implications. First this can lead to a war of attrition in outer space which would in turn exponentially increase the presence of space debris, a major concern for all satellites be they civil or military. The militarily increased space debris would in turn endanger satellites belonging to neutral States. We argue that the debris problem could conceivably be a violation of the rights of neutral States during international armed conflicts. The resulting debris from the use of force in outer space must be factored in the proportionality calculus of military operations. In this case space benefits from an indirect protection regime. Space is protected not in itself but as an application of other rights of international public law. Although this is good, we nonetheless argue that such protection to the space environment is not sufficient to ensure the industrialization and human settlement of space. Outer space in itself, and in particular orbits should benefit from specific rules of protection through LOAC.

Military astronauts

The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched Into Outer Space (Rescue Agreement) edicts in its article 4 an obligation to return an astronaut to the representatives of the launching authority. Two questions now arise. First, does this article prohibit a belligerent State from capturing a military astronaut during times of international armed conflict? and second, Does this article of law preclude an astronaut from seeking asylum?

As far as the issue of capture is concerned we argue that this agreement does not prevent the capturing of military astronauts. Space law norms must not be interpreted in a vacuum but in conjunction with all other norms of public international law. Article 31 of the Vienna Convention on the Law of Treaties edicts that treaties must be interpreted in good faith in accordance with the ordinary meaning to be given to the terms in their context and in the light of its object and purpose. We argue that this agreement was never intended to modify the LOAC pertaining to the rules of capture and detention. An astronaut who is in accordance with the definitions LOAC a combatant can effectively be captured, detained and given the privileges of POW status.

An exegetical analysis of the Rescue Agreement presupposes its application in times of peace. A condition precedent to the application of the rescue agreement is the occurring of an accident, condition of distress, or an unintended or emergency landing. It is plausible to argue using a broad interpretation of these terms that this treaty can be applied to situations of armed conflict. Although such reasoning is certainly logical we argue that it is not reasonable given the object of the agreement. The Rescue Agreement never specifically enounces conditions of war or of use of military force. Furthermore, there is no specific mention of any intent to modify the Geneva Conventions which regulate capture.

We therefore propose to restrict the interpretation of the conditions of applicability of the rescue agreement to purely civilian causes. Furthermore a broad interpretation preventing the capture of military astronaut would force States to denounce this convention during times of international armed conflict thus reducing the rights of civilian astronauts.

As far as the second issue is concerned we argue that the Rescue Agreement cannot preclude a military astronaut from seeking political asylum since this is a well established right in international public law. A contrary interpretation would have the effect of denying a fundamental human right on the basis of occupation. Similarly the Rescue Agreement could not be a valid argument to prevent extradition of a military astronaut. Furthermore the concept of launching authority is now a legal amphibology. Joint ventures and the commercialization of space launches have blurred this distinction. From this point of view we argue that a modification of this agreement is now urgently required.

Another rule which prima facie complicates the capture of military astronauts is that of diplomatic immunity²¹ The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Celestial Bodies (Outer Space Treaty) edicts in its Article V that astronauts shall be regarded as envoys of mankind. The Outer Space treaty does not make any distinction between civil or military astronauts. In fact when this treaty was signed all astronauts were military officers. This article can be interpreted as giving all astronauts diplomatic immunity as edicted in the Vienna Convention on Diplomatic Relations which codified the customary international norms on the issue. The Vienna Convention on Diplomatic Relations treaty not allow any exceptions to the principle of diplomatic inviolability. The reasons for this is to ensure an efficient execution of diplomatic functions by State representatives. Nonetheless, we argue that the natural and

unalienable right of all States to defend themselves creates an exception to diplomatic immunity²². A military astronaut who participates in acts of hostility against another State, can certainly be the object of defensive measures. A military astronaut which participates in hostile acts does not exercise diplomatic functions.

We proffer that military astronauts are not obliged to wear military uniforms in a military spacecraft which is properly identified as such. Although the wearing of military space uniforms is a good practice in itself, we do not see it yet as being a legal necessity. We argue that an important distinction can be made between military pilots of aircrafts and military astronauts. The pilot of a military airplane is obliged to wear his uniform. A pilot has the option of parachuting from a disabled aircraft. The first additional Protocol protects airmen who are parachuting from a disabled aircraft from attack as they are not considered combatants while parachuting. They are subject to capture and POW status, the uniform is therefore necessarily part of their identification. Astronauts however no not have the luxury of parachuting from their spacecraft. We argue that this technological impossibility allows the military astronaut to wear a civilian space suit without suffering any legal consequences as far as the LOAC is concerned. In other words the fact that a military astronaut is not wearing a military space suit would not be a reasonable argument for the denial of POW status by a belligerent enemy force during capture.

We argue that a military astronaut returning to earth in a disabled spacecraft should by elementary considerations of humanity, and by the Martens clause not be considered a legitimate target by belligerent States. In this case we make a parallel with the principles edicted in Additional Protocol I which protects parachuting airmen from disabled aircrafts.

Civilian astronauts and armed conflicts

In principle a civilian astronaut is a non combatant and is therefore not a legitimate target of military force. The

hybrid nature of space technology however complicates the issue.

First, warfare is not an exact science. The legitimate use of force against a military target can regrettably cause collateral civilian casualties. A civilian astronaut is not an exception to this rule.

Considering the fact that space technology has a dual civil/military nature a civilian astronaut must be cautious not to cross the line and get involved in military activities. From a commander's perspective a civil astronaut must not necessarily be considered as a non legitimate target. In this case a functionalist approach is required. In establishing the legality of the target it is therefore necessary to scrutinize the activity of the civilian astronaut. If he or she takes part in the conduct of hostilities the astronaut, despite his or her civilian status becomes a legitimate target of the use of military force. Similarly a civilian space ship which is carrying on a military function becomes a legal military target.

On the other hand a space vehicle used for humanitarian assistance to combatants in outer space properly identified as such with either a red cross or red crescent would not be a legitimate military target.

Space launch

An important aspect of space warfare is the denial of access to space of belligerent forces. In applying this concept the attack of space launch installations is a definite possibility. In such a scenario a civilian space launch facility which launches military space vehicles could become a legitimate target of opposing belligerent forces. From a LOAC perspective denial to space must not include the denial of the accessibility to space of humanitarian assistance. We argue that in such a scenario it is conceivable to have neutral space faring nations ensure humanitarian assistance to either civil or military astronauts in outer space. In this case it is important the humanitarian assistance to military astronauts not endanger the neutrality of

States. We argue for specific treaty dispositions dealing with this issue.

LOAC, orbits, and the environment

For a lawyer an orbit is a closed elliptical trajectory whose center is our planet. The only orbit which benefits of a distinctive legal regime is the geostationary orbit which is considered to be a limited natural resource. This fact presupposes two premises. First, an orbit is the result of the natural forces of gravity of our planet against a specific object. Second, the geostationary orbit is the perfect orbit to place telecommunication satellites. Being a global natural resource its use is allocated in an equitable fashion allowing all nations access to it. This orbit is located at an altitude of approximately 35,785 km above the equator and has a radius of 42,164 km. Orbits are non consumable and non renewable resources. Intercontinental missiles carrying multiple independent reentry vehicles (MIRVs) enter orbit without completing a closed orbital trajectory. In this sense ICBMs respect the Outer Space Treaty's restrictions on military uses of orbits.

One of the focus of LOAC is the interface between environmental needs and military needs.²³ LOAC has traditionally protected the environment as a necessary part of human survival. That is the environment qua environment was not the concern of LOAC. The issue at hand is whether orbits as limited natural resources are protected by LOAC from a generic attack. Irak, regrettably proved during the Gulf conflict that it was capable of environmental warfare by setting the oil wells of Kuwait ablaze. With SCUD missiles and a small nuclear device it is certainly possible commit acts of space warfare by nuking the LEO.

There are two treaties which could possibly be interpreted as protecting orbits. First there are articles 35 and 55 of Additional Protocol I which edict certain rules protecting the environment. Regrettably, the applicability of these dispositions to the protection of orbits from

direct acts of aggression remains uncertain . Second there is the 1976 Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification techniques (ENMOD)²⁴ prohibiting modifications to the environment during warfare. The applicability of this treaty to orbital protection is also regrettably uncertain. To complicate matters, the ENMOD treaty and Additional Protocol I use similar terms but with different definitions, thus complicating their possible application to orbital protection. We argue that their legal definitions should be harmonized and specifically amended to include orbits as part of our global environment. In this manner their specific application to space warfare would be specific and unequivocal.

The International Court of Justice has recognized the legitimacy of nuclear weapons and the threat to use them in its recent advisory opinion on the subject²⁵. Nevertheless the ICJ did recognize that the indiscriminate aspect of nuclear weapons did not respect the imperatives of LOAC. According to the ICJ the legitimate use of nuclear weapons is restricted to situations where the survival of the State itself is in question.. We cannot conceive of a conflict where the nuclear destruction of orbits would ensure the survival of a State. Although there are no unequivocal positive disposition in treaties protecting orbits from direct attacks, we argue that the principles of customary international law of proportionality, military necessity, along with the Martens clause could be interpreted as prohibiting such uses of force. Nonetheless specific treaty dispositions on these issues are preferable.

Conclusion

The security of national space assets is an important precondition of space manufacturing and in the human settlement of outer space. General principles of international customary law applicable to international armed conflict presently assure a minimum of security on this level. Nevertheless these issues are subject to

interpretation and their application is uncertain. Conventional norms protecting the space environment and astronauts are desirable. We therefore propose that international conventions regulating the conduct of hostilities be amended to include concerns of national security interests pertaining to astronauts and assets in outer space. Orbits, as natural resources, must be protected from attack. Access to space for humanitarian assistance must be assured during times of armed conflict.

Furthermore the status of the corpus lex spatialis could also be improved for space application in peacetime by military personnel . The maintenance of a minimum level of public order must be ensured at all times in outer space. The purpose of this note is to initiate a dialogue amongst scholars on these issues.

¹ United States Space Command, Long Range Plan, p. vii

² See CNN interactive at www.cgi.cnn.com/US/9710/20/pentagone.laser/

³ See Military Space Programs at www.fas.org/spp/military/program/asat/overview.html

⁴www.fas.org/spp/military/program/asat/hertf.htm

⁵ We will not list all Hague system treaties but see D. Schindler, and J. Toman (eds), *The Laws of Armed Conflicts : A Collection of Conventions, Resolutions and Other Documents*, 3rd edn 1988; and *Conduite des Hostilités*, Collection des Conventions, Office of the JAG , DND, Canada, 1998 edn.

⁶ Geneva Convention (I) for the Amelioration of the Condition of Wounded and Sick in Armed Forces in the Field, 12 August 1949, 75 U.N.T.S. 31; Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, 12 August 1949, 75 U.N.T.S. 85; Geneva Convention (III) Relative to the Treatment of Prisoners of War, 12 August 1949, 75 U.N.T.S. 135; Geneva Convention Relative to the Protection of civilian Persons in Time of War, 12 August 1949, 75 U.N.T.S. 3516; Protocol Additional to the Geneva conventions of 1949, and Relating to the Protection of Victims of International armed Conflicts (Protocol I), 8 June 1977, 1125 U.N.T.S. 3; Protocol Additional to the Geneva Conventions

of 1949 and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 8 June 1977, 1125 U.N.T.S. 609.

⁷ 27 January 1967 TIAS No. 6347, 610 U.N.T.S. 205

⁸ TIAS No. 7762 961 U.N.T.S. 187

⁹ TIAS No. 7762, 961 U.N.T.S. 187.

¹⁰ TIAS No. 8480 1023 U.N.T.S. 15

¹¹ U.N. Doc. A/34/664

¹² 480 U.N.T.S. 43. For quick reference to these treaties see www.rmc.ca/academic/poli-econ/poe450/poe450bourbonniere.html

¹³ see First Geneva Convention art. 62 par. 4, second sentence, Second Geneva Convention, art 62 par. 4 second sentence, Third Geneva Convention art 142, par. 4 second sentence, Fourth Geneva Convention art 158 par. 4 second sentence.

¹⁴ The Steamship Lotus, France vs. Turkey (1927), P.C.I.J. ser. A., No. 10.

¹⁵ The Law of Armed Conflict at the Operational and Tactical Level, Office of the Judge Advocate General, DND, Canada, July 1998 Edition. P. 1-2.

¹⁶ EPIL, Vol. 3 p. 252

¹⁷ IBID

¹⁸ The Law of War and Military Necessity by : William Gerald Downey, Jr. AMJIL p. 252

¹⁹ see rules on Perfidy at first Geneva Convention art 53, Second Geneva Convention art 45 Additional Protocol I art 37-39, 85(3).

²⁰ Proportionality and the Use of Force in International Law , by : Judith Gail Gardam, AJIL vol 87 (1993) p. 391

²¹ Professor Juan Manuel de Faramifian-Gilbert qualified this as supranational immunity of astronauts. See ECSL Space Law and Policy Summer Course, Basic Materials 1994, Martin Nijhoff Publishers, p. 25.

²² See John S. Beaumont, « Self Defense as a Justification for Disregarding Diplomatic Immunity » in Canadian Yearbook of International Law (1991) p. 391.

²³ See Michael N. Smitt, « Green War », in Yale Journal of International Law (1997) 22, p.1 and « War and the Environment » in Archiv des Volkerrechts (1999) 39, p.25.

²⁴ 18 May 1977, 1108 U.N.T.S. 151.

²⁵ Legality of the Threat or use of nuclear weapons. Advisory Opinion. (1977) 35 I.L.M. 809 and 1343.