LEGALLY PERMISSIBLE SCOPE OF CURRENT MILITARY ACTIVITIES IN SPACE AND PROSPECTS FOR THEIR FUTURE CONTROL.

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ABSTRACT

The exploration of outer space has led to the extension of human activity to this region. The military aspect of this activity has not been excluded. There is increasing concern that, along with the perceived benefits of this aspect, potential dangers may exist. This concern has given rise to a call for the regulation of military space activities. This thesis will analyse the international treaty format as a means of achieving such regulation.

The first chapter is an inventory of the present military utilization of space.

Observing that the space power base is ever-widening, chapter two considers the political rationales underlying these developments.

Chapter three is a presentation of existing international law, both general and specifically relating to space, with particular consideration given to defining the permissible scope of military activities in outer space.

The fourth chapter deals with the problems of verification of treaty compliance and definition of terminology.

The fifth chapter considers the efficacy of an international treaty as a regulatory mechanism. The format

of such a treaty is analyzed comparing and evaluating the different types of treaties. In light of the foregoing, proposals and draft treaties on space weaponization control are then discussed.

The final chapter assesses the effectiveness of the arms control treaty format in the past, and evaluates its feasibility for space weaponization control in the future. Emphasis is given to the role that Canada could play to help curb the arms race in outer space.

RESUME

L'exploration de l'espace extra-atmosphérique a permis d'étendre les activités humaines dans ce milieu. Malheureusement, les aspects militaires de ces activités n'ont pas été exclus. Quoique certaines utilisations militaires de l'espace sont bénéfiques, la prolifération des armements dans l'espace a suscité un appel pour réglementer les activités militaires dans l'espace. Cette thèse analysera l'hypothèse d'élaborer un traité international permettant d'atteindre cet objectif.

Le chapitre premier dresse un inventaire des utilisations militaires de l'espace qui existent à l'heure actuelle.

Notant que l'emprise des puissances spatiales s'accroît, le deuxième chapitre analyse les motifs politiques qui sous-tendent ce fait.

Le chapitre trois discute du droit international existant (le droit général autant que spatial), en tentant plus particulièrement de déterminer l'étendue permise des activités militaires dans l'espace extra-atmosphérique.

Le chapitre quatre se penche sur les problèmes concernant la vérification des traités et leur terminologie.

Le chapitre cinq considère l'efficacité d'un traité international en tant que mécanisme régulatoire. Le format d'un tel traité, ainsi que les différentes propositions présentées sur le contrôle des armements dans l'espace y sont discutés.

Le dernier chapitre évalue l'efficacité des traités existant sur le contrôle des armements, et évalue leur faisabilité et potentiel pour contrôler les armements dans l'espace. Une attention particulière est donnée au rôle que pourrait jouer le Canada pour effectivement prévenir une course aux armements dans l'espace.

ACRONYMS

ABM	Anti-ballistic missile.
ACDA	Arms Control and Disarmament Agency.
AFSATCOM	Air Force Satellite Communications System.
AOA	Airborne Optical Adjunct.
ASAT	Anti-satellite.
ATP	Acquisition, tracking and pointing.
AWS	Advanced Warning System.
AWST	Aviation Week & Space Technology.
BM/C^3	Battle Management/Command, Control and Communications.
BMD	Ballistic Missile Defense.
CASL	Centre for Research in Air and Space Law.
CD	Committee on Disarmament.
C^3/I	Command, Control, Communications and Intelligence.
COPUOS	Committee for the Peaceful Uses of Outer Space.
CRS	Congressional Research Service.
CSOC	Consolidated Space Operations Centre.
DARPA	Defense Advanced Research Projects Agency.
DCS	Defense Communications System.
DOD	Department of Defense.
DSCS	Defense Satellite Communications System.
DSP	Defense Support Program.
DTS	Diplomatic Telecommunications System.

ECM	Electronic counter-measures.
ELINT	Electronic intelligence satellite.
EMP	Electromagnetic pulse.
EORSAT	Electronic Intelligence Ocean Reconnaissance Satellite.
ERIS	Exoatmospheric Re-entry Vehicle Interceptor System.
ESA	European Space Agency.
FLTSATCOM	Fleet Satellite Communications System.
FRG	Federal Republic of Germany.
FY	Fiscal Year.
FYDP	Five-Year Defense Program.
GBMD	Global Ballistic Missile Defense.
GDR	German Democratic Republic.
GMF	Ground Mobile Forces.
GPO	Government Publishing Office.
GPS	Global Positioning System.
HALO	High-altitude low observation.
HEDS	High-altitude Endoatmospheric Defense System.
HOE	Homing Overlay Experiment.
IASL	Institute of Air and Space Law.
ICBM	Intercontinental Ballistic Missile.
ILA	International Law Association.
IONDS	Integrated Operation Nuclear Detection System.
ISMA	International Satellite Monitoring Agency.
ITU	International Telecommunications Union.

IUS	Inertial Upper Stage.
LEO	Low Earth Orbit.
LFC	Large Format Camera.
LODE	Large Optics Demonstration Experiment.
MHV	Miniature Homing Vehicle.
MILSTAR	Military, Strategic, Tactical and Relay Satellite.
MIRV	Multiple Independently Targetable Re-entry Vehicle.
NASA	National Aeronautics & Space Administration.
NATO	North Atlantic Treaty Organization.
NCA	National Command Authorities.
NTM	National Technical Mean.
NOAA	National Oceanic & Atmospheric Administration.
NORAD	North American Aerospace Defense Command.
NOSS	National Oceanic Satellite System.
NPG	Nuclear Planning Group.
NSDO	National Security Directive Order.
NSSD	National Security Decision Directive.
OTA	Office of Technology Assessment.
PRC	People's Republic of China.
R & D	Research & Development.
RORSAT	Radar Ocean Reconnaissance Satellite.
SAMRO	Satellite Militaire de Reconnaissance Optique.
SATKA	Surveillance, acquisition, tracking & kill assessment.
SDI	Strategic Defense Initiative.

SDIO	Strategic Defense Initiative Organization.
SDS	Satellite Data System.
SDTO	Strategic Defense Technology Office.
SIPRI	Stockholm International Peace Research Institute.
SLBM	Submarine Launched Ballistic Missile.
SPACECOM	Space Command.
SPC	Special Political Committee.
SPOT	Système Probatoire d'Observation de la Terre.
SRAM	Short-Range Attack Missile.
SSTS	Space Surveillance & Tracking System.
TDRS	Tracking Data Relay Satellite.
TIP	Transit Improvement Program.
UCS	Union of Concerned Scientists.
UK	United Kingdom.
UN	United Nations.
UNISPACE	United Nations Conference on the Exploration & Peaceful Uses of Outer Space.
UNSSOD	United Nations Special Session on Disarmament.
USA	United States of America.
USAF	United States Air Force.
USN	United States Navy.
USSR	Union of Socialist Soviet Republics.
WWMCCS	World-wide Military Command & Control System.

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INTRODUCTION

> Over the beneficial effects of the opening up of outer space, the extension to it of the armaments race hangs like an ominous shadow.[1]

Having progressed from the era of exploration, to one of concurrent exploitation of the outer space milieu, we have reached a significant plateau. At this watershed, there must be a recognition and acceptance of what has gone before, and a concerted effort to lay the ground rules for the future. To amplify, both Super-powers must acknowledge the military ethos of their respective space programmes. As a corollary of this, there must be a concomitant recognition and acceptance of a certain amount of military activity in space, by the rest of the world community.

The initial chapter of this thesis is a brief catalogue of extant military utilization of space. With this technological understanding, the political rationales underlying these developments are then discussed in the following chapter. Chapter three is a presentation of the entire corpus of currently applicable international law

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1. Manfred Lachs, The Law of Outer Space, Sijthoff-Leyden, 1972, 105.

defining the permissible scope of military activity in space. The fourth chapter, concentrates on two special areas of difficulty: verification of compliance; and definition of terminology. Thus alerted to the major difficulties, proposals and draft treaties on space weaponization control are then discussed. The final chapter is an assessment of the effectiveness of the arms control treaty format in the past, and an evaluation of its feasibility and potential for space weaponization control in the future.

CHAPTER I

MILITARY ACTIVITIES IN OUTER SPACE

> ...control of space will be decided in the next decade. If the Soviets control space, they can control Earth, as in past centuries the nation that controlled the seas dominated the continents.[1]
>
> John F. Kennedy

The military potential of space technology was perceived by both super-powers almost immediately after the advent of the space age in 1957. As early as 1958, the Soviet Union submitted a proposal to the UN General Assembly to ban the use of outer space for military purposes.[2] In 1960, President Eisenhower warned the UN General Assembly that it was faced with an urgent choice: preserving outer space for peaceful uses and for the benefit of all mankind or transforming it into a new arena for the arms race.[3]

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1. Cited in, Jasani, B. (ed.), Outer Space - A New Dimension of the Arms Race, SIPRI, Taylor & Francis Ltd., London, 1982, 41.

2. UN Doc. G.A. Verbatim Off. Rec., 13 Sess., 1st Comm. A/C.1/L.219 (1958).

3. Senate Committee on Aeronautics & Space Sciences, "Statements by Presidents of the United States on International Cooperation in Space - A Chronology: October 1957 - August 1971, US Senate, 92nd Cong., 1st Sess., 1971, 16.

During the intervening 28 years, outer space has been transformed into a "large and highly specialized support area for terrestrial military theaters."[4] The following survey of military activities in outer space is not intended to be exhaustive, but is meant to underscore the advanced and pervasive level of outer space militarization.[5]

A. MILITARY SATELLITES

Earth-orbiting satellites are used by the military to enhance the performance of Earth-based armed forces and weapons. Since 1958, approximately 2,219 military oriented satellites have been launched. This constitutes at least 75% of all satellites orbited.[6] In 1984 alone, the US,

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4. Durch, W.J., "Anti-Satellite Weapons, Arms Control Options, and the Military Use of Space", Report prepared for the US Arms Control and Disarmament Agency, July 1984, 2.

5. The term "militarization" is used in this study to mean the use of "space military support systems", which do not have any capability to damage, destroy or otherwise interfere with other space objects or objects on the earth or in the atmosphere, yet actively support military operations. For a discussion of the scope of the terms "militarization" and "weaponization", see Chap. IV B.

6. Jasani, B. & Perry, G.E., "The Military Use of Outer Space", in, SIPRI, World Armaments and Disarmament, Taylor & Francis Ltd., 1985, at 133. (Hereinafter

the USSR, the People's Republic of China and NATO countries launched a total of 105 satellites with actual or potential military uses.[7] Of the several types of military satellites launched each year, three kinds are the most important to the US and Soviet armed forces: reconnaissance, navigation and communications satellites.[8] There are four kinds of reconnaissance satellites: photographic, electronic, ocean and early warning.

1. Reconnaissance Satellite (Recsat)

a) Photographic Reconnaissance

i) USA

The development of US recsat began even prior to the advent of the space age, with the United States Air Force (USAF) WS-117L programme, for which Lockheed was

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(continued from previous page)
cited to as SIPRI Yearbook 1985.

7. Ibid.

8. Meteorological and geodetic satellites are the final members of the military spacecraft arsenal. The US and Soviet programmes are discussed extensively in Outer Space-Battlefield of the Future?, SIPRI, Taylor & Francis Ltd., London, 1978, 144-67.

awarded a contract in 1956.[9] The WS-117L programme developed two types of satellites for space reconnaissance: the area surveillance; and the close-look. The first type of satellite is used to scan large areas of a given country for objects of potential military interest, using a wide angle low resolution camera.[10] Their mission duration is 180 days. In contrast, the close-look satellites are more specialized and can return images with resolution of at least 15 centimetres.[11] These recsats incorporate a number of "film pods" which are returned to Earth by way of at least two re-entry vehicles that are retrieved in mid-air by C-130 aircraft near Hawaii.[12] Their mission duration is a much shorter 50-80 days.[13]

With the development of new generation US Big Bird satellites, the above-mentioned recsats have been phased

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9. Whelan, C.R., Guide to Military Space Programs, Pasha Publ., Arlington, 1984, 74.

10*d. Jasani (ed.), Outer Space - A New Dimension to the Arms Race, supra, note 1, 43-44.

11. "Space Reconnaissance Dwindles", Aviation Week & Space Technology (hereinafter cited to as AWST), 6 October 1980, 18.

12. "Recent Trends in Orbital Reconnaissance", Spaceflight, vol. 24, January 1982, 10.

13. Supra, note 11.

out. The Big Bird, launched using the Titan IIID launcher,[14] combines the area surveillance and close-look functions. Estimates of their mission duration vary between 261-300 days.[15] However, these recsats are being replaced by the KH-11 digital imaging spacecraft. The KH-11 satellites transmit images via digital radio links for ground processing, avoiding the delays of film recovery and processing.[16] Although the digital imaging system decreases the resolution, a modified KH-11 with image resolution close to that obtainable from film-based reconnaissance spacecraft is planned for the mid-to-late 1980s.[17]

ii) USSR

Soviet recsats are all launched under the Kosmos designation. They have similar mission profiles to the area

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14. The Titan III vehicles are the standard US heavy-duty vehicles and are used to launch most military satellites.

15. Young, A.J., Space Transportation Systems, LL.M. Thesis, Institute of Air & Space Law, McGill University, December 1984, 199 (unpublished).

16. Supra, note 12.

17. Whelan, supra, note 9, 78.

surveillance and close-look satellites discussed above, but their mission duration is much shorter.

> the Soviet Union's reconnaissance satellites are planned to operate for only a few weeks, whereas the much larger American satellites remain in orbit for many months. So the quantity of American reconnaissance information is probably much greater than that of the Soviet Union.[18]

Hence, the considerable difference in the launch rates between the US and Soviet satellites.[19] The mission duration of the majority of Soviet photorecsats is 14 days.[20] However, an upgrading of capability in this field is reflected by the launch of Kosmos 1552 in May 1984, with a lifetime of 173 days.[21] According to US sources, "this could indicate a new system or an advanced modification of an old one, demonstrating their increasing sophistication and capabilities."[22]

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18. "War and Peace in the Space Age", 25 Spaceflight, February 1983, 50.

19. For example, the number of photographic reconnaissance satellites launched by the Soviet Union during 1984 was 16, as compared to 3 for the USA.

20. SIPRI, Yearbook 1985, supra, note 6, 151-52.

21. Ibid.

22. Soviet Military Power 1985, (4th ed.), GOP, Washington, D.C., April 1985, 59.

iii) People's Republic of China (PRC)

After the USA and USSR, the PRC was the third country to launch a recsat. The first Chinese photographic recsat is thought to have been China 4, launched on 26 November 1975,[23] which ejected a re-entry capsule on 2 December 1975.[24] This was duplicated several times subsequently.[25] The most recent photorecsats to be launched was China 16 on 12 September 1984.[26]

iv) France

France announced its interest in developing military recsats as early as 1973.[27] Its military recsats is expected to be based on the civilian earth observation satellite SPOT (Système Probatoire d'Observation de la Terre) which was partially financed by the French

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23. Jasani (ed.), Outer Space - A New Dimension to The Arms Race, supra, note 1, 50.

24. Ibid.

25. A compilation of all launches by the PRC can be found in Young, supra, note 15, 320, Appendix III.

26. SIPRI, Yearbook 1985, supra, note 6, 151.

27. Le Monde, 18 January 1975.

military.[28] The first SPOT spacecraft, scheduled for launch in October 1985,[29] will be capable of 20 metres resolution in multispectral mode (colour) and 10 metres in panchromatic (black and white) mode.[30] A built-in stereoscopic imagery capability will also allow a three dimensional perspective of the target area.[31] The military version of SPOT is called SAMRO (Satellite Militaire de Reconnaissance Optique), and is expected to be launched in late 1985 or early 1986.[32] It will incorporate infra red imagery and have a higher resolution than that of the civilian programme.[33]

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28. Jasani (ed.), Outer Space -- A New Dimension to The Arms Race, supra, note 1, 50.

29. "French Prepare SPOT Satellite for Ariane Launch in October", AWST, 29 April 1985, 146.

30. "Group Created to Market SPOT Satellite Data", AWST, 12 July 1982, 26.

31. Ibid.

32. "Études de définition du satellite français de reconnaissance SAMRO", Air et Cosmos, no. 845, 31 January 1981, 55.

33. Ibid.

b) Electronic Reconnaissance

Electronic reconnaissance or electronic intelligence ELINT satellites carry equipment designed to detect and monitor radio signals transmitted by a state's military forces, both within its borders and throughout the world. The signals are detected by "ferrets", electronic objects attached to the satellite. These satellites are also used to gather data on missile testing and on various other types of communication traffic, as well as to locate precisely the sources of the signals which they intercept.[34] "Ferrets" may thus be used to direct photographic recsats over areas of any electronic distortion which may be caused by increased military activity. While quite a lot is known about photographic recsats comparatively little data is available on ELINT satellites.

i) USA

Both the USA and the Soviet Union, are known to have launched ELINT satellites. Since 1980, the USA has

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34. Jasani, B., "Outer Space: Militarization Outpaces Legal Controls", in, Jasentuliyana, N. (ed.), Maintaining Outer Space for Peaceful Uses, Proceedings of a Syumposium Held in The Hague, The United Nations University, Japan, 1984, 222.

launched one ELINT satellite per year.[35] A large classified military ELINT satellite payload was successfully deployed into geosynchronous orbit, during space Shuttle mission 51-C of 27 January 1985.[36] This satellite will monitor Soviet radio transmissions from a geosynchronous orbit, over the equator 3,000 miles south of Soviet territory.

ii) USSR

On 24 September 1984, the Soviet Union launched the largest single military satellite in the history of its space programme. According to US analysts, the spacecraft "is a new electronic intelligence gathering vehicle positioned in an orbit frequently overflying the U.S. to

35. World Armaments and Disarmament - SIPRI Yearbook 1982, Taylor & Francis Ltd., London, 1982, 308 (hereinafter cited as SIPRI Yearbook 1982); World Armaments and Disarmament - SIPRI Yearbook 1983, Taylor & Francis Ltd., London, 1983, 450 (hereinafter cited as SIPRI Yearbook 1983); World Armaments and Disarmament - SIPRI Yearbook 1984, Taylor & Francis Ltd., London, 1984, 371 (hereinafter cited as SIPRI Yearbook 1984); and SIPRI Yearbook 1985, supra, note 6, 153.

36. "IVS Meets Mission Objectives on Defense Dept. Shuttle Flight", AWST, 4 February 1985, 20.

intercept radio communications and data."[37] The new Soviet ELINT spacecraft, Kosmos 1603, was launched on the Soviet Union's largest operational booster, the SL-12 Proton booster.[38] Launch of the larger Kosmos 1603 indicates the Soviets desire to obtain much more detailed radio intelligence data from the USA. The orbit was such that the ground tracks over the USA are repeated every 24 hours, thus providing repetitive signal reception capability over specific US military intelligence targets.[39]

c) Ocean Reconnaissance

Ocean reconnaissance satellites detect, locate, and target naval forces and also determine sea conditions which can help in detecting submarines.[40]

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37. "Soviets Orbit Large New Military Electronic Intelligence Satellite", AWST, 14 January 1985, 19.

38. The SL-12 Proton booster has a capability of placing up to 50,000 lbs. into low earth orbit (LEO). For a review of extant Soviet launch vehicles and their capacities, see, Young, supra, note 15, 73-82.

39. Supra, note 37. Kosmos 1603 is in a 851 km high orbit with an inclination of 71°.

40. Jasani (ed.), Outer Space - A New Dimension of the Arms Race, supra, note 1, 54.

i) USA

While the US Soviet Military Power 1985 publication alleges that the "US has no counterpart to Soviet ocean reconnaissance satellites",[41] the National Oceanic Satellite System (NOSS), a joint endeavour of NASA, the National Oceanic and Atmospheric Administration (NOAA) and the Department of Defence (DOD), belongs to the same category of spacecraft.[42] This system is expected to assist the US Navy in the selection of operating areas, in anti-submarine warfare and acoustic predictions.[43] The US Navy is reported to have launched 8 such satellites in 1983,[44] and 4 in 1984.[45]

ii) USSR

The first operational Soviet ocean reconnaissance

41. Supra, note 22, 58.

42. "Expanded Ocean Surveillance Effort Set", AWST, 10 July 1978, 22.

43. NASA, News Release No. 80-7, 28, January 1950.

44. SIPRI Yearbook 1984, supra, note 35, 371.

45. SIPRI Yearbook 1985, supra, note 6, 154.

satellite was launched in May 1974.[46] The Soviet programme consists of its Electronic Intelligence Ocean Reconnaissance Satellite (EORSAT) and its nuclear-powered Radar Ocean Reconnaissance satellite RORSAT. RORSATs, which have an orbital period of approximately 90 minutes,[47] can locate and target US and allied naval forces for destruction by anti-ship weapons launched from Soviet platforms.[48] The radar is powered by a nuclear reactor. Following the accident of Kosmos 954, which distributed itself over North West Canada on 24 January 1978, there was a short lull before launches of ocean reconnaissance satellites were resumed in 1980. After record-setting performances in 1981 and 1982 when six and seven missions were flown respectively,[49] only a pair of spacecraft were orbited in 1983, no doubt as a result of the malfunction of Kosmos 1402, which crashed in the Indian Ocean on 24 January 1983.[50] Recent

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46. Jasani (ed.), Outer Space - A New Dimension to The Arms Race, supra, note 1, 56.

47. Gray, C.S., American Military Space Policy, University Press of American Inc., Lanham, 1982, 27.

48. Supra, note 22, 58.

49. Johnson, N.L., The Soviet Year in Space: 1983, Teledyne Brown Engineering, Colorado Springs, 1983, 31.

50. SIPRI Yearbook 1983, supra, note 35, 450.

reports have indicated that the Soviets have developed a new kind of ocean reconnaissance satellite which are equipped with side-looking radar. The side-looking radar on board Kosmos 1500 and Kosmos 1602 provide 1.5-2km ground resolution over a viewing field of 460 km.[51] Both satellites were used for mapping ice formations in polar regions. The importance of such information became apparent when the Soviet capability to fire submarine-launched ballistic missiles (SLBMs) through the Arctic ice-cap was revealed in late 1984.[52] This system will enable Soviet missile-firing submarines to escape detection by hiding under the ice, where the USA has little ability to detect or counter them.[53]

d) Early-Warning Satellites

i) USA

Early-warning satellites were initially developed to detect enemy missiles as soon as they were launched.

51. SIPRI Yearbook 1985, supra, note 6, 139.

52. Ibid., 141.

53. "Soviet Ability to Fuel Through Ice Creates New SLBM Basic Mode", AWST, 10 December 1984, 16.

Missiles are tracked through the use of sensors able to detect the infrared radiation emitted by the hot plume of a rocket. The first USAF/TRW early-warning satellite was launched in May 1971. In June 1981, TRW began development of the 14th through 17th spacecraft in the series to carry the effort into the shuttle programme.[54] Delivery of the No. 14 spacecraft to Cape Canaveral for integration with the Shuttle's mission is set for late 1985, with launch set for late 1986 or early 1987.[55]

The existing early-warning satellites involve a 12 feet long infrared telescope placed in geosynchronous orbit, where it scans the Soviet Union for the rocket plumes of ballistic missile firings and of boosters carrying satellites into orbit. These spacecraft are critical in assessing Soviet missile and satellite launch activities. The infrared telescope also provides a warning against missile attack. Three or more of these satellites are kept operational at all times and positioned around the equator, to permit scanning of all Soviet and Chinese launch sites and SLBM sites. Data is transmitted to several ground

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54. "USAF Initiates Broad Program to Improve Surveillance of Soviets", AWST, 21 January 1985, 14, at 15.

55. Ibid.

stations for relay to the North American Aerospace Defense Command (NORAD) and to the USAF Space Command in Colorado Springs.

In an attempt to improve the US early warning capability against Soviet ballistic or cruise missile attack, an advanced Defense Support Program (DSP) missile early-warning satellite is being developed to replace the current USAF early warning satellites.[56] The new satellites will incorporate a new improved infrared sensor, and a higher power satellite-to-ground data link, to permit transmission of data to smaller ground antennae.[57] Additional modifications include survivability-enhancement, to prevent Soviet laser jamming, and extended satellite lifetime.[58]

In addition to these current enhancements, the USAF and the Defense Advanced Research Projects Agency (DARPA) have also sponsored the development of the "Teal Ruby" programme, an infrared sensor designed to track aircraft from space.[59] It could also lead to the ability to

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56. Ibid.

57. Whelan, supra, note 9, 81.

58. Ibid.

59. For details of Teal Ruby see, Ulsamer, E., "Advanced Technology in Space", Air Force Magazine, Vol. 64, No. 6, June 1981, 98-99; "Problems Double Costs of Teal

detect and track multiple independently targeted re-entry vehicle (MIRV) bases from low orbit.[60] It is expected to be deployed in solar orbit by the first Shuttle launch from Vandenberg AFB, Calif., set for early 1986.[61]

Almost as important as improvements in the early warning system, is the planned Integrated Operational Nuclear Detection System (IONDS). The IONDS programme was initiated to develop a system with the capability to detect, locate, and report in near real-time, nuclear detonations on a global basis.[62] It will provide the National Command Authorities with a survivable system to evaluate nuclear strike and damage assessment.

ii) USSR

The Soviet Union was slow to exhibit the ability to place payloads into geosynchronous orbit. Since the inception of the early-warning satellite constellation in

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Ruby", AWST, 6 July 1981, 23; and, Whelan, supra, note 9, 94-96.

60. Gray, supra, note 47, 26.

61. Whelan, supra, note 9, 96.

62. Ibid., 88. See also, Gray, supra, note 47, 26.

1976, 35 payloads have reached earth orbit.[63] Of these, at least 14 have either failed to reach their proper orbit, or have broken up once on station. It appears that an early-warning system consisting of nine satellites at 40° spacings is gradually being established.[64]

2. Communications Satellites

a) USA

Communications satellites are of vital interest to the USA, as 70% of US overseas military communication is routed through space.[65] From the early 1960s to the present, the Defense Satellite Communications System (DSCS) has been a major focus of military application of satellite

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63. Johnson, supra. note 49, 29; SIPRI Yearbook 1985, supra, note 6, 26, 154.

64. Perry, G. E., "Identification of Military Components Within the Soviet Programme", in Jasani (ed.), Outer Space - A New Dimension of the Arms Race, supra, note 1, 146.

65. "Space-Based Systems Stessed", AWST 3 March 1980, 25; "Defense and Space Equation", Jane's Defense Review No. 1, 1980, 73-77.

communications.[66] The DSCS is a key component of the Defense Communications System (DCS), which is the main system for providing worldwide telecommunications to DOD and other government agencies. The DSCS provides voice and data channels to military operations overseas and thus assures reliable and secure communications to both fixed bases and mobile and tactical units.[67] Furthermore, the DSCS acts as a high capacity communications system to the World-wide Military Command and Control System (WWMCCS), the National Command Authorities (NCA), the Ground Mobile Forces (GMF), the Diplomatic Telecommunications System (DTS), and selected allies.[68] Satellites under this programme are launched in pairs in geosynchronous orbit. The configuration of the system was established at four operational satellites and two spare satellites on-orbit.[69] The first series of satellites in this system, the DSCS II, is being replaced by the DSCS III series. The latter have been designed to resist the effects of nuclear weapons and are equipped with

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66. Karas, T., The New High Ground - Strategies and Weapons of Space-Age War, Simon-Schuster Inc., New York, 1983, 63-96.

67. Jasani (ed.), Outer Space - A New Dimension of the Arms Race, supra, note 1, 23.

68. Ibid.

69. Ibid.

anti-jam capabilities.[70] The first DSCS III satellite was launched on 30 October 1982.[71] The DSCS II and III satellites also relay data gathered by photographic and electronic reconnaissance satellites, for monitoring troop movements, the deployment of weapons and crisis management.[72]

The more important US military communications systems in space are: the DSCS; the Air Force Satellite Communications System (AFSATCOM); the Fleet Satellite Communications System (FLTSATCOM); the Satellite Data System (SDS); and the future MILSTAR (Military, Strategic, Tactical and Relay satellite).

AFSATCOM provides the US military with command, control, communication and intelligence (C^3I) capability. The key operational requirement that has distinguished this system from other military communications systems, is the need for AFSATCOM to provide a communications network

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70. Ibid., 26.

71. SIPRI Yearbook 1983, supra, note 35, 452.

72. Burke, K.H., "FY 1982 Budget Estimates, Research, Development, Test & Evaluation, United States Air Force", Committee on Armed Services, US House of Representatives, 97th Cong., 1st Sess., 1981, 385-415.

survivable throughout the entire spectrum of conflict.[73] AFSATCOM has no satellites devoted exclusively to its purposes. Initial AFSATCOM capability was provided by placing its transponders[74] on the US Navy's FLTSATCOM system, and the Air Force SDS satellites. The SDS provides critical, transpolar, two-way real-time command, control, and communications.[75] The SDS satellites are launched into highly elliptical orbits, similar to that used by the Soviet MOLNIYA satellites, at orbital inclinations of approximately 63° and orbital periods of 12 hours.[76]

The FLTSATCOM system operates in the UHF band and

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73. As stated by General Richard Ellis, USAF (Director, Joint Strategic Connecticut Staff, Joint Chiefs of Staff; Commander in Chief, Strategic Air Command; Director, Strategic Target Planning, Joint Chiefs of Staff): "Once execution is complete, we must have sufficient feedback data and intelligence information to evaluate not only the effects of our retaliatory attack on the enemy but also our own resources remaining to continue the war... Finally, we need communications in the trans-and-post attack period to reconstitute our surviving forces, generate follow-on sorties and retarget our forces, as required. This complicated cycle is then repeated until hostilities are terminated."; quoted in Karas, supra, note 66, 85.

74. A transponder is a combined receiver and transmitter the function of which is to transmit signals automatically when commanded.

75. Whelan, supra, note 9, 39.

76. Karas, supra, note 66, 85.

provides communications by digitalized voice, teleprinter and other techniques. These satellites will also be able to transmit computer-to-computer data, thus providing real-time readiness of combat direction, for example.[77] Four FLTSATCOMs have been launched since February 1978.[78] The latest one, FLTSATCOM 5, was launched on 6 August 1981, and is the last in a series of five, intended as an on-orbit spare for the four operational FLTSATCOMs.[79] Three new FLTSATCOM spacecraft have been approved for funding, and launching is expected to begin sometime in late 1985.[80]

The concept of leasing service for military satellite communications has been carried forward in the new LEASAT satellites.[81] LEASAT is to provide continuing UHF communications to the FLTSATCOM user group. The US Navy awarded a contract to Hughes Communications Services Inc.

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77. Jasani (ed.), Outer Space - A New Dimension of The Arms Race, supra, note 1, 105.

78. FLTSATCOM satellites were launched in February 1978, May 1979, January 1980 and October 1980.

79. SIPRI Yearbook 1982, supra, note 35, 310.

80. Whelan, supra, note 9, 47.

81. The LEASAT programme was approved in 1978, when the US Congress directed DOD to obtain extended UHF service by a lease rather than purchasing new satellite hardware; see, Karas, supra, note 66, 77.

which is to provide the services of four geosynchronous satellites for five years.[82] The LEASAT satellite has a launch weight of 15,000 pounds, and is designed for Shuttle launch only. The USN-LEASAT 1 was successfully launched during Shuttle mission 41-D on 31 August 1984,[83] while, USN-LEASAT 2 was also successfully launched on Shuttle mission 51A on 8 November 1984.[84]

Among the new US satellite communication systems currently envisaged, MILSTAR is of particular significance. An operational MILSTAR system, would comprise seven operational satellites, three in geosynchronous orbit, and four in polar orbit.[85] Their function will be to provide jam-resistant communications to both strategic and tactical users.

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82. Ibid.

83. "Mission Bolsters Commercial Viability", AWST, 10 September 1984, 95.

84. "Shuttle Deploys Two Communication Satellites", AWST, 19 November 1984, 19.

85. "Milstar to Employ Centaur Upper Stage", AWST, 2, January 1984, 21-22. Three satellites will be placed in equatorial orbit position to cover the Atlantic, Pacific and Indian Ocean areas, and South America. The other four satellites will be placed in inclined orbits to cover the polar regions, Europe, Africa and Western Asia.

b) **USSR**

The Soviet communications network is a three-tiered system, with satellites placed in low altitude, highly elliptical and geosynchronous orbits.

The first tier, comprises two constellations of satellites, placed at altitudes of 800 km and 1,400-1,500 km respectively,[86] at an inclination of 74°. They are launched under the Kosmos designation and are believed to function as relays of non time-urgent global communications.[87]

In 1984, four satellites were placed in highly elliptical MOLNIYA orbits, named after the Soviet satellites that pioneered this peculiar orbit.[88] MOLNIYA orbits are characterized by low altitude perigees (400 to 600 km) and very high apogees (39,000 to 40,000 km). These satellites spend over 75% of their 12-hour orbital period at very high altitudes over the northern latitudes, where Soviet military facilities and activities are almost exclusively concentrated, thereby allowing long intervals of communications

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86. For economy reasons, these satellites are launched eight at a time.

87. Johnson, supra, note 49, 16.

88. SIPRI Yearbook 1985, supra, note 6, 156.

over wide areas.

The number of geostationary satellite launches has risen considerably in recent years. Between 1974-78, one to two launches per year were conducted. In 1979, the rate increased to five per year, and eight launches occurred in 1984.[89]

3. Navigation Satellites

The ability to accurately determine the position of ground, air, and naval units, is essential to military operations. Navigation satellites send out coded signals with which armed forces can plot their own positions with a high degree of accuracy. Both the USA and Soviet Union have developed such satellites.

a) USA

The US Navy launched the first navigation satellite system, FRA Tansit, as early as 1960. The Transit system was developed to provide accurate location fixes for the

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89. Soviet Military Power 1985, supra, note 22, 58. For a detailed discussion of the three major Soviet programmes of geosynchronous communications satellites, see Johnson, supra, note 49, 18-20.

inertial navigation systems of Polaris, Poseidon, and now Trident submarines.[90]

The newest, and perhaps the most significant, use of navigation satellites is the US Global Positioning System (GPS) or NAVSTAR, which is being developed "to provide precision position location for accurate weapon delivery and other military operations in all weather conditions, on a global basis".[91] NAVSTAR is now in full-scale development[92] and is scheduled for full operational deployment in the next few years. When fully deployed, the GPS will consist of 18 satellites, an operational control segment, and approximately 25,000 sets of user equipment. The satellites will be arranged in three clusters of six,[93] in subsynchronous orbits of 10,900 nautical miles (20,000

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90. The programme name was recently changed to Transit Improvement Program (TIP), Nova and Oscar. The Navy uses about six satellites in polar orbit at an altitude of about 1,200 km.

91. Whelan, supra, note 9, 103.

92. NAVSTAR was approved for full-scale development in August 1979. See "GPS to Test Nuclear Detonation Sensor", AWST, 27 August, 1979, 51.

93. In its original conception, the system was to consist of 24 satellites orbiting the earth in 3 groups of 8 satellites. Budgetary restrictions were to cause the reduction in the number of satellites to be used. See, "NAVSTAR Program Changes Planned to Reduce Costs", AWST, 14 April 1980, 20.

km), and will provide ships, airplanes and even soldiers on the battlefield with position accuracy within 16 meters in three dimensions and velocity within 0.1 metre/ second in three dimensions. In addition, precise time will be available to all users, synchronized to within a millionth of a second.[94] The system will be able to navigate ICBMs to their targets very accurately and is envisaged for use with nuclear weapons.

The GPS will also carry new nuclear-explosion detectors, making up the Integrated Operational Nuclear-explosion Detection System (IONDS), which will serve both warning and damage assessment purposes. The ability to assess the number of nuclear warheads successfully detonated in the adversary's territory, would diminish the number of weapons needed to accomplish the same amount of destruction. This new technology, thus, has the potential for arming a nation with a first-strike capability.[95] To assure the uninterrupted functioning of the system, the signals on one channel are resistant to electronic countermeasures (ECM)

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94. Milton, T.R., "Space Operations Centre", in, NATO's Sixteen Nations, Vol. 29, Nov. 1984, 80, at 82.

95. According to Karas, with 10 IONDS, a "first-strike" intended to disarm the adversary's ICBM's looks feasible with a far smaller arsenal than before. See, supra, note 66, 173-78.

and multipath, and can be restricted to authorized users by means of transmission security devices.[96]

A useful summary of the NAVSTAR GPS has been provided by K.D. MacDonald of the Federal Aviation Administration (FAA).

> The NAVSTAR GPS has been developed to satisfy several long-standing concerns of the DoD. Its implementation should: (a) provide multiple users with accurate, continuous, world-wide, all-weather, common-grid, three-dimensional position and velocity data for navigation and other functions; (b) reverse the present trend towards proliferation of radio navigation systems used for various missions; (c) increase military force effectiveness by enhancing accuracy and other capabilities for weapon delivery; and (d) provide a cost-effective satellite host for complementary payloads.[97]

b) USSR

The Soviet Union launches six to seven Kosmos series navigation satellites into marginally elliptical orbits every year.[98] These satellites appear to have

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96. Whelan, supra, note 9, 111; Gray, supra, note 47, 32.

97. MacDonald, K.D., "Navigation Satellite Systems: Their Characteristics, Potential and Military Applications", in, Jasani (ed.), Outer Space - A New Dimension of the Arms Race, supra, note 1, 167.

98. See SIPRI Yearbook 1982, supra, note 35, 312; SIPRI

analogous capabilities and functions to those of the US Transit and Nova series. In 1982, the Soviet Union informed the International Telecommunications Union (ITU) that it intended to develop a Global Navigation Satellite System (GLONASS). The system will consist of 9 to 12 satellites in three orbital planes spaced 120° apart.[99] Three sets of triple GLONASS satellites have been launched since 1983.[100]

> While the Soviet Union insists that GLONASS is intended for testing elements and equipment of the space navigation system which is being set up with a view to determining the location of civil aviation planes and ships of the merchant and fishing fleets of the Soviet Union,[101]

the high cost of such a system and the low signal level at the earth's surface (to enhance jam resistance) both suggest a military application.[102]

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Yearbook 1983, supra, note 35, 453; SIPRI Yearbook 1984, supra, note 35, 374; SIPRI Yearbook 1985, supra, note 6, 157.

99. Johnson, supra, note 49, 21.

100. See SIPRI Yearbook 1982, supra, note 35, 312; SIPRI Yearbook 1983, supra, note 35, 453; SIPRI Yearbook 1984, supra, note 35, 374; SIPRI Yearbook 1985, supra, note 6, 157.

101. Tass, Moscow, 25 July 1983.

102. Gray, supra, note 47, 33. See also, Soviet Military Power 1985, supra, note 22, 58.

B. ANTI-SATELLITES (ASATs)

Often referred to as "killer satellites",[103] the term ASAT is used to describe any device capable of destroying the operational capability of satellites in Earth orbit.[104] These devices can be ground-based, air-based or space-based. Ground and air-based systems can involve: (1) the direct ascent launch of a missile carrying either a nuclear or non-nuclear warhead; (2) co-orbital devices with explosive warheads; or (3) the use of a directed-energy weapon such as a laser. Space-based systems could involve

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103. Vlasic, I., "Disarmament Decade, Outer Space and International Law", (1981) 26 McGill L.J. 135, 158.

104. Robert W. Buchheim, head of the US Delegation to the USA - USSR anti-satellite weapons talks asserted that "an anti-satellite system is any kind of system to destroy a satellite or to damage a satellite (for example, by poking a hole in the skin or by damaging equipment incorporated in the satellite - in short, any kind of system for doing violence to a satellite." Buchheim, R.W., "Arms Control Measures, Current and Potential, Applicable to Satellites and Their Uses", in, Arms Control and the Militarization of Space, Subcommittee on Arms Control, Oceans, International Operations and environment, Committee on Foreign Relations, US Senate, 97th Cong., 2nd Sess., Wash., D.C., 20 September, 1982, 47. For a review of the various definitions of ASAT weapons, see, Lexicon, prepared by the Centre for Research in Air and Space Law, (CASL), McGill University, 31 March 1984, 22-34 (unpublished).

explosive "space mines", conventional interceptors, or directed-energy weapons.[105]

1. USSR

Although the Soviet Union may have several ASAT systems, only one, the ground-based co-orbital system, has been termed "operational" by the US DOD.[106] Since 1968, the USSR has been making sporadic tests of an ICBM-launched interceptor satellite, launched into an orbit close to that of the target satellite. The interceptor, bearing a conventional warhead, explodes when it is approximately 1 km from the target. The interceptor itself weighs more than 2,000kg and is about six metres long.

Test results for the Soviet ASAT system are summarized in Table I.[107]

The overall success rate for this system has been

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105. See Smith, M.S., "'Star Wars': Antisatellites and Space-Based Ballistic Missile Defense", Congressional Research Service (CRS), Issue Brief No. IB 81123, Updated 21 April 1984, Library of Congress, Wash., D.C., 2-3.

106. "Soviet Space Programs: 1976-80", Committee on Commerce, Science and Transportation, US Senate, Part I, Wash., D.C., December 1982, 184.

107. See, Johnson, supra, note 49, 39.

TABLE I

TEST	DATE	INTERCEPTOR (KOSMOS NUMBER)	INTERCEPT ALTITUDE (KILOMETERS)	ORBITS BEFORE INTERCEPT	TEST RESULT
1	Oct. 20, 1968	249	525	2	FAILURE
2	Nov. 1, 1968	252	535	2	SUCCESS
3	Oct. 23, 1970	374	530	2	FAILURE
4	Oct. 30, 1970	375	535	2	SUCCESS
5	Feb. 25, 1971	397	585	2	SUCCESS
6	Apr. 4, 1971	404	1,005	2	SUCCESS
7	Dec. 3, 1971	462	230	2	SUCCESS
8	Feb. 16, 1976	804	575	1	FAILURE
9	Apr. 13, 1976	814	590	1	SUCCESS
10	July 21, 1976	843	1,630	2	FAILURE
11	Dec. 27, 1976	886	570	2	FAILURE
12	May 23, 1977	910	1,710	1	FAILURE
13	June 17, 1977	918	1,575	1	SUCCESS
14	Oct. 26, 1977	961	150	2	SUCCESS
15	Dec. 21, 1977	970	995	2	FAILURE
16	May 19, 1978	1,009	985	2	FAILURE
17	Apr. 18, 1980	1,174	1,000	2	FAILURE
18	Feb. 2, 1981	1,243	1,005	2	FAILURE
19	Mar. 14, 1981	1,258	1,005	2	SUCCESS
20	June 18, 1982	1,379	1,005	2	FAILURE

Source: Garwin, R. L., Gottfried, K. and Hafner, D.L., "Antisatellite Weapons", Scientific American, June 1984, at 47.

45 percent. Tests have been limited to low orbits, with the highest altitude achieved being 1,710km, and have been restricted to orbital inclinations between 62 and 65° with respect to the Equator.[108] Only 18 US satellites are in orbits that low, the "highest value" satellites being in geosynchronous orbit, at about 36,000km.[109]

Several flaws have been attributed to the Soviet ASAT system. First, a satellite can only be attacked when its ground track runs close to the ASAT's launch site, a condition satisfied only for satellite orbits with inclinations higher than the latitude of the ASAT's launch site. As this occurs only twice a day, an average wait of six hours is required to attack a given satellite. Second, the ASAT weapon requires a massive booster rocket which can be launched only from a limited number of facilities in the USSR.[110] Third, successive launchings of such massive boosters from the same launching site are difficult to execute. Fourth, the highest altitude reached during the Soviet testing is far below the orbits of the important US

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108. Ibid.

109. "Antisatellite Weapons: What They Are and Do", N.Y. Times, 4 July 1984, p. A-4.

110. A total of eight sites have been labelled as possible launching sites. See, "Earthly Folly in Space", N.Y. Times, 2 March 1984.

navigation, early-warning and communications satellites. Taken together, these factors have lead to the estimate that it would take the Soviet ASAT force a week or more to destroy all US satellites within its reach.[111] From the foregoing, a number of leading scientists have concluded that the current Soviet ASAT system "presents a ponderous, inflexible and quite limited threat to the US".[112]

A Soviet high-altitude orbital interceptor capability is thought to be a possible threat, though there is no direct evidence of such a programme being undertaken by the Soviets.[113] Speculation has existed for several years that the Soviet Union is developing space-based laser and particle beam weapons.[114] In March 1983, the US DOD

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111. If satellites at 20,000 km or higher were to be attacked, a much more massive booster rocket would be required, and judging from the test record it is unlikely that the ASAT weapon would have the manoeuvring and booming capabilities to intercept at such altitudes. See, Garwin, R.L., Gottfried, K. and Hafner, D.L., "Antisatellite Weapons", Scientific American, June 1984, 45, at 49.

112. Ibid.; see also, "ASAT's and Security", N.Y. Times, 12 July 1984, p. A-9 and "A Step Closer to Star Wars", Time Magazine, 12, Dec. 1983, 18.

113. US Policy on ASAT Arms Control Communication from the President of the United States, US House of Representatives, 98th Cong., 2nd Sess., 3 April 1984, 8-9.

114. "Soviets Test Killer Spacecraft", AWST, 30 October

released a report stating that there was now under development

> a very large, directed energy research program including the development of laser-beam weapon systems which could be based either in the USSR, aboard the next generation of Soviet ASATs or aboard the next generation of Soviet manned space stations.[115]

According to DOD estimates, the Soviets could field a prototype space-based laser ASAT system in the late 1980's.[116] The first operational system might appear as soon as the early 1990's. Likewise, a space-based ABM system might be tested in the 1990's, but not gain operational status until after the year 2000.[117] In late 1983, USAF officials reportedly described the Soviet space-based laser effort as one that might reach a limited ASAT

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1978, 17. According to this article the Soviets have conducted eight successful electron beam atmospheric propagation experiments using unmanned Cosmos spacecraft, the manned Soyuz spacecraft, and the manned Solyut space station.

115. Soviet Military Power, (2nd ed.), GPO, March 1983, 67.

116. Ibid., 68.

117. These estimates were reiterated by Under Secretary of Defense Fred Ikle; see, "Ikle Sees Soviet Space-Based Laser ASAT in Late '80's", Defense Daily, 20 May 1983, 115.

capability in the late 1980's.[118]

The report added that a space-based ballistic missile defense system using lasers might be tested in the 1990's, but would probably not be operational until the year 2000.

While exotic, space-based, directed-energy weapons may pose a threat in the long-run, several other near term threats have been alluded to by US officials. One such threat, would be the development of large Soviet boosters which could lead to ASATs capable of reaching American geosynchronous satellites.[119] Even more ominous were two separate reports that Soviet ground-based directed-energy systems may already have interfered with high-value US space payloads. One account claimed that a US recsats malfunctioned while flying over the Soviet Union.[120] Other incidents concerned the possible laser illumination of allied communications satellites by the Soviets.[121]

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118. "Soviet SBL: Lower Power Than Proposed U.S. System", Defense Daily, 27 December 1983, 293.

119. "Soviet Threat in Space Said to Be on Rise", AWST, 16 May 1983, 46-47.

120. "Damaged Satellite", AWST, 21 February 1983, 13.

121. "Soviet Rebuff", AWST, 2 January 1984, 13.

2) USA

Although several systems were discussed in the early 1960's, the only operational ground-based ASAT system developed by the United States, used nuclear warheads launched by Air Force Thor missiles and Army Nike-Zeus missiles. Tests of the Army system were conducted beginning in May 1963, but the system was deactivated in 1964. The Air Force tested its system beginning in May 1964 and it remained operational until 1975.[122]

The origins of the decision to develop a new American ASAT system as a response to the continued Soviet ASAT effort, can be traced to the closing days of the Ford Administration.[123] In concurring with development of an American counter-weapon to the Soviet ASAT, several shifts in American policy were emphasized. The US ASAT development programme began during President Carter's tenure, as a

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122. For information on the US ground-based ASAT system see, "Anti-satellite Polaris Being Developed", AWST, 28 September 1964, 18-9; "Satellite Killers", AWST, 21 June 1976, 13; "Anti-satellite Effort Decision Awaited", AWST, 24 January 1977, 19.

123. Outer Space Arms Control Negotiations, US Senate, 98th Cong., 1st Sess., 18 November 1983, 5.

"response to Soviet activities in this area".[124] It consists of a miniature homing vehicle (MHV) which would be launched from a two-stage rocket,[125] carried by an F-15

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124. White House Press Release (Description of a Presidential Directive on National Space Policy). The White House, 20 June 1978. Reproduced in Christol, C.Q., The Modern International Law of Outer Space, Pergamon Press, New York, 1982, 900.
The White House Stated:

> The United States finds itself under increasing pressure to field an anti-satellite 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 oportunity at this early juncture to stop an unhealthy arms competition in space before the competition develops a momentum of its own. The two countries have commenced bilaterial discussion on limiting certain activities directed against space objects, which we anticipate will be consistent with the overall U.S. goals of maintaining any nation's right of passage through and operations in space without interference.
>
> While the United States seeks verifiable, comprehensive limits on anti-satellite capabilities and use, in the absence of such an agreement, the United States will vigorously pursue development of its own capabilities. The U.S. space defense program shall include an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to the U.S. space systems. (emphasis added).

See also Chapter II B. 1(b)(i).

125. "Perry Sees Technology Shifts to Soviets", Aerospace Daily, 4 March 1981, 18. The MHV will be fitted to a Short-Range Attack Missile (SRAM) acting as the first stage, and a Thiokol Altair research rocket as the second stage.

aircraft.[126] This air-launched missile was tested for the first time on 21 January 1984, the first of a scheduled twelve test flights.[127] According to DOD, the system should be operational in 1987. It is worthy of note that the ASAT testing was strongly opposed by the US Congress.[128] This moveable launch platform will give wide coverage to the US ASAT. The MHV's will steer themselves towards the target satellite using a heat-seeking sensor, and, if successful, will destroy the target by impaction. The maximum altitude of the US ASAT weapon has not been announced, although it is surmised that the highest priority targets would be reconnaissance and ocean-surveillance satellites at altitudes of 500 km or less.[129]

The small size of the MHV makes the US ASAT system

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126. "USAF Flight Tests ASAT Weapon", AWST, 30 January 1984, 19. The ASAT missile carried a simulated miniature vehicle, and was launched by the F-15 toward a point in space, althought no part of the weapon system went into orbit. No target was involved in the test. See also, "ASAT Carried by F-15 During Compatibility Testing", AWST, 2 May 1983, 19.

127. "USAF Flight Tests ASAT Weapon", ibid.

128. "ASAT Test Opposed", AWST, 21 March 1983, 19.

129. Garwin et al., supra, note 111, 49-50; see also, "Priorities Set for Antisatellite System", AWST, 3 September 1979, 57.

much more versatile than the current Soviet system. In principle, any F-15 can be adapted to carry the ASAT weapon, and scientists believe that if the USA were to invest in the required control facilities and bases, it could acquire a force capable of destroying all low-orbit Soviet satellites in a matter of hours.[130] As with the Soviet ASAT system, more capable launch vehicles could be utilized to increase the altitude range of the US ASAT system.[131]

President Reagan reaffirmed the US commitment to pursue an operational ASAT system in his space policy directive issued on 4 July 1982:

> The United States will develop and maintain an integrated attack warning, notification, verification and contingency reaction capability which can effectively detect and react to threats to United States space systems. The United States

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130. As stated by Garwin, Gottfried and Hafner: "The characteristics of the U.S. antisatellite system demonstrates that in the unconstrained scenario it is entirely possible that by the end of the decade all low-orbit satellites could be threatened with virtually simultaneous prompt destruction. By that time space mines might be following geosynchronous satellites; eventually antisatellite weapons armed with lasers could also be available to attack high-altitude satellites"; ibid.

131. However, in a Communication from the President on US Policy on ASAT Arms Control, it was stated that: "The United States has no plans to extend the altitude capability of the MHV ASAT system to place high altitude satellites at risk. We are, however, continuing to review ways in which US ASAT capability could be improved"; supra, not 113, 18.

> will proceed with development of anti-satellite (ASAT) capability, with operational deployment as a goal. The primary purposes of a United States ASAT capability are to deter threats to space systems of the United States and its allies and, within such limits imposed by international law, to deny any adversary the use of space-based systems that provide support to hostile military forces.[132]

C. STRATEGIC DEFENSE INITIATIVE (SDI)

A March 23, 1983 televised Presidential address provided the most dramatic indication that space is rapidly becoming the new line of defence. In what has popularly been dubbed the "Star Wars Speech", President Reagan presented a "vision of the future", in which the capability to "intercept and destroy strategic ballistic missiles before they reached our own soil and that of our allies" would allow the USA to abandon a strategy of deterrence which requires keeping our society hostage to nuclear war.[133]

While acknowledging that developing capabilities

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132. Reproduced in, Communication from the President of the United States, U.S. Policy on ASAT Arms Control, supra, note 113. 7.

133. Text of Reagan address on Defense Policy, reproduced in (1983) 41 Congressional Quarterly Weekly Rep. 629, at 632.

suitable to this mission would be "a formidable task", the President noted that such a programme involved many uncertainties and could take decades of intense effort to complete. Nevertheless, the President believed the goal worthy of challenging the scientific community to render nuclear weapons "impotent and obsolete", and directed "a comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles."[134]

The pursuit of an impenetrable defence which would protect against the threat from nuclear weapons is not a new phenomenon. The American anti-ballistic missile (ABM)[135] effort began shortly after the Second World War. Soviet advances in long-range rocketry led to an increased US interest in ABM research. In the late 1950s, $300 million dollars a year was poured into the development of a

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134. Ibid., 633.

135. Anti-ballistic Missile (ABM) and Ballistic Missile defense (BMD) are often used interchangeably to describe systems designed to destroy ballistic missiles. The ABM designation fell out of favor after the eventual demise of the Sentinel and Safeguard ABM systems in the late 1960's. BMD has largely replaced ABM as the term of choice. This study will use both terms interchangeably.

defensive system called Nike-Zeus.[136] The Nike-Zeus was a single-layer ground-based missile system, which used mechanically-steered radars to guide a long-range rocket interceptor armed with a nuclear warhead.[137] The system was highly vulnerable to simple counter-measures, such as balloon decoys, and would have been easily overwhelmed by later increases in Soviet nuclear forces.[138] Despite intense Army and contractor pressure, deployment of the Nike-Zeus system was blocked by President Kennedy.

The second-generation US ABM, was a two-layer system begun in 1968, called Sentinel. In 1969, President Nixon announced a decision to deploy a more modest ABM

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136. Paper presented by L. Jack Ruina at the Canadian Student Pugwash Meeting on "International Security and Outer Space", reproduced in, Proceedings of a Conference Held at McGill University on 16-17 March 1984, p. 34. According to Dr. Ruina, this amount represents approximately $1 billion dollars a year in current US dollars.

137. Chayes, A. & Wiesner, J., (eds), ABM An Evaluation of the Decision to Deploy an Antiballistic Missile System, New York, 1969, at XV.

138. "June 1984 National Campaign to Save the ABM Treaty Report on the Impact of United States and Soviet Ballistic Missile Defense Programs on the ABM Treaty", in, "Arms Control in Outer Space", Hearings before the Sub-Committee on International Security and Scientific Affairs, Committee on Foreign Affairs, US House of Representatives, 98th Cong., 1984, 361. (Hereinafter cited as "Arms Control in Outer Space Report").

system to replace Sentinel, called Safeguard. That system was land-based and comprised of large phased-array radars, computers and two missiles with nuclear warheads.[139] The use of nuclear warheads in the BMD system was perceived as a severe limitation. If ever used, the nuclear explosions of the ABM warheads could interfere with the radars, computers and communications required for the system to be operational.[140] Moreover, the cost of the defence was much greater than that of the offensive buildup required to overcome it.[141]

As indicated in Table II, infra, research on BMD continued to be funded in the USA even after the signing of the ABM Treaty,[142] primarily out of fear of a "technology

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139. The two missiles were the Spartan, with a range of several hundred miles, designed to intercept incoming reentry vehicles in outer space; and the Spirit, with a range of 25 miles, designed to intercept incoming targets during reentry, see, supra, note 137, at 7.

140. Smith, M. L., "Legal Implications of a Space-Based Ballistic Missile defense", (1985) 15 Cal. Western Int'l L.J. 52, 54-55.

141. "Arms Control in Outer Space Report", supra, note 138.

142. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems, U.S.T. 3435. Signed 26 May 1972; entered into force 3 October 1972.

TABLE II

U.S. Spending on BMD after the ABM Treaty
Fiscal 1973-85
Millions of dollars

Year and type of funding	Continued deployment of Safeguard	Continued development of site defense	Development of advanced missile technology	Development of systems technology	Development	Procurement
1973						
Actual	599	80	93	...	...	...
1974						
Planned	341	110	62	...	...	...
1975						
Actual		...	95	117	...	...
1976						
Actual	...	...	97	100	...	...
1976						
Planned	...	...	25	25	...	...
1977						
Planned	...	...	103	100	...	...
Actual	...	...	102.7	100	...	...
1978						
Planned	...	...	107.3	106.2	...	...
Actual	...	...	107.3	106.2	...	...
1979						
Planned	...	...	113.5	114	...	...
Actual	...	...	113.5	114	...	...
1980						
Planned	...	...	120.8	120.8	...	...
Actual	...	...	...	240.7	...	...
1981						
Planned	...	...	...	268.2	...	...
Actual	...	...	...	266.6	...	...
1982						
Planned	...	...	...	...	462.1	57.3
Actual	...	...	...	...	462.1	...
1983						
Planned	...	...	...	...	519	...
1984						
Proposed	...	...	...	...	709.3	...
1985						
Proposed	...	...	...	...	1564	...

Reproduced in, Schwartz, D.N., "Past and Present: The Historical Legacy", in, Carter, A.B. & Schwartz, D.N. (eds.), Ballistic Missile Defense, The Brookings Institution, Wash., D.C., 1984, at 344.

surprise" and a rapid Soviet "break-out" from the ABM Treaty.[143] American missile R&D focused on improving techniques for defending military installations, particularly ICBM silos, rather than defending the population.[144] Improvements in technology relevant to BMD, did not advance sufficiently to convince the policy community that defensive weapons systems were worthy of a second look.[145]

In 1982, retired Air Force General Daniel O. Graham launched the "High Frontier Project", which stimulated a renewed public debate on BMD. "High Frontier" is not a technology development programme. It is a strategy - "a new national strategy", as the subtitle of General Graham's book clearly indicates.[146] The Graham proposal holds that existing weapons systems would allow the USA to achieve a "technological end-run on the Soviets". "High Frontier" proposes a Global Ballistic Missile Defense (GBMD) system which would consist of two levels of space-based platforms

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143. Stein, J.B., From H-Bomb to Star Wars, Lexington Books, Lexington, 1984, 54.

144. The Site Defense Program developed a rapidly deployable radar and interceptor system for this mission.

145. See Chapter II B.1

146. Graham, Gen. D., High Frontier - A Strategy for National Survival, Pinnacle Books, New York, 1983.

and a ground-based point defence network. The first layer would be designed to intercept Soviet ICBMs, while the second layer is projected as a broader space-based network, which would use "advanced beam weaponry". The project emphasized that a space-based BMD system could be established with existing technology, while allowing that some-day, lasers might be used.[147] The project can achieve all its objectives for approximately $40 billion. The group recommended placing 432 satellites in Earth orbit, positioned to cover all Soviet ICBM silos, each armed with 40-50 miniature homing vehicles,[148] based on the design for the F-15 ASAT system.[149] Although the specifics of 'High Frontier' failed to convince top US defence and science advisors,[150] the strategy it espoused struck a responsive chord with President Reagan. Thus, following his Star Wars speech, the President issued a National Security Decision Directive (NSDD) on 25 March, 1983, to "direct the development of an intensive effort to define a long-term research and development program", to remove the ballistic

147. Ibid., 147-190.

148. Ibid., 152-3.

149. See supra, this chapter, Section B.

150. For a detailed survey of some of the questions raised see, Stein, supra, note 143, 58-59.

missile threat.[151] The President's press release also stated:

> In order to provide the necessary basis for this effort, I further direct a study to be completed on a priority basis to assess the roles that ballistic missile defense could play in future security strategy of the United States and our allies. Among other items, the study will provide guidance necessary to develop research and development funding commitments for the FY 1985 Departmental budgets and the accompanying Five-Year Defense Program (FYDP).[152]

Pursuant to the 25 March, 1983 NSSD, the DOD established a Defensive Technologies Study Team, under former NASA Administrator James C. Fletcher, to prescribe a plan for the R&D programme. A parallel effort, called the Future Security Strategy study and headed by Fred S. Hoffman, addressed the implications for nuclear policy of renewed emphasis on BMD.

1. Ballistic Missile Characteristics

The first study group, the Fletcher Panel, examined a variety of potential missile defence technologies. The study is both optimistic and cautious, and recommends that

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151. The White House, Office of the Press Secretary, Press release of 25 March, 1983 (emphasis added).

152. Ibid.

"with vigorous technology development programs, the potential for ballistic missile defense can be demonstrated by the early 1990's".[153] While a long-term BMD technology is outlined, it is also recommended that "certain intermediate technologies can and should be demonstrated as part of the evolutionary research and development program."[154] The successful demonstration of such technologies would build "credibility and confidence".[155]

The Fletcher Panel focused on the technologies required to develop a layered defence, that would attempt to intercept ballistic missiles during each of the 4 principal stages of its trajectory: boost, postboost, midcourse and terminal.[156] During the boost-phase, the rocket engines accelerate the missile through and out of the atmosphere, and produce a unique and intense signature. The boost-phase of existing ICBMs lasts for 3 to 5 minutes and ends at an

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153. Robinson, C.A., "Panel Urges Technology Advances", AWST, 17 October 1983, 16.

154. Robinson, C.A., "Study Urges Exploiting of Technologies, AWST, 24 October 1983, 50.

155. Robinson, supra, note 153, 18.

156. Weiner, S., "Systems and Technology", in, Carter, A.B. & Schwartz, D.N. (eds.), Ballistic Missile Defense, The Brookings Institution, Wash., D.C., 1984, 51-52.

altitude of 300 to 400 km above the atmosphere.[157] A post-boost or deployment phase follows boost. This phase may last another several hundred seconds. During this phase, a post-boost vehicle or "bus" separates from the main engines, and the MIRVs (multiple independently targetable re-entry vehicles) are deployed along slightly different trajectories. The bus can also be used to deploy penetration aids such as decoys and CHAFF.[158]

In the third or midcourse phase, the individual reentry vehicles and penetration aids travel on ballistic trajectories through space, above the earth's atmosphere for approximately 1,000-1,500 seconds. To be effective in this phase, a defensive system would have to be capable of discriminating between debris, decoys and re-entry vehicles.

In the terminal phase of the missile trajectory, the re-entry vehicles and penetration aids re-enter the earth's atmosphere, where they are affected by atmospheric drag. Thus, the atmosphere acts to filter out booster, bus and other debris, as well as penetration aids. Although

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157. Bethe, H.A., Garwin, R.L., Gottfied, K. & Kendall, H.W., "Space-Based Ballistic Missile Defense", Scientific American, October 1984, Vol. 251, No. 4, 39, at 41.

158. Chaff are radar-reflecting wires; see, ibid., 42.

discrimination is slightly easier in this phase, the time available for interception is approximately 30-100 seconds.[159]

This layered approach, thus, builds on the previous US BMD research efforts: the Nike-Zeus and the Sentinel-Safeguard system.[160] By additional layers, the SDI hopes to improve the overall effectiveness of the defence. The envisioned four layers, would be capable of intercepting 95% of incoming warheads.[161] Furthermore, the use of different types of sensors and interceptors for each layer would make the defence less vulnerable to counter-measures.[162]

This brief account reveals why boost-phase interception would be an indispensable part of any BMD: every missile that survived boost phase would become a complex "threat cloud" by the time it reached midcourse.[163]

The SDI programme seeks to explore technologies enabling the construction of a very effective three or four-

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159. Weiner, supra, note 156, 23.

160. Supra, this chapter, Section C.1.

161. Stares, P. & Pike, J., "The 'Star Wars' Initiative - Problems and Prospects", in, Space Policy, Vol. 1, No. 2, May 1985, 153, at 154.

162. Ibid.

163. Bethe et al., supra, note 157, 42.

layer defense system.[164] According to Dr. Richard D. De Lauer, US Under-Secretary of Defense for Research and Engineering, the key functions of BMD capable of engaging the missile attack along its flight path include:

- to promptly and reliably warn of an attack and initiate the defence;
- continuously track all threatening objects from the beginning to the end of their trajectories;
- efficiently intercept and destroy the booster or post-boost vehicle;
- terminal intercept at the outer reaches of the atmosphere and destruction;
- battle-management, communications, and data processing.[165]

Following the Fletcher and Hoffman Panel recommendations, the President signed NSSD #119 on 6 January 1984, formally implementing the multi-billion dollar SDI Research development effort. The SDI is administered within the DOD by the Strategic Defence Technology Office (SDTO) which is run by Lt. Gen. James Abrahamson who will report directly to

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164. De Lauer, R.D., "Antiballistic Missile Defense - The Opportunity and the Challenge" in, NATO's Sixteen Nations, November 1984, at 23.

165. Ibid., 24.

the Secretary of Defence, Caspar Weinberger.[166]

The DOD portion of the SDI program has brought together a number of existing BMD related technologies. These have been consolidated into the SDI's five principal technical areas of development:

1. Surveillance, acquisition, tracking and kill assessment (SATKA);
2. Directed energy weapons;
3. Kinetic energy weapons;
4. Systems analyses and battle management; and
5. Support programmes.

Over the past decade, the US ABM research programme has been funded at about $1 million annually. The SDI is expected to break with this trend, by spending about $26 billion during the next five years, as indicated infra in Table III.[167]

2. SATKA

Within this programme, there are three major elements. First, are technology based efforts, to develop the database and techniques for ABM radar and optical

166. "Abrahamson Will Direct Strategic Defense", AWST, 2 April 1984, 21.

167. Stares & Pike, supra, note 161.

TABLE III

SDI Budget Breakout
($ in millions)

PE	Subject	Original FY 1985 Budget	Adjust.	Final FY 1985	FY 1986	FY 1987
63220C	Surveillance Acquisition, Tracking, Kill Assessment	$721.0	-$175.0	$546.0	$1,386.3	$1,874.9
63221C	Directed Energy Weapons	489.0	-112.7	376.3	965.4	1,195.6
63222C	Kinetic Energy Weapons	356.0	-100.0	256.0	859.7	1,238.6
63223C	Systems Analysis and Battle Management	99.0	0	99.0	243.3	272.5
63224C	Survivability, Lethality and Key Support Technology	112.0	0	112.0	258.1	316.7
	Management Headquarters	0	8.0	8.0	9.2	10.0
TOTALS		$1,777.0	-$379.7	$1,397.3	$3,722.2	$4,908.3

Source: Military Space - 18 February, 1985

sensors.[168] Optical, infrared and radar signatures of re-entry vehicles and penetration aids will be measured.[169] The second element, is the advanced development of new techniques of radar imaging. In the early 1990's, the Imaging Radar Project, will demonstrate a space-based imaging radar capable of monitoring ballistic missiles in the boost and post-boost phase and discriminating re-entry vehicles from decoys.[170] The Imaging Laser Project will attempt the same thing, using lasers rather than radar beams.

The third element, system demonstrations, calls for the testing of prototype sensor systems. Four key demonstrations have been identified. The first will be of advanced boost-phase detection and tracking system. Formerly called the Advanced Warning System (AWS), it incorporates greatly enhanced infrared sensors which provide high resolution and precision for tracking missiles in their boost-phase.[171] The second, will be of the Space

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168. Ibid., 155.

169. "The SDI Program and Rationale", excerpts of a statement delivered on 9 May 1984 to the US Congress by Lt. Gen. Abrahamson, reproduced in, Survival, Vol. XXVII, No. 2, March/April 1985, 75, at 77.

170 Stares & Pike, supra, note 161, 155.

171. The AWS program is evoked to the Defense Advanced

Surveillance and Tracking System (SSTS) which will use cryogenically-cooled infrared sensors to track and distinguish re-entry vehicles from decoys during the midcourse flight phase. This system, was previously under development to track satellites in support of the new air-launched ASAT weapons.[172] The third test, will involve the Airborne Optical Adjunct (AOA), consisting of a modified C-135 aircraft that carries two infrared telescopes for tracking and identifying re-entry vehicles for midcourse and terminal interception. Finally, ground radar imaging and tracking demonstrations will continue as part of the mid-course and terminal defence programmes. New demonstrations will be conducted as technology progresses.

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Research Projects Agency (DARPA) HALO (high altitude low observation) surveillance technology. It is also the follow-on for the current Defense support Program (DSP) satellites. See "Panel Urges Boost-Phase Intercepts", AWST, 5 December 1983, 50, at 52; see also, Whelan, supra, note 9, 79-83 and 90-92.

172. Stares & Pike, supra, note 161, 155; see also, Jasani (ed.), Outer Space - A New Dimension of The Arms Race, supra, note 1, 380.

3. Directed-Energy Weapons[173]

Directed-energy weapons are intended to intercept ballistic missiles in their boost and post-boost phases. This programme pursues four main areas of development: space-based lasers;[174] ground-based lasers; space based particle beams;[175] and nuclear driven directed-energy weapons. DOD plans "to demonstrate the feasibility of the leading candidate beam-generators by the mid 1980s and their scalability to weapon performance levels in the late 1980s

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173. Directed-energy weapon is defined as a weapon that employs a highly focussed and precisely directed beam of very intense energy, either in the form of light (a laser), or atomic particles travelling at velocities close to the speed of light (a particle beam weapon). See Glossary of ABM Terms, Appendix 41, in, "Arms Control in Outer Space Report", supra, note 138, 476.

174. Laser is the acronym for Light Amplification by the Stimulated Emission of Radiation. It is a device for producing an intense beam of light. The beam of light is amplified when photons (quanta of light) strike atoms or molecules. These atoms or molecules are thereby stimulated to emit new plutons (in a cascade or chain reaction) which have the same wavelengths and are moving in phase and in the same direction as the original pluton. Lasers convert electrical or chemical energy into light; ibid.

175. Particle beams weapons rely on the technology of particle accelerators (atom-smashers) to emit beams of charged or neutral particles travelling at the speed of light, such a beam could theoretically destroy a spacecraft by heating it.

or early 1990s."[176]

The space-based laser project, has incorporated DARPA's[177] Triad project, which includes three components: the ALPHA laser; the TALON GOLD pointing and tracking experiment; and the Large Optics Demonstration Experiment (LODE) demonstration.

The ALPHA long-wavelength infrared chemical laser, is aimed at weight reduction and increased fuel efficiency to achieve a design configuration suited for space deployment.[178] Ground demonstration of the ALPHA laser is planned for about 1987. The TALON GOLD programme, involves the design, fabrication, and space demonstration of a laser acquisition, tracking and pointing (ATP) system. The TALON GOLD system, includes a laser radar and improved inertial reference platforms.[179] It is planned to orbit the pointing and tracking equipment, for satellite high-energy defence applications using the space shuttle in 1988-

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176. Supra, note 169.

177. Overall responsability for the programme recently was transferred from DARPA and USAF to the new SDI. See, "Talon Gold Launch Slips", AWST, 20 August 1984, 16.

178. Whelan, supra, note 9, 121.

179. Fossum, R., "Research and Development, Title II", Part 4, Statement made before the Committee on Armed Services, US House of Representatives, 97th Cong., 1st Sess., 1981, 82-170.

89.[180] Coupled with this, is the LODE. The purpose of the LODE programme, is a ground demonstration of a four metre diameter optical system, suitable for providing the beam- forming for DARPA's space laser programme.[181]

The ground-based lasers would include lasers operating at visible and ultraviolet wavelength. These lasers would use space-based mirrors to direct their beams onto distant targets. Lasers of this type are said to be at least five years behind in development, as compared to long wavelength lasers such as ALPHA.[182]

Space-based neutral particle beam weapon technology is not as advanced as that of space-based lasers. Particle beam weapons would provide in-depth energy diposition, soft kill of electronics and melting of components and structures.[183] Methods of neutralizing accelerated charged particles are being investigated at Los Alamos Laboratory.[184] According to Lt. Gen. Abrahamson, the neutral particle beam weapons are "essentially operational on a

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180. Supra, note 177.

181. Whelan, supra, note 9, 123.

182. Stares & Pike, supra, note 161, 156.

183. See "Panel Urges Boost-Phase Intercepts", supra, note 171, 51.

184. Lemer, "Killer Particle Beams", IEEC Spectrum, Sept. 1981, 41-47.

small scale at Los Alamos".[185] Numerous technical difficulties may, however, preclude near-term demonstrations.[186]

Finally, the nuclear-driven directed energy project will develop X-Ray lasers which are powered by a small nuclear explosion.

4. Kinetic Energy Weapons

Kinetic energy weapons include interceptor missiles and hypervelocity gun systems. They would be capable of intercepting ballistic missiles in all phases of their trajectory. Targets are destroyed through the use of explosive warheads, or by direct collision. The goals of this programme, are to expand the technology data base to support the development of improved and advanced weapons, and to develop and demonstrate kinetic energy weapons designed to satisfy the SDI mission needs.[187] Several prototypes of interceptors are being considered.

The High-altitude Endoatmospheric Defense System

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185. "Current Technologies Could Aid in Implementing Reagan's SDI Policy", AWST, 10 December 1984, 75.

186. Supra, note 169.

187. Ibid.

(HEDS), is a rocket interceptor using a heat seeking hit-to-kill warhead, to destroy re-entry vehicles in the upper atmosphere.[188]

The Army's Ballistic Missile Defense Advanced Technology Center, is also conducting flight tests with a new hit-to-kill interceptor missile, using on-board millimeter wave radar sensors, designed to home in on nuclear-aimed re-entry vehicles and destroy them on impact within the atmosphere.[189]

The Exoatmospheric Reentry Vehicle Interceptor System (ERIS) is a heat-seeking rocket, that will intercept warheads outside the atmosphere and destroy them on impact.[190] ERIS is an advanced follow-on to the Homing Overlay Experiment (HOE) which was completed in June 1984 and consisted of four tests of a ground-based exoatmospheric non-nuclear kill vehicle.[191]

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188. Stares & Pike, supra, note 161, 156; Whelan, supra, note 9, 383.

189. Robinson, C.A., "Army Testing Hit-to-Kill, Radar Guided Interceptor", AWST, 9 July 1984, 38, at 40.

190. Stares & Pike, supra, note 161, 156.

191. The HOE used an optically guided non-nuclear warhead that homes on and destroys reentry vehicles by colliding with them at high speed. The kill vehicle is equiped with a long wavelength infrared sensor.

A rocket-propelled defence system to protect space-based assets and a system to intercept SLBM during boost-phase, are also under study.[192]

The greatest technical emphasis in kinetic energy weapons research, is placed on hypervelocity launches or electromagnetic rail guns.[193] The rail gun will use an electromagnetic accelerator to propel projectiles to very high velocities for boost phase and midcourse defence.[194]

5. Systems Analysis and Battle Management

A space-based BMD system would require an unprecedented information-processing capability to assist in sensing, discriminating, and tracking ballistic missiles.

(continued from previous page)
Only the fourth test, conducted on 10 June 1984 successfully intercepted and destroyed a target wearhead. See, "BMD Homing Intereceptor Destroys Reentry Vehicle", AWST, 18 June 1984, 19-20.

192. See, supra, note 189.

193. Robinson, C.A., "USAF Studies Hypervelocity Technology", AWST, 5 December 1983, 62-68. The gun will be capable of firing projectiles at velocities in excess of 10 km/sec. (or 6.2 mi/sec.).

194. Robinson, C.A., "Defense Dept. Developing Orbital Guns", AWST, 23 July 1984, 61-69.

In response to this, the Battle Management/Command, Control and Communications (BM/C^3) Project will develop technologies necessary "to allow eventual implementation of a highly responsive, ultra reliable, survivable endurable and cost effective BM/C^3 system for a low leakage defense system".[195]

The "Systems Analysis Project" will define the concepts, technologies and tactics, required to insure continued system effectiveness. The output from these studies, will be incorporated into other elements of SDI.

6. Support Programmes

The support programme, will examine certain fundamental issues related to the success of SDI. The "System Survivability Project", will identify promising survivability concepts or tactics, necessary to insure continued system effectiveness. Promising counter-measures will also be assessed. The "Lethality and Target Hardening Project", will assess the effectiveness of potential missile defence weapons, and the survivability of defence components against direct attack.[196]

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195. Supra, note 169, 78.

196. Ibid.; Stares & Pike, supra, note 161, 157.

Other support R&D includes the "Space Power and Conversion Project" which will consider both nuclear and non-nuclear systems as power sources for space-based weapons systems and sensors. The "Space Logistics Project" will research heavy-lift launch, orbit-to-orbit assembly and servicing, reusable systems, robotics, and advanced cryogenic engines.[197]

D. REUSABLE MANNED LAUNCHERS

1. USA

DOD involvement in the Shuttle design was prevalent since the inception of the programme. Of the 311 missions listed on the most recent shuttle manifest, for the years FY83-FY94, 114 (37%) will be for DOD use, compared to 93 (30%) for NASA, 38 (12%) for US commercial users and 38 (12%) for foreign users.[198] Furthermore, President Reagan recently signed NSDO 164, requiring USAF to book at least one third of all shuttle flights starting in

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197. "SDIO Support R & D Notes Hardening, Reactors", Military Space, 10 June 1985, 9-10.

198. Smith, M.S., "Space Shuttle", CRS Issue Brief No. 1B81175, 18 July 1984, Library of Congress, Wash., D.C., 7.

1988.[199]

Most indicative of the level of DOD commitment to the space shuttle programme, is the development and construction under its auspices, of shuttle-related facilities at Vandenberg Air Force Base, California. This "west coast launch site" facility is expected to become operational in October 1985.[200] The raison d'être of this project, is the military need for an orbital window to high inclination solar or sun-synchronous orbits, which gives more comprehensive coverage of Soviet military installations.[201] According to DOD, the "(p)erformance loss in launches to these orbits from the East Coast Kennedy Space Center would be unacceptable".[202]

DOD has also committed itself to fund whatever

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199. "Reagan Signs New Shuttle Policy", Military Space, 4 March 1985, 1-2

200. Statement of Edward C. Aldridge Jr., Under-Secretary of the Air Force on 23 February, 1984, in, "1985 NASA Authorization", Hearings before the Sub-Committee on Space Science and Applications, Committee on Science and Technology, US House of Representaties, 98th Cong., 2nd Sess., 1984, Vol. II, 658, at 660.

201. Moore, Maj. J.P., "Partners Today for Tomorrow - The Air Force and the Space Shuttle", Air University Rev., May/June 1982, 20 at 26.

202. "Aeronautics and Space Report of the President", 1980, Activities in the DOD section, 41.

shuttle facilities are deemed necessary for DOD operations. These include the Consolidated Space Operations Centre (CSOC), operational in 1986, and USAFs Space Command (SPACECOM), established on 1 September, 1982.[203] The latter was created due to a concatenation of perceived factors:

> the Soviet threat in space, ...increasing dependence on space systems, an ever-increasing space resource commitment, and the need to take full advantage of the space shuttle to enhance man's presence in space.[204]

USAF involvement in Shuttle operations is also exemplified by their role in the development of the Inertial Upper Stage (IUS), which will be used to place payloads from low earth orbit (LEO) to higher orbits, or into deep-space trajectories.[205] The IUS was specifically developed for USAF and is designed for the heavier defence payloads, such as the Tracking and Data Relay Satellite (TDRS).[206] The IUS successfully placed a classified military payload into geosynchronous orbit during Shuttle mission 51-C of 27

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203. Young, supra, note 15, 227-28, and sources thererein cited.

204. "Space Command", Air Force Magazine, May 1983, 96.

205. Young, supra, note 15, 85-90.

206. "Boeing Aerospace Wins IUS Contract", AWST, 14 February 1983, 23.

January, 1985.[207]

The utilization of the Shuttle for deployment of various military recsats, is anticipated with the phased transfer of this role to it from Atlas, Titan and Delta launchers, currently used for this purpose.[208] The military capabilities of the Shuttle are not simply a more efficient way of orbiting a variety of space instrumentalities. The key to its practical significance stems from the increased frequency of orbital activity it makes possible. The Shuttle's manoeuvrability in orbit, both its vehicular ability and the manned presence on board, makes it particularly suitable as a reconnaissance vehicle.[209] A Large Format Camera (LFC) was recently developed to be carried in the Shuttle's cargo bay.[210] It is capable of at least 23

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207. "IUS Meets Mission Objectives on Defense Dept. Shuttle Flight", AWST, 4 February 1985, 20. The IUS had previously failed on the launch of TDRS-A, on space shuttle mission 6. IDES-A was however stabilized and inserted into its proper orbit. See, "Loss of IDRS-A averted by Joint Action", AWST, 11 April 1983, 19-21.

208. "Space Reconnaissance Dwindles", AWST, 6 October 1980, 18.

209. Young, supra, note 15, 233-34.

210. "The Large Format Camera", 25 Spaceflight, 2 February 1983, 65.

metre resolution in black and white.[211] It is, thus, useful in a high quality, high flexibility reconnaissance mode and has been used extensively to photograph the Soviet Union.[212]

Both DOD and NASA see the Shuttle as "the primary means of launch until 2000".[213] Furthermore, the SDI programme, headed by former Shuttle manager Lt. Gen. James Abrahamson, promises to become one of the Shuttle's best customers. Two Shuttle SDI missions per year are scheduled, beginning in 1987, to "gradually improve US anti-missile defense capability."[214] However, the first SDI shuttle test was in fact successfully performed during Shuttle mission 5I-G on 20 June 1985.[215] The SDIO device carried

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211. Ibid., 66.

212. "Shuttle Crew Photographs Soviet Silo", AWST, 9 January 1984, 19; "Mission 98 Astronauts Photographed Submarine, Fighter Bases at Petropavlosk", AWST, 19 March 1984, 17; "US Space Shuttle Astronauts Photographed Soviet Flight Test Centre", AWST, 26 March 1984, 17.

213. "Reagan Signs New Shuttle Policy", Military Space, 4 March 1985, 1, at 2.

214. Covault, C., "Strategic Defense Initiative Will Use Two Shuttle Flights a Year", AWST, 18 February 1985, 20.

215. "Discovery Launch Demonstrates Shuttle Turnaround Capability", AWST, 24 June 1985, 24-26.

on the Shuttle was a 6 inch diameter laser retroreflector, which received and reflected a low-energy laser beam emanating from a test site on Maui, Hawaii. The experiment was designed to determine how well a low-power laser can track and obtain range rates reflected from an object in LEO.[216]

DOD involvement in the Shuttle programme has, thus, prompted a perception of the Shuttle as primarily a military vehicle, rather than both military and civilian.

2. USSR

Speculation about the existence of a Soviet Shuttle began in the 1970's. The US DOD has stated that facilities were being developed at Tyuratam to accommodate a reusable heavy-lift shuttle system, similar to the US Shuttle.[217] Estimated to be capable of lifting some 60,000 kg, this would give it twice the capability of the US Space Shuttle.[218]

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216. Ibid., 25; "SDI Begins Probable Decade of Shuttle Use With Test this Month", Space Commerce Bull., Vol. 2, No. 11, June 1985, at 5.

217. Soviet Military Power (2nd ed.), supra, note 115, 67.

218. Ibid.

Other space powers such as France[219] and Japan,[220] are also studying a shuttle development concept.

E. SPACE STATIONS

1. USSR

The Soviets have emphasized man in space since the beginning of their space programme. Since 1971, the Soviets have placed seven space stations in orbit.[221] Salyut 7 orbits low enough to be of utility in a reconnaissance mode.[222] In the opinion of one author,

> [t]he Soviets have used their manned Salyut space station for military purposes, regardless of their claims to

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219. "France Proposes Mini Shuttle Spacecraft", AWST, 8 August 1983, 17; Young, supra, note 15, 99-100.

220. "Japan Studies Small Shuttle Development", AWST, 4 October 1982, 22.

221. Smith, M.S., "Evolution of the Soviet Space Program From Sputnik to Salyut and Beyond", in, Ra'anan, U. & Pflatzgraff, R.L., (eds), International Security Dimension of Space, Medford, Mass., 1984, 285, at 288-293.

222. Salyut 7 orbital altitude varies from 295-350 km. above the earth's surface. See Johnson, supra, note 49, 42.

> the contrary. The Salyut on-board telescope is claimed to be a "solar research telescope" that has all the attributes of a reconnaissance instrument capable of a ground resolution on the order of half-meter (18 inches) or less.[223]

In its 1984 edition of Soviet Military Power, DOD states that the station's mission profile will range from command-control-communication (C^3) functions and reconnaissance, to "more offensively oriented missions as well",[224] though these are not defined. Other reports, claim that the complex will incorporate "kinetic and directed energy weapons" for its defence.[225] In the 1985 edition of Soviet Military Power, DOD claims that large space complexes will "enhance their (Soviet) space-based military support and warfighting capabilities".[226] Mission profiles would include military R&D, on-orbit repairs of satellites, reconnaissance, imagery interpretation, ASAT support operations, and BMD support opera-

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223. Stine, G.H., Confrontation in Space, New Jersey, 1978, 23. According to Marcia Smith, of the seven Soviet space stations, three are categorized as military, while four are considered to be primarily civilean. "Salyut 7 is probably a civilian station", see Smith, supra, note 221, 288.

224. "Soviet Space Station Will Carry Defense", AWST, 11 June 1984, 18.

225. N.Y. Times, 26 January 1984, p. B-8.

226. Supra, note 56.

tions.[227] The Soviets have had, and are projected to indefinitely to place greater emphasis than the USA on manned military space systems.[228]

2. USA

An American space station, set as a goal for the early 1990s in President Reagan's 1984 State of the Union Address on 25 January 1984, is not now intended for military use.[229] As stated by Lawrence S. Eagleburger, former US Assistant Secretary of Foreign Affairs:

> Le Président a approuvé un projet de station spatiale civile devant être entièrement financé par le budget de la NASA, sans l'apport de fonds de la Sécurité nationale.[230]

NASA Administrators have revealed that "the first station will have an orbit of low inclination (28°) and will not

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227. Ibid.

228. Johnson, supra, note 49; see also "Soviets Ready New Boosters at Tyuratam", AWST, 27 August 1984, 18.

229. "Reagan Votes for Space Station", New Scientist, 2 February 1984, 3.

230. Eagleburger, L.S., "De l'Atlantique au Pacifique: l'Occident s'est élargi", Géopolitique, Printemps-été 1984, 26 et 28.

pass over the Soviet Union".[231] Although this does not preclude reconnaissance activities, it would tend to negate the raison d'être for such activity. Lack of DOD enthusiasm over the space station programme may also be attributed to the participation of several countries in this project.[232] "The price of the necessary investment and construction commitment will be manned access to the station for representatives from the participating nations".[233] Thus, "the prospect of foreign personnel being privy to US military hardware seems all the more objectionable".[234] However, Space Command officers are now starting to discuss whether the space station could be used as a suitable mount for a space-based space tracking system, beneficial to both NASA and the military.[235]

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231. "Space Station Design is in the Air", New Scientist, 15 March, 1984, 24.

232. Memoranda of Understanding have been signed between NASA and Canada (16 April 1985), Japan (20 August 1985) and ESA (3 June 1985).

233. Young, supra, note 15, 241.

234. Ibid., 242.

235. Current NORAD/Space Command tracking capability is limited to spacecraft operating above 3,000 mi. altitude. See "USAF Initiates Broad Program to Improve Surveillance of Soviets", AWST, 21 January 1985, 14, at 16.

Furthermore, in its report on BMD technology, the Fletcher Panel indicated that

> ... a space-based system may also require a continuous manned space presence. Over 100 complex and expensive satellites with missions of highest national importance can be envisioned...Both cost and effectiveness may justify manned systems ...Development of a repair and refurbishment system may be the key to operational and economic viability of space-based ballistic missile defense.[236]

According to US military experts, the Fletcher report could have been an influential factor in President Reagan's decision on development of a space station.[237]

While the Shuttle fleet would seem to satisfy military requirements in the short term, long term military projects could benefit from manned space stations. It would therefore not be surprising if future DOD plans include their own space stations. If this were the case, "la NASA se tiendrait à sa disposition pour travailler avec lui et lui fournir toutes les informations nécessaires, ainsi que la loi l'exige."[238]

The military reconnaissance capacity of space stations was recognized by French President François Mitterand,

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236. Robinson, C.A., "Study Urges Exploiting of Technologies", AWST, 24 October 1983, 50.

237. Ibid.

238. Eagleburger, supra, note 230.

who called upon European countries to cooperate in the development of a manned military space station.[239]

The above discussion indicates the extent of military applications of outer space. The rampant militarization of outer space, has revealed a significant change of attitude among states. After years of merely tacit disapproval of the two Super- powers, many nations have now decided to express their objections formally and to seek urgent and effective measures against further abuses of outer space. The next chapter focuses on the attitudes of the world community towards these military space applications.

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239. "Mitterand Outlines Military Space Station", AWST, 20 February 1984, 61; see also Chapter II B.3.

CHAPTER II

POLITICAL PERSPECTIVES[1]

> The practical measures that we take are always based on the assumption that our enemies are not unintelligent.
>
> King Archidamus of Sparta, 432 B.C.[1]

> The great achievements of science ...are only instruments by which men try to do the things they most want to do.
>
> Franklin D. Roosevelt[2]

A. INTERNATIONAL PERSPECTIVES

1. The United Nations General Assembly

a) Prior to 1981

Following the adoption of the Outer Space

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1. Thucydides, The Peloponnesian War (trans. Rex Warner). Penguin Books, New York, 1977, 85.

2. Cited in, Teller, E. & Brown, A., The Legacy of Hiroshima, Doubleday, Garden City, N.Y., 1962, at 12.

Treaty[3] in 1966, the UN General Assembly became sanguine about the military implications of outer space. This occurred, despite the warnings of the Secretary General at the time of the adoption of the Treaty, that article IV covering arms control measures in outer space left much to be desired as it would permit the conduct of certain military activities and the placing of certain types of weapons in outer space.[4]

The ensuing decade was to witness not only the increased militarization of outer space but also the inception of its weaponization through the development of ASATs. The latter sensitized the General Assembly to the growing dangers of military escalation in outer space. On the basis of a working paper submitted by Italy,[5] the UN General Assembly during its first Special Session on

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3. Treaty of Principles Governing Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, adopted by UNGA Res. 2222(XXI), 19 December 1966; 610 U.N.T.S. 206. Opened for signature 27 January 1967; entered into force 10 October 1967.

4. See UN Doc. A/PV.1499 (1966), at 72.

5. UN Doc. A/AC.187/97 (1978). The working paper called for consultations with States parties to the Seabed Treaty to consider measures in the field of disarmament for the prevention of an arms race on the seabed and ocean floor and noted that parallel efforts should also be made for outer space in accordance with the spirit of the 1967 Outer Space Treaty.

Disarmament,[6] started considering the issue of increasing militarization of outer space. Though the Special Session did not pay great attention to the question of arms control in outer space, the final document contained the following declaration:

> In order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[7]

Little attention was paid to the growing dangers of the militarization of outer space during the 1979 and 1980 sessions of the General Assembly.[8]

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6. Which corresponds to the Tenth Special Session of the General Assembly, held from 23 May to 1 July 1978.

7. See Final Document of the Tenth Special Session of the General Assembly, UN Doc. A/RES/S-10/2 (1978), at 17. It is interesting to note that during the 1978 session, the General Assembly also considered the role that outer space could play in preserving peace on earth. French President Valerie Giscard d'Estaing proposed the establishment of an International Satellite Monitoring Agency (ISMA) to monitor compliance with disarmament and arms control agreements and to assist in investigating situations endangering international peace. For a discussion on ISMA, see, infra, Chapter IV A. 6.

8. It may however be noted that during the 1979 session, the General Assembly adopted and recommended to its member states for signature the "Agreement Governing Activities of States on the Moon and Other Celestial Bodies" (A/RES/34/68), generally referred to as the

b) 1981 Session

In 1981, by a letter dated 10 August, the Soviet Union requested that an item entitled "Conclusion of a Treaty on the Prohibition of the Stationing of Weapons of any Kind in Outer Space"[9] be included in the agenda of the General Assembly at its thirty-sixth session. In the letter, Soviet Foreign Minister Andrei Gromyko stated, that none of the existing international legal instruments had excluded the possibility of stationing in outer space those kinds of weapons which were not covered by the definition of weapons of mass destruction. Consequently, in the opinion of the Soviet Union, the danger of the militarization of outer space still existed and had recently been increasing.

When the proposal came up for discussion in the First Committee of the General Assembly, several delegations agreed that the time had come for an intensification of efforts to conclude further measures to prevent an arms race

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Moon Treaty. For further details see infra, Chapter III D. 3.

9. UN Doc. A/36/192 (1981). For a detailed discussion of the 1981 Soviet Draft see, infra, Chapter V B. 1(b).

in outer space.[10] Several delegations referred to the bilateral discussions between the USA and the USSR on the control of ASATs.[11] While some urged the resumption of these talks at the earliest opportunity, the delegate from Ireland emphasized that bilateral negotiations should not preclude the question from being considered in a multilateral forum where the participation of both super-powers was necessary.[12]

A draft resolution introduced by Mongolia, and sponsored by other Socialist states, noted the draft treaty proposed by the Soviet Union, and requested the Committee on Disarmament (CD) to start negotiations with a view to achieving agreement on the text of an appropriate treaty to prevent the spread of the arms race to outer space.[13] This resolution was adopted by a recorded vote of 123 to 0, with 21 abstentions.[14]

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10. For a detailed synthesis of discussions at the General Assembly, see, UN Disarmament Yearbook, Vol. 6, 1981, 267-75.

11. These bilateral talks broke down in 1979 following the Soviet invasion of Afghanistan.

12. Supra, note 10, 269.

13. UN Doc. A/RES/36/99, 9 December 1981.

14. Abstaining were: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Iceland,

Subsequently, Italy, on behalf of itself and a number of Western states, introduced a draft resolution entitled "Prevention of an Arms Race in Outer Space."[15] In it, the General Assembly would, inter alia, urge all states, particularly those with major space capabilities, to contribute actively to the goal of preventing an arms race in outer space and would request the CD to: (a) consider, from the beginning of its 1982 session the question of negotiating effective and verifiable agreements aimed at preventing an arms race in outer space; (b) give priority to the question of negotiating an effective and verifiable agreement to prohibit anti-satellite systems; and (c) report on its consideration of the subject to the General Assembly at its thirty-seventh session. This resolution was adopted by a recorded vote of 129 to 0, with 13 abstentions.[16]

Deliberations on these two resolutions revealed a somewhat different approach by the Socialist states on the one hand and the Western states on the other. The former

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Israel, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Portugal, Spain, Tunisia, Turkey, UK, and USA.

15. UN Doc. A/RES/36/97C, 9 December 1981.

16. Abstaining were: Afghanistan, Bulgaria, Byelorussia, Cuba, Czechoslavakia, German Democratic Republic, Hungary, Lao People's Democratic Republic, Mongolia, Poland, Ukraine, USSR, Viet Nam.

group focused on a broad treaty to prohibit the stationing of weapons of any kind in outer space, and called specifically for the CD to embark on negotiations of such a treaty. The latter group placed emphasis on the contribution of satellites in the verification of disarmament agreements and in promoting peace, stability and international co-operation, and also on the specific question of ASAT systems. The CD was asked to consider the negotiation of verifiable agreements aimed at preventing an arms race in outer space.

c) 1982 Session

The 1982 session of the General Assembly underlined the different approaches by Socialist states and Western states to the question of precluding an arms race in outer space. The former group favoured the conclusion of a comprehensive treaty regulating space weapons including ASATs. As stated by the Soviet delegate:

> the substance of the problem is the prevention of the arms race in outer space as a whole, and the question of anti-satellite systems can be considered in the context of the adoption of effective measures to resolve that problem.[17]

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17. UN Doc. A/C.1/37/PV.9 (1982), at 27. The Soviet Union also reconfirmed its "readiness to resume negotiations with the United States on anti-satellite systems". Ibid., 28.

The Western bloc continued its 1981 policy by giving priority to the negotiation of a treaty banning ASAT systems.

Three resolutions were adopted during the thirty-seventh session of the General Assembly. The first, sponsored by the socialist and non-aligned countries, requested the CD to establish an ad hoc working group at the beginning of its 1983 session, "with a view to undertaking negotiations for the conclusion of an agreement or agreements, as appropriate, to prevent an arms race in all its aspects in outer space."[18] This attracted the support of some Western countries, such as France, the Federal Republic of Germany, Italy and the Nordic countries, and was adopted by a vote of 138 in favour. Only the USA voted against it, while seven countries abstained.[19] The second, sponsored by the USA and other Western Europe states, requested the CD "to continue consideration of the question of negotiating effective and verifiable agreements aimed at preventing an arms race in outer space", and to consider as a matter of priority, "the question of negotiating an effective and verifiable agreement to prohibit anti-satellite sys-

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18. UN Doc. A/RES/37/83, 9 December 1982.

19. Abstaining were: Australia, Belgium, Canada, Israel, Luxembourg, The Netherlands, UK.

tems."[20] This resolution was adopted by a vote of 112 to 0, with 29 abstentions.[21] The third resolution requested the Secretary General to report to the General Assembly at its thirty-eighth session on the implications of establishing an ISMA.[22]

The 1982 session exhibited a rapidly growing and serious concern by an overwhelming number of countries about the need to prevent an arms race in outer space. This concern, no doubt, was largely influenced by discussions in 1982 at the UNISPACE Conference,[23] the CD,[24] and the Committee on Peaceful Uses of Outer Space (COPUOS).[25]

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20. UN Doc. A/RES/37/99D, 13 December 1982.

21. Abstaining were: Afghanistan, Angola, Argentina, Benin, Bulgaria, Byelorussia, Colombia, Cuba, Czechoslovakia, Ecuador, Egypt, German Democratic Republic, Guinea-Bissau, Hungary, Lao People's Democratic Republic, Lebanon, Madagascar, Mexico, Mongolia, Mozambique, Panama, Peru, Poland, Saudi Arabia, Sri Lanka, Tanzania, Ukraine, USSR, Viet Nam.

22. UN Doc. A/RES/37/78 K, 9 December 1982. This resolution was adopted by a vote of 126 in favour, 9 against, and 11 abstentions. The USSR voted against it, while the USA abstained.

23. See, infra, this chapter, section A. 4.

24. See, infra, this chapter, section A. 2.

25. See, infra, this chapter, section A. 3.

d) 1983 Session

In 1983, by a letter dated 19 August, Soviet Foreign Minister Andrei Gromyko requested that an item entitled "Treaty on the Prohibition of the Use of Force in Outer Space and From Space Against Earth",[26] be included in the agenda of the General Assembly at its thirty-eighth session. In his letter, the Foreign Minister stated that the draft treaty was intended to completely ban the testing and deployment in space of any space-based weapon for destruction of objects on Earth, in the atmosphere and in outer space. The draft treaty also proposed, in Gromyko's opinion, a radical solution to the question of ASAT systems: the unconditional pledge of states not to create new ASAT systems and to destroy any ASAT system that they might already have.[27]

Both the Socialist and Western groups presented similiar proposals to the 1982 General Assembly resolutions sponsored by them. However, they later withdrew them in favour of a joint proposal of Egypt and Sri Lanka.[28]

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26. UN Doc. A/38/194 (1983). For a detailed discussion of the 1983 Soviet Draft see, infra, Chapter V B. 1(f).

27. See, infra, Chapter V, ibid.

28. "Prevention of an Arms Race in Outer Space", UN Doc.

This proposal, taking note of the Soviet draft treaty[29] presented at the 1983 session, requested the CD to: (a) intensify its consideration of the question of the prevention of an arms race in outer space in all its aspects; and (b) to establish an ad hoc working group at the beginning of its 1984 session with a view to undertake negotiations for the conclusion of an agreement or agreements, as appropriate. This proposal, when presented to the General Assembly as a resolution, received the support of 147 countries representing all political groups (Socialist, non-aligned and Western), with the exception of the USA, which voted against it, and the UK which abstained.[30] Commenting on the outcome of the consideration of this joint proposal by the General Assembly, Mr. Nandasiri Jasentuliyana, Deputy Chief of the UN Outer Space Affairs Division, remarked that

> (i)t is in a sense a historic resolution as no other disarmament resolution has received such a resounding vote in the General Assembly. It is indeed regrettable that although great efforts were made, a complete consensus could not be reached, but it nevertheless represents a strong statement by the international community calling for meaningful negotiations in this field, and it is difficult to see how such negotiations could be

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A/C.1/38/L.36 (11 November 1983).

29. Supra, note 26.

30. UN Doc. A/RES/38/70, 15 December 1983.

resisted too much longer.[31]

In view of their support for two resolutions previously adopted by the General Assembly,[32] the 1983 negative vote by the USA and the abstention by the UK seem not to be related to the need for an agreement, but rather to its nature. This fact is clear from the discussions which took place during various sessions of the CD.

There also exists a controversy over the appropriateness of fora, i.e. whether the CD or COPUOS, should discuss the issue of militarization and weaponization of outer space. The controversy became more evident at the 1983 session of the General Assembly's Special Political Committee (SPC). During discussions in the SPC on the report of COPUOS, some states, especially the Soviet Union[33] and some South American countries,[34] wanted to

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31. Jasentuliyana, N., "Arms Control in Outer Space: A Review of Recent United Nations Discussions", (1984) 9 Annals of Air and Space Law 329, 343. (Hereinafter cited as AASL).

32. See supra, notes 15 and 20.

33. The Soviet delegate to the SPC regretted the fact that the CD had been unable to make any progress in elaborating a treaty on the prevention of militarization of outer space. He further stated that "COPUOS in view of its long experience in the field, would be able to elaborate such a treaty". See UN Doc. A/SPC/38/SR.21 (1983), 3.

34. For example, the Brazilian delegate to the 1983

extend COPUOS' jurisdiction to include the military use of outer space. It is interesting to note, that the Soviet Union, which had previously always preferred the CD to have exclusive jurisdiction over the issue, changed its position. This move could be viewed either as a reflection of the urgency which the USSR attaches to this issue, or as a mere propaganda tactic. The USA was adamantly opposed to giving any jurisdiction to COPUOS in this matter and considered the CD to be the sole forum for all disarmament matters, including arms control in outer space. Resolution 38/80, which dealt with all aspects of the work of COPUOS, was adopted by the General Assembly by a vote of 124 in favour, 12 against and 8 abstentions.[35] The resolution urged all

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Session of the SPC was concerned that "outer space must not be turned into a battleground." He further elaborated that "COPUOS was the competent United Nations body to consider ways of filling in the gaps in international legislation concerning outer space .... COPUOS must not remain idle at a time when the legal framework governing the use of outer space was clearly inadequate to cope with current realities." However, he stressed that this "did not imply that negotiation of specific instruments relating to disarmament in outer space should be done in isolation from the Committee on Disarmament, which was the main multilateral negotiating body for questions of disarmament. The work of the two bodies should complement each other". See UN Doc. A/SPC/38/SR.19 (1983), 4.

35. See UN Doc. A/RES/38/80, 15 December 1983. Negative votes were cast by: Australia, Belgium, France, Federal Republic of Germany, Israel, Italy, Japan,

states to undertake prompt negotiations with a view to reaching agreement or agreements designed to halt the militarization of outer space and to prevent an arms race in outer space. It requested COPUOS to consider, as a matter of priority, questions relating to the militarization of outer space, taking into account that the CD was requested to consider the question of preventing an arms race in outer space. COPUOS was further requested to take into account the need to co-ordinate COPUOS and CD efforts in this matter. In brief, the General Assembly requested COPUOS to consider the generalities of militarization of outer space, while the CD was called to negotiate the specifics of a treaty or treaties to prevent an arms race in outer space. After the adoption of the Resolution, the US delegate at the 1983 session of the SPC "rejected the notion that COPUOS had any competence to hold substantive discussions on arms controls issues, [since the] Committee on Disarmament was the sole appropriate forum for such discussions", and asserted that "his government would have to re-examine its decision to participate in the work of COPUOS. It would do so with the keenest regret."[36]

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Luxembourg, The Netherlands, New Zealand, UK, USA. Abstaining were: Canada, Denmark, Finland, Iceland, Norway, Portugal, Spain, Sweden.

36. See UN Doc. A/SPC/38/SR.43 (1983), at 20-21.

The US hard line position adopted both in the SPC and the General Assembly were directly linked to President Reagan's 23 March, 1983 speech, which made a space-based defence system the centre-piece of US defence policy.[37]

e) 1984 Session

The statements made by many delegations in the 1984 session focused on the alarming danger of an arms race in outer space. Socialist countries were quick to deplore President Reagan's Strategic Defence Initiative (SDI), and accused the USA of striving for a first-strike capability.[38] Many of the Western countries warned against the destabilizing effects of SDI and of ASATs, and urged countries to work together in preventing an arms race in outer space.[39] Concurrently, the important functions performed by satellites such as national technical means

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37. See Jasentuliyana, supra, note 31, 346.

38. See statements made by the delegates of the USSR, UN Doc. A/C.1/39/PV.3 (1984); Bulgaria, UN Doc. A/C.1/39/PV.8 (1984); Mongolia, UN Doc. A/C.1/39/PV.20 (1984); and the German Democratic Republic, UN Doc. A/C.1/39/PV.29 (1984).

39. See statements made by the delegates of: Sweden, UN Doc. A/C.1/39/ PV.4 (1984); The Netherlands, UN Doc. A/C.1/39/PV.13 (1984); and Ireland, UN Doc. A/C.1/39/PV.29 (1984).

(NTM) of verification, reconnaissance, early warning, and communications were underlined, and were hailed as playing an indispensable role in fostering strategic stability.[40] It thus became clear that, although a considerable number of countries were willing to permit military uses which enhance stability, recent developments such as ASATs and Ballistic Missile Defence (BMD) systems were generally viewed as destabilizing and undermining international security.

For the third consecutive year, a joint proposal was made by the delegations of Egypt and Sri Lanka.[41] It was adopted by the General Assembly by a vote of 150 in favour, 0 against, and one abstention, the USA.[42] The resolution: (a) called upon all states, particularly those with major space capabilities, to take immediate measures to prevent an arms race in outer space; (b) requested the CD to establish an ad hoc committee at the beginning of its 1985 session, with a view to undertaking negotiations for the conclusion of an agreement; and, (c) urged the USSR and USA to initiate immediately bilateral negotiations on the

40. See statements made by delegates of: Sweden, UN Doc. A/C.1/39/PV.4 (1984); Ireland, UN Doc. A/C.1/39/PV.6 (1984); Italy, UN Doc. A/C.1/39/PV.8 (1984); Federal Republic of Germany, UN Doc. A/C.1/39/PV.11 (1984); and, Denmark, UN Doc. A/C.1/39/PV.17 (1984).

41. UN Doc. A/C.1/39/L.37 (1984).

42. UN Doc. A/RES/39/59, 12 December 1984.

subject. In a separate vote on the establishment of an ad hoc committee, the USA were against and ten other nations, including the UK, West Germany, Japan, and the Netherlands, abstained.[43]

2. The Committee on Disarmament (CD)

The CD has been the main forum for multilateral arms control negotiations for more than twenty years.

Following two resolutions of the General Assembly at its 1981 session, the CD, in 1982, started considering the issue of the control of militarization and weaponization of outer space.[44] Three separate proposals were submitted to the CD, respectively by a group of Western European states and the USA, the Socialist states, and a group of non-aligned states and Sweden (known as the Group of 21).[45] While each of the proposals referred to the need for establishing an ad hoc working group within the CD, they differed on the question of the mandate of such a

43. See "Arms Control Chronicle", Nos. 6-7, February-April 1985, at 8.

44. Supra, notes 13 and 15.

45. For details, see UN Report of the Committee on Disarmament, 37 UN GAOR, Supp. (No. 27); UN Doc. A/37/ 27 (1982), 101-03.

working group. The Western states urged that a working group should be established only when an agreement had been reached on its mandate which, according to them, should be the negotiation of an effective and verifiable agreement to prohibit ASAT systems. The Socialist states proposed the establishment of an ad hoc working group to undertake the negotiation of a treaty prohibiting the stationing in outer space of weapons of any kind. The proposal of the Group of 21, contained a draft mandate of the proposed working group, to undertake negotiations, in a comprehensive manner, for the conclusion of an agreement or agreements to prevent an arms race in outer space in all its aspects. Although almost all the member states expressed the necessity of agreements to prevent weaponization and further militarization of outer space, no consensus could be achieved on the question of establishing an ad hoc working group.

Both at the 1983 and 1984 sessions of the CD, all three political groups continued their 1982 policies and thus the ad hoc group was not established.[46] However, numerous delegations expressed their concern that a point of no return would soon be reached if, within the next year or two, effective steps were not taken to stop the introduction

46. See UN Report of the Committee on Disarmament, UN Doc. A/38/27 (1983), 168-169; Report of the Conference on Disarmament, UN Doc. No. A/39/27, (1984), 158-165.

of weapon systems in outer space.[47] The group of non-aligned nations, identified the following areas for the consideration by the proposed ad hoc group:

> (i) Negotiations to draft a comprehensive agreement or agreements, as appropriate, to prohibit:
>
> (a) the stationing in orbit around the earth, on any celestial bodies or at any other location in outer space of any weapon which has been designed to inflict injury or cause any other form of damage on the earth, in the atmosphere or on objects placed in space; and
>
> (b) the testing, production, deployment or use of any space-based, air-based or ground-based weapon system which is designed to damage, destroy or interfere with the functioning of any spacecraft of any nation.
>
> (ii) Examining the feasibility of extending Article IV of the Outer Space Treaty of 1967 to include a ban on all kinds of weapons from space, including all weapons based in space for use against any target and all anti-satellite weapons regardless of where they are based.
>
> (iii) Prohibition by international agreements of damage, disturbance or harmful interference in the normal functioning of permitted space objects, in order to strengthen the Outer Space Treaty of 1967 and to confirm the International Telecommunication Convention.[48]

France submitted a working paper in which it proposed that a concerted international effort be undertaken speedily to encompass the following:

> (1) Very strict limitation of anti-satellite systems, including in particular prohibition of all those capable of reaching

47. Ibid.

48. Ibid., 164.

high-orbit satellites, whose preservation is most important from the viewpoint of the strategic balance.

(2) Prohibition for a five-year period, which would be renewable, of the deployment on the ground, in the atmosphere or in outer space of directed energy weapons systems capable of destroying ballistic missiles or satellites at considerable distances and, as a corollary, prohibition of the relevant tests.

(3) Strengthening of the existing system for the provision of information, with an undertaking by each launching State or body to provide more detailed information on the characteristics and missions of objects launched so as to facilitate verification.

(4) Commitment by the United States and the USSR to extend to satellites of third countries the arrangements concerning the immunity of certain space objects already agreed between them bilaterally.[49]

There also existed, as noted earlier, a controversy over the appropriateness of fora, i.e. whether the CD or COPUOS should discuss the issue of militarization and weaponization of outer space. This difference remained unsolved throughout the debate on this specific item.

However, on 29 March 1985, the CD succeeded in reaching agreement on a mandate for an ad hoc Committee on

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49. See "French Statement to Conference on Disarmament, 12 June 1984", Excerpts reprinted in Survival, Vol. XXVI, Sept./Oct. 1984, 235, at 236-37. For further details see also, infra, Chapter V B. 2(a).

the Prevention of an Arms Race in Outer Space.[50] This development was welcomed by member nations as a first step toward an organized examination of the subject. This process is in accordance with the UN General Assembly resolution which was adopted without dissent during its 39th session on 12 December 1984,[51] and which called upon the CD to consider the question of preventing an arms race in outer space as a matter of priority. The mandate now adopted by the CD will permit the CD to begin some action and undertake concrete work also immediately.

The ad hoc Committee on the Prevention of an Arms Race in Outer Space established under the mandate, is "to examine, as a first step at this stage, through substantive and general consideration, issues relevant to the prevention of an arms race in outer space."[52] In the process, it should take into account all existing agreements, existing proposals and future initiatives, then report on the progress of its work to the CD in August 1985.

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50. See "Working Paper Survey of International Law Relevant to Arms Control and Outer Space", paper prepared by Canada for the CD, July 1985, at 1.

51. UNGA Res. A/39 A/39/20 (1984).

52. Supra, note 50.

3. COPUOS

Following the finalization of the Outer Space Treaty, which was considered by US President Johnson as "the most important arms control development since the limited test ban Treaty of 1963",[53] COPUOS remained silent over the growing military uses of outer space. This indifference continued despite the warnings of its Chairman, Ambassador Peter Jankowitsch, in his opening statement to the Committee in 1978, when he stated that

> (i)f indeed the human presence in outer space is to become more than a passing phenomenon, we must redouble our efforts to strengthen the basis - in international law, and most of all, in international treaties - of international co-operation for peaceful, and exclusively peaceful, uses of outer space, because the more outer space assumes the roles dreamers and utopians of former ages have suggested,

53. See "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies; Analysis and Background Data," Staff Report prepared for the use of the US Senate Committee on Aeronautical and Space Sciences, March, 1967, 16. It is also interesting to note, in this regard, the statement made by US Secretary of State Dean Rusk before the US Senate Committee on Foreign Relations. "Finally, the Treaty's arms control provisions are of immediate and particular importance to our national security....The Treaty succeeds in substantial measure in establishing the necessary standards for reducing the dangers of military conflict in outer space.". See "Treaty on Outer Space," Hearings before the US Senate Committee on Foreign Relations, 90th Cong., 1st Sess., Executive D, 1967, at 4.

> which the scientists of our time are now about to confirm, the more we shall feel obliged to protect this new environment from the ills, from the evils and from the burdens of our old terrestrial spheres. We must make sure that outer space can be spared the fate of so many human discoveries of previous ages - namely, becoming a mere battlefield. ... In this endeavour for peace in outer space the Committee holds an important role.[54]

These concerns were echoed in his 1979 opening remarks to the Committee when he observed that

> (e)fforts to strengthen and deepen détente in outer space should therefore be pursued no less energetically than similar efforts for détente here on earth. In order to preserve outer space as a predominantly peaceful environment, every effort should therefore be made to negotiate meaningful space arms control agreements.[55]

Only in 1980, after the Chairman had repeated his concern for the third time during his opening statement,[56] did members of the Committee start expressing their views on this issue. Concern was particularly expressed by several of the Socialist and third world countries, as well as Italy and Sweden. In this respect, some of these delegations expressed the view that the mandate of COPUOS should be broadened to include an item concerning the militarization of outer space. Other

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54. See Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/33/20 (1978), Annex I, at 25.

55. UN Doc. A/34/20, (1979), Annex I, at 22.

56. UN Doc. A/35/20, (1980), Annex I, at 20-21.

countries suggested that an additional protocol to the Outer Space Treaty should be developed in order to halt the militarization of outer space. The USA and some Western European states proposed that the question of disarmament should be discussed in the appropriate bodies of the UN dealing with disarmament, rather than in COPUOS.[57] In 1980, the COPUOS report to the General Assembly included, for the first time, a paragraph drawing the attention of the Assembly to the views expressed in the Committee on this issue.[58]

Similar views were aired at the 1981 session of COPUOS and the discussion centred around the agenda of its 1982 session. While Italy proposed that an item on "Ensuring the Use of Outer Space Exclusively for Peaceful Purposes" be added to the Committee's agenda, other Western countries and the USA opposed it. In their view, COPUOS was an inappropriate forum, since the question of arms control in outer space was inseparable from the complex question of general arms control on earth. They argued that such discussions should be undertaken in other fora, namely bilateral and in other bodies dealing with arms control such

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57. See Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/35/20 (1980), para. 67.

58. Ibid., para. 57.

as the CD.[59] Delegations from the non-aligned countries expressed the view that the time was ripe to elaborate legal rules forbidding the deployment of weapons of any kind in outer space.[60] However, no consensus was reached and the question remained unsolved at the end of the 1981 session of COPUOS. No progress was made at its 1982 session either, though numerous countries reiterated their desire that the international community should consider, as early as possible, the negotiation of measures to prevent an arms race in outer space.[61]

In his opening address to the Committee in 1983, the Chairman reminded the delegates that

> when discussing space activities we cannot overlook the fact that whatever happens in outer space has a growing effect not only on the security of nations, but also on the security of the entire international system.[62]

While admitting that COPUOS' mandate is limited to peaceful uses of outer space, he expressed the desire that

> the views and opinions on these matters

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59. See Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/36/20 (1981), para. 68.

60. See UN Doc. A/AC.105/PV.216, 217, 219-221 (1981).

61. Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/37/20 (1982), para. 55.

62. Report of the Committee on the Peaceful Uses of Outer Space, UN Doc. A/38/20 (1983), Annex I, para. 34.

> which emanate from this Committee, as they have in the past, should certainly be heard in fora that are competent and perhaps better equipped to deal with questions of arms control in outer space. It is our hope that questions of arms control in outer space will not only remain a priority item on the agenda of existing fora but that they will perhaps also return in the not-too-distant future to the agenda of arms control negotiations between the major space powers.[63]

This view was shared by a large majority of delegations at the 1983 session of COPUOS. Referring to the relevant portions of the UNISPACE '82 report,[64] they called for the early preparation of pertinent legal instruments for preventing any further militarization of outer space and its use for non-peaceful purposes.[65] Some countries, led by Brazil, felt that this issue should be included in COPUOS' agenda and considered on a priority basis. Others, led by the USA, however, were adamantly opposed to this and reiterated the view that negotiations of arms control agreements should be undertaken by the CD. Finally, several delegations favoured the resumption of bilateral negotiations between both super-powers on ASAT systems.[66] These divergent views were reflected in the Committee's report to

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63. Ibid.

64. Infra, this chapter, section A. 4.

65. Supra, note 61, para. 77.

66. Ibid., para. 78.

the Assembly.[67]

Pursuant to General Assembly Resolution 38/80,[68] COPUOS was given a mandate to consider the question of militarization of outer space. Thus, the 1984 session of COPUOS started its discussion on the agenda item entitled "Questions Relating to the Militarization of Outer Space". Since the USA had opposed the extension of COPUOS' mandate to consider the issue of militarization of outer space, the US delegation withdrew from the COPUOS meeting when it commenced discussion of this issue. Explaining the reasons for the walkout, the US delegate said that it

> was prompted by the Committee's increasing interest in disarmament issues over its traditional agenda of scientific exchange .... While the US hasn't reached a conclusion about future participation, there is little room for optimism regarding the future usefulness of the Committee.[69]

In the absence of the USA, the delegations of the other Western nations observed silence on this subject, with the exception of the UK delegate, who stated that "any such substantive discussion or dialogue [on this item] is for the Conference on Disarmament and not for this Committee".[70]

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67. Ibid.

68. Supra, note 35.

69. Quoted in Space Business Week, 30 July 1984, at 3.

70. UN Doc. A/AC.105/PV.261 (1984), at 6.

This statement seemed to represent the views of other Western members of COPUOS.

On the other hand, the delegations of both the non-aligned and Socialist states expressed their views that COPUOS had competence, as confirmed by General Assembly Resolution 38/80, to discuss the questions of militarization of outer space. India, on behalf of the Group of 77, issued a statement[71] which outlined the Third World's approach. The raison d'être of this statement can be drawn from the comments of the Nigerian delegate:

> It has often been argued that the subject of the militarization of space belongs solely to the Conference on Disarmament. That argument may well be plausible, but what naturally follows from it is that there are indeed weapons already deployed in space which will be the subject of control, limitation and destruction, to be discussed within the Conference on Disarmament. Yet the two space Powers have in turn told us that there are no such weapons in outer space. Granted that, we accept this for now, the question then arises, particularly in relation to those who insist on the sole competence of the Conference on Disarmament to deal with the matter: what, in all candour, is the Conference on Disarmament being asked to discuss limiting, controlling and ultimately destroying? What we want to see happen is the Committee legislating to prevent an arms race in outer space.[72]

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71. See UN Docs A/AC.105/PV.265 (1984), at 2-3; A/AC.105/L.150 (1984).

72. UN Doc. A/AC.125/PV.259 (1984), at 34.

No consensus could however be reached as to the future approach which COPUOS should adopt on the question of militarization of outer space.

4. UNISPACE '82[73]

Although UNISPACE '82

> was born of a desire to explore how the worldwide activities in outer space, including international cooperation, could be developed to ensure that the potential benefits from space science, technology and their applications would be truly realized for all countries;"[74]

the issue of an arms race in outer space was hotly debated.

Attention of the Conference was drawn to this matter by the Secretary-General of the United Nations, Perez de Cuellar, when he proclaimed in his opening address, that

> I spoke earlier of one factor that marred the rosy picture of co-operation in space. Now I wish to mention another one that, like approaching storm clouds, threatens to cut off all rays of hope: this is the increasing and rapidly escalating militarization of outer space. It is a trend which runs against the very principles on which a true United Nations approach should be based: international co-operation for the advantage of all and

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73. United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982.

74. Pal, J., "UNISPACE '82 and Beyond", (1982) 10 J. Space L. 181, 185.

> peaceful use of outer space to build, rather than to destroy. An arms race in space would increase the areas and the potential for confrontation, adding a new dimension to the human destruction that would stem from it: it would also divert urgently needed resources from programmes of social and economic development.
>
> We must oppose vigorously the increased militarization of outer space. We have time - but very little. Almost daily we read of proposals and even plans to increase the military component of space programmes. It is essential that the forces of reason and peace join together to counter what would be a frightening escalation of the arms race. For once, we have the possibility to face jointly, as the human family, the challenges and opportunities which lie in outer space for all humanity. The Outer Space Treaty of 1967, has made space 'the province of all mankind' and has declared the exploration of outer space be carried out 'for the benefit and in the interest of all countries'. The United Nations has the duty to be in the forefront of those who choose peace, rather than war, in this last and greatest of frontiers of the universe.[75]

The President of the Conference, Dr. Willibald Pahl, echoed this theme in his opening statement, when he remarked:

> Much international concern has been raised by the pursuit of research programmes in the field of anti-satellite and ABM-technology, programmes which might lead to a costly and destabilizing arms race in an area which should exclusively serve peaceful co-operation.... At the moment we are certainly at a crossroads between two options. There is the option of peace security and co-operation. But there is also the dark option of carrying hostilities beyond the confinement of the earth,

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75. Cited in Jasentuliyana, supra, note 31, 335-36.

> to disrupt the free interchange of science and applications and to plant all the seeds for destruction and conflict in outer space. I trust that this conferance will raise a clear signal towards the right direction.[76]

The most forceful plea to halt the growing militarization of outer space was voiced by the Group of 77, which made the following declaration:

> Group 77 nations are firmly of the view that the issue of militarization of Space is a matter of great concern. Group 77 nations urge that the Conference recommends that all Member Nations and, especially, those who have the capability, be asked to refrain from any activities which lead to the extension of arms race into outer space. Group 77 nations further reiterate that militarization of Space is detrimental to the entire humanity and hence extension of arms race to Outer Space, the moon and other celestial bodies that are the common heritage of mankind, should not be permitted. The position of the Group 77 nations is that testing, stationing and deployment of any weapons in Space should be banned. The Group of 77 considers necessary the adoption of a legal instrument that definitely bans the emplacement of weapons in outer space and verifiable controls and guarantees. In view of their special responsibility in this field, it is recommended that the two major powers open negotiations for an early agreement to prevent an arms race in outer space. Such negotiations should not inhibit or prevent the General Assembly from giving the necessary directives to the Committee on the Peaceful Uses of Outer Space and the Committee on Disarmament for the urgent consideration of this question in conformity with the spirit of the Treaty on Principles Governing the Activities of

76. Ibid., 336.

States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[77]

The US position on the militarization issue at UNISPACE '82 was that:

> Questions of arms control and militarization are not on the UNISPACE '82 agenda and it would be disruptive to insist that the conference pay special attention to it.[78]

US reluctance to discuss the issue at this conference, particularly in view of willingness to discuss it by all the other 93 participating countries, appeared to be, to many delegations, an effort to "stifle debate". The Soviets, for their part, positioned themselves before and during the conference to take maximum advantage of the US refusal to address the militarization issue. As stated in a recent Office of Technology Assessment (OTA) report:

> Soviet propaganda and diplomacy has positioned the Soviet Union vis-à-vis the United States very well on the space "militarization" issue. No matter who takes the "blame" for initiating an arms race in space..., the United States bears the onus for refusing to negotiate on it

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77. UN Doc. A/CONF.101/5, 13 August 1982. No consensus was obtained on this proposal. Due to the disapproval of the USA and of some Western European nations, the proposal is merely referred to in the UNISPACE '82 report and does not form one of its annexes.

78. "UNISPACE '82 Issue Paper: The Militarization of Outer Space", in, US Delegation to the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna-August 9-21, 1982: Briefing Book, sec. III-C.

[outside the Committee on Disarmament].[79]

In the end, the Conference arrived at compromise wording for the final "Decisions and Recommendations", which did not even raise any difficulties for the USA. The language of the relevant paragraphs is as follows:

> 13. The extension of an arms race into outer space is a matter of grave concern to the international community. It is detrimental to humanity as a whole and therefore should be prevented. All nations, in particular those with major space capabilities, are urged to contribute actively to the goal of preventing an arms race in outer space and to refrain from any action contrary to that aim.
>
> 14. The maintenance of peace and security in outer space is of great importance for international peace and security. The prevention of an arms race and hostilities in outer space is an essential condition for the promotion and continuation of international co-operation in the exploration and use of outer space for peaceful purposes. In this regard, the Conference urges all States to adhere to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies and strictly to observe its letter and spirit.
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> 426. The Conference strongly recommends that the competent organs of the United Nations - in particular the General Assembly and also the Committee on Disarmament - when dealing with measures aimed at a prevention of an arms race in outer space - in particular those mentioned in the relevant resolutions of the General Assem-

79. UNISPACE '82 - A Context for International Cooperation and Competition, A Technical Memorandum, US Cong., OTA Report, March 1983, 66.

bly - give appropriate attention and high priority to the grave concern expressed in paragraphs 13 and 14.[80]

The discussions held within the above mentioned bodies of the UN, all reveal a significant change of attitude among states towards the rampant militarization of outer space. After years of watching the USA and USSR with tacit disapproval, many nations have now decided to express their objections formally and to seek urgent and effective measures against further abuses of outer space.

5. North Atlantic Treaty Organization (N A T O)[81]

In his "visionary" speech of 23 March 1983, President Reagan challenged the scientific community to find the means of intercepting and destroying "strategic ballistic missiles before they reached our own soil or that of our allies."[82] In the past year, the impact of the SDI on

80. Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, UN Doc. A/CONF.101/10 (1982).

81. The 16 NATO member nations are: Belgium, Canada, Denmark, Federal Republic of Germany, France, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Turkey, UK, USA.

82. "Text of Reagan Address on Defense Policy", Congressional Quarterly Weekly Rep., Vol. 41, No. 12, 26 March 1983, 629, at 632 (emphasis added).

the NATO alliance has been questioned by several Western European nations. By making the deployment of nationwide BMD an explicit national goal, the SDI has raised concerns in Europe that the USA is moving toward a "Fortress America" mentality, and thus perceives its own security as separate from that of its NATO allies.[83] Furthermore, ABM systems are considered by many as limited by numerous technical problems, notably the short warning time available to implement such a system. The flight-time for missiles travelling from the Soviet Union to Western Europe is less than half the time taken to reach the USA. For missiles launched from Eastern Europe, the flight time is even shorter. This short flight time would require an automatic US ABM response, leaving no margin for error, or time for consultation.[84] In its 1983 report on space-based BMD, the North Atlantic Assembly, an advisory body to NATO, contended that the "practical obstacles to be overcome are daunting", extending to the development of new energy-generating devices and the need for "phenomenal accura-

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83. Gallois, P., "Militarisation de l'espace. Les projets défensifs et leurs conséquences sur l'Alliance", (1984) IX AASL 291.

84. "Europeans Support U.S. Space-Based Systems", AWST, 24 October 1983, 59. See also, Herman, R.G. & Rose, C.V., "Star Wars and NATO", Arms Control Today, July/Aug. 1984, 8.

cy".[85] Nevertheless, the report concluded that "(h)owever undesirable some feel an American ballistic missile defense system would be, the presence of solely a Soviet system would be still less desirable. Thus, while Soviet missile defense research continues, there is every reason for American research to continue."[86]

In the April 1984 NATO Nuclear Planning Group (NPG) meeting in Turkey, US Secretary of Defense, Caspar Weinberger, explained the SDI to his fellow defense ministers. They appear to have responded with a barely disguised dismay, the West German Defense Minister Manfred Wörner being particularly outspoken, stating that "(i)t is in the best interest of all mankind that [the US program] does not open up a new dimension of the arms race."[87] Wörner expressed concern that the US effort to develop anti-missile systems in space could "destabilize the East-West balance", undermine the US nuclear guarantee to defend Western Europe, and possibly split the Atlantic

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85. Ibid.

86. Ibid. A resolution asking the USA to continue developing a three-layer, space-based BMD approved by the 200 Legislators representing the parliaments of NATO countries except Turkey. One dissenting vote was cast by Danish Knud Damgoard.

87. Cited in Herman & Rose, supra, note 84.

Alliance.[88] NATO leaders thus concluded that both super-powers should give higher priority to negotiating arms control agreements than to developing these systems.

In 1985, the USA continued to actively solicit the participation of its NATO allies in the SDI research programme. At a security seminar convened in Munich in February 1985, Assistant Secretary of Defense Richard N. Perle appealed to 150 NATO officials and experts, to support the Reagan administration's space weapons program, saying that "defensive weapons would promote stability between the super-powers and reduce the risk of war."[89] Once again, these words were met with scepticism and widespread concern that an effective US BMD could lead to "decoupling" of Western Europe from the defense of the USA unless Europe were protected as well.[90] In March 1985, the NATO NPG issued a final communiqué, which included a statement of support for the SDI research programme, and which stated inter alia:

> (4) We have continued the comprehensive consultations on the political and stra-

88. Ibid. See also, Freedman, L., "NATO and the Strategic Defence Initiative", NATO's Sixteen Nations, Vol. 29, No. 6, November 1984, 18, at 19.

89. "NATO Is Urged to Back U.S. on Space Defense", Int'l Herald Tribune, 11 February 1985, p. 1.

90. Ibid.

> tegic implications of the United States' Strategic Defense Initiative (SDI). This is designed to establish whether recent advances in technologies could offer the prospect of significantly more effective defence against ballistic missiles. We support the United States research programme into these technologies, the aim of which is to enhance stability and deterrence at reduced levels of offensive nuclear forces. This research, conducted within the terms of the ABM Treaty, is in NATO's security interest and should continue. In this context, we welcome the United States invitation for Allies to consider participation in the research programme.
>
> (5) We noted with concern the extensive and long-standing efforts in the strategic defence field by the Soviet Union which already deploys the world's only ABM and anti-satellite systems. The United States strategic defence research programme is prudent in the light of these Soviet activities and is also clearly influenced by the treaty violations reported by the President of the United States.[91]

As underlined by the Secretary General of NATO, Lord Carrington, failure by the USA to research space-based BMD, could eventually tip the strategic balance of power in favour of the Soviet Union. "The US must research although not necessarily deploy the Strategic Defense Initiative (SDI)... because the Soviet Union is already researching such a system."[92] According to a survey by the Congres-

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91. NATO NPG Final Communiqué Excerpts, reproduced in, Survival, Vol. XXVII, No. 3, May/June 1985, 129.

92. "Star Wars Plan Needs Research-Carrington", The

sional Research Service of the US Library of Congress, most government officials in Western Europe share this view. Research is favoured, partly as a hedge against possible Soviet breakthroughs, and partly because they believe that research cannot be stopped.[93] Deployment, on the other hand, is overwhelmingly rejected, for reasons succinctly explained by General Pierre Gallois:

> Dans la mesure où le projet du Président Reagan, à long terme, aboutirait à la suppression totale de la garantie stratégique américaine sans pouvoir stopper les armes à courte portée qui menacent l'Europe, encore moins les forces d'invasion terrestres, les pays européens de l'OTAN se trouveraient à la discrétion de ceux du Pacte de Varsovie. A partir de l'espace il peut, peut-être, y avoir, un jour, une "forteresse America" et une "forteresse Sovietica". Difficilement une "forteresse Europa."[94]

In June 1985, NATO Foreign Affairs Ministers met in Portugal to discuss world security issues. A final communiqué was issued which included a statement of overwhelming support for current USA-USSR disarmament talks, but no mention of the SDI.[95] While the NATO NPG statement in

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Montreal Gazette, 25 January 1985, p. B-4. (emphasis added).

93. Supra, note 89, p. 2.

94. Gallois, supra, note 83, 300.

95. "OTAN: appui mitigé à la politique américaine", Le Devoir, 8 June 1985, p. 4. See also, "L'Alliance

support of the SDI research programme is more influential than this decision, the fact remains that Western European countries have expressed serious misgivings over the feasibility of President Reagan's SDI.

B. NATIONAL PERSPECTIVES

1. US Policy

a) The National Aeronautics and Space Act (NASAct) 1958[96]

The NASAct contains a "Declaration of Policy and Purpose", proclaiming: "The Congress hereby declares that it is the policy of the United States that activities in space shall be for peaceful purposes for the benefit of all mankind". Although Congress adopted the "peaceful purposes" standard for space activities and placed these activities under the auspices of NASA, Congress also carved out a national defence exception to handle certain military activities. Section 102(b) of the NASAct 1958 provides

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atlantique refuse de soutenir la guerre des étoiles", La Presse, 8 June 1985, p. A-12.

96. Public Law 85-568, 42 USC 2451.

that

> 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), shall be the responsibility of, and shall be directed by, the Department of Defense...

Furthermore, section 102(c) of the NASAct states, in part, that:

> (t)he aeronautical and space activities of the United States shall be conducted so as to contribute materially to...
> (6) The making available to agencies directly concerned with national defense of discoveries that have military value or significance....

Thus, it is apparent that at the time of the enactment, in 1958, of the basic legislation for US space endeavours, space activities associated with weapons systems, military operations or defence of the United States, were considered to be "for peaceful purposes". The military provisions, therefore, suggest that non-aggressive national defence programmes should play an active part in national space policy.[97]

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97. Halpern, J., "Antisatellite Weaponry: The High Road To Destruction", (1985) 3 Boston U. Int'l L. J. 167, 171.

b) Executive Policies and Directives

Following the enactment of the NASAct, successive administrations have made assurances that the USA is dedicated to promoting activities in space, through international cooperation, that are beneficial to all mankind.[98]

i) Carter Administration

In an effort to clarify domestic policy for space activities, the Carter Administration, in 1978, ordered the National Security Council Policy Review Committee to review existing space policy and develop guidelines for space activities.[99] The resulting Presidential Directive, established guidelines for US activities in, and use of, the space environment. The principles advanced included inter alia:

- The United States will pursue space activities to increase scientific knowledge, develop useful commercial and government applications of space technology, and

98. See, Christol, C.Q., The Modern International Law of Outer Space, Pergamon Press, Inc., New York, 12-48.

99. White House Press Release (Description of Presidential Directive on National Space Policy), 20 June 1978, reproduced in, Christol, ibid., 897.

maintain United States leadership in space technology.

- The United States is committed to the exploration and use of outer space in support of its national well-being.

- The United States holds that 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 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 and thereby strengthen national security, the deterrence of attack, and arms control agreements.

- The United States will conduct international cooperative space activities that are beneficial to the United States scientifically, politically, economically, and/or militarily.[100]

In addition to these guidelines, the Presidential Directive contemplated a space policy with an enhanced military role. Specifically, the Directive declared that national security related space programmes will conduct space activities necessary

> to our support of such functions as command and control, communications, navigation, environmental monitoring, warning and surveillance, and space defense as well as to support the formulation and execution of national policies; and to support the planning for and conduct of military operations.[101]

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100. Ibid., 898-99.

101. Ibid., 900.

The Directive also focused on the perceived Soviet threat in the field of ASAT capability. While recognizing that "by exercising mutual restraint", the United States and the Soviet Union have an opportunity "to stop an unhealthy arms competition in space", the Directive stated that the USA was pressured by existing Soviet ASAT development to pursue its own ASAT capability.[102]

Although it expressed hopes for mutual restraint in this area, the Directive reiterated the US position:

> While the United States seeks verifiable, comprehensive limits on anti-satellite capabilities and use, in the absence of such an agreement, the United States will vigorously pursue development of its own capabilities. The U.S. space defense program shall include an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to U.S. space systems.[103]

US-USSR discussions on limiting certain activities directed against space objects were discontinued in the summer of 1979, following the Soviet invasion of Afghanistan.[104] Only recently have negotiations been

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102. Ibid.

103. Ibid., 901.

104. Buchheim, R.W., "Statement, Arms Control and the Militarization of Space", Hearings Before the Sub-Committee on Arms Control, Oceans, International Operations and Environment, Committee on Foreign Relations, US Senate, 97th Cong., 2nd Sess., 1982, 44. The hearings were conducted to assess the adoption of

resumed.[105]

Following a four-month review, President Carter announced a space policy aimed to "confirm our [US] support of the continued development of a legal regime for space that will assure its safe and peaceful use for the benefit of mankind."[106]

Finally, mention should be made of the Carter administration's views on the feasibility of a BMD system. In 1980, President Carter's final year in office, Michael Deane noted that although "some exploratory research is being conducted" under the auspices of the Department of Defence (DOD), "no real optimism exists for the possibility of creating an effective weapon."[107] Similarly, in

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Senate Resolution 129 of 27 April 1981, which called for the resumption of negotiations on ASAT weapons.

105. See, infra, this chapter, section B.1(b)(ii).

106. Fact Sheet on US Civil Space Policy issued by the White House, 11 October 1978, reproduced in, Christol, supra, note 98, 902-07.

107. Deane, M., "Soviet Military Doctrine and Defensive Deployment Concepts: Implications for Soviet Ballistic Missile Defense", in, Davis, J.K., Pfaltzgraff, R.L., Uri'Raanan, Deane, M.J., & Collins, J.M., The Soviet Union and Ballistic Missile Defense, Cambridge, Mass., Institute for Foreign Policy Analysis, March 1980, 59. Deane also notes that Richard Garwin and other physicists and engineers believe that "the chances of developing an effective charged-particle beam weapon are extremely remote. While acknowledging

assessing the new technologies as recently as 1981, scientists wondered whether directed-energy weapons "will pass the test of engineering feasibility." Space-based defense was considered only for the "more distant future", and only then because new fears concerning hostile Soviet space activities beyond ASAT weapons rekindled US interest in pursuing further BMD research.[108]

ii) Reagan Administration

In August 1981, President Reagan directed a National Security Council review of space policy. The Directive indicated that Presidential Science Advisor, Dr. George Keyworth III, in coordination with affected agencies, should examine whether new directions in national space policy were warranted. On 4 July 1982, the President announced a National Space Policy that was to "set the direction of US efforts in space for the next decade".[109]

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Soviet research in this area, they labelled Soviet efforts as "completely irrelevant" and "technically infeasible".

108. Kincade, W., "Over the Technological Horizon", Daedulus, Winter 1981, 117.

109. The White House Fact Sheet on National Space Policy, 4 July 1982, reproduced in, Gray, C.S., American Mili-

Basic goals of the Space Policy included inter alia:

- strengthening the security of the United States;
- maintaining United States space leadership;
- cooperating with other nations in maintaining the freedom of space for activities which enhance the security and welfare of mankind.[110]

Pursuant to the principles underlying the conduct of the US space programme, the USA is "committed to the exploration and use of space by all nations for peaceful purposes and for the benefit of mankind. "Peaceful purposes" here allow activities in pursuit of national security goals.[111] After referring to the right of space systems to pass through, and operate in, space without interference, the 1982 policy statement noted that, "(p)urposeful interference with space systems shall be viewed as an infringement upon sovereign rights".[112]

US military space policy also specifies the goal of

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tary Space Policy, University Press of America Inc., Lanham, 1982, 107-13.

110. Ibid., 107-08.

111. Ibid., 108.

112. Ibid.

achieving an operational ASAT capability, both to deter attacks on US space systems and to deny any adversary the use of their space-based assets.[113] Not surprisingly, the approach adopted for ASAT arms control permits the government to hold open all options.

> The United States will continue to study space arms control options. The United States will consider verifiable and equitable arms control measures that would ban or otherwise limit testing and deployment of specific weapons systems, should those measures be compatible with the United States national security.[114]

Contemporaneously, the Reagan Administration also issued a "Defense Guidance" Directive, which offered a five-year plan in which space operations would "add a new dimension to our military capabilities."[115] The Directive also ordered "the prototype development of space-based weapons systems so that we will be prepared to deploy fully developed and operationally ready systems, should their use

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113. Ibid., 112. Operational deployment being scheduled for FY 1987. Ibid., 96.

114. Ibid., 109. This statement has been dubbed by Colin S. Gray as "a minor masterpiece [that] may well become a collector's item." Ibid., 96.

115. July 1982 Presidential Directive on National Space Policy, reported in, N.Y. Times, 27 March 1983, at A-1.

prove to be in our national interest".[116] However, leaked documents pertaining to this Directive contain discomforting statements, to the effect that the USA should be able to "wage war effectively" from outer space and "vigorously pursue" space systems to "project force in and from space".[117]

Momentum for a serious and sustained BMD program, initially linked to ASAT development, was gained in the early months of 1983, as a means to counter reports of Soviet ASAT and BMD progress.[118] Urged by such advocates of strategic defense as Edward Teller, Gen. Daniel Graham and Casper Weinberger, President Reagan announced, in his 23 March 1983 speech, his desire to shift doctrinal emphasis over the long term from the strategy of deterrence to a strategy of defense.[119] The merits and demerits of this

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116. Ibid.

117. "Five Year Defense Guidance: 1984-88" Department of Defense, cited in "Militarizing the Last Frontier: The Space Weapons Race", (1983) 12 The Defense Monitor, No. 5.

118. Stein, J.B., From H-Bomb to Star Wars, Lexington Books, Lexington, Mass., 1984, 56-60.

119. As recommended by Gen. Graham in his High Frontier Project: "We urgently recommend the adoption of a new national strategy of Assured Survival to replace [that of Mutually Assured Destruction] MAD. See Graham, D., High Frontier, Tom Doherty Assoc. Inc., 1983, 63. See

momentous decision have spawned a plethora of articles and books, the analysis of which is beyond the scope of this thesis.[120] While the relationship between politics and technology has often resembled that of slave and master - usually political slave and technological master - the SDI decision was clearly dictated by political forces. As conceded by President Reagan, the requisite technological advances "may not be accomplished before the end of this

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also, Teller, E., "The Role of Space and Defense in the NATO Alliance", NATO's Sixteen Nations, November 1984, Vol. 29/No. 6, 14-16; "President's News Conference on Foreign and Domestic Issues", N.Y. Times, 25 Jan. 1985, B-8; Hoffman, F., "The SDI in U.S. Nuclear Strategy", International Security, Summer 1985, Vol. 10, No. 1, 13-25.

120. Pro: Graham, Teller and Hoffman, ibid.; see also, Abrahamson, Gen. J., "SDI and the New Space Renaissance", Space Policy, May 1985, Vol. 1, No. 2, 118-21; Menaul, S., "Military Uses of Space-Ballistic Missile Defense", Space Policy, May 1985, Vol. 1, No. 2, 122-30; Payne and Gray, "Nuclear Policy and the Defensive Transition", (1984) 62 Foreign Aff. 820-42. Contra: Glaser, C.L., "Do We Want the Missile Defenses We Can Build?", International Security, Summer 1985, Vol. 10, No. 1, 25-57; Longstreth, Pike and Rhinelauder, "The Impact of U.S. and Soviet Ballistic Missile Defense Programs on the ABM Treaty (3rd ed.), A Report for the National Campaign to Save the ABM Treaty, March 1985, 67-74; Bethe, Garwin, Gottfried and Kendall, "Space-Based Ballistic Missile Defense", Scientific American, Oct. 1984, Vol. 251, No. 4, 39-49; Comments made by Drs. J. Ruina, M. May and N. Johnson, Panel chaired by Dr. I. Vlasic on "The Arms Race and Outer Space", in, Proceedings of a Conference Held at McGill University on 16-17 March 1984, 31-53.

century".[121] Thus, what has clearly emerged during President Reagan's term in office, is the quest for the USA to achieve and sustain the potential for asserting clear strategic superiority through defensive invulnerability in space.[122] This move has been widely interpreted as extending the arms race into outer space.[123]

2. USSR Policy

The early roots of Soviet space activity were closely linked with military considerations. The "first sputnik was the result of Soviet attempts to perfect the inter-continental missile system as an answer to the American atomic bomb and long-range bomber (B-29) capable of delivering it."[124] The use of rockets to put artificial satellites into earth orbit was a spin-off of the fascina-

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121. "Text of Reagan Address Defense Policy", supra, note 82.

122. Gray, supra, note 109, 99; Stein, supra, note 118, 60.

123. Stein, ibid.; see also opponents to SDI cited in fn. 120.

124. Matte, N.M., Space Policies and Programmes: Today and Tomorrow, CASL, McGill University, Montreal, 1980, 9.

tion of Soviet scientists working on military projects, rather than the result of any official Soviet government policy.[125]

By 1958, internal policies of the USSR reflected its dual interest in space affairs. Premier Khrushchev extolled the advanced character of Soviet society, referring to Sputnik as exemplary of Soviet scientific achievements.[126] Shortly after the world community took an interest in the prospects of space exploration, the Soviet leader hailed the Soviet space successes as "achievements not just of the Soviet people but of all mankind".[127] However, he also emphasized that the rockets which put Sputniks into orbit were also capable of firing ICBMs.[128]

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125. The Soviet Union did agree to meet one of the recommendations of the Committee of Scientists Planning the International Geophysical Year: to launch a small satellite vehicle and study the problems associated with satellite experiments. Matte, ibid., 13.

126. Ibid., 136.

127. Ibid., 139.

128. In a speech to the Byelorussian Agricultural Workers, Krushchev stated:

> "The Soviet Union launched an intercontinental ballistic missile, the testing of which yielded positive results. We can now send a missile to any point on the globe, carrying, if necessary, a hydrogen war-head. Our announcement to this effect was greeted with disbelief and regarded as an

Since the inception of the space age, the Soviet Union has never officially recognized or admitted to carrying out any military activities in outer space,[129] despite unequivocal proof to the contrary.[130] The Soviets have always claimed to use outer space for "peaceful purposes" and for the achievement of "peaceful coexistence".[131] The latter term is not to be interpreted as a collectivity of nation states with differing social systems, but rather, as persuasively argued by Professor Mircea Mateesco-Matte:

> ...peaceful coexistence merely constitutes a transitory phase during which Marxist States owe it to themselves to make use of the capitalist States and their contradic-

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> attempt by the Soviet leaders to instil confidence in their own people and intimidate the Western governments. But then the Soviet Union, using the intercontinental ballistic missile, launched an artificial earth satellite, and when it started circling the globe and when everyone - unless he was blind - could see it by looking up into the sky, our opponents became silent...". Ibid.

129. Vlasic, I., "Disarmament Decade, Outer Space and International Law", (1981) 26 McGill L.J. 135, 171.

130. Supra, Chapter I.

131. In 1969, Leonid Brezhnev "declared that one of the major foreign policy objectives of the socialist countries was to ensure the 'peaceful coexistence of states irrespective of their social system'." See, Jasketic, B., "The Peaceful Uses of Outer Space: Soviet Views", (1978-79) 28 Am. U.L. Rev. 483, at 487 fn. 21.

tions in order to arrive at the edification of communism on a global scale.[132]

The Soviet military space programme has de facto always dominated the overall Soviet space effort. According to Soviet Military Power 1985, recent Soviet military activities reflect the "continuing expansion into space of the Soviet drive for military purposes."[133]

Up until 1968, both the USA and USSR had carried out "passive" military activities in outer space. The Soviet Union, however, implemented its first ASAT system as early as 1968.[134] When, in March 1983, President Reagan announced the SDI programme, Soviet President Yuri Andropov strenuously denounced this act. Accordingly, on 18 August 1983, President Andropov launched what is referred to in

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132. Mateesco-Matte, M., "Space Militarisation and Space Law At a Time of 'Non-Peaceful Coexistence'", (1984) IX AASL 355, 387. See also, ibid., 488. As cited in fn. 25, "after the 1917 Revolution, Soviet theorists debated whether to impose socialism on other countries by force, or to encourage world revolution by peaceful means. The latter approach, espoused by Lenin, was adopted. Lenin argued that those espousing Marxism should not try to instigate revolutions, but should allow them to occur naturally. The Soviet objective was to set an example that would encourage the development of revolution in all countries".

133. Soviet Military Power 1985, (4th ed.) US GPO, Wash., D.C., 43.

134. "Outer Space Arms Control Negotiations", Committee on Foreign Relations, US Senate, 98th Cong., 1st Sess., 1983, 12.

Moscow as a "new peace initiative", and announced several Soviet initiatives to a nine-member Senate delegation, headed by Senator Pell. Andropov told the group that the Soviet Union was declaring a unilateral moratorium on launches of ASAT weapons into space, so long as the USA and other nations showed similar restraint. This proposal constitutes yet another attempt by the Soviet Union to gain international Kudos for their attempts to "prevent the militarisation of outer space".[135] As stated in Le Monde:

> A certain number of statistics compel us to welcome Mr. Andropov's declarations with caution. Almost from the start of the conquest of space, the USSR has been interested in its use for military purposes. For 12 years already, it has regularly conducted experiments with anti-satellite weapons which, in the event of conflict, would be aimed at destroying its adversary's surveillance and communication satellites. Under these circumstances, the unilateral moratorium announced by the USSR will not penalize it in any way at all. This is not the case with the United States which entered the fight against satellites later.[136]

President Reagan's March 1983 speech also provoked Soviet responses. On 29 June 1984, General Secretary

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135. See statement by the Soviet delegate to the UN General Assembly, UN Doc. A/39/467 (1984).

136. "L'URSS et la démilitarisation de l'espace", Le Monde, 20 August 1983, at 1, as translated by CASL.

Chernenko invited the USA to meet in Vienna in September 1984, to begin negotiations on space weapons.[137] While reacting positively, the USA indicated it would propose other disarmament subjects for discussion. After several exchanges between Reagan and Chernenko, both leaders agreed to a meeting between Secretary of State George Schultz and Soviet Foreign Affairs Minister, Andrei Gromyko, to be held in Geneva on 7 and 8 January 1985.[138]

Many have expressed the view that the Geneva agreement was, to a great extent, made possible by the Soviet fear of Star Wars. While the Soviet concern with SDI is genuine, "the Soviet leadership also appears to perceive the campaign against 'the militarization of outer space' as a major propagandistic opportunity in the framework of a new peace offensive".[139] This position is confirmed by statements recently made by Soviet leader Mikhail Gorbachev. Speaking at a dinner for Italian Prime Minister Bettino Craxi, Gorbachev called for a revival of the détente of 1970s, when the "foundations for peaceful co-operation among states belonging to different social systems and different

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137. N.Y. Times, 30 June 1984, at A-1 & A-7.

138. Le Figaro, 23 November 1984.

139. Gimes, D.K., "Are the Soviets Interested in Arms Control?", The Washington Quarterly, Spring 1985, 147, at 155.

military-political alliances were laid."[140] However, as stated by Aleksander Bovin, Soviet political commentator for Izvestia, "the main objective of détente was to make 'international transformation' favorable to the USSR as painless as possible".[141] In response to a letter sent by the Union of Concerned Scientists (UCS), Gorbachev stated:

> L'Union Soviétique ne construit pas d'armes spatiales de frappe, ni un système de défense anti-satellite à grande échelle et elle respecte strictement l'esprit et la lettre du traité ABM de 1972 ... Nous appelons les dirigeants américains à se joindre à nous et à renoncer à leurs projets en gestation de militarisation de l'espace qui conduiraient inévitablement à la rupture du traité ABM.[142]

For years, the USSR has engaged in a concerted effort to develop some form of strategic space-based defense system. In fact, according to top Soviet physicist Yevgeny Velikhov,

> measures to counter-act U.S. plans for a space-based anti-missile defence system already exist and will be developed

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140. "Star Wars a Threat to Peace: Gorbachev", The Montreal Gazette, 30 May 1985, A-7. See also, "Chévarnadzé réitère l'appui soviétique aux accords d'Helsinki et à la détente", Le Devoir, 30 July 1985, 4.

141. Quoted in Simes, supra, note 139, 149 and fn. 1.

142. "Gorbatchev demande aux Etats-Unis de renoncer à la militarisation de l'espace", Le Devoir, 6 July 1985, A-4.

further if Washington goes ahead with its so-called Star Wars plan.[143]

Thus, the professed Soviet outrage over the American interest in transforming space into a new arms arena cannot be taken literally.

It would seem that the primary substantive Soviet interest in arms control is to stop the development of new technologies, to prevent being locked into a position of technological inferiority. This position is reminiscent of the Soviet attitude in the early 1960's, towards the US reconnaissance satellites. Accusations of violating international law gradually stopped, as the Soviet Union's own reconnaissance capabilities improved.[144]

Although there is enough interest and authority in the Kremlin to allow a resumption of arms control negotiations, the prospects for an early agreement at Geneva are extremely slim. Both super-powers hold radically different positions on the US space-defense project. The US negotiating team is seeking radical reductions by the Soviets in offensive nuclear weapons. The Soviets argue that only the "renunciation of the development, including research,

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143. "Superpowers Must Face A-Talks Deadline: Soviets", The Montreal Gazette, 1 June 1985, p. E-11.

144. Young, A.J., Space Transportation Systems, LL.M. Thesis, Institute of Air and Space Law, McGill University, (unpublished), December 1984, at 190.

testing and deployment of space strike arms, would open the way to radical reductions in nuclear arms."[145]

3. France

Since the late 1960's, France has espoused the view that Europe must collectively develop its own space capabilities to avoid being overly dependent on the two superpowers. As noted by Lebeau, space technologies

> sont l'une des grandes mutations techniques de notre époque; une incapacité de les maîtriser serait synonyme d'un état de dépendance dans d'innombrables secteurs ...Quel serait le coût de cette dépendance? C'est un problème politique autant qu'économique, mais, s'il se posait un jour, ce serait demain, et il serait trop tard.[146]

This "indépendantiste" approach was the driving force behind the creation of the European Space Agency (ESA),[147] and has also influenced France's approach to the militarization of outer space. As outlined in the

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145. "We'll Seek Radical Cuts in Arms at Geneva: U.S.", The Montreal Gazette, 30 May 1985, A-7.

146. Lebeau, M., "L'Europe face aux deux superpuissances spatiales", in, L'espace extra-atmosphérique et ses utilisations, Problème politique et sociologique, Paris, 1978, 21.

147. For an authoritative analysis of ESA see, Young, supra, note 44, at 7-25 and 165-77.

previous section, during recent discussions at the CD, the French Government viewed the militarization of outer space with pragmatism.[148] The French proposal sought

> to maintain the major prospects for progress that the use of space for civil purposes offers the international community. It also aims to safeguard in the military area itself the instruments for observation, communication and control that contribute to stability and consequently to security and peace.
>
> We are not ready to resign ourselves to the introduction and multiplication of new weapons in space that would create serious risks of destabilization and relaunch a new and ruinous arms race.[149]

Thus, while opposing the weaponization of outer space, France has developed its own military reconnaissance satellite called SAMRO.[150]

France is adamantly opposed to the SDI because of the possible impact of such a programme on its national nuclear deterrent.[151] President Reagan's SDI has spurred

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148. Supra, this chapter, section A-2. See also, infra, Chapter V B.2(a).

149. "French Statement to Conference on Disarmament (excerpts) - 12 June 1984", in, Survival, Vol. XXVI, No. 5, Sept./Oct. 1984, 235, at 237.

150. Supra, Chapter I A.1(a)(iv).

151. "NATO Is Urged to Back U.S. on Space Defense", Int'l Herald Tribune, 11 February 1985, 1; Freedman, L., "The 'Star Wars' Debate: The Western Alliance and Strategic Defence: Part II", in, New Technology and Western Security Policy, Adelphi Paper No. 199, The

French President François Mitterand to propose European cooperation in space-based military reconnaissance/observation programmes, which could eventually lead to European development of a manned military space station.[152]

According to Mitterand,

> (i)f Europe were capable of launching its own manned space station that permits it to observe and react to all threats, then Europe would make a big step for its own defense.[153]

More recently, French Defense Minister Charles Hernu, met with his West German counterpart in an effort to establish a joint European research project on the military uses of outer space. Mr. Hernu noted that a French "think tank" had already been set up to study the development of reconnaissance satellites. While underlining that European cooperation in this area would be desirable, Mr. Hernu added "(s)i cette coopération se révélait impossible, la France devrait alors s'engager seule sur cette voie."[154] He

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International Institute for Strategic Studies, Summer 1985, 34, at 42; Gallois, supra, note 83.

152. "Mitterand Outlines Military Space Station", AWST, 20 February 1984, 61.

153. Ibid.

154. "Hernu est d'accord sur la militarisation de l'espace", Le Devoir, 27 July 1985, 3.

further declared:

> Ce serait mieux si nous, Français et Allemands, avions nos propres satellites pour contrôler nous mêmes le désarmement par les superpuissances plutôt que faire une confiance aveugle à d'autre.[155]

Thus, French policy reflects the philoso isolationism and independence is out, European co is in.

4. United Kingdom UK

The UK is deeply concerned to help prever race in the new area of outer space. As expressed delegate to the UN General Assembly, "[w]e have n see space turned into a theatre of war."[156] Wh Minister Margaret Thatcher is one of the USA's s supporters, the UK response to the SDI has been mut the least. Like the French, the British are pa concerned about its impact on their national nucle rent. Thus, while Prime Minister Thatcher ag research of space-based BMD should proceed, the c of such a system would be subject to East-West

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155. Ibid.

156. UN Doc. A/C.1/39/PV.24 (1984), at 13.

tions.[157] In more recent statements, the British Government has raised serious questions about the technical feasibility and the strategic desirability of the US proposed system of missile defense in space. As stated by Foreign Secretary Sir Geoffrey Howe, "(w)e must make sure we are not developing what might prove to be only a limited defense against weapons of devastating destructive force."[158] The British are strong supporters of the ABM Treaty and consider that going beyond research into defensive systems would be inconsistent with it.[159] While Prime Minister Thatcher continues to warn Western leaders against "Soviet propaganda",[160] the SDI issue has elicited a guarded response.

5. Federal Republic of Germany FRG

The FRG has also expressed a pragmatic viewpoint concerning the militarization of outer space. In a recent

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157. "Britain Questions 'Star Wars' Plan", N.Y. Times, 16 March 1985, A-8.

158. Ibid.

159. Ibid.

160. "Thatcher incite l'Ouest à plus de fermeté face à la propagande soviétique", Le Devoir, 27 July 1985, 4.

statement to the UN General Assembly, the West German delegate, while endorsing the belief that states should cooperate in the progressive research and use of outer space, also highlighted the indispensable role in strategic stability played by existing military satellites.[161] He went on to state:

> Those very countries which accuse others of wanting to militarize space employ a large proportion of their satellites for military purposes. They even have an operational anti-satellite system. The "demilitarization of space" therefore proves to be a catchword which, if anything, obscures rather than eliminates the complicated reality.[162]

The West German attitude towards present military uses of outer space resembles that of both the UK and France. However, Chancellor Helmut Kohl's Government is growing increasingly concerned about the implications of the Reagan Administration's proposals to develop ASATs and BMD. The most serious doubts have been voiced by Defense Minister Manfred Wörner, who favors negotiations on limiting ASATs "before space becomes the next area of the arms race."[163] With respect to the SDI programme, Wörner stated that nothing can be said against the research efforts.

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161. UN Doc. A/C.1/39/PV.11, (1984), 31.

162. Ibid.

163. "Bonn Is Worried by U.S. Arms Research", N.Y. Times, 14 April 1984.

> My concerns would begin when the West under certain circumstances or the Americans would begin building such systems, because in the final analysis I think this would not lead to stability, but just the opposite".[164]

As was the case with the UK and France, West Germany fears that if both super-powers protect their own sanctuaries, Europe will be more vulnerable. Because of growing concern that the USA is not willing to offer the allies a full partnership in the SDI, the German government is considering a separate research programme for an independent European anti-missile defense.[165] The West German cabinet has also decided to explore the feasibility of a "European Defence Initiative" to shield European allies from short and medium range Soviet missiles.[166] Furthermore, the West German government is becoming more receptive to France's suggestion for a European reconnaissance satellite system.[167] Like France, West Germany does not want to be wholly dependent on the USA. Ironically, the phantom of a complete defence against nuclear weapons may yet unify Western Europe and push it into becoming a military super-

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164. Ibid.

165. "Bonn Pondering Separate Star Wars Plan for Europe", The Montreal Gazette, 13 June 1985, A-9.

166. Ibid.

167. Ibid.

power in its own right.[168]

6. People's Republic of China (PRC)

China has always maintained that outer space, as part of the common heritage of mankind, should be used solely for peaceful purposes. In this context, the Chinese delegate to the UN declared that, "the non-militarization of outer space should be the overall goal that nations should strive for".[169] In view of the divergence of views on how to achieve this goal, however, China has adopted a more realistic goal. It has called for the prohibition of space weapons, which directly threaten international security and stability, "to achieve the non-weaponization, so to speak, of outer space".[170] China favors the conclusion of an international treaty banning all space weapons, with the question of banning ASATs being considered first.[171]

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168. "West Europe Attacks U.S. 'Star Wars' Plan", The Montreal Gazette, 19 April 1984, B-3.

169. UN Doc. A/C.1/39/PV.35 (1984), 12.

170. He, Qizhi, "Towards Legal Control of Space Arms", seminar given at the Institute of Air and Space Law, 1985, 15 (unpublished).

171. Ibid.

7. Canada

Canada has always advocated the peaceful use of outer space. It is also concerned about the use of outer space for military purposes and has urged the international community to take measures to ban an arms race in outer space. Canada's official position, under the Liberal Government of Prime Minister Pierre Elliot Trudeau, with respect to the militarization of outer space, can be taken from the latter's address to the Second United Nations Special Session on Disarmament (UNSSOD II):

> ...The (Outer Space) Treaty lays down that nuclear or other weapons of mass destruction are not to be placed in orbit around the earth or stationed in space. In retrospect, that leaves loopholes which risk being highly destabilizing. I am thinking particularly of anti-satellite weapons or anti-missile laser systems. I believe that we cannot wait much longer if we are to be successful in foreclosing the prospect of space wars. I propose, therefore, that an early start be made on a treaty to prohibit the development, testing and deployment of all weapons for use in space.[172]

This position was later modified to banning high-altitude ASATs.[173]

The present Conservative Government of Prime

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172. Quoted in Briefing Paper - Outer Space in the 1980's, UN Association in Canada, September 1983, 5.

173. For discussion, see infra, Chapter V B.2(b).

Minister Brian Mulroney, also favours a halt to the growing militarization of outer space. As stated by Canadian Ambassador to the UN, Douglas Roche:

> We call for urgent efforts towards preventing an arms race in outer space. This is one of Canada's highest priorities.[174]

Following Secretary of Defense Caspar Weinberger's "invitation" to participate in the SDI research programme, the Mulroney Government set up a Joint Commons-Senate Committee on international relations, to report, with recommendations by 23 August 1985, on whether Canada should participate in the programme.[175] Canada has agreed that the USA should proceed with research of a space-based BMD. However, as stated by Secretary of State for External Affairs, Joe Clark,

> le développement et le déploiement dans l'espace de systèmes anti-missiles balistiques par l'une ou l'autre partie transgresseraient les limites du Traité sur les missiles anti-missiles balistiques dans sa forme actuelle. Cela pourrait avoir de sérieuses répercussions sur le contrôle des armements et exigerait donc de tous les intéressés qu'ils suivent la situation très attentivement.[176]

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174. UN Doc. A/C.1/39/PV.19 (1984), 7.

175. "Star Wars Will Hurt Canada", The Montreal Gazette, 27 July 1985, A-8.

176. "Déclaration du Secrétaire d'Etat aux Affaires Extérieures, le Très Honorable Joe Clark, à la Chambre des Communes sur les entretiens américano-soviétiques sur le contrôle des armements", Ottawa, 21 January 1985,

The Mulroney Government's preference for private entrepreneurship, coupled with the camaraderie between President Reagan and Prime Minister Mulroney, as exemplified in Quebec City on 17 March 1985 during the "Shamrock Summit", is likely to favour some form of Canadian participation in the SDI programme. In recent statements, Defense Minister Erik Nielsen has expressed the view that it would be a "terrible impediment to free enterprise if the federal government told private companies they could not participate in the U.S. Star Wars research program."[177] External Affairs Minister Joe Clark made similar comments: "We have a free-market economy in Canada and we can't do much about it...but we made it clear (to the United States) that any step beyond research would be subject to negotiations."[178] Not surprisingly, the first major group to back Canadian participation in the SDI programme was the Aerospace Industries Association of Canada,[179] followed

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177. "Nielsen Won't Force Firms to Reject Star Wars Work", The Montreal Gazette, 1 June 1985, A-10.

178. Ibid.

179. "First Major Group Backs Star Wars", The Montreal Gazette, 12 June 1985, B-1.

by Canadian Marconi.[180]

The strongest opposition to the SDI programme was voiced by the federal Liberal Party. In its Working Paper on peace, security and disarmament, the Liberal Party urged the present Canadian government to adopt the role of international conciliator and to continue supporting peaceful uses of outer space.[181]

While a decision is pending, it would appear that the Canadian Government may try to abdicate its responsibility, by allowing private companies to accept contracts, without "engaging" the government itself. The subtle suggestion of outspoken US Ambassador to Canada, Paul Robinson may be prophetic:

> ...You know, there are solutions to this that could be taken that wouldn't necessarily embrace or reject [participation]. One way - and I'm not suggesting this - would be for the government to leave it up to individual companies to decide whether to bid on the research projects.[182]

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180. "Ottawa devrait dire oui à la 'guerre des étoiles'", Le Devoir, 24 July 1985, 8.

181. "Le Canada et l'initiative de défense stratégique", Le Devoir, 17 July 1985, 9.

182. "Rejection Will Damage U.S. Ties: Envoy", The Montreal Gazette, 27 July 1985, A-8.

CHAPTER III

CURRENTLY APPLICABLE INTERNATIONAL LAW REGULATING MILITARY ACTIVITES IN OUTER SPACE

> Elaborer ce droit serait une tâche fascinante pour la science juridique. Mais en s'y appliquant dans le monde réel de la fin du siècle on retombe en plein en politique. La seule tâche que les Etats laissent dans ce domaine aux juristes est la rédaction en termes "judicieux" du compromis qu'ils sont disposés à accepter momentanément. En cherchant de solutionner ces nouveaux problèmes d'une manière scientifique on ferait ce qu'on appelle en français 'travailler pour le roi de Prusse'.[1]

A. INTRODUCTION

This chapter will comprise an assessment of the scope and effectiveness of: relevant general international law; specific space arms control treaties; other treaties on space law which address the issue of military activities in outer space; and an evaluation of the legality of extant and projected Antisatellite (ASAT), Ballistic Missile Defence (BMD), and Strategic Defence Initiative (SDI) technologies. This review is essential for an understanding

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1. René L. Mankiewicz in, Report of the 1980 Belgrade Conference (ILA Report of the Fifty-Ninth Conference, 187).

de lege lata, and an appreciation of what is required de lege ferenda.

B. GENERAL INTERNATIONAL LAW

1. Constituents of International Law

> Decisions of the International Court [of Justice (ICJ)], unanimously supported resolutions of the General Assembly of the United Nations concerning matters of law, and important multilateral treaties concerned to codify or develop rules of international law, are all lacking the quality to bind states generally in the same way that...[national legislation does]... In a sense 'formal sources' do not exist in international law. As a substitute, and perhaps an equivalent, there is the principle that the general consent of states create rules of general application.[2]

Article 38 of the Statute of the ICJ,[3] generally regarded as a "complete statement of the sources of international law",[4] provides that the ICJ shall apply:

> (a) international conventions, whether general or particular, establishing rules expressly recognized by the

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2. Brownlie, I., Principles of Public International Law, (3rd ed.), Clarendon Press, Oxford, 1979, 1-2.

3. (1776-1949) 3 Treaties and Other International Agreements of the United States of America 1179, at 1187.

4. Supra, note 1, 3.

contesting states;

(b) international customs, as evidence of a general practice accepted as law;

(c) the general principles of law recognized by civilized nations;

(d) subject to the provisions of Article 59, (the decision of the Court is binding only inter partes and relates to the particular case only) judicial decisions and the teaching of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.

These, then, are the several indicia of international law. Whilst not necessarily being generally applicable international law per se, an international instrument may come to "stand for a threshold of consensus and confront states in a significant way".[5] In this chapter, the main concentration will be upon the first category of international law as expounded above, namely international conventions, or treaties. Where appropriate, categories (b) to (d) will be invoked in an attempt to state the law as it is, or to disclose subsequent nuances of interpretation of existing category (a) law.

Since international treaty law differs greatly from national legislation, in, inter alia, its legal foundation, applicability and enforceability, a final necessary preliminary issue to emphasize, is treaty interpretation. The

5. Ibid., 2.

Vienna Convention on the Law of Treaties[6] affirms the following general rules of interpretation in article 31:

> 1. A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.
>
> 2. The context for the purpose of the interpretation of a treaty shall comprise, in addition to the text, including its preamble and annexes:
>
> (a) any agreement relating to the treaty which was made between all the parties in connection with the conclusion of the treaty;
>
> (b) any instrument which was made by one or more parties in connection with the conclusion of the treaty and accepted by the other parties as an instrument related to the treaty.
>
> 3. There shall be taken into account, together with the context:
>
> (a) any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions;
>
> (b) any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation;
>
> (c) any relevant rules of international law applicable in the relations between the parties.

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6. In force 27 Jan. 1980; reproduced in (1969), 63 A.J.I.L. 875 et seq.

4. A special meaning shall be given to a term if it is established that the parties so intended.

2. The United Nations (UN) Charter 1945[7]

The preamble to the UN Charter states that the peoples of the United Nations will "unite [their] strength to maintain international peace and security", and pledge that "armed force shall not be used, save in the common interest...". Another relevant prefatory point to mention is contained in article 1. The latter outlines the purposes for which the UN was created, one of them being, in part,

> (t)o 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 peace.

Drafted before the Space age began, the principles contained in the Charter were, nevertheless, universally taken to apply to that milieu, and were later expressly stated to be so applicable.[8]

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7. Signed on 26 June, 1945 in San Francisco, USA, in force 24 October, 1945. Text is reproduced in Brownlie, I., Basic Documents in International Law, (2nd ed.), Oxford, 1972, 1-31.

8. UNGA Resolution 1721 (XVI) "International Co-operation in the Peaceful Uses of Outer Space" of 20 December, 1961 states in paragraph 1(a) that "International law,

In this context, the two most important provisions of the UN Charter are articles 2(4) and 51. Article 2(4) states that:

> (a)ll members (of the UN) shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations.

Space instrumentalities, particularly manned craft, are, by virtue of article VIII of the 1967 Outer Space Treaty,[9]

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including the Charter of the United Nations, applies to outer space and celestial bodies"; this has been reiterated: in paragraph 4 of UNGA Resolution 1962 (XVIII) "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space" (13 December, 1963); Article III of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, (hereafter the Outer Space Treaty) 610 U.N.T.S. 206. Opened for signature 27 January 1967; entered into force 10 October 1967; and article 2 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereafter the Moon Treaty) UN Doc. A/RES/34/ 68, 14 December 1979.

9. Article VIII of the Outer Space Treaty provides that: A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall

taken to be flag ships, in the same way as sea vessels in Maritime law.[10] This "quasi-territorial jurisdiction"[11] may be equated with the "territorial integrity" of a state in article 2(4) of the Charter. In the opinion of one writer,

> (i)nterference with the operation of a satellite, particularly a manned vehicle could be claimed by the owner state as the threat or use of force against its territorial integrity, giving rise to assertions of the right to act in self-defence to destroy the source of interference.[12]

The corollary provision to article 2(4), is article 51, and the latter states that

> (n)othing in the present Charter shall impair the inherent rights of individual or collective self defence if an armed attack occurs against a Member of the United Nations....

In the view of some authorities, article 51 limits the

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be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.

10. See Lay, S., & Taubenfeld, H., The Law Relating to Activities of Man in Space, University of Chicago Press, 1970, 220 et seq.

11. See Cheng, B., "The 1967 Space Treaty", (1968), 95 J. Droit Int. 532, at 568 et seq.

12. Bridge, R.L., "International Law and Military Activities in Outer Space", (1980), 3 Akron L. Rev. 649, at 660.

exercise of the right of self-defence to situations where "armed attacks" have "occurred", rather than against those which may be in the making.[13] In other words, military action in self-defence is justified in the case of an actual attack, but not as a preventive measure to a forthcoming attack.

Nevertheless, two schools of thought have developed, which purport to be either a legitimate extension to, or a valid interpretation of this inherent right of self defence. Thus, in the first, the traditionally recognized right to act in self-defence in the face of a threat of an armed attack would be included within the ambit of article 51.[14] In the second, it has been argued that anticipatory self-defence must be recognized as a right, especially in view of the short delivery times of modern muclear weapons.[15]

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13. Kittrie, N.N., "Aggressive Uses of Space Vehicles - The Remedies in International Law", in, Proceedings of the 4th Colloquium International Institute of Space Law of the International Astronautical Federation, 1960, 198, at 204. (Hereinafter cited as the IISL Coll.).

14. McDougal, M.S., & Feliciano, F.P., Law and Minimum World Public Order - The Legal Regulation of International Coercion, New Haven, University Press, 1961, 232-240.

15. DeSaussure, H. & Reed, W.D., "Self-Defense - A Right

What the law actually permits, and the ambiguity concerning what it proscribes, were succinctly stated long ago, by one of the founding space law jurists, Andrew Haley. The latter wrote that there is

> (c)learly...a...principle which must be added to the rule of law in outer space, namely the basic right of national self-preservation, as embodied in Article 51 of the Charter of the United Nations. In brief, a nation is justified in protecting itself from attack no matter where the staging area of the attack may be, including on the high seas or in outer space, and a nation may carry its defensive forces to such areas. The great unresolved problem, so far as defensive measures in space are concerned, is to translate the general recognition of this right of self-defence into some workable criteria for distinguishing between the defensive and offensive uses of space.[16]

It can be said with reasonable certainty that, in order to exercise the right of self-defence, a nation must be in a dangerous situation of such an overwhelming nature, that it has no choice but to act.[17] However, there are two important caveats. Firstly, it has been authoritatively stated by the former Director of the US Arms Control and Disarmament Agency, Professor Eugene Rostow, that

the Soviet Union does not accept the

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in Outer Space", (1965) 7 A.F. J.A.G. Rev. 40.

16. Haley, A., Space Law and Government, Appleton Century Crafts, New York, 1963, at 157.

17. De Saussure & Reed, supra, note 15, at 43.

> binding authority of the United Nations Charter as a codification of international law. It regards itself as "exempt" in effect from the rules of the Charter which purport to confine the international use of force to individual or collective self defense....[18] (emphasis in original)

The second caveat would question the extent to which self-defence can justify the development of space weapon systems.

3. UN General Assembly (UNGA) Resolutions

In fidelity to a chronological exposition, this section is a digression from category (a) law, to category (b) or (c) - if law it is - for the purposes of article 38 of the Statute of the ICJ. UNGA Resolutions have figured prominently in the development of the entire corpus of space law. Apart from those establishing the UN Committee on Peaceful Uses of Outer Space (COPUOS),[19] which was the forum for the development of the five major space treaties

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18. Roston, E.V. & Hoinkes, M.E., "The United States Approach to Negotiating Arms Limitation Agreements with the Soviet Union", (1983) 28 McGill L.J. 750.

19. UNGA Res. 1348 (XIII), "Question of the Peaceful Use of Outer Space" 13 December, 1958, which established COPUOS as an ad hoc body, and UNGA Res. 1472 (XIV) "International Co-operation in the Peaceful Uses of Outer Space" 12 December, 1959, which made COPUOS a permanent body of the UN.

to date, two are especially worthy of note. The first landmark resolution, 1721(XVI) of 20 December, 1961,[20] established the principles of: the application of international law to outer space;[21] that exploration and use of outer space was to be free for all states;[22] and that outer space and celestial bodies were "not subject to national appropriation".[23] The other such resolution, entitled the "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space",[24] was the blueprint for the subsequent Outer Space Treaty.

In the present context, two resolutions merit discussion. During 1963, a joint draft resolution to ban nuclear and other weapons of mass destruction from outer space was initiated in the Eighteen-Nation Disarmament Committee (ENDC). Following private negotiation and agreement between the United States and the Soviet Union, the draft was referred to the General Assembly. On 17

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20. Entitled "International Co-operation in the Peaceful Uses of Outer Space".

21. Ibid., para. 1(a).

22. Ibid., para. 1(b).

23. Ibid.

24. UNGA Res. 1962 (XVIII) 13 December, 1963.

October, 1963, the General Assembly approved the draft as Resolution 1884 (XVIII).[25] In its operative part, the resolution calls upon all states:

> to refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner.

This resolution went on to become article IV of the Outer Space Treaty, and will be discussed further in that context.[26]

The other UNGA Resolution worthy of note is 36/97C of 9 December, 1981. Entitled "Prevention of an Arms Race in Outer Space", the principal preambular and textual provisions of importance, include those whereby the General Assembly states that it is

> Noting the important and growing contribution of satellites both for civilian purposes and the verification of disarmament agreements and aware of the possibilities of their use to promote peace, stability and international cooperation ...
>
> ...Aware of the need to prevent an arms race in outer space and in particular of the threat posed by anti-satellite systems and their destabilizing effects for international peace and security,

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25. The Resolution was entitled "Question of General and Complete Disarmament".

26. See infra this chapter, section D, 1.

> Convinced that further measures are needed to prevent outer space from becoming an area of military confrontation, contrary to the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,
>
> Considering it necessary for the international community to give attention to specific measures regarding the question of anti-satellite systems in the Committee on Disarmament,
>
> Bearing in mind that the restraint of anti-satellite systems has already been a subject of negotiations between the Union of Soviet Socialist Republics and the United States of America,
>
> 1. Considers that further effective measures to prevent an arms race in outer space should be adopted by the international community;
>
> 2. Urges all States, in particular those with major space capabilities, to contribute actively to the goal of preventing an arms race in outer space and to refrain from any action contrary to that aim.

Unlike those resolutions adverted to previously in this section, Resolution 36/97C was not adopted unanimously, there being 13 abstentions including the USSR.[27]

Article 17 of the UN Charter, which gives the General Assembly power to make decisions on "important

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27. World Armaments and Disarmament - SIPRI Yearbook 1982, Taylor & Francis Ltd., London, 1983, Appendix 16A, at 477 (hereafter SIPRI Yearbook 1982). The other votes were 127 for, and 0 against.

questions" by a two-thirds majority, states that '(t)hese questions shall include: recommendations with respect to the maintenance of international peace and security....' (emphasis added). UNGA decisions or resolutions are, therefore, recommendatory only. However, when such resolutions are passed unanimously, some consider them to have a greater status. Thus, in the opinion of one author,

> (t)he United States has officially taken the position with regard to the various resolutions dealing with outer space that they are simply restatements of pre-existing customary international law. The prevailing view among nations seems to be that the resolutions dealing with outer space may be taken as statements of what the law is; whether they create law or are merely evidence of customary law.[28]

In contrast, Dr. Nicolas Matte, following an extensive review of the legal status of UN Resolutions,[29] concludes by stating that

> even when unanimously approved ... [he would] refuse to acknowledge that the said resolutions are binding, while recognizing their importance in clearing the way to new agreements ... Law must not be confused with pseudo-law, its arch enemy.[30]

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28. See Bridge, supra, note 12, at 664. See also Cooper, J.C., in, Vlasic, I. (ed.), Explorations in Aerospace Law, Montreal, McGill University Press, 1968, at 348 et seq.

29. Matte, N.M., Aerospace Law, Carswell Co., Toronto, 1969, 275-81.

30. Ibid., 281.

However one characterizes the legal import of General Assembly resolutions, it is evident that subsequent space treaty law has reflected many principles embodied in them.[31]

C. ARMS CONTROL TREATIES AND OUTER SPACE

1. The Partial Test Ban (PTB) Treaty, 1963[32]

The four principal motivating forces underlying the negotiation of the PTB Treaty, were stressed by U.S. President John F. Kennedy, who was of the opinion that such a Treaty "would reduce fallout, limit proliferation, lead to détente, and slow the pace of the arms race."[33] Subsequent to the signing of the treaty, initially by the USA,

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31. For further discussion of the legal status of UNGA Resolutions, see Stojak, M.L., Le nouvel ordre économique international et son influence sur le droit aérospatial, LL.M. Thesis, Institute of Air and Space Law, McGill University, 1983, 13-17 (unpublished).

32. The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, 480 U.N.T.S. 43. Opened for signature 5 August 1963; entered into force 10 October 1963.

33. Blacker, C.D. & Duffy G., International Arms Control: Issues and Agreements, (2nd ed.), Stanford University Press, California, 1984, 131.

USSR and U.K., the US nuclear testing programme, now underground, intensified to between 10 and 40 tests per year, while that of the USSR remained between 8 and 20 tests per year.[34]

> It turned out that many types of tests previously carried out above ground could be carried out more reliably underground. Nuclear weapons design advanced significantly in the decade following the treaty.[35]

Turning now to the actual provisions of the Treaty, Article 1 states that:

> 1. (e)ach of the parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control:
> (a) in the atmosphere; beyond its limits, including outer space; - or under water, including territorial waters or high seas;
> ...

Paragraph 2 of the same article provides that

> (e)ach of the parties to this Treaty undertakes furthermore to refrain from causing, encouraging, or in any way participating in, the carrying out of any nuclear weapon test explosion, anywhere which would take place in any of the environments described, or have the effect referred to, in paragraph 1 of this Article.

Whilst apparently comprehensive, not only did underground testing of nuclear weapons remain permissible, but also the PTB Treaty neglected to prohibit the testing of nuclear

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34. Ibid., 132-33.

35. Ibid., 133.

weapon delivery systems.[36] Furthermore, in the context of BMD and SDI technologies, if X-ray or Gamma ray lasers are deployed, there may be a potential conflict with the provisions of the PTB Treaty.[37] Since X-ray and Gamma ray lasers can be produced by "small thermonuclear explosions or small hydrogen and neutron bombs",[38] if these methods are indeed employed, it is submitted that a breach of treaty will have occurred. However, in view of the provisions of article IV of the treaty, the conflict may well not arise. The latter states that whilst the treaty is to be

> of unlimited duration ... (e)ach Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other Parties to the Treaty three months in advance'. (Emphasis added).

As of 31 December, 1984, there were 112 parties to the PTB Treaty.[39] However, non parties include France and

36. See Jasani, B. & Lunderius, M., "Peaceful Uses of Outer Space - Legal Fiction and Military Reality", (1982) 13 Bull. of Peace Proposals 57.

37. Ibid.

38. Jasani, B., "The Reagan Star War Syndrome and Militarization of Outer Space", (1983) 14 Bull. of Peace Proposals 243, at 245.

39. World Armaments and Disarmament - SIPRI Yearbook 1985, Taylor & Francis, London, 1985, 503 (hereafter SIPRI Yearbook 1985).

China.[40] Nevertheless, the treaty is well established, and there are sound arguments alleging its being part of the unwritten corpus of customary international law.

> The Moscow Test Ban Treaty of 1963 may itself have started or at least acknowledged, a general rule of customary international law dating approximately from 1963 to the effect that all atmospheric tests of nuclear weapons are illegal. The nearly universal acceptance of this treaty indicated an international consensus of overwhelming force in favour of the principles contained therein. Any claim to the contrary must be a claim of special interest against community interest. Additionally, the treaty and subsequent practice under it (i.e. restraint from conducting atmospheric tests and restraint from withdrawing from the treaty under its withdrawal clause) can be argued to be the equivalent of the practice and acquiescence of states to a rule banning atmospheric nuclear tests even in the absence of a treaty. As in any area in which a customary principle is claimed, the basic importance of the Test-Ban Treaty here is the overwhelming (not necessarily universal) expectation of the peoples of the world about the unlawfulness of atmospheric nuclear testing.[41]

In the realm of the pragmatic, the likelihood of illegal testing (or testing by a non party) of nuclear weapons in outer space is remote. This is due to the

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40. China may well become a signatory in the near future, see "Pékin prêt à discuter de l'interdiction des essais nucléaires", Le Devoir, 7 March, 1985, p. 10.

41. D'Amato, A., "Legal Aspects of the French Nuclear Tests", (1967) 61 A.J.I.L. 66, 76-77.

devastating effects on satellites, particularly those performing communication functions, of electro-magnetic pulse (EMP). The latter acts like a lightning bolt, overloading all circuits and rendering them useless.[42] Furthermore, the incipient space station era, with its attendant permanency of man in space, militates strongly against any use of nuclear weapons technology in space.

Finally, it is interesting to note that in the somewhat ironical opinion of some writers, "it is no coincidence that the first legal regulation of activities in outer space is devoted entirely to a military use of outer space".[43]

2. The Anti-Ballistic Missile (ABM) Treaty, 1972[44]

This Treaty was the most important of the four concluded during the 1969-1972 bilateral Strategic Arms Limitation Talks (SALT I).[45] In negotiating the ABM

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42. See further, Matte, N.M., "The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water", in, Jasentuliyana, N. (ed.), Maintaining Outer Space for Peaceful Uses, U.N. University, Japan, 1984, 170, at 176-77.

43. Jasani, supra, note 38.

44. Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation

Treaty, both the US and the USSR adopted the doctrine of deterrence. This doctrine consists essentially in one state being discouraged from striking another state first, as the former would be unable to successfully withstand the latter's retaliation. Vulnerability to a second strike was the key. Under the ABM Treaty, the few permitted weapons systems could be relatively easily targeted, and would provide no effective protection. In other words, the vulnerability to a second strike would be greatly increased, while the military significance of a first strike would be greatly diminished. Consequently, it was thought that the result would be a more stable deterrent relationship. In its final incarnation, the doctrine of deterrence became the

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of Anti-Ballistic Missile Systems, 23 U.S.T. 3435. Signed 26 May, 1972; entered into force 3 October, 1972.

45. The other three were, the two Executive Agreements, both signed and in force on 30 September 1971, and entitled: Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War Between the United States of America and the Union of Soviet Socialist Republics, 807 U.N.T.S. 57, and the Agreement Between the United States of America and the Union of Soviet Socialist Republics on Measures to Improve the U.S. - U.S.S.R. Direct Communications Link, (1971) 806 U.N.T.S., 402. The other bilateral treaty, together with the ABM Treaty, was the Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, 23 U.S.T. 3462. Signed 26 May 1972; entered into force 3 October 1972.

doctrine of Mutual Assured Destruction or MAD. The latter provides that, in view of the massive nuclear arsenals possessed by both super powers, any use of them by either power would attract retaliation and counter-retaliation, ascending an inevitable scale of escalation resulting in complete destruction of both.

The initial articles of the Treaty provide for undertakings both to limit ABM Systems,[46] and not to deploy such systems[47] except within a 150 mile radius of their respective capital cities.[48] The most significant article in the present context, is article V(I), which embodies the undertaking "not to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile land-based" (emphasis added). This provision, apparently all-embracing, still permits development, testing and deployment of fixed land-based systems, albeit limited to certain geographical areas in continental US and USSR. Article VI of the ABM Treaty seeks to "enhance assurance of the effectiveness" of ABM limitations by preventing upgrading of other weapons to ABM capability by testing them "in an ABM mode". Reading the two articles

46. Art. I(1).

47. Art. I(2).

48. Art. III.

together, it has been observed that "any testing 'in an ABM mode' of fixed, land-based lasers that would be relevant to space-based BMD lasers can be conducted within the terms of the Treaty."[49] Furthermore, Agreed Statement D to the ABM Treaty attempts to provide for future contingencies by making future ABM systems "based on other physical principles" subject to discussion and bilateral agreement. The, by now familiar, laser-weapon scenario was not envisaged in 1972 when the ABM Treaty was negotiated. Light amplification by the stimulated emission of radiation (LASER) is very different from the ballistic weapons then (and still) in vogue. However, the treaty speaks only in terms of systems "to counter strategic ballistic missiles or their elements in flight trajectory".[50] In the opinion of one writer, it would thus appear that "there are no restrictions on testing of space-based laser components (eg. pointing and tracking) against non-ballistic missile targets, even though such testing would have direct BMD applications".[51]

In view of the US commitment to the development of

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49. See, Jones, A.M., "Implications of Arms Control Agreements and Negotiations for Space-Based BMD Lasers", in, Payne, K.B. (ed.), Laser Weapons in Space - Policy and Doctrine, Western Press, Boulder, 1983 55 et seq.

50. Art. II(1).

51. Jones, supra, note 49, at 66.

technology in relation to its SDI initiative, the international law doctrine of rebus sic stantibus is relevant here. The latter is an implied term in a treaty, (as in a domestic legal contract, a treaty being merely its international counterpart) whereby the obligations contained therein will cease upon a fundamental change of circumstances.[52] This doctrine is codified in article 62 of the Vienna Convention on the Law of Treaties, which states the following principles:

> 1. A fundamental change of circumstances which has occurred with regard to those existing at the time of the conclusion of a treaty, and which was not foreseen by the parties, may not be invoked as a ground for terminating or withdrawing from the treaty unless:
>
> (a) the existence of those circumstances constituted an essential basis of the consent of the parties to be bound by the treaty; and
> (b) the effect of the change is radically to transform the extent of obligations still to be performed under the treaty.
>
> 2. A fundamental change of circumstances may not be invoked as a ground for terminating or withdrawing from a treaty:
>
> (a) if the treaty establishes a boundary; or
> (b) if the fundamental change is the result of a breach by the party invoking it either of an obligation under the treaty or of any other international obligation owed to any other party to the treaty.

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52. See Brownlie, supra, note 2, at 617 et seq.

> 3. If, under the foregoing paragraphs, a party may invoke a fundamental change of circumstances as a ground for terminating or withdrawing from a treaty it may also invoke the change as a ground for suspending the operation of the treaty.

Since SDI technology is designed to be used against ABMs, when this system becomes operational, the ABM Treaty provisions limiting BMD will be entirely moribund. This could well be interpreted as a "fundamental change of circumstances" tantamount to an effective "termination" of the Treaty.

Article IX of the ABM Treaty is also highly significant. It provides that

> (t)o assure the viability and effectiveness of this Treaty, each party undertakes not to transfer to other states, and not to deploy outside its national territory, ABM systems or their components limited by this Treaty.

In elaboration of the intent of this article, Agreed Statement G, supplemental to the ABM Treaty, stipulates that

> (t)he Parties understand that article IX of the Treaty includes the obligation of the US and the USSR not to provide to other States technical descriptions or blue prints specially worked out for the construction of ABM systems and their components limited by the Treaty.

In the context of the development of SDI technology, a number of North Atlantic Treaty Organization (NATO) allies have expressed interest in joint ventures with the USA. These would involve limited technology transfer, and enable

their respective private sectors to share in the pecuniary benefits of SDI R&D. However, Ambassador Gerard Smith, the chief US negotiator at SALT I, observed recently that "those who propose these joint ventures have not read the [ABM] Treaty closely".[53] He is of the opinion that article IX and Agreed Statement G together would result in these joint ventures being "choked off after the research phase",[54] a major disincentive.

A major innovation in the ABM Treaty, was the setting up, in article XIII, of a Standing Consultative Commission to

> promote the objectives and implementation of the provisions of the Treaty, and to
> (a) consider questions concerning compliance with the obligations assumed and related situations which may be considered ambiguous;
> (b) provide on a voluntary basis such information as either Party considers necessary to assure confidence in compliance with the obligations assumed;
> (c) consider questions involving unintended interference with national technical means of verification;
> (d) consider possible changes in the strategic situation which have a bearing on the provisions of this Treaty;
> (e) agree upon procedures and dates for destruction or dismantling of ABM systems or their components in cases

53. "ABM Treaty Limits SDI Cooperation?" Military Space, 1 April, 1985, p. 1.

54. Ibid.

provided for by the provisions of this Treaty;

(f) consider, as appropriate, possible proposals for further increasing the viability of this Treaty, including proposals for amendments in accordance with the provisions of this Treaty;

(g) consider, as appropriate, proposals for further measures aimed at limiting strategic arms.

Finally, in relation to the duration of the Treaty, article XV(1) provides that it "shall be...unlimited". However, paragraph (2) of this article is a verbatim reiteration of article IV of the PTB Treaty, except that the notification period is doubled to six months. The ambiguity with respect to jeopardy to a party's 'supreme interests' may result in the termination of the ABM Treaty before long. A recent report by the National Campaign to save the ABM Treaty, concluded that "supposed imprecision in Treaty language does not provide any basis for claiming adherence to the Treaty's terms by the SDI after 1988".[55] Furthermore, the SDIO Director, Lt. Gen. James Abrahamson, stated recently that component testing can be done in the laboratory, but "at some point, you must depart from the Treaty, ... around the turn of the next decade".[56] Clearly, the USA intends to invoke article XV in the not too distant future.

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55. Ibid., 2.

56. Ibid.

3. The ENMOD Convention (1977)[57]

This Convention aims at prohibiting the hostile use of potentially disastrous environmental modification techniques (EMT). It is relevant to outer space, chiefly due to the vantage point which earth orbital status imparts. Any EMT effected from orbital altitudes, will inevitably affect large areas of the earth. If controls against misuse of EMT are required at a terrestrial and atmospheric level, they are *a fortiori* required for operations in outer space. The dual-purpose nature of space technology is nowhere more poignantly exemplified than in the area of EMT. This receives recognition in the preamble to the ENMOD Convention, in which it is observed that

> the use of [EMT] for peaceful purposes could improve the interrelationship of man and nature and contribute to the preservation and improvement of the environment for the benefit of present and future generations.

However, it is also recognized "that military or any other hostile use of such techniques could have effects extremely harmful to human welfare."

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57. The Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques, 31 U.S.T. 333. Opened for signature at Geneva, 18 May 1977; entered into force 5 October 1978.

Article I(1) of the Convention embodies the undertaking

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

EMT are defined as those which can be used

> for changing through the deliberate manipulations of natural processes - the dynamics, composition or structure of the earth, including its lithosphere, hydrosphere, and atmosphere, or of outer space.[58]

The Convention has the serious limitation of not establishing a ban on all environmental modification technologies for military or hostile purposes, but only for those which have "widespread, long-lasting or severe effects." No definition of these terms may be found in the Convention itself. However, understandings which accompany the ENMOD Convention, and form part of its negotiating record, define: "widespread" as encompassing an area of several hundred square kilometers; "long-lasting" as lasting approximately a season; and "severe" as involving significant disruption or harm to human life, natural and economic resources or other assets.[59] These broad, and legally

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58. Art. II (emphasis added).

59. Understanding to art. I reproduced in Agreement Governing the Activities of States on the Moon and other Celestial Bodies, Committee on Commerce, Science, and

non-binding, provisions do not alter the fact that whatever is not prohibited verbis expressis by a Convention, is implicitly permitted.[60] Thus, non-hostile techniques are not prohibited, regardless of their effects, nor are techniques which produce destructive effects below a certain threshold.[61] Until these terms are more clearly defined, states party to the Convention may reserve the right to interpret these terms themselves.[62] Therefore, the Convention offers a limited arms control solution, and has been classified as a "law of war" rather than a disarmament measure.[63] Furthermore, while the Convention prohibits the hostile employment of EMT, it does not control or

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(continued from previous page)
Transportation, 95th Cong., 2nd Sess., May 1980, 250.

60. Dolman, A.J., Resources, Regimes, World Order, Pergamon Press, New York, 1981, 322.

61. Krieger, D., Disarmament and Development. The Challenge of the International Control and Management of Dual-Purpose Technologies, Foundation Reshaping the International Order (RIO), Rotterdam, 1981, 41.

62. As was the case when Turkey became a signatory to the ENMOD Convention.

63. Goldblat, J., "The Environmental Warfare Convention: How Meaningful Is It?" Ambio 6, No. 4, Stockholm, 1973, 217.

prohibit their R&D, or possession.[64] This omission is defended by both super-powers, who argue that the "dual applicability of civilian and military ends of much research and development in this field" makes verification very difficult.[65]

Another serious defect of the ENMOD Convention, derives directly from the dual-purpose character of EMT. The Convention states that its provisions "shall not hinder the use of environmental modification techniques for peaceful purposes."[66] Their dual-purpose character often makes the distinction between peaceful and military applications very difficult to draw. Peaceful applications include: changing rainfall patterns; dissipating fog; and the diversion of hurricanes and earthquakes.[67] Warlike applications include: triggering of earthquakes; upsetting

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64. Goldblat, J., "Multilateral Arms Control Efforts", in, SIPRI Yearbook 1985, supra, note 39, 461, at 474.

65. UN Doc. CCD/PV.684 (1975), 11.

66. Art. III.

67. In 1975, Canada submitted a working paper to the Conference of the Committee on Disarmament (CCD) which groups 19 technologies within three main categories: atmospheric modification; modification of the oceans; and modification of the land masses and water systems associated with them. UN Doc. CCD/463 (1975); see also UN Doc. CCD/465 (1975) for the Swedish delegation's study.

the ecological balance of a region; destroying crops; and interfering with communications. In contrast, a recent study has indicated that military and civilian weather satellites could be used to verify compliance with the provisions of the ENMOD Convention, though it would be difficult to determine the cause of any unusual developing weather pattern which may have been detected.[68] Since techniques for peaceful purposes are not to be hindered, it has been observed that solar power satellites could be used for peaceful purposes, but would require many controls, deemed necessary to avoid harmful consequences.[69] However, no specific controls have been suggested.

Article III(2) of the Convention states that parties to the Convention undertake to

> facilitate, and have the right to participate in, the fullest possible exchange of scientific and technological information on the use of environmental modification techniques for peaceful purposes.

Article IV provides that a party to the Convention may undertake any measure it considers necessary 'in accordance with its constitutional process to prohibit and prevent' activities in violation of the provisions of the Convention.

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68. Jasani, B., (ed.), Outer Space - A New Dimension of the Arms Race, SIPRI, Taylor & Francis Ltd., London, 1982, 111.

69. Supra, note 59, at 76.

Such a provision has little practical significance, since no guidance is given as to what constitutes "activities in violation". Furthermore, recourse to different national laws precludes the establishment of a uniform and objective set of sanctions in case of non-compliance.

As of 31 December, 1984, there were 47 signatories to the ENMOD Convention, including both the USA and USSR.[70] The Convention is expressed to be of unlimited duration.[71] The first of a series of five year reviews, provided for in article VIII, was held from 10-21 September, 1984 in Geneva. The declaration, which was adopted at the close of discussions,[72] made the following essential points:

> (a) the years that have elapsed since the entry of the Convention into force have demonstrated its effectiveness;
> (b) the obligations assumed by the parties have been faithfully observed;
> ...
> (e) the parties are concerned that the Convention has not achieved universal acceptance which, it is believed, would enhance international peace and security.[73]

Although suffering from many defects, the consultation and review provisions in article V of the

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70. SIPRI Yearbook 1985, supra, note 39.

71. Art. VII.

72. UN Doc. A/C.1/39/5 (1984).

73. Summarized by Goldblat, supra, note 64.

Convention may be its most positive contribution to the area of arms control in outer space. In this article, States parties undertake to consult and co-operate with each other "through appropriate international procedures within the framework of the United Nations and in accordance with its Charter".[74] In the event of complaint, two procedures for redress are outlined. First, a "Consultative Committee of Experts", made up of representatives from any State party, is convened, on request, by the UN Secretary General (UNSG). The Committee hears the dispute, and submits a summary of findings of fact and expert testimony to the UNSG.[75] Alternatively, a State party may lodge a complaint with the UN Security Council, if it "has reason to believe that any other State Party is acting in breach of obligations deriving from the provisions of the Convention."[76]

If the latter alternative is chosen, each State Party undertakes both to "co-operate in carrying out any investigation which the Security Council may initiate",[77] and to

> provide or support assistance ... to any State Party which so requests, if the Security Council decides that such Party

74. Art. V(1).

75. Art. V(2) and Annex to Convention.

76. Art. V(3).

77. Art. V(4).

has been or is likely to be harmed as a result of the violation of the Convention.[78]

These provisions are some of the most forthright in arms control treaties to date, and represent a sound methodology for ensuring treaty compliance through communication, or, ameliorating non-compliance at the highest international level of authority. It is perhaps this very fact which explains the paucity in the number of signatories to the Convention.

4. SALT II (1979)[79]

The SALT II bilateral Treaty resulted from a series of negotiations which began on 21 November, 1972, shortly after the US Congressional ratification of the SALT I Treaties.[80] SALT II established quantitative limits on inter alia ballistic missile delivery systems, warheads, and cruise missiles. Qualitative limits were also negotiated, controlling modernization or other alteration or replacement

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78. Art. V(5).

79. Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms, (1979) 18 I.L.M. 1112. Signed 18 June 1979; not in force.

80. See Blacker & Duffy, supra, note 33, 255-65.

of agreed arsenals.[81]

In the present context, two articles are of especial interest. Article IX(1)(c) states that

> Each Party undertakes not to develop, test, or deploy:...
> (c) systems for placing into Earth orbit nuclear weapons or any other kind of weapons of mass destruction, including fractional orbital missiles;

This is an elaboration on article IV of the Outer Space Treaty, which will be discussed at some length in the following section. However, at this juncture, it is worthy of note that the specific mention of delivery systems for nuclear weapons, and "fractional orbital missiles", were designed to fill perceived lacunae in the aforementioned article IV. The latter was drafted in ignorance of the initial testing of the Soviet Fractional Orbital Bombardment System (FOBS).[82] The latter incorporated a missile which was launched into orbit, but did not complete an entire earth-orbit, before descending and unexpectedly approaching its target at a lower elevation than a standard Inter-Continental Ballistic Missile (ICBM). Although the FOBS system was tested extensively, no violation of article IV of the Outer Space Treaty occurred, since no nuclear warheads

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81. Ibid., 266.

82. See Cheng, supra, note 11.

were ever used atop the missile.[83] Nevertheless, SALT II goes a step further, by proscribing development, testing and deployment of such a system.

The other article of interest here, is article XII, which provides that

> (i)n order to ensure the viability and effectiveness of this Treaty, each Party undertakes not to circumvent the provisions of this Treaty, through any other state or states, or in any other manner.

This echoes article IX of ABM Treaty, discussed previously in this Chapter,[84] and is aimed at preventing transfer of technology leading to proliferation of such technology.

Although never ratified by the US Senate, both the US and USSR agreed to act as if SALT II were in force. Thus, 31 December, 1985 is its official expiry date.[85] However, its impending lapse, coupled with its somewhat questionable legal status, do not augur well for a protraction beyond this date.

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83. Blacker & Duffy, supra, note 33, 121 et seq.

84. Supra, section C.2.

85. Art. XIX(1).

D. SPACE LAW AND THE MILITARIZATION OF THE MILIEU

1. Article IV of the 1967 Outer Space Treaty

a) Introduction

Much has been written on the Outer Space Treaty, before and since its entry into force on 10 October, 1967. Its most contentious provision has always been article IV, which is also the only article to deal directly with the permissible scope of military activities in outer space. Although the major concentration will be upon this article, where appropriate, other articles of the Treaty will be adverted to.

In view of the prolific output of jurists, and other commentators, on the meaning and ambit of this article, this section will involve a comparative review of their recorded opinions. If justification other than the desire for clarity and legal certainty is required, the statements recorded herein represent the "teachings of the most highly qualified publicists of the various nations".[86] Thus, their validity as category (d) international law cannot be

86. Art. 38(1)(d) of the Statute of the ICJ, see supra, note 3.

disputed. Whilst the treaty itself has precedence, being category (a) international law,[87] the ambiguity and contention with respect to the interpretation of article IV, renders a consideration of doctrine apposite.

The text of article IV reads as follows:

> (I) 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.
>
> (II) The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the Moon and other celestial bodies shall also not be prohibited.

b) Taxonomic Analysis

A thorough reading of expressed opinion on article IV discloses three lines of interpretation. In the succeeding discussion, each of these interpretive hypotheses will be illustrated by their major proponents.

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87. See supra, this chapter, section B.

i) The Verbis Expressis Rule

This is the international legal counterpart of the "literal rule" of statutory interpretation, found in the national legal systems of both the common law[88] and civil law[89] traditions. According to USAF Lt. Col. Robert L. Bridge,

> (o)ne of the fundamental truths of international law is the fact that if an act is not specifically prohibited, then international law permits it ... there is very little which is specifically prohibited in space. ... While space is dedicated to peaceful uses, it does not follow that military uses are forbidden. In truth, space provides a vital extension of United States defensive forces. Defensive activities in space are all the more vital when one considers the fact that potential enemies of the United States are also unfettered by extensive prohibitions.[90]

Support for this conclusion can be found in opinion expressed by Dr. B. Bakotic, a Yugoslavian jurist, during the recent 1984 Paris Conference of the International Law

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88. See Williams, G., Learning the Law, (10th ed.), Stevens, London, 1978, 91 et seq.

89. See David, R. & Brierley, J.E.C., Major Legal Systems in the World Today, (2nd ed.), Stevens, London, 1978, 109 et seq.

90. Bridge, supra, note 12, at 664.

Association.[91] In amplification of his affirmative reply to the question "do you agree that under the rules of international law so far adopted none of the present military uses of outer space are prohibited?", he stated that

> such an answer does not imply my accepting, generally and without any reserves, a view whereby everything that is not prohibited is permitted. I do accept such a view in this particular case, because of the incontestable existence of legi speciali, derogating legi generali and providing ground-work for a contrario conclusion as well. This approach is validated, among others, by the Soviet proposals of 1981 for the conclusion of a Treaty on the Prohibition of the Stationing of Weapons of any Kind in Outer Space (UN. Doc. A/36/192), and of 1983 for the conclusion of a Treaty on the Prohibition of the Use of Force in Outer Space and from Space Against the Earth (UN. Doc. A/38/194).[92] I would hold a different view if the only international space law rule adopted in this respect were to read, simply, "outer space shall be reserved for peaceful purposes", as applied to the high seas in Art. 88 of the 1982 U.N. Convention on the Law of the Sea.[93]

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91. "Discussion Paper on the Legal Aspects of the Present and projected Military Uses of Outer Space", Space Law Committee, International Law Association (ILA), in, Report of the Sixty-First Conference, Paris, 1984, 356-75.

92. The two Soviet drafts are discussed in detail infra, Chapter V, sections B.1.(b) and B.1.(f).

93. Supra, note 91, 358-59.

Whilst expressing disapproval with its merits, Professor Ivan Vlasic concludes that

> (i)ronically, by specifying prohibited activities in space, article IV, particularly its second paragraph, has often been cited, not without some justification, in support of the claim that the Treaty allows all military uses of outer space which are not explicitly forbidden. Thus the Treaty stipulation that was supposed to curb the militarization of outer space has had the opposite effect in practice. Major space powers have demonstrably been acting on the premise that whatever is not prohibited verbis expressis by the Treaty is permissible, and therefore lawful. While the document as a whole does not permit such an interpretation, the muddled text of article IV can be used, and has been used, to undermine the legally and politically sounder interpretation.[94]

An alternative viewpoint has been expressed by former judge of the ICJ, Dr. Manfred Lachs, who observes that

> (t)he old principle that everything not prohibited is permitted is not valid today. The freedom of action is determined by the possibility of infringing upon the rights of others. Hence the limitation of rights and the need for co-operation and consultation in all cases where a state may by its activity affect the rights of others. This is of particular importance in regard to outer space.[95]

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94. In Vlasic, I., "Disarmament Decade, Outer Space and International Law", (1981) 26 McGill L.J. 135, at 170.

Swiss jurist, Professor Marco Markoff, is in implicit agreement, when he remarks that "the list of the prohibited uses in Article IV(2) is an explanatory, not an exhaustive one."[96] Finally, in this section, Soviet legal authority, Professor V.S. Vereshchetin, is emphatically opposed to the verbis expressis doctrine as applied to article IV,

> (i)t should be stated with all certainty, that the unqualified assertion on legality of everything not directly prohibited in the sphere of military activities in outer space runs counter to the general principles of international law, the tendencies of legal regulation of this type of activity and to the norms of international morality.[97]

While sympathizing with the latter three viewpoints, one must be cognisant of state practice since the inception of the Space Age. The panoply of military uses of outer space, outlined in chapter one of this thesis, effectively reinforce the verbis expressis rule as applied to article IV.

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96. Markoff, M., "Disarmament and 'Peaceful Purposes' Provisions in the 1967 Outer Space Treaty", (1976) 4 J. Space L. 3, at 17.

97. In Vereshchetin, V.S., "Against Arbitrary Interpretation of Some Important Provisions of International Space Law", 25th IISL Coll. 1982, Paris, at 153.

ii) The Treaty "Intent and Purpose" Override

Whilst accepting that article IV per se has inherent flaws and lacunae as a measure to limit or prevent military uses of outer space, a number of commentators adopt a "golden rule", or "mischief rule" interpretive methodology. The latter involves construing the objects for which the treaty was created, in such a manner as to 'cure' the defects in article IV. This has been criticized as "an attempt to win, through interpretation, a battle lost behind the negotiating table".[98] In apparent confirmation of this criticism, Argentinian jurist Professor Aldo A. Cocca stated recently that

> (m)any of us who participated in the elaboration of the Space Treaty of 1967 expressed our deep disagreement on the text of Art. IV, which was considered the most vulnerable part of the Treaty. In our view, the concept of partial demilitarization was not in accordance with the inner spirit and inspiration of Space Law. On the other hand, it was not in harmony with the context of the Treaty. Just the contrary, it was opposed to the Preamble - the expression of intents of the instrument - and also to specific provisions of other articles.
>
> The reading of Art. IV, outside of the Treaty context, is seriously misleading.[99]

The preambular provisions to which Professor Cocca refers,

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98. In Jasani & Lunderius, supra, note 36, at 65.

99. Supra, note 91, at 359.

provide that, in promulgating the Outer Space Treaty, States Parties are

> Recognizing the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes,
>
> Believing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development,
>
> Desiring to contribute to broad international co-operation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes. ...

Certainly, the Vienna Convention on the Law of Treaties advocates a consideration of the preamble to a treaty, for assistance in its interpretation.[100] This has led Professor Vlasic to conclude that

> the cumulative effect of the directives contained in the preamble and in the operative part of the Treaty, more than any single specific stipulation in it, suggests convincingly that the present level of "defence" activities in space is contrary to the letter and the spirit of the document.[101]

However, the most forceful exponent of this viewpoint is Professor Markoff. The latter accords precedence to article I(1) of the Outer Space Treaty, which enacts that

> (t)he exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the

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100. Art. 31(2).

101. Vlasic, supra, note 94, 174.

> benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

In construing this provision, Professor Markoff states categorically that:

> (i)t is Article I(1) and not Article IV, that fixes and determines the fundamental criterion of reference relating to the legal use of outer space. This criterion mandates the exploration and use of outer space in the interests of all states. The principle set forth in Article I(1) is intimately connected with the preamble's prescription of use for peaceful purposes, as well as with the disarmament provisions of Article IV, paragraph 1 and 2. The "soft law" of Article I(1) has been reinforced by the prohibitive rules of Article IV, which constitute a "hard law" of duly specified and self-executing treaty obligations. Yet Article IV constitutes but a limited, or partial application of the general principle contained in Article I(1). The objectives of the obligations established in Article IV are to prohibit a variety of, but not all, possible military activities in outer space. The objective of the fixed treaty obligation in Article I(1) is to obtain from all States Parties and especially from the major space powers, the required domestic legislative and executive implementing acts, to ensure that use of outer space should really be "for the benefit and in the interests of all countries."[102]

Although one cannot but admire and respect the scholarly advocacy of, particularly, the latter jurist, who has consistently and tenaciously defended this proposition, it suffers from the same weakness as the previous one.

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102. Markoff, supra, note 96, 15-16.

Political reality has little respect for legal nicety, or to put it another way, nécessité fait loi.

iii) A Regime of Relativity of Denuclearization and Demilitarization

There is a somewhat surprizing consensus of opinion among the foremost international space law jurists of both the Western alliance, and the Eastern bloc, concerning this third category of interpretation of article IV. This anomaly is perhaps better understood if one recalls the relative equality of military activity, of both eastern and western space powers, outlined in chapter one.

Dealing with eastern bloc opinion first, one of the earliest legal commentaries was by the Hungarian, Dr. Gyula Gal. In his 1969 book on Space Law, Dr. Gal observed that

> the Space Treaty is only the first step towards the complete demilitarization of outer space. The fact that the space powers have been able to agree on the demilitarization of the celestial bodies, but not on that of space in general, shows that the price of the compromise was the adjournment of the question.[103] (Emphasis added).

This was reinforced by the 1976 Soviet publication, edited by Professor A.S. Piradov, in which it was categorically

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103. Gal, G., Space Law, Sijthoff, Leyden, Oceania New York, 1969, 172.

stated that,

> (t)he principle of the partial demilitarisation of outer space and the total demilitarisation of celestial bodies is formulated in Article IV of the Space Treaty.[104]

It is further averred that

> (i)n future, should agreement be reached on the total demilitarisation of all outer space - and not just the Moon and other celestial bodies - the Space Treaty will be amended to incorporate the principle that outer space may be used for peaceful purposes exclusively. This principle will supersede the present principle of the partial demilitarisation of outer space and the total demilitarisation of celestial bodies.[105]

More identifiable Soviet opinion has been expressed by, arguably, the three foremost Soviet space lawyers to date, Professors Vereshchetin, Kolosov and Zhukov. The most eminent, Professor Vereshchetin, stated recently:

> (h)ardly disputable now is the thesis that the Space Treaty has not fully banned any military activity in outer space in general. The use of outer space in (sic) peaceful purposes generally is proclaimed in the Treaty as a desire and a task for the future rather then an approved legal obligation.[106]

Professor Kolosov is in total agreement, when he remarks that "contemporary international law completely excludes any

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104. Piradov, A.S. (ed.), International Space Law, Progress Publishers, Moscow, 1976, 91.

105. Ibid., 92-93.

106. Vereshchetin, supra, note 97, at 155.

military use of celestial bodies, but does not ban military use of outer space per se".[107] This is augmented by the comments of his colleague, Dr. Zhukov, who observed that

> the provisions of the 1967 Space Treaty on the "exploration and use of outer space for peaceful purposes" carry a future-oriented character. In future if agreement is reached on the complete demilitarization of outer space, the principle of the use of outer space exclusively for peaceful purposes would be incorporated in the 1967 Space Treaty to replace the present principle of the partial demilitarization of outer space and complete demilitarization of celestial bodies.[108]

These remarks are reiterated, virtually verbatim, in the most recent Soviet space law publication,[109] and can be taken as the authoritative Soviet interpretation of article IV.

Turning now to the opinions of the foremost western jurists, Professor Bin Cheng, in his definitive article on the Outer Space Treaty,[110] stated that

> (a)rticle IV is divisible into two clearly

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107. Kolosov, Y.M., "Notions of "Peaceful" and "Military" Space Activities", 25th IISL Coll., 1982, Paris, at 117.

108. Zhukov, G., "The Problem of Demilitarization of Outer Space", 25th IISL Coll., 1982, Paris 113, at 115.

109. Zukhov, G. & Kolosov, Y., International Space Law, Novosti, and Moscow, Praeger, 1984, 53-61.

110. Cheng, supra, note 11.

> separate sections. The first consists in an agreement partially to demilitarise extra-terrestrial space, including all celestial bodies; the second completely to demilitarise all celestial bodies.[111]

Professor Cheng's remarks, in explanation of this fact, become more veracious with each passing year,

> (t)he very fact that missiles, whether of inter-continental or intermediate range, have to go through outer space to reach their targets explains why, at present, notwithstanding the expressed wishes of many States the super-Powers, in the absence of general disarmament, are unwilling to agree to limit outer space to peaceful uses only; for apart from the transit of missiles, outer space is now used extensively for military purposes.[112]

Dr. Nicolas Matte, in his 1969 publication on Aerospace Law,[113] interprets article IV to the effect that

> (i)n the first paragraph, the deliberate omission of the obligation of not sending nuclear arms or weapons of mass destruction into outer space seems designed to permit the use of Intercontinental Ballistic Missiles, which - at least for a short time - would cross outer space. Such a restriction would have forced the two great atomic powers to abandon an important, if not vital, part of their defensive systems.[114]

Furthermore, he states ironically that

> (t)he manner in which the second paragraph of Article IV of the Space Treaty was

111. Ibid., 602.

112. Ibid., 604.

113. Matte, supra, note 29.

114. Ibid., 298.

> drawn up, practically represents a franchise, if not an invitation to use outer space for military purposes, such as reconnaissance and surveillance via satellites.[115]

Finally, the comments of two of the most respected US space law jurists are apposite. Professor Carl Q. Christol construes article IV as follows:

> par. 1, while applicable to the totality of the space environment, prohibits the presence in these areas of only nuclear weapons and weapons of mass destruction. Further, as is clear from the text of par. 2, the area of outer space, per se, is excluded from the requirement of use exclusively for peaceful purposes.[116]

S. Neil Hosenball, former NASA General Counsel, and US representative to COPUOS, has remarked that

> (i)t appears that under the 1967 Outer Space Treaty, except for the limitations expressly set forth in Article IV, paragraph 1, no military activities are barred in outer space. ...[117]

The conclusion is inescapable, that article IV of the Outer Space Treaty was, at best, a first step towards controlling military uses of outer space. One would do well

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115. Ibid., 299.

116. Christol, C.Q., The Modern International Law of Outer Space, Pergamon Press, New York, 1982, 26.

117. Hosenball, S. N., "Present and Prospective Military Technologies and Space Law: Implications of the 1967 Outer Space Treaty", in, Ra'anan, U. & Pfaltzgraff, R.L. Jr., (eds.), International Security Dimensions of Space, Archon Books, Medford, Mass., 1984, 213, at 218.

to be mindful of Professor Cheng's 1968 caveat to the effect that

> (t)he present position, therefore, is that outer space as such is militarily too important already to be demilitarised except as part of a general programme of disarmament. Both super-Powers made it clear that any attempts within the context of the space treaty to demilitarise outer space would simply make the treaty as a whole unacceptable to them.[118]

Furthermore, the often overlooked article VI of the Outer Space Treaty provides that

> (a)ny State Party to the Treaty may give notice of its withdrawal from the Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year from the date of receipt of this notification.

However, 85 states have ratified the Outer Space Treaty,[119] among them, both the long-established and emerging space powers. Thus, what article IV represents, may well be Statute of the ICJ category (b) international law, namely 'international custom, as evidence of a general practice accepted as law.'

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118. Cheng, supra, note 11, at 604.

119. SIPRI Yearbook 1985, supra, note 39.

2. The Registration Convention[120]

Shortly after the advent of the Space age, the registration of satellite launchings and satellites in orbit came to be regarded as an important factor in the promotion of an orderly use of outer space. As early as 1961, the General Assembly adopted Resolution 1721B(XVI) calling upon the launching states to furnish information promptly to COPUOS regarding the registration of launchings.[121] The Secretary-General of the United Nations was requested to maintain a public registry of this information. As the resolution did not define the format or contents of the launch information to be reported, and because such reporting was voluntary, the information given to the United Nations lacks uniformity.[122]

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120. Convention on Registration of Objects Launched into Outer Space, 28:1 U.S.T. 695 (hereinafter cited as the Registration Convention). Opened for signature 14 January 1975; entered into force 15 September 1976.

121. UNGA Res. 1721B(XVI), 20 December 1961.

122. Sheldon, C.S. & Luxemberg, B.A., "A Comparison of United Nations Voluntary Registrations of Space Objects with Data from Other Sources as a Test of Registration Compliance 1957-1974", in, Report on Convention on Registration of Objects Launched into Outer Space: Analysis and Background Data, Committee on Aeronautical and Space Sciences, US Senate, 94th Cong., 1st Sess., 1975, 26-33; Cocca, A., "Convention

With the entry into force of the Outer Space Treaty in 1967, it was expected that the launching states would be more formally obliged to give public notice of their activities in outer space. Articles V and VIII of the Outer Space Treaty, respectively, contain such expressions as "the State of registry of their space vehicle" and "a State Party to the Treaty on whose registry an object launched into outer space is carried". No obligatory international registration system was created. As a result, no clear or uniform picture of the space powers' outer space activities was drawn.

The Registration Convention established mandatory registration with the Secretary General of the United Nations of space objects launched into orbit and beyond.[123] Three reasons have been posited for the establishment of a central registry: effective management of traffic; enforcement of safety standards; and imputation of liability for damage.[124] While the central registry

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on Registration of Objects Launched Into Outer Space", in, Jasentuliyana, N. and Lee, R. (eds), Manual on Space Law, Oceania, New York, 1979, 175.

123. Art. III (1).

124. Matte, N.M., Aerospace Law [:] From Scientific Exploration to Commercial Utilization, Carswell Co. Ltd., Toronto, 1977, 175.

is the most significant feature of the Treaty, it fulfils several other important objectives. Launching countries must maintain a national registry.[125] While the contents of this registry are left to each country, it is mandatory for states to supply specific information for the central registry. Thus, article IV states:

> Each State of registry shall furnish to the Secretary-General of the United Nations, as soon as practicable, the following information concerning each space object carried on its registry:
> (a) Name of launching State or States;
> (b) An appropriate designator of the space object or its registration number;
> (c) Date and territory or location of launch;
> (d) Basic orbital parameters, including:
> (i) Nodal period,
> (ii) Inclination,
> (iii) Apogee,
> (iv) Perigee;
> (e) General function of the space object.

This information is to be transmitted "as soon as practicable"[126] to the UN Registry for Space Objects, which invariably results in ex post facto notification.[127] Furthermore, states are not obliged to reveal the true function of a satellite. Only the "general function of the space object" is to be reported.[128]

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125. Art. II.

126. Art. IV(3).

127. See Vlasic, supra, note 94, at 190.

128. Art. IV(1)(e).

States are not always willing to reveal that they have launched a satellite for military or other national security purposes. Consequently, the permissive nature of this article enables nations to give a minimum of information on the function of their space object, while still being in compliance with the convention. In the assessment of a US Senate report, "such descriptions have tended to be so vague as to be close to meaningless".[129]

The underlying reason for this laconism, exhibited by launching states, is the general mistrust states have of one another. The reporting records of the US and the USSR are particularly interesting: neither has ever reported any space mission as serving military purposes.[130] Both super-powers possess effective monitoring devices which allow them to accurately determine the true function of a spacecraft. Thus, "the description seems aimed at the nations lacking such devices as much as at the potential adversary."[131] Thus, one of the main objectives of the Registration Convention, to reduce mistrust through quick, accurate and full reporting of space missions, is not achieved.

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129. Sheldon & Luxemberg, supra, note 122, at 22.

130. Vlasic, supra, note 94, at 191.

131. Ibid.

Strengthening of the existing declaration system may improve the situation. In a recent statement to the UN Conference on Disarmament,[132] the French delegation proposed that every state or launch body commit itself

> to provide more detailed information on the features and missions of objects launched into space in order to improve the possibilities of verification.[133]

This amendment to the Convention could delineate the specifics to be provided about the space object's function. Ideally, complete disclosure would be achieved. The reality of our world, however, precludes full disclosure as the result of such an amendment. In Goedhuis' opinion,

> it appears difficult to expect that these Powers [launching states] will be willing to accept in a convention a principle providing for an obligation to inform the world community with full and detailed information on the purpose of all these launchings.[134]

The suggested amendment, recently essayed by the Chinese legal adviser to the Ministry of Foreign Affairs,

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132. The 12 June 1984 statement is reproduced in Survival, vol. XXVI, Sept./Oct. 1984, 235-37.

133. Ibid., 237; see also Diedericks-Verschoor, I.H. Ph., "Observations on the Registration Convention", in, Jasentuliyana, N., (ed.), Maintaining Outer Space For Peaceful Uses, supra, note 42, at 114.

134. Goedhuis, D. (ed.), The Present State of Space Law, in, The Present State of International Law and Other Essays, Boston, 1973, 222.

may provide a viable option.[135] He proposed adding a paragraph to article IV stating that

> (t)he State of registry shall immediately inform the Secretary-General of the United Nations in case any object carrying any kind of outer space weapon has been launched into outer space.[136]

Whilst the disclosure of specific details is not mandatory, the notification of whether the object carries weapons or not is. Although such an amendment would greatly contribute to maintaining outer space for peaceful uses, it is unlikely that states would freely reveal data of such a sensitive nature.

The ex post facto notification system, established under article IV of the Registration Convention, is also questionable. A statement by R. Cargill Hall in 1965, regarding the voluntary system of notification which preceded the Registration Convention, is equally valid today. He states that

> (a)lthough the launch register generally is recognized to establish nationality and jurisdiction for registered craft (in itself a major achievement), it is not a usable source of information for determining real time space traffic in airspace

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135. He, Q., "The Registration Convention and Maintenance of the Peaceful Uses of Outer Space", in, Jasentuliyana, N., (ed.), Maintaining Outer Space for Peaceful Uses, supra, note 42, at 120.

136. Ibid.

and in outer space.[137]

He advocated pre-launch registration, through the filing of registration and identification papers and a flight plan, paralleling the system developed for aircraft.[138] Information to be furnished would include: "proof of flag state ownership"; nature of the craft, whether public or private; "spacecraft identification, markings and characteristics"; whether the craft is manned; the purpose of the mission; and the communication frequencies employed.[139]

Pre-launch notification would provide the ideal solution, but, once again, in light of the perennial mistrust among states, this is not a rational expectation.

Other suggestions, with regard to the time to furnish information, include altering the phrase "as soon as practicable", found in article IV paragraph 1, to "the Secretary-General of the United Nations shall be promptly informed".[140] This would oblige states to file their registrations within 30 to 60 days after launch, or, if contact were lost following launch, within the 30 to 60 days

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137. Hall, R.C., "Comments on Traffic Control of Space Vehicles", (1965) 31 J.A.L.C. 327, 331.

138. Ibid., 334-35.

139. Ibid.

140. He, supra, note 135.

following an object's retrieval.[141] Thus, although notification would still remain ex post facto, the international community would be notified of launching at the earliest possible time, rather than have to wait for months, as is often the situation currently.

It is worthy of note, that the Committee on Space Research (COSPAR) operates an ad hoc information service, superior to that established by the Registration Convention in the UN. Its "Advisory Committee on Data Problems and Publications" functions

> to elaborate rules concerning rocket and satellite information and data exchange in the frame of international services such as SPACEWARN, world data centres, and satellite warning centers, and to formulate proposals on COSPAR publication policy.[142]

The SPACEWARN system is managed for COSPAR by the International Ursigram and World Days Service (IUWDS), and was designed to inform scientists of space launchings and their detailed orbital parameters. IUWDS coordinates four "satellite regional warning centers" in Japan (Western Pacific region), West Germany and the UK (Western Europe), the USSR (Eurasia) and the US (Western Hemisphere).[143]

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141. Sheldon & Luxemberg, supra, note 122, at 21.

142. Chipman, R. (ed.), The World in Space - A Summary of Space Activities and Issues, New Jersey, 1982, 656.

143. Ibid., 657.

"The messages are sent from one continent to another by telegram, and further distribution to national centers and individual laboratories is achieved by the most effective rapid means available."[144] Although this represents a significant improvement over the UN registration system, it remains ex post facto except for the most widely pre-publicised missions.

The Registration Convention, though a step in the right direction, unfortunately falls far short of guaranteeing timely and accurate reporting of space missions. It has the potential of being useful in maintaining outer space for peaceful uses and of lessening the growing uncertainty and suspicion as to the nature of all space activities. To achieve these results, however, more precise and timely information would have to be furnished by launching states. This process of world-wide cooperation in registration of space objects, could pave the way to a more open climate in political relations.

144. Ibid.

3. The Moon Treaty[145]

The most recent of the space law treaties, the Moon Treaty was adopted by consensus in the UN General Assembly on 5 December, 1979, but only came into force, with the minimum five ratifications, on 11 July, 1984.[146]

While arms control was not a major focus of discussion during the treaty negotiations in COPUOS, some nations did express concern over the military implications of certain space activities. Article 3 of the Moon Treaty, containing the only provisions addressed to military activities, reads as follows:

> 1. The moon shall be used by all States Parties exclusively for peaceful purposes.
>
> 2. Any threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited. It is likewise prohibited to use the moon in order to commit any such act or to engage in any such threat in relation to the earth, the moon, spacecraft, the personnel of

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145. Supra, note 8. For an analysis of the development of the Treaty, see Matte, N.M., "Treaty Relating to the Moon" in, Jasentuliyana, N. & Lee, R. (eds.) Manual on Space Law, Vol. I, Oceania, New York, 1979, 253 et seq.

146. The five ratifying states are: The Netherlands, The Philippines, Chile, Uruguay and Austria, none of which are, or are likely to become, independent space powers.

spacecraft or man-made space objects.

> 3. States Parties shall not place in orbit around or other trajectory to or around the moon objects carrying nuclear weapons or any other kinds of weapons of mass destruction or place or use such weapons on or in the moon.
>
> 4. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on the moon shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration and use of the moon shall also not be prohibited.

Although apparently a reiteration of article IV of the Outer Space Treaty, there are some significant additions. Paragraph 1 of article 3, operates to expand the area of application of the peaceful purposes admonition in article IV(2) of the Outer Space Treaty.[147]

Regarding the second paragraph, some nations wanted to ensure that this provision did not differ in effect from article 2(4) of the UN Charter, and did not derogate from the right of self-defence under article 51 thereof. It is worth noting, that when France signed the Moon Treaty it reported a clarification to the UN, which stated that

> France is of the view that the provisions of article 3, paragraph 2 of the

147. Norris, R.W., & Bridge, R.L., "Some Implications of the Moon Treaty with Regard to Public Order in Space", 23rd IISL Coll., 1979, 57.

> agreement, relating to the use or threat of force, cannot be construed as anything other than a reaffirmation, for the purposes of the field of endeavour covered by the agreement, of the principle of the prohibition of the threat or use of force, which states are obliged to observe in their international relations, as set forth in the UN Charter.[148]

Paragraph 3, is a clarification of the lacunae left by article IV of the Outer Space Treaty, and the Moon is now definitely included in the denuclearization of celestial bodies contained in article IV(1).[149] Paragraph 4, however, adds nothing, and is a superfluous reiteration of the latter part of article IV(2) of the Outer Space Treaty.

In conclusion, not only does the Moon Treaty make a very modest extension to the pre-existing régime, but also, in view of the paucity of signatories thereto, its impact on controlling the militarization of outer space is minimal.

4. International Telecommunication Convention (1982)[150]

The presently applicable International Telecommunication Convention was adopted in 1982 in Nairobi.

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148. Ibid., 58.

149. See Jasentuliyana, supra, note 42, 121, at 130.

150. International Telecommunication Convention. Nairobi,

The purposes of the International Telecommunications Union (ITU) are to maintain and extend international cooperation for the improvement and rational use of telecommunications, to ensure the efficient use of the radio spectrum and to harmonize the actions of states in the attainment of these ends. The ITU is also responsible for the allocation of radio frequencies for all outer space activities, and for ensuring that the radio spectrum is utilized in such a manner as to avoid harmful interference. Article 35 of the Convention provides that

> (a)ll stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Members or of recognized private operating agencies, or of other duly authorized operating agencies which carry on radio service, and which operate in accordance with the provisions of the Radio Regulations.

Whilst measures can be taken to ameliorate harmful interference in terrestrial radio-communications, it is virtually

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1982. General Secretariat, International Telecommunication Union. Geneva. See also annual reports: Twenty-third Report by the ITU on Telecommunications and the Peaceful Uses of Outer Space. Booklet No. 32. Geneva 1984. See also International Telecommunication Convention with annexes and protocols, Malaga-Torremolinos October 25, 1973. T.I.A.S. 8572. See, in general, Matte, N.M., Aerospace Law [:] Telecommunications Satellites, Butterworth, Toronto, 1982.

impossible to do so with space telecommunications.[151]

With respect to the use of the geostationary orbit, provision is made requesting states to undertake efficient and economical utilization to ensure equitable access for all members.[152] However, the opportunities for an equitable and rational allocation of orbital positions are reduced by Article 38(1) of the Convention, which states that

> members retain their entire freedom with regard to military installations of their army, naval and air forces.

Thus, it would appear that the Convention grants virtually unrestricted freedom to military radio installations, regardless of the fact that military satellites cause interference with civilian uses of the radio spectrum, even when not operating from the geostationary orbit.

This concludes the analysis of extant space law. In the final part of this chapter, the two burgeoning areas of space weaponization will be discussed, in order to evaluate their legality.

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151. Berrada, A., "Space and Radio Communications", in, Jasentuliyana (ed.), Maintaining Outer Space for Peaceful Purposes, supra, note 42, 163, at 166.

152. Article 33 of the Convention, see Jakhu, R.S., "The Legal Status of the Geostationary Orbit", (1982) VII AASL 333.

E. LEGALITY OF ASATs AND SPACE-BASED BMD

1. Legality of ASATs

a) Outer Space Treaty

The possibility of introducing weapons systems into space had clearly been considered by both the US and the Soviet Union prior to their ratification of the Outer Space Treaty. In the negotiations which led to the adoption of the "Declaration of Legal Principles" of 1963,[153] Soviet Ambassador Federenko stated that the "proposal" does not and could not, of course, deal with the matter of military use of Outer Space.[154] He expressed the view that the Soviet Union was unable to "agree with attempts to divorce the matter of military use of outer space from other matters of disarmament which are intimately linked with it ..."[155] This outlook influenced the Soviet conclusion that article IV of the Outer Space Treaty established the principle of the "partial demilitarization" of outer space.[156]

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153. UNGA Res. 1962 (XVIII), 13 December 1963.

154. UN Doc. A/C.1/PV.1342 (1963), at 41.

155. Ibid.

156. Supra, this chapter, section D. 1.

During the Senate Committee hearings on the Outer Space Treaty, and in direct reference to ASAT weapons, Secretary of State Dean Rusk testified that article IV "does not inhibit, of course, the development of an anti-satellite capability in the event that should become necessary."[157] Thus, the muddled text of article IV reflects the Soviet and American desire not to foreclose opportunities to develop such military capabilities.

As discussed in a previous section, under article IV(1) of the Outer Space Treaty, "(s)tates are perfectly entitled to use the whole of outer space for military purposes, bar the stationing of nuclear and other weapons of mass destruction."[158] This proscription clearly does not apply to existing operational ASAT systems. The current American ASAT consists of a two-stage rocket booster, capped by a non-explosive Miniature Homing Vehicle (MHV). When released from an F-15 fighter plane, the ASAT destroys its target by direct impact.[159] In contrast, the Soviet ground-based ASAT system is launched by a modified SS-9

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157. Rusk, D., "Treaty on Outer Space", Hearings before the Committee on Foreign Relations, US Senate, 90th Cong., 1st Sess., 1967, 27.

158. Supra, note 156.

159. See supra, Chapter I, section B.2.

booster rocket, equipped with a conventional warhead,[160] which destroys its target by impacting it with shrapnel. Thus, neither version can be considered a nuclear weapon. However, because ASAT technology greatly resembles that of BMD, fears have been expressed that the R&D of high energy lasers, including X-ray lasers, being conducted for BMD, will be used for ASATs.[161] X-ray lasers derive their energy from small nuclear explosions. As averred previously, the use of such an ASAT weapon would undeniably infringe article IV(1) of the Outer Space Treaty.[162] The testing of such weapons would also jeopardize the 1963 Partial Test Ban Treaty, which bans inter alia nuclear weapons tests in outer space.[163]

While there is no lack of analytical definition of

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160. Ibid., section B.1.

161. Jasani, B., "Space Weapons", in, Space Policy, vol. 1, No. 2, May 1985, 164, at 174.

162. See supra this chapter, section D.1. See also the comments made by Goedhuis, in the "Discussion Paper on the Legal Aspects of the Present and Projected Military Uses of Outer Space", ILA Paris Conference supra, note 91, 366; see also Christol, C.Q., "Arms Control and Disarmament in Space: The Rough Road to Vienna 1984", in, Space Policy, ibid., at 34.

163. See, supra, this chapter, section C.1.

the term "weapons of mass destruction",[164] it seems that the 1948 definition by the Commission for Conventional Armaments has received wide approval. The latter states as follows:

> Weapons of mass destruction should be defined to include atomic explosive weapons, radioactive material weapons, lethal chemical and biological weapons and any weapon developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above.[165]

Dealing with lasers and particle beam weapons, Lt. Col. A.J. Butler stated that they are "considered 'point' weapons and not indiscriminate weapons of mass destruction."[166] ASATs can also be considered a "point" weapon, as they all target specific and aimed at destroying individual satellites.[167] The Soviet proposals to ban

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164. Gorove, S., "Linking the Use of Arms in Outer Space", (1982) 25 IISL Coll. 93; Hasselmann, "Weapons of Mass Destruction; Article IV Outer Space Treaty and the Relationship to General Disarmament", (1982) 25 IISL Coll. 99, at 106.

165. UN Doc. S/C.3/30, 13 Aug. 1948. This definition was later affirmed by UNGA Res. 32/84B, 3 December 1977.

166. Butler, A.J., "Peaceful Uses and Self-Defense in Outer Space", (1982) 25 IISL Coll. 77, at 79.

167. Halpern, J.N., "Antisatellite Weaponry: The High Road to Destruction", (1985) 3 Boston U. Int'l L. J. 167, 182-83; see also comments by Christol and Gorove in

all weapons in outer space further emphasize the view that ASATs are not considered as "weapons of mass destruction".[168]

Article IV(2) which reserves the moon and other celestial bodies for "exclusively peaceful purposes" is not disposed of as readily. The scope of this expression has been discussed in extenso in a previous section.[169] In this context, suffice it to say that while the Soviet Union has officially interpreted "peaceful" to mean "non-military" in practice, it is in accord with the US definition of it as "non-aggressive".[170]

The highly destabilizing and offensive character of ASATs has been widely recognized with trepidation.[171] As

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"Discussion Paper on the Legal Aspects of the Present and Projected Military Uses of Outer Space", ILA Paris Conference, supra, note 91, at 367.

168. Goedhuis, D., "What Additional Arms Control Measures Related to Outer Space Could Be Proposed?", in, Jasani, B. (ed.), Outer Space - A New Dimension to Arms Race, supra, notes 68, 301-02; also, Christol, ibid.

169. Supra, this chapter, section D. 1.

170. Vlasic, supra, note 94, 171.

171. "Avoiding Star Wars", N.Y. Times, 1 Feb. 1984, at A-9; Vlasic, ibid., 161; Gorove, S., "Arms Control Provisions in the Outer Space Treaty, A Scrutinizing Reappraisal", (1973) 3 Ga. J. Int'l C.L. 114.

noted by Christol

> (i)t is evident that there are vast differences between the destructive capabilities of an Asat and the reconnaissance capabilities of traditional space objects. For example, the Asat seemingly has utility only in an attack or offensive situation, while satellites -- although able to serve both civil and military purposes -- traditionally have been wholly defensive in character. An operational Asat is to be characterized by its highly provocative potential. Traditional reconnaissance satellites have been employed to acquire information in nonprovocative circumstances.[172]

Nonetheless, the official US position with respect to ASATs, is one of vigorous pursuit of their development.

> ... For these fundamentally defensive reasons, the President has called for a prudent, measured response to the Soviet military space threat in order to protect U.S. and Allied security interests. In his National Space Policy statement he said:
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> > The United States will develop and maintain an integrated attack warning, notification, verification and contingency reaction capability which can effectively detect and react to threats to United States space systems. The United States will proceed with development of an anti-satellite (ASAT) capability, with operational deployment as a goal. The primary purposes of a United States ASAT capability are to deter threats to space systems of the United States and its Allies and, within such limits imposed by international law, to deny any adversary the use of space-based systems that provide support to

172. Christol, supra, note 116, 30.

hostile military forces.[173]

While the Soviet Union has proposed a "Draft Treaty on the Prohibition of the Use of Force in Outer Space and From Space Against the Earth",[174] as well as declared a unilateral moratorium on such weapons for as long as other states, including the US, refrain from placing any kind of ASAT weapon in outer space,[175] it has never labelled ASATs as an "aggressive" use of outer space.

The inter-relationship of politics and law is particularly evident in discussing the legality of ASATs. A party will interpret and try to persuade authoritative decision-makers so to interpret, a rule in a manner which benefits its exclusive interest. This is the approach adopted by both the USA and USSR with respect to article IV of the Outer Space Treaty.

As has been rightly stated by Vlasic:

> tacit acceptance of the use of contemporary unsophisticated space technology for military surveillance and telecommunications has been interpreted by the super

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173. "US Policy on ASAT Arms Control", Communication from the President of the United States, House of Representatives, 98th Cong., 2nd Sess., 3 April 1984, at 16.

174. UN Doc. A/38/194 (1983). For a detailed discussion of the 1983 Soviet draft, see, infra, chapter V B.1.(f).

175. UN Doc. A/C.1/38/PV.10 (1983).

> powers as a license for an almost unrestricted arms race in outer space.[176]

This is clearly contrary to the letter and spirit of the 1967 Outer Space Treaty.[177]

b) ASATs and the ABM Treaty

Under the terms of this Treaty, the USA and the Soviet Union "undertake not to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile land based."[178] While the agreement clearly prohibits ABM weapons in outer space, it does not

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176. Vlasic, supra, note 94, 174.

177. Matte, N.M., Space Policy and Programmes Today and To-morrow, CRASL, McGill University, 1980, 68; Vlasic, Ibid.; comments made by Prof. Maureen Williams in, the 1984 ILA Paris Conference Discussion Paper, supra, note 91, at 365. Contra: Christol, who argues that "since the peaceful purposes principle does not apply to outer space, per se, ASATs would not be prevented from being placed in outer space"; see, Christol, C.Q., "Article IV of the 1967 Principle Treaty: Its Meaning and Prospects for Its Clarification", (1978) 21 IISL Coll. 199; Hosenball, S.N., "Present and Prospective Military Technologies and Space Law: Implications of the 1967 Outer Space Treaty", in, Ra'anan and Pfaltzgraff (eds.), International Security Dimensions of Space, supra, note 117, at 215.

178. Art. V(1) Former Secretary of State Cyrus Vance did not think the ABM Treaty prohibited the development and deployment of ASATs; see Reed, W.D. & Norris, R.W., "Military Uses of the Space Shuttle", (1960) 13 Akron L.R. 665, 671.

forbid the development or testing of ASAT technology.[179] Since ASAT and BMD technologies overlap substantially, it is feared that "(a)n extensive ASAT capability will...erode the ABM Treaty".[180] Since an ABM system could "masquerade" as an ASAT to circumvent the provisions of the ABM Treaty, this conclusion rests on the belief that an extensive ASAT system "would probably have some ABM capability". This is in view of the negligible difference between ballistic trajectory interception, which the ABM Treaty bans, and orbital interception, which it does not ban.[181] The usefulness of this approach was confirmed in a recent statement by Dr. George Keyworth, US science advisor and director of the Office of Science and Technology Policy. While talking about near-term research milestones for the SDI plan, he stated that:

> One is a geosynchronous anti-satellite capability. It may not necessarily be the best way for the ASAT mission, but a geosynchronous anti-satellite capability is important to test the technology to destroy missiles in each of the three

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179. Garwin, R.L., Gottfried, K. & Hafner, D.L., "Anti-satellite Weapons", Scientific American, Vol. 250, No. 6, June 1984, 45, at 52.

180. Deudney, D., "Unlocking Space", (1983) 53 Foreign Policy 91, at 101.

181. Ibid.

layers.[182]

The development, testing, or deployment of ASAT systems could undermine the prohibitions in article V(1) to the extent such systems or components were dual-capable for ABM use or aided the development of space based ABM systems.[183]

At present, the only spacecraft granted protection under the ABM Treaty are those used by parties as their "national technical means of verification" of compliance with SALT agreements.[184]

c) ASATs Under Other Arms Control Agreements

Several other international agreements afford protection to satellites and constrain offensive military uses of outer space. Briefly, these include:

1. The ITU Convention[185] and related agreements provide

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182. Cited in "Arms Control in Outer Space", Hearings before the Subcommittee on International Security and Scientific Affairs, Committee on Foreign Affairs, US House of Representatives, 98th Cong., 1984, at 374 hereinafter cited as Arms Control in Outer Space Hearings).

183. Ibid., 375; see also Halpern, supra, note 167, 191.

184. Art. XII.

185. Supra, this chapter, section D.4.

regulations intended to prevent or minimize radio-frequency interference with satellites.[186]

2. The "Hot Line" Modernization Agreement of 1971[187] requires that the US and the USSR establish and maintain two direct communication links satellite.

3. The "Accident Measures" Agreement of 1971[188] and the Prevention of Nuclear War Agreement of 1973,[189] call for notification and consultation should a risk of nuclear war arise from detection of unidentified objects on early warning systems, or from any accidental, unauthorized, or other unexplained incident involving the possible detonation of a nuclear weapon.[190] While the agreements do not *per se* prohibit interference with satellite early-warning or military communication satellites, any interference would be

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186. *Ibid.*

187. Agreement Between the United States of America and the Union of Socialist Republics on Measures to Improve the Direct Communications Link, *supra*, note 45; see also, *infra*, chapter V, section B.5.

188. *Ibid.*

189. Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War Between the United States of America and the Union of Soviet Socialist Republics, *supra*, note 45; see, also *infra*, chapter V B.3.

190. *Ibid.*

incompatible with the spirit of the agreements.[191]

4. The Salt I Interim Agreement (1972),[192] which prohibits interference with national technical means of verification.[193]

5. The Treaty on the Limitation of Strategic Offensive Arms (SALT II),[194] although not ratified as yet, repeats the SALT I prohibition on interference with national technical means of verification.[195]

Although the obligations of these agreements are substantial, they have not prevented a competition in ASAT weaponry by the two space powers. The major drawback of all these agreements, is that they do not specifically limit the testing, acquisition and deployment of such weapons, the corollary being that each side must anticipate that the weapon will in fact be used, and must therefore take appropriate measures.

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191. Gray, C.S., American Military Space Policy, University Press of America Inc., Cambridge, Mass., 1982, 79.

192. Supra, this chapter, section C.2.

193. Art. V.

194. Supra, this chapter, section C.4.

195. Art. XV.

2. Space-Based BMD and the ABM Treaty

a) The Definition of Development in the ABM Treaty

Article V paragraph 1 of the ABM Treaty prohibits all mobile ABM systems and components, specifically including space-based systems. It states:

> Each Party undertakes not to develop, test, or deploy ABM systems or components which are sea-based, air-based, space-based, or mobile land-based.

The term "develop" is the key to determining the scope of the ban on space-based systems. In response to a question on the meaning of the word "development", Ambassador Gerard Smith, Chief of the US SALT I delegation, made the following written submission to the Senate Armed Services Committee:

> The prohibitions on development contained in the ABM Treaty would start at that part of the development process where field testing is initiated on either a prototype or breadboard model. It was understood by both sides that the prohibition on "development" applies to activities involved after a component moves from the laboratory development and testing stage to the field testing stage, wherever performed. The fact that early stages of the development process, such as laboratory testing, would pose problems for verification by national technical means is an important consideration in reaching this definition.[196]

196. "Military Implications of the Treaty on the Limitat-

This unilateral definition was never the object of an agreed statement during the negotiations, and Soviet officials have not publicly stated whether they agree with it.[197] However, subsequent practice by the US and USSR supports this interpretation.[198] Both Parties have spent billions of dollars in BMD research and development,[199] and have never protested that such acts are in violation of

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ions of Anti-Ballistic Missiles Systems and the Interim Agreement on Limitation of Strategic Offensive Arms", Hearings before the Committee on Armed Services, US Senate, 92nd Cong., 2d Sess., 1972, 377. [hereinafter cited as the ABM Treaty Hearings]. Ambassador Smith's definition has been used and accepted in statements submitted to Congress by President Reagan. See "Fiscal Year 1985 Arms Control Impact Statements", US Cong. Joint Committee, 98th Cong., 2nd Sess., 1984, 212, at 252.

197. Privately, the Soviets have indicated that they are under no obligation to comment on documents prepared for US ratification. See, "June 1984 National Campaign to Save the ABM Treaty Report on the Impact of United States and Soviet Ballistic Missile Defense Programs on the ABM Treaty", in, Arms Control in Outer Space Hearings, supra, note 182, 369.

198. State practice may be referred to in interpreting a Treaty pursuant to art. 31(3)(b) of the Vienna Convention, supra, this chapter, section B.1.

199. "Pentagon Says It May Revise Antiballistic Missiles", N.Y. Times, 24 March, 1980, at A-19. See also, Stevens, S., "The Soviet BMD Program", in, Carter, A.B. and Schwartz, D. (eds.), Ballistic Missile Defence, The Brookings Institution, Wash., D.C., 1984, 182-221.

the ABM Treaty. By failing to protest, both Parties have tacitly accepted that laboratory research is permitted under the ABM Treaty.[200]

The negotiating history of the Treaty also reveals that the prohibitions contained in article V(1) apply to the development of systems or components which can be monitored by NTM of verification:

> It was understood by both sides that the prohibition on "development" applies to activities involved after a component moves from the laboratory development and testing stage to the field testing stage, whenever performed. The fact that early stages of the development process, such as laboratory testing, would pose problems of verification by national technical means is an important consideration in reaching this definition.[201]

Article XII, which provides for compliance by "national technical means of verification", further supports an interpretation of 'develop' as referring to "field

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200. Smith, M.L., "Legal Implications of a Space-Based Ballistic Missile Defense", (1985) 15 Cal. Western Int'l L.J. 52, 66.

201. See statement by Ambassador Gerard Smith before the ABM Treaty Hearings, supra, note 196; see also, Schneiter, G., "The ABM Treaty Today", in, Carter, A.B. and Schwartz, D. (eds.), Ballistic Missile Defense, supra, note 4, 221, at 228. According to Alan M. Jones: "[t]he ABM Treaty established an artificial distinction in which the main criterion was not the weapons acquisition process but rather the ability of each side to monitor the other's weapons programs by its own intelligence collection assets". See, Jones, supra, note 49, 44.

testing" as opposed to "laboratory" development and testing, as such systems can not detect laboratory development.

Furthermore, the prohibition of art. V(1) only applies to activities that are clearly ABM related and associated with ABM functions or missions, i.e., that are "tested in an ABM mode" against "strategic ballistic missiles, or their elements in flight trajectory."[202] Thus, a side could develop, test and deploy ASAT weapons, provided such weapons were not capable of countering strategic ballistic missiles or their elements in flight trajectory or tested in an ABM mode.[203]

For the purpose of categorizing programmes in the defence budget, the Pentagon has divided the research and development process into five stages: basic research,[204] exploratory development;[205] advanced development;[206]

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202. Art. II. The US unilateral statement on the meaning of "tested in an ABM mode" states that the Treaty is not intended "to prevent testing of non-ABM components for non-ABM purposes". Cited in Jones, ibid., 45.

203. Art. VI(a).

204. Which involves efforts directed towards the expansion of specific knowledge of natural phenomena, but not tied to a specific program. See, Arms Control in Outer Space Hearings, supra, note 182, 369.

205. Includes efforts directed towards the development of materials and components with potential applications to new military weapons. Emphasis is placed on

engineering development;[207] and operational systems development.[208] The DOD categorization, read in conjunction with Ambassador Smith's written statement, suggests that article V would permit basic research and those aspects of exploratory and advanced development which preceded field testing. Article V would ban field testing as part of exploratory and advanced development, as well as engineering and operational systems development.[209]

Current plans of the Reagan administration for SDI

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- exploring the feasibility of various approaches to military problems up to the point of breadboard and prototype fabrication; ibid.

206. Involves efforts directed toward the development of experimental hardware for technical or operational testing; ibid.

207. Efforts directed toward the development of a particular system engineered for service use, but which has not been approved for production and deployment; ibid.

208. Efforts directed toward the continued test, development, evaluation and design, improvement of projects which have entered the production-deployment phase; ibid.

209. This interpretation was advanced by Ambassador Smith during the ABM Treaty Hearings: "...[a]rticle V... places no constraints on research and those aspects of exploratory and advanced development which preceded field testing. Engineering development would clearly be 'prohibited'"; supra, note 196, 378.

tend to be rather confusing. The first phase of the SDI development schedule, the research phase, would extend to the early 1990's when a decision on whether to enter systems development could be made by the President and Congress.[210] As underlined in the Fletcher Report, such a decision can only be made after a series of demonstrations have been effected.[211] SDIO Director Lt. Gen. James Abrahamson has recently stated that research and development "with significant technology demonstrations" can be "carried out" without violating the ABM Treaty.[212] This position was recently amplified by presidential science advisor Dr. George Keyworth III:

> As it's emerging, the Strategic Defense Initiative would move towards a series of progressive demonstrations of evolving subsystems. Each of these demonstrations would test out a piece of militarily meaningful technology. These would be building blocks from which an eventual system could be designed, but in and of themselves would not constitute a weapons system. Such activity would be fully within the provisions of existing treaty

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210. Excerpts from Lt. Gen. James Abrahamson Statement to Congress, 9 May 1984, reproduced in, Survival, Vol. XXVII, No. 2, March/April 1985, 75-79, at 75.

211. "Panel Urges Defense Technology Advances", AWST, 17 October 1983, 16.

212. "Strategic Defense Group Speeds Efforts", AWST, 11 June 1984, 16, at 18.

limitations.[213]

This position has been strongly criticized by Ambassador Smith and others.[214] The divergence of opinion stems from the definition of what constitutes an "ABM system or component".

b) The Definition of an "ABM System or Component"

Pursuant to article II of the ABM Treaty, an "ABM system" is one that can counter strategic ballistic missiles or their elements in flight trajectory, currently consisting of:

(i) ABM interceptor missiles, which are interceptor missiles constructed and deployed for an ABM role, or of a type tested in an ABM mode;

(ii) ABM launchers, which are launchers constructed

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213. Cited in, Arms Control in Outer Space Hearings, supra, note 182, 371. For a summary of the report outlining SDI test plans according to categories created in the ABM Treaty, see, "SDIO Reports on ABM Compliance", Military Space, 29 April, 1985, 1-3.

214. According to Ambassador Smith: "The first point in time we can see them doing something [with NTM of verification] that is where the ban [on development] starts". Thus, demonstrations of ABM components, if outside the laboratory, are not permitted by the ABM Treaty. See Address by Ambassador Gerard Smith, MIT-Harvard Summer Program on Nuclear Weapons and Arms Control, 27 June 1984. See also Arms Control in Outer Space Hearings, ibid.

and deployed for launching interceptor missiles; and

(iii) ABM radars, which are radars constructed and deployed for an ABM role, or of a type tested in an ABM mode.

The ABM Treaty also provides for restrictions on "ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars". This restriction is set forth in Agreed Statement D to the ABM Treaty which states that:

> (i)n order to insure fulfillment of the obligation not to deploy ABM systems and their components except as provided in Article III of the Treaty, the Parties agree that in the event ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars are created in the future, specific limitations on such systems and their components would be subject to discussion in accordance with Article XIII and agreement in accordance with Article XIV of the Treaty.[215]

Certain aspects of this statement deserve special note. The negotiating history makes clear that technologies such as those being considered by DOD to achieve SDI objectives, notably lasers, particle beams and infrared

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215. Agreed statements, Common Understandings, and Unilateral Statements regarding the Treaty with the Union of Socialist Republics on the Limitation of Anti-Ballistic Missiles, 26 May, 1972, para. [D], 11 ILM 769, at 797. (emphasis added).

sensors, had been envisaged as future ABM components.[216] Thus, in contrast to the prohibition on development of space-based ABM systems,[217] the prohibition on ABM systems "based on other physical principles" applies only to the deployment, not to the development and testing, of fixed land-based BMD. Thus, research, development, and testing (but not deployment) of fixed, land-based components utilizing directed energy systems such as lasers or particle beams is permitted.[218]

Excerpts from the ABM Treaty Hearings also reveal that Agreed Statement D was aimed at prohibiting deployment of systems capable of substituting for ABM components, and not merely supplementing them. In response to a question dealing with fixed, land-based laser R&D, Dr. Foster, then Director of Defense Research and Engineering, stated that

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216. This interpretation is supported by Ambassador Smith, who stated that "the Parties have agreed that no further types of ABM systems based on other physical principles...can be deployed unless the Treaty is amended". See, ABM Treaty Hearings, supra, note 196, 295. Moreover, in a statement before the Senate Foreign Relations Committee, Secretary of State Dean Rusk said that "the Parties have agreed that future exotic types of ABM systems, i.e., systems depending on such devices as lasers may not be deployed." (1972) 67 Dep't State Bull. 920.

217. Schneiter, supra, note 201, 227; Jones, supra, note 49, 47-55.

218. Art. V(1).

> (a) laser could be used as part of an auxiliary designator system but it could not be used in substitution for the prime detector, that is, the ABM radar, or interceptor missile component.[219]

This interpretation also corresponds with the State Department's analysis of Agreed Statement D:

> Devices other than ABM interceptor missiles, ABM launchers, or ABM radars could be used as adjuncts on an ABM system provided that such devices were not capable of substituting for one or more of these components.[220]

Reagan Administration officials interpret the term "components" in such a way as to include within its scope only those devices capable of performing "the complete function of or substitute on a stand alone basis for an ABM component as defined in Article II of the Treaty.[221] Such an interpretation would permit significant "demonstrations" outside the laboratory of space-based BMD related technology which did not involve a "component."[222]

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219. Testing of such systems and their components must be conducted at designated ABM test ranges pursuant to art. IV.

220. ABM Treaty Hearings, supra, note 196, 222.

221. "Letter of Submittal by the Secretary of State to the President on the ABM Treaty and the Interim Agreement", in, ABM Treaty Hearings, ibid., 78-97, quoted at 81; see also, Jones, supra, note 49, 49-55.

222. Arms Control in Outer Space Hearings, supra, note 182, 370.

The relationship between Agreed Statement D on "other physical principles" and the undertaking in article V on "space-based" BMD systems or components can be simply stated: any testing "in an ABM mode" of fixed land-based lasers, sensors or particle beams that would be relevant to space-based BMD technologies can be conducted within the terms of the Treaty.[223] As for space-based BMD systems, devices that are not tested in "an ABM Mode" i.e. against "strategic ballistic missiles or their elements in flight trajectory", are not BMD systems or components, and are therefore allowed. The latter would allow testing of space-based laser components, such as pointing and tracking, against non-ballistic missile targets,[224] regardless of

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223. Administration officials claim that planned demonstrations will provide useful data for future system deployment, but will not by themselves be capable of performing the functions of existing ABM components. Disagreement has already surfaced with respect to the 1988 scheduled test of the Airborne Optical System (AOS). The administration feels that the AOS is not an ABM component, "but merely an adjunct to the Terminal Imaging Radar", See, "ABM Treaty Limits SDI Cooperation", Military Space, 1 April, 1985, 1, at 2. Contra: Arms Control in Outer Space Hearings, ibid. Proponents of the ABM Treaty argue that present administration policy is difficult to reconcile with the provisions of art. V, and that its prohibitions apply to development of components that can be monitored by NTM.

224. Jones, supra, note 49, 55; see, also, Gray, supra, note 181, 81.

the BMD applications of such testing.

c) Definition of the Term Space-Based in the ABM Treaty

The discrepancy between permitted development and testing of fixed, land-based BMD systems and the prohibition of development and testing of space-based BMD systems raises the subject of the interpretation of "space-based" in the ABM Treaty. Certain SDI projects, such as the Homing Overlay Experiment (HOE), involve land-based launchers with components which would operate and accomplish their mission in space.[225]

The ABM Treaty contains no definition of the term "space-based", nor was the issue discussed during the ratification headings. Furthermore, no definition or delimitation of the term "space" is contained in any other international agreement.[226] However, it is generally

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225. Jones, ibid.

226. See, "Treaty on Outer Space", Hearings Before the Committee on Foreign Relations, US Senate, 90th Cong., 1st Sess., 1967, 17. Several theories have been proposed regarding the definition/delimitation of outer space. See, Cheng, B., "The Legal Regime of Airspace and Outer Space: The Boundary Problem Functionalism Versus Spatialism: The Major Premises", (1980) V AASL 323; Matte, supra, note 29, 70; Haanappel, P.C., "Air Space, Outer Space and Meso-

accepted that an object in earth orbit is in outer space.[227] The term "based" is more easily defined. Its ordinary meaning includes inter alia a starting point.[228] In discussing the HOE, it was noted that "it is the basing that is determining. The treaty clearly permits interceptor missiles, which fly when they operate, provided that launchers are fixed".[229] The scope of the term "space-based" should therefore be confined to BMD components which are placed in earth orbit.[230] Consequently, land-based components such as the HOE may be developed and tested in

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space", (1975) 19 IISL Coll. 160, at 161.

227. See testimony of then Secretary of State Dean Rusk during the Outer Space Treaty Hearings, ibid., at 17.

228. The Concise Oxford Dictionary includes the following relevant definitions of "base": 1. that on which anything stands or depends; support, foundation; principle, starting-point. The Concise Oxford Dictionary (7th ed.), 1983, 72.

229. Schneiter, supra, note 201, 226. The HOE would be similar to ICBMs, which travel through space on the way to accomplishing their mission, and are considered land-based because the launchers from which operations commence are permanently located on the ground.

230. According to Jones, this would raise the possibility of testing sub-orbital lasers, for example, against "strategic ballistic missiles or their elements in flight trajectory". Jones, supra, note 49, 63-64.

space without violating the ABM Treaty.[231]

Although many have argued that the "SDI program would require the renunciation of the [ABM] treaty",[232] the ambiguous language of the ABM Treaty permits substantial partial testing of components for space-based BMD systems, while prohibiting full-system testing in an ABM mode. As noted in Military Space, "the Reagan administration has either outfoxed or given in to ABM defenders by delaying, until the president leaves office, tests that could violate the [ABM] treaty."[233] It would seem that "the ABM Treaty is being overtaken by events,[234] and undermined by top US officials.[235] There is no doubt, however, that deploy-

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231. Gray, supra, note 181; contra, Jones, supra, note 49, 56-57, and Schneiter, supra, note 201, 229-30.

232. "SDIO Reports on ABM Compliance", Military Space, 29 April 1985, 1, at 2.

233. "ABM Treaty Limits SDI Cooperation?" Military Space, 1 April, 1985, 1, at 2.

234. Supra, note 232, at 3.

235. Supra, note 233. Several top US official have indicated that at some point in the future (probably in the early 1990's) the ABM Treaty might have to be amended. See, Lt. Gen. James Abrahamson, ibid.; "Weinberger says ABM Pact May Ultimately Need Amending", N.Y. Times, 25 March, 1983, at A-9. The Soviet delegate to the UN, Mr. Petrovsky has recently stated that "[t]he programme adopted by the United States Administration to develop the so-called large-scale anti-ballistic

ment of a nationwide defence system to protect against ballistic missiles would be inconsistent with the ABM Treaty.[236]

3. Space-Based BMD and the Outer Space Treaty

The Outer Space Treaty has little effect on the establishment of a BMD. It is submitted that the legality of the deployment of such a system depends on the type of weapons to be used. Article IV(1) of the Outer Space Treaty prohibits placing "nuclear weapons" or other "weapons of mass destruction" in earth orbit. The beam weapons and small homing vehicles currently under study as components of a space-based BMD do not constitute weapons of mass destruction,[237] as their success depends on their ability to zero-in on a small target.[238] The potential use of X-ray

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missile defence system is totally incompatible with that major [ABM] agreement". UN Doc. A/C.1/39/PV.32, (1984), at 27.

236. Ibid., 3.

237. See a discussion on the underlying motivation of the Administration in, Arms Control for Outer Space Hearings, supra, note 182, 372-73.

238. See, supra, this chapter, section E.1(a).

lasers, however, would be prohibited under art. IV.[239] Such a laser derives its energy from nuclear explosions which then send intense pulses of X-rays at enemy missiles. The use of space-based X-ray lasers would also contravene article I of the Partial Test Ban Treaty.[240]

A final issue to consider, is whether the deployment of a space-based BMD would contravene the obligation of using outer space for "peaceful purposes". As discussed in the previous section, the term "peaceful" is generally interpreted as meaning "non-aggressive" as opposed to "non-military". Since ABMs are meant to provide a defence system, they are regarded by the majority of writers as being "non-aggressive".[241]

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239. Meredith, P., "The Legality of a High-Technology Missile Defence System: The ABM and Outer Space Treaties", (1984) 78 A.J.I.L. 418, 423; Ruina, J., "The Arms Race in Outer Space", paper presented at a conference sponsored by the UN Association in Canada and Canadian Student Pugwash on International Security and Outer Space, in, Proceedings of a Conference Held at McGill University, 16-17 March 1984, at 40. See also, the replies furnished by Dr. N.M. Matte, M. Bourély and D. Goedhuis to the question: "What are the legal implications of the plans to build BMD systems?", in, the "Discussion Paper on the Legal Aspects of the Present and Projected Military Uses of Outer Space", supra, note 91, at 365-68.

240. Christol, comments made supra, note 91, 367.

241. Meredith, supra, note 238; Stein has stated that: "Clearly [article IV] does not prohibit ... satellites or space stations having anti-missile, communications

At present, however, this question is rather academic, since, as noted by René Mankiewicz,

> ... le Président Reagan a déclaré que la satellitation d'instruments capables de détruire les fusées nucléaires de l'adversaire est une activité pacifique parce que purement défensive, destiné à maintenir la paix. Il me semble que de telles prémisses préemptent toute interprétation juridique des traités spaciaux: s'y prêter, permettez-moi cette expression, est chasser des chimères.[242]

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or other military functions as long as they do not carry nuclear or other mass destruction weapons"; see Stein, E., "Legal Restraints in Modern Arms Control Agreements", (1972) 66 A.J.I.L. 255, 262-63.

The Soviets have accused President Reagan's global ABM defense system: 1° as projecting an unrestricted arms race into outer space, see, Andropov statement, 41 New Times, Oct. 1983; 2° as an active combative use of outer space, see, UN Doc. A/C.1/38/PV.10 (1983), at 24, and; 3° as violative of the ABM Treaty, see, UN Doc. A/C.1/39/PV.32 (1984), at 27, but not as an "aggressive" use of outer space.

242. Supra, note 91, 360.

CHAPTER IV

SOME PERENNIAL PROBLEMS IN ARMS CONTROL TREATIES

A. VERIFICATION

> The SALT I Anti-ballistic Missile (ABM) Treaty could not have been achieved had not satellite reconnaissance been available, and it and future agreements could not remain in effect were such reconnaissance capabilities not available for verification. Any threat to these capabilities could doom arms control and result in rapidly escalating arms races. Interference with such capabilities would not only contravene agreements like the ABM Treaty but could immediately halt any restraint on weapons procurement. The provocation would be so strong as to be considered an act of war.[1]

Since the verification of most of the existing, and any future, outer space arms control treaties must largely be conducted from space, by reconnaissance satellites, it is apposite to consider their legality as an initial issue.

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1. Scoville, H. & Tsipis, K., "Can Space Remain a Peaceful Environment?" The Stanley Foundation, Occasional Paper 18, July 1978, 8.

1. Space-Based Reconnaissance

a) Historical Perspective

Aerial reconnaissance, although still militarily significant, has been subordinated to satellite reconnaissance since the late 1960s. Its zenith in public awareness was following the infamous U2 incident, in which the Soviets felled the US reconnaissance aircraft, piloted by Francis G. Powers, on 1 May, 1960, 1200 miles inside their territory.[2]

> From a diplomatic point of view, the U2 incident was costly not only because the plane was vulnerable to Soviet SAMs (surface-to-air-missiles), but also because the United States was diplomatically vulnerable, and could not cite any legal support or legitimacy for its actions. It was this diplomatic and political situation...that forced Eisenhower to suspend the U2 program.[3]

The U2 reconnaissance aircraft clearly transgressed the sovereign rights of the USSR articulated in the 1944 Chicago

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2. Fedele, F., "Overflight by Military Aircraft in Times of Peace", (1967) 9 Jag. L. Rev. 15.

3. Steinberg, G.M., Satellite Reconnaissance - The Role of Informal Bargaining, Praeger, New York, 1983, p. 46.

Convention.[4] This "penetrative" reconnaissance,[5] i.e. that which penetrates the envelope of sovereign airspace, is to be contrasted with "peripheral" reconnaissance, which does not.[6] According to USAF,

> the United States has maintained the view that a state has no right to prevent the use of international airspace for purposes of surveillance or observation of its airspace or territory. It is common practice for military aircraft to fly in the international airspace adjacent to the national airspace of other states for purposes of photographing and otherwise observing activities within the national airspace or territory.[7]

As a logical extension of the latter, when the space milieu became technologically available for reconnaissance activities, they were conducted therein. Thus, in 1960, even as the U2 was downed, the USA was launching and

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4. "Convention of International Civil Aviation", ICAO Doc. 7300/6 (6th ed.) 1980. Article 1 states that "(t)he Contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory". Article 3(c) states that "No State Aircraft (including military) of a Contracting State shall fly over the territory of another State...without authorization...."

5. Terms used by Fedele, supra, note 2.

6. See ibid. for a full account and comparison of the U2 incident with the RB 47 incident, both occurring in 1960.

7. US Department of the Air Force, International Law, The Conduct of Armed Conflict and Air Operations, 1976, Section 2-5(e).

retrieving Central Intelligence Agency (CIA) Reconnaissance Satellites (hereafter recsats) and USAF SAMOS recsats.[8] When the Soviets became cognisant of this activity they were outraged, denouncing this as "illegal espionage"[9] and tantamount to an act of war.[10]

The antecedents of the historic 1963 UN Declaration on Space[11] reveal overt political duplicity by the superpowers, which was endured due to their privileged position in space. In response to the aforementioned Soviet discomfiture, the Arms Control and Disarmament Agency of the US Department of State lobbied for what has become one of the fundamental principles of international space law, namely, the non-appropriation provision, later embodied in Article II of the Outer Space Treaty. It took as its rationale the fact that

> if the United States could gain acceptance of the principle that space is beyond the limits of national sovereignty, and that there should be no restrictions on 'non-

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8. See Steinberg, supra, note 3, 41.

9. Ibid., 26-29.

10. Ibid., at 32 where he states that: "By the end of 1960, the probability seemed high of US-Soviet conflict in space being triggered by reconnaissance satellite activities."

11. UNGA Res. 1962(XVIII) "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space", 13 December, 1963.

> aggressive' activities in space, then it would be the Soviet Union that would risk violating accepted international norms by interfering with US reconnaissance satellites.[12]

As for the Soviets, paragraph 8 of their draft declaration stated that

> the use of artificial satellites for the collation of intelligence information in the territory of foreign states is incompatible with the objectives of mankind in its conquest of outer space.[13]

However, in the now familiar fashion, Soviet advocation of this ceased with the successful launch of its own recsat, Kosmos 4, on 26 April, 1962,[14] and regulation of reconnaissance activities is conspicuous by its absence in the 1963 Declaration of Principles.

b) Legality of Recsats

By 1965 Professor Jenks, recognizing their legal ambiguity in a discussion of 'intelligence satellites', that

> all that can be said with confidence is that no agreement exists on any special rule governing the use of intelligence satellites and that the use of such satellites is therefore governed by the general international law relating to intelligence

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12. Steinberg, supra, note 3, 47.

13. UN Doc. A/AC.105/C.2/3, (1962), at 3.

14. Steinberg, supra, note 3, 64.

activities.[15]

As noted above, the US position on aerial peripheral reconnaissance is clearly in favour of its legality. By their conduct of recsat missions, the Soviet Union contributed to a "climate of legitimacy" being established.[16] After a review of the familiar articles 2(4) and 51 of the UN Charter[17] Professor Brownlie concluded in 1964 that

> reconnaissance in space is not per se an illegal 'armed attack' or 'use of force' and therefore it is difficult to support a right of self defence.[18]

Since these activities have continued unabated and without significant protest, they have undoubtedly passed into the annals of customary international law. All the

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15. Jenks, C.W., Space Law, Stevens & Sons, London, 1965, 305.

16. Term used by Steinberg, supra, note 3, 45.

17. Charter of the United Nations 26 June 1945, 16 U.S.T. 1134. It will be recalled that article 2(4) states that: "All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations". The latter include the maintenance of "international peace and security" Article 1(1)). However, article 51 states in part that "nothing in the present Charter shall impair the inherent right of individual or collective self defence if an armed attack occurs against a Member of the United Nations..." (emphasis added).

18. Brownlie, I., "The Maintenance of International Peace and Security in Outer Space", (1964) 40 B.Y.I.L. 1.

elements of the latter's definition, developed by the International Court of Justice and expounded in the North Sea Continental Shelf Cases of 1969,[19] are present. Thus, in relation to space based reconnaissance, "state practice including that of states whose interests are specially affected [has been] both extensive and virtually uniform", and there has been a "general recognition that a rule of law or legal obligation is involved",explicitly by the US and implicitly by the Soviet Union.[20] Furthermore, it is difficult to outlaw such activities as being in contravention of article IV(2) of the Outer Space Treaty, which, at its most expansive interpretation, would mandate that activities in space be conducted "exclusively for peaceful purposes".[21] Recsats are used to fulfil the clear intent of article III of that Treaty. Thus, "in the interest of maintaining international peace and security", recsats are a major part of the "national technical means of verification" used by the superpowers to monitor, inter alia the 1972 ABM Treaty.[22] As Gerald Steinberg states in his definitive

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19. Federal Republic of Germany (FRG) v. Denmark and FRG v. Netherlands (1969) ICJ 8 I.L.M. 340.

20. Ibid.

21. See further supra this Chapter, section D. 1.

22. Treaty Between the USA and USSR on the Limitation of

historical treatment of satellite reconnaissance:

> Although the national technical means referred to also include seismographs and various radar and other electronic installations, these two modes of verification could have been mentioned specifically with little difficulty. Reconnaissance satellites, in contrast, are politically sensitive and it is for this reason that the euphemism was developed and employed.[23]

Photoreconnaissance has become the classic example of ambiguous technology since, basically the same science is involved in civilian remote sensing of the earth's surface.

c) Regulation and Identification of Reconnaissance Activities

Recsats are not totally without regulation. Article 5 of the 1968 Rescue and Return Agreement[24] creates the obligation to notify the launching authority and the Secretary General of the UN if a state party discovers (or is informed of) a re-entered space object (or its com-

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Anti-Ballistic Missile Systems, 23 U.S.T. 3435. Signed 26 May 1972; entered into force 3 October 1972. See infra this chapter, section A.2.

23. Steinberg, supra, note 3, 67.

24. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 672 U.N.T.S. 119. Opened for signature 22 April 1968; entered into force 3 December 1968.

ponent parts) and, at the request of the launching state to attempt to recover such object(s).[25] Paragraph 3 of that article is the most significant, in that it establishes a three stage procedure for reclaiming an errant space object. Thus, the launching authority must initially request its return, the "finder" state then elects to return it or "hold it at the disposal of representatives of the launching authority" and, in either event, the latter must produce proof of ownership. This may become significant should those photo recsats err in their periodical jettison of film pods for aerial or sea-borne recovery.

As discussed in the previous chapter,[26] the 1975 Registration Convention of 1975[27] makes the registration of space objects in both national and UN registers mandatory,[28] replacing the voluntary system which had been in place since 1961.[29] It will be recalled that

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25. Ibid., paras. 1 and 2.

26. See supra Chapter III D.2.

27. Convention on Registration of Objects Launched into Outer Space, 28:1 U.S.T. 695. Opened for signature 14 January 1975; entered into force 15 September 1976.

28. Ibid., preamble passim and Articles II (National Registry) and III (UN Registry).

29. UNGA Res. 1721(XVI) "International Co-operation in the Peaceful Use of Outer Space", 20 December, 1961, Part

article IV of the latter convention requires that the UN Secretary General be informed, in relation to each space object launched, of the identity of the launching state, the date and place of the launch, and the designation, basic orbital parameters and "general function" of the space object. Whilst this appears extremely limited and ex post facto information,[30] the mission profiles of recsats are so distinctive that accurate identification is possible despite its paucity.

Essentially, recsat missions are of short duration, due to the low perigee of their orbits. They operate at least as low as 150-180 km above the earth's centre[31] and thus encounter resistance from the earth's exosphere.[32] The nodal period requirement of the Registration Convention[33] is revealing. To maximize the utility of a

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B.

30. Information is to be furnished "as soon as practicable" which is invariably some weeks after the event.

31. Jasani, B.(ed.), Outer Space - A New Dimension of the Arms Race, SIPRI, Taylor & Francis, London, 1982, 45.

32. For information on the exosphere see for example Philips New World Atlas (3rd ed.), George Philip & Son Ltd., 1980, 8 et seq.

33. Article IV 1(d)(i).

recsat, it must orbit over strategic terrestrial areas as often as possible. Thus, photo recsats invariably have a nodal period of 90 minutes (plus or minus 5 minutes).[34] Furthermore, the orbital inclination, also required by the aforementioned article,[35] is highly descriptive, since it "determines the range of latitudes over which the satellite travels on each revolution".[36] To observe an area situated at high latitudes "a near 90° inclination (i.e. from the equator) orbit produces two or more daylight passes per day over the area".[37] This is contrasted with a low inclination orbit, required for observation of equatorial targets. Thus, what initially appears scant disclosure, is quite satisfactory.

Having thus established generic recsats as legal,

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34. Stine, G.H., Confrontation in Space, Prentice Hall Inc., New Jersey, 1981, 13 et seq. A 90 minute nodal period enables a recsat to repeat its ground coverage of a particular area at every 16th orbit. See Jasani, supra, note 31, 14.

35. Article IV 1(d)(ii).

36. See Jasani, supra, note 31.

37. Ibid. For more detailed information on orbital mechanics generally and photo recsats in particular see pp. 4-27. For details on the various imaging systems in use see "Paper 5: Image Analysis and Sensor Technology for Satellite Monitoring", T. Sakata and H. Shimoda and "Paper 6: Information Extraction From Images", T. Orhaug and G. Forssell both ibid., pp. 197- 227.

ubiquitous, and detectable, it is now apposite to consider them in the wider context of measures for the verification of arms control treaties.

2. Verification Defined

> Verification involves as much art (and politics) as science. Indeed, as one astute observer points out, "'verification' - 'the authentication of truth,' according to Webster - hardly is the right word" for a "thicket of political, technical and psychological considerations."[38]

In view of the pre-eminence which is accorded to verification in all arms control negotiations, the many guises it has assumed, and the range of measures it encompasses (employed singly or in concert in arms control agreements) it is necessary to fully understand what is meant by verification, before discussing extant regimes. Various definitions have been essayed over the years, and can be grouped under two rubrics: the semantic; and the conceptual, or enumerative.

According to the Concise Oxford Dictionary,[39] the verb to verify means "to establish the truth or correct-

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38. Potter, W.C.(ed.), Verification & Salt - The Challenge of Strategic Deception, Westview Press, Colorado, 1980, 1 and footnote.

39. Oxford, (7th ed.), Clarendon Press, 1982.

ness of by examination or demonstration". However, in the opinion of Massachusetts Institute of Technology Professor, Stephen M. Meyer,

> in contrast to the common usage of the verb "to verify" - which may be the source of much confusion - arms control verification does not involve the substantiation of absolute truth. Rather, verification must be seen as a political act in which one party states: "on the basis of the available evidence, I have decided that you have/have not been living up to the terms of the agreement.[40]

Two semantic definitions, promulgated in the UN, are instructive. Verification has been defined both as: "the process of determining that a commitment laid down in a particular agreement in the field of disarmament or arms limitation is being met;"[41] and as "a dynamic process for determining whether or not commitments assumed under an international agreement are being fulfilled".[42] This is echoed in a US Arms Control and Disarmament Agency (ACDA) report,[43] in which it is stated that verification

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40. Meyer, S.M., "Verification and Risk in Arms Control" (1983-84) 8 International Security 111, at 113.

41. UN Doc. A/AC.187/109.

42. Reduction of Military Budgets, UN Study Series 10 pamphlet on Disarmament, prepared by the Dept. for Disarmament Affairs for the UN Secretary General, UN Publication, New York, 1983, p. 26, para. 134.

43. "Verification: The Critical Element of Arms Control",

> as a technical term in the vocabulary of arms control, refers to the process of assessing compliance with the provisions contained in arms control treaties and agreements. It is the attempt to ascertain whether states are living up to their international obligations.[44]

In 1948, at the beginning of the "cold war", a resolution of the Commission for Conventional Armaments defined verification as

> an adequate system of safeguards, which by including an agreed system of international supervision will ensure the observance of the provisions of the treaty or convention by all parties thereto.[45]

As will be discussed presently, it is this international element, which has always been a major obstacle to effective and stabilizing verification regimes. This latter formulation is, therefore, somewhat exceptional, and is less an accurate synthesis of verification, than an aspiration.

A more recent and highly authoritative definition, is that prepared during the SALT I negotiations. Verification was there defined as "(t)he process of determing the degree to which parties to an agreement are complying with

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US ACDA Publication 85, March 1976.

44. Ibid., 2.

45. Resolution of the Commission for Conventional Armaments: Formulation of Proposals for Regulation & Reduction of Armaments and Armed Forces, 12 August, 1948, in, Documents on Disarmament, 1945-1959, Vol. I, 1945-1956, p. 175.

the provisions of an agreement".[46] This is strongly reminiscent of both the first UN definition, and that of ACDA cited above, and would indicate a tentative consensus.

The final, and arguably most complete, semantic formulation to be presented, is that adduced by the Stokholm International Peace Research Institute (SIPRI), which defines "verification of disarmament" as

> (a) process, specifically established or approved by a disarmament agreement, carried out by individual state parties to the agreement, either reciprocally or not, or by an international body established or empowered to carry out the process, by personnel or by technical means, in order to determine the degree to which the parties to the agreement have implemented its provisions and thereby observed or discharged their obligations under the treaty.[47]

Turning now to the realm of the conceptual, verification must be distinguished from "monitoring", also a many-faceted concept. Monitoring envisages

> efforts to detect, identify, and 'measure' developments and activities of interest ...[and its]...objective...is to observe and record as many 'signals' and traces of ...weapon research, development, testing, production, deployment, and operations as

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46. Salt Lexicon, ACDA Publication No. 74, Washington, Arms Control and Disarmament Agency, 1974.

47. Strategic Disarmament, Verification and National Security, SIPRI, Taylor & Francis, London, 1977, 13-14.

is possible.[48]

Monitoring is thus the technical infrastructure for information gathering, most obviously represented by recsats. Verification information, is that part of the corpus of intelligence about an adversary, gained through monitoring, which is used to assess the other's compliance with arms control provisions.[49] Furthermore,

> (v)erification is inherently subjective and judgmental. The 'hard' technical data obtained from monitoring are but a few - and often not the most important - of the inputs into the verification process.[50]

This subjective process of inference is a continuum, generated and perpetuated by the diplomatic corps of both the USA and USSR, and evaluated in their respective Departments of State and Defence.

In recognition of the multiplex nature of the verification concept, the UN Department for Disarmament Affairs has summarized its purposes as being to "protect the security of the parties to the agreement", as a deterrent to violation of a treaty, as a "channel of communication", and

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48. Meyer, supra, note 40, 112.

49. See, Durch, W.J., "Anti-Satellite Weapons, Arms Control Options, and the Military Use of Space", paper prepared for the US Arms Control and Disarmament Agency, July 1984, 34.

50. Meyer, supra, note 40.

to "evoke a response in the case of non-compliance".[51] The dual functions of deterrence and generation of a "climate of international trust"[52] are clearly fundamental to verification.

3. Verification Methodologies in Arms Control Treaties

A number of verification formulae have been devised over the several decades of active arms control negotiations, negotiations, not all of which have become, or are susceptible to inclusion in, international treaty law. The categorization propounded by Lt. Col. F.R. Cleminson, of the Canadian Department of National Defence, is most comprehensive, and is widely used in the UN.[53] His three-tiered tabulation is reproduced herein,[54] and the terms incorporated therein will be adopted in the ensuing discussion, in

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51. Supra, note 42, p. 28, para. 139.

52. Ibid., para. 140.

53. Cleminson, F.R. & Gilman, E., "A Conceptual Working Paper on Arms Control Verification", Operational Research and Analysis Establishment Report No. R79, Dept. of National Defence, Ottawa, August 1981. This report is largely reproduced as Working Paper IV in the UN Disarmament publication, supra, note 42 at 95-99.

54. See infra Table IV.

VERIFICATION CATEGORIZATION

	REGIMES
1	ABSOLUTE VERIFICATION
2	ADEQUATE VERIFICATION
3	LIMITED VERIFICATION
4	TOKEN VERIFICATION
5	NO VERIFICATION

	METHODS
1	GENERAL ON-SITE INSPECTION
2	SELECTIVE ON-SITE INSPECTION
3	CHALLENGE ON-SITE INSPECTION
4	CONTROL POSTS/OBSERVER/ LIAISON MISSIONS
5	REMOTE SENSING IN-SITU
6	REMOTE SENSING-NATIONAL TECHNICAL MEANS
7	COMPLAINTS/CONSULTATION
8	COLLATERAL ANALYSIS

	SYSTEMS
1	PHOTO RECONNAISSANCE SATELLITE
2	"FERRET" SATELLITE
3	NUCLEAR RADIATION DETECTION SATELLITE
4	SPACECRAFT LABORATORY
5	SEISMIC SENSORS
6	CONTROL POSTS
7	REMOTE SENSING POSTS
8	PEACE KEEPING/OBSERVER MISSIONS
9	LITERATURE SURVEY
10	INTERNATIONAL INFORMATION EXCHANGE
	ETCETERA ETCETERA

the hope that uniformity may contribute to clarity.

a) No Verification

The first of the modern arms control treaties, the Partial Test Ban (PTB) Treaty of 1963[55] proscribed the testing of nuclear weapons in air space, outer space and under water. It contained no verification provisions, since violation could be established with a minimum of earth and/or space-based equipment. As observed by the Soviet Union in the UN Eighteen-Nation Disarmament Committee (ENDC), no verification measures were required because

> science and technology have not attained such a level that there is no difficulty in recording any explosions of nuclear weapons and establishing whether they were explosions of nuclear weapons or natural events.[56]

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55. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water, 480 U.N.T.S. 43. Opened for signature 5 August 1963; entered into force 10 October 1963. See supra Chapter III C.1.

56. UN Doc. ENDC/PV.8, (1962) at 23-24.

b) Collateral Analysis[57]

This category is a pot-pourri of sources of information, in the public domain, such as world press reports, and scientific publications, such as those by SIPRI. Their existence is understood, and this category is implicit in verification regimes, no explicit formulation being required in a treaty format.

c) Complaints/Consultation

As a small but significant increment up the verification scale, a procedure whereby suspected or potential treaty violations can be resolved through a complaints procedure, is a move in the right direction. The unratified 1974 Threshold Test Ban Treaty (TTBT),[58] which would establish an upper yield limit of 150 kilotons for

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57. See Cleminson & Gilman, supra, note 53, 20.

58. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon Tests, UN Doc. A/9698, Annex I-II, 9 August 1974. Signed 3 July 1974. Reproduced in Blacker, C.D. & Duffey, G., (eds.), International Arms Control - Issues and Agreements (2nd ed.) Stanford University Press, California, 1984, 434-38.

underground nuclear weapons testing,[59] provides in article II(3) that

> (t)o promote the objectives and implementation of the provisions of this Treaty the Parties shall, as necessary, consult with each other, make inquires and furnish information in response to such inquiries.

A more comprehensive formulation was adopted for verification of the 1977 ENMOD Convention.[60] In their understanding in article V(1) to consult and cooperate with one another, states parties may either avail themselves of the UN Security Council,[61] or a Consultative Committee of Experts,[62] to resolve their dispute.[63] The rules of procedure established for the latter in the Annex to the Convention, stipulate that it shall "undertake to make appropriate findings of fact and provide expert views". The Committee operates by simple majority, and the UN Secretary General is the Chairman. The most significant feature, is the discovery procedure outlined in paragraph 5 of the

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59. Ibid., art. I.

60. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques. Opened for signature 18 May 1977; entered into force 5 October 1978.

61. Ibid., Art. V(3) and (4).

62. Ibid., Art. V(2).

63. For a full analysis of Article V see supra, Chapter III C.3.

Annex, which states that each expert, appointed by a State party to serve on the Committee,

> shall have the right, through the Chairman, to request from States and from international organizations, such information and assistance as the expert considers desirable for the accomplishment of the Committee's work.

Another example of a reference to a consultative procedure, is the rather vague formulation contained in the 1972 Biological Weapons Convention.[64] In their undertaking "never" to develop, produce, stockpile or procure biological or chemical weapons,[65] State parties, also agree in article V to

> consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and cooperation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

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64 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, 26 U.S.T. 583. Opened for signature 10 April 1972; entered into force 26 March 1975.

65. Ibid., art. I.

d) Remote Sensing - National Technical Means

The less obtrusive activities controlled by the 1972 ABM Treaty[66] required the most sophisticated space-based technologies to ensure compliance. The formula adopted therein in article XII, and reiterated verbatim in both the contemporaneous Interim Agreement (article 5)[67] and the subsequent, unratified, 1979 SALT II Agreement[68] (article XV) reads as follows:

> 1. For the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with generally recognized principles of international law.
>
> 2. Each Party undertakes not to interfere with the national technical

66. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems (SALT I) 1972, 23 U.S.T. 3435. Signed 26 May 1972; entered into force 3 October 1972. See supra Chapter III C.2.

67. Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms, 23 U.S.T. 3462. Signed 26 May 1972; entered into force 3 October 1972.

68. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms (SALT II), (1979) 18 I.L.M. 1112; see supra, Chapter III C.4.

> means of verification of the other Party operating in accordance with paragraph 1 of this Article.
>
> 3. Each Party undertakes not to use deliberate concealment measures which impede verification by national technical means of compliance with the provisions of this Treaty.

It was due to the political sensitivity of possession and use of reconnaissance satellites,[69] particularly the low perigee photoreconnaissance variety, which were not admitted to by either the USA or USSR, that the euphemism of national technical means of verification (NTMs) was utilised.[70] This form of verification is peripheral and involves no derogation from, or compromise of, the sovereignty of a signatory to a Treaty embodying it. The 1974 TTBT also incorporated the use of NTMs, in exactly the same terms as above, however, in this context, they refer to terrestrial seismic sensors.[71]

e) Remote Sensing in Situ

This modality has yet to be incorporated into an arms control treaty. However, it came close during the

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69. See supra, this Chapter, section A.1.

70. See Steinberg, supra, note 3, 67.

71. See Cleminson & Gilman, supra, note 53, 24 et seq.

negotiations prior to the signing of the 1963 PTB Treaty. During the ENDC discussions in late 1962, the Soviet Union at first acceded to,[72] and then rejected the placement of seismic stations or 'black boxes' on their territory, in order to monitor their treaty-compliance. Informal measures, such as the use of nuclear explosion detection satellites and more remote seismic detectors, were employed instead.

f) Control Posts/Observance/Liaison Missions

Another latent methodology, this was also hypothesized during the 1962 ENDC negotiations.[73] A group of eight non-aligned states proposed that the control over the partial test ban should be entrusted to an "International Commission" of scientists. The latter would receive information from networks of observation posts, relayed to collection points for their analysis.[74] However, there were fundamental differences of opinion concerning such a

72. UN Doc. ENDC/PV.90, (1962), at 14-15.

73. See Morris, E., "Soviet Positions on Verification, 1962-1982", Paper presented at the Arms Control Verification Symposium, Carlton University, Ottawa, 6-8 June, 1983, 9 et seq.

74. Ibid., 7.

system. These were succinctly summarized by the Soviet delegation on 7 May, 1962, which stated that

> (t)he United States and the United Kingdom demand the establishment on the territory of the Soviet Union of an international network of control posts staffed by foreign personnel and directed by an international control organization. The Soviet Union...proposes that control...should be organized through existing national systems of detection without establishing a network of international control posts.
> ...The United States and the United Kingdom continue to persist in their demand for compulsory inspection, carried out by decision of the international control commission. The Soviet Union's proposal has not provided...either for the establishment of any international control body or for international inspection.[75]

The Soviet Union remained adamant and, as noted previously, no verification provisions appear in the PTB Treaty.

g) Challenge On-Site Inspection

The zenith of verification procedures, on-site inspection is rarely tolerated, since it involves physical intrusion by foreign personnel into the sovereign state. As such, it is a compromise of sovereignty in the strictest sense. Nevertheless, states have permitted it in the past, and continue to do so. It is to be hoped that they may have a precedental effect upon any future outer space arms

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75. UN Doc. ENDC/PV.32, (1962), at 24-25.

control treaties which are concluded.

The first category of three increasingly more intrusive, liberal, or safe regimes, depending on one's viewpoint, involves states acceding to inspection when requested or challenged to do so. Therefore, inspectors are only on-site infrequently, at the initiative of another party, and thus with advanced notice. An example of this category, can be found in the 1948 "Brussels Treaty of Collaboration and Collective Self-Defence Among Western European States".[76] As amended in 1954,[77] the Treaty provides for the control, in the Federal Republic of Germany, of a specified list of armaments, including atomic weapons, biological and chemical weapons, and guided missiles. Verification of compliance with this treaty, is performed by the Agency for the Control of Armaments (ACA).[78] The on-site inspection initiative lies with the ACA, which shall

> (a) scrutinise statistical and budgetary information supplied [to it]; and
>
> (b) undertake on the mainland of Europe test checks, visits and inspections at production plants, depots and

76. 19 U.N.T.S. excerpts reproduced in Goldblat, J., Agreements for Arms Control - A Critical Survey, SIPRI, Taylor & Francis Ltd., London, 1982, 138.

77. 211 U.N.T.S., ibid., at 145-48.

78. Ibid., Protocol No. IV.

forces....[79]

h) **Selective On-Site Inspection**

This category differs from the latter, in that it gives greater freedom for continuous inspection. However, it is still circumscribed in some manner, whether by a geographical limitation, or one relating to strict relevance to the activity being monitored.

The International Atomic Energy Agency (IAEA) was created in 1956,[80] with the objective of seeking "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world".[81] As a research and development agency, the IAEA was also commissioned to transfer the benefits of atomic, or nuclear, technology, whilst retaining the control of fissionable materials, and ensuring against the military perversion of such technology. A number of safeguards are provided for in Article XII of its Statute, culminating in paragraph A(6),

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79. Ibid., art. 7. See also Cleminson & Gilman, supra, note 53, at 16 et seq.

80. "Statute of the International Atomic Energy Agency", 276 U.N.T.S. 3, 26 October, 1956, as amended to 1 June, 1973, T.I.A.S. 7668.

81. Ibid., art. II.

which enables the IAEA

> (t)o send into the territory of the recipient States inspectors, designated by the Agency after consultation with the State or States concerned, who shall have access at all times to all places and data and to any person who by reason of his occupation deals with materials, equipment, or facilities which are required by this Statute to be safeguarded ...to determine whether there is compliance with the undertaking against use in furtherance of any military purpose....

This procedure was incorporated by reference into both the 1967 Treaty of Tlatelolco[82] and the 1968 Non-Proliferation Treaty (NPT).[83] Article 12 of the former, stipulates that contracting parties must conclude agreements with the IAEA for the application of its safeguard provisions just outlined. Article 16 of the Treaty of Tlatelolco, also establishes an alternative procedure. The five member Council, elected from the General Conference of Contracting Parties,[84] has the power of carrying out special inspections

> (w)hen so requested, the reasons for the request being stated, by any Party which suspects that some activity prohibited by

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82. Treaty for the Prohibition of Nuclear Weapons in Latin America, 634 U.N.T.S. 281. Opened for signature 14 February 1967; entered into force 22 April 1968.

83. Treaty on the Non-Proliferation of Nuclear Weapons, 729 U.N.T.S. 161. Opened for signature 1 July 1968; entered into force 5 March 1970.

84. Supra, note 82, art. 10.

> [the] Treaty has been carried out or is about to be carried out, either in the territory of any other Party or in any other place on such latter Party's behalf, the Council shall immediately arrange for such an inspection...[85]

Expenses for the latter are borne by the Complainant State, except where the Council concludes that the IAEA should do so.[86] The most far-reaching provision is article 16(4), which provides, in part, that

> (t)he Contracting Parties undertake to grant the inspectors carrying out such special inspections full and free access to all places and all information which may be necessary for the performance of their duties and which are directly and intimately connected with the suspicion of violation of this Treaty.

The Treaty goes on to provide in article 18, concerning the conduct of nuclear explosions for peaceful purposes, that the

> General Secretary and the technical personnel designated by the Council and the International Atomic Energy Agency may observe all the preparations, including the explosion of the device, and shall have unrestricted access to any area in the vicinity of the site of the explosion in order to ascertain whether the device and the procedures followed during the explosion are in conformity with the information supplied under paragraph 2 of this article and the other provisions of the Treaty.[87]

In contrast, the NPT procedure is less elaborate,

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85. Art. 16(1)(b)(i).

86. Art. 16(2).

87. Art. 18(3).

merely incorporating by reference the safeguard provisions of the IAEA,

> for the exclusive purpose of verification of the fulfilment of its obligations assumed under [the] Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices.[88]

The bilateral Peaceful Nuclear Explosions (PNE) Treaty[89] of 1976, although never ratified, contains a series of verification provisions, which virtually run the entire gamut of available means. It is perhaps this fact that has prevented its ratification. Article IV of the Treaty reiterates the national technical means provisions of, inter alia the ABM Treaty, discussed in part (d) above, with the addition of a commitment to "provide to the other Party information and access to sites of explosions and furnish assistance...."[90] Furthermore, article V of the Treaty establishes a "Joint Consultative Commission". Although not as extensive as those for the Consultative Committee of Experts in the ENMOD Convention,[91] the Joint Consultative

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88. Supra, note 83, art. III(1).

89. Treaty Between the USA and the USSR on Underground Nuclear Explosions for Peaceful Purposes, signed at Moscow and Washington on 28 May, 1976, reproduced in Goldblat, supra, note 76, 218.

90. Ibid., art. IV(b).

91. See supra, this Chapter, Section A.3.(c).

Commission in the PNE Treaty, provides for consultation and information exchange, and operates on a technology review body in contemplation of the necessity for any future amendment.

In the space milieu, the 1967 Outer Space Treaty[92] provides prospective verification provisions, in order to ensure that celestial bodies are used 'exclusively for peaceful purposes'. Thus, article XII provides that

> (a)ll stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other States Parties to the Treaty on a basis of reciprocity. Such representatives shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited.

However, it will be recalled that due to the establishment of only a partial demilitarization régime in article IV of the Treaty,[93] the outer space medium itself is left virtually unfettered. This assumes added significance in the verification context, in that article XII applies only to instrumentalities and installations on the "moon and

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92. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 610 U.N.T.S. 206. Opened for signature 27 January 1967; entered into force 10 October 1967.

93. See supra Chapter III D.1.

other celestial bodies". Thus, there is least provision for verification where it is, arguably, needed the most.

The 1979 Moon Treaty[94] establishes a more comprehensive inspection procedure in article 15, in order that

> (e)ach State Party may assure itself that the activities of other States Parties in the exploration and use of the moon are compatible with the provisions of this Agreement. To this end, all space vehicles, equipment, facilities, stations, and installations on the moon shall be open to other States Parties. Such States Parties shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited. In pursuance of this article, any State Party may act on its own behalf or with the full or partial assistance of any other State Party or through appropriate international procedures, within the framework of the United Nations and in accordance with the Charter.[95]

Furthermore, a consultation procedure is outlined, similar to those discussed earlier.[96] However, due to the

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94 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, UNGA Resolution 34/68, 5 December, 1979, UN Doc. A/34/664 Annex, reproduced in 18 ILM 1434-1449.

95. Ibid., art. 15(1).

96 The article 15 consultation procedure is as follows:

> 2. A State Party which has reason to believe that another State Party is not fulfilling the obligations incumbent

limited applicability of the Moon Treaty,[97] and its prospective nature, it is of little current value as a

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upon it pursuant to this Agreement or that another State Party is interfering with the rights which the former State has under this Agreement may request consultations with that State Party. A State Party receiving such a request shall enter into such consultations without delay. Another State Party which requests to do so shall be entitled to take part in the consultations. Each State Party participating in such consultations shall seek a mutually acceptable resolution of any controversy and shall bear in mind the rights and interests of all States Parties. The Secretary-General of the United Nations shall be informed of the results of the consultations and shall transmit the information received to all States Parties concerned.

3. If the consultations do not lead to a mutually acceptable settlement which has due regard for the rights and interests of all States Parties, the parties concerned shall take all measures to settle the dispute by other peaceful means of their choice appropriate to the circumstances and the nature of the dispute. If difficulties arise in connexion with the opening of consultations or if consultations do not lead to a mutually acceptable settlement, any State Party may seek the assistance of the Secretary-General, without seeking the consent of any other State Party concerned, in order to resolve the controversy. A State Party which does not maintain diplomatic relations with another State Party concerned shall participate in such consultations, at its choice, either itself or through another State Party or the Secretary-

verification provision.

i) General On-Site Inspection

This final category is the ultimate in verifiability, and comprises total freedom of access. Naturally, due to its highly intrusive nature, it has never been applied to treaties applicable to the mainland of either Super-power. The earliest example of general on-site inspection occurs in the Antarctic Treaty of 1959.[98] Article I of the Treaty provides that

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

In order to ensure compliance with this objective, article VII(1) gives each contracting party the "right to designate observers to carry out any inspection". Such observers "shall have complete freedom of access at any time to any or

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(continued from previous page)
General as intermediary.

97. See supra Chapter III D.3, where it is observed that there are only five signatories to the treaty.

98. In force 23 June, 1961.

all areas of the Antarctic",[99] in which "all stations, installations and equipment...and all ships and aireraft at points of discharging and embarking cargoes or personnel... shall be open at all times to inspection."[100] Furthermore, "aerial observation may be carried out at any time over any and all areas of Antarctica",[101] and contracting parties must give advanced notice to other parties of: any projected expeditions; occupied stations in Antarctica; and any military personnel intended to be landed thereon.

The Sea-Bed Arms Control Treaty of 1971,[102] embodies the undertaking not to "emplant or emplace" nuclear weapons on the seabed, or in its subsoil, beyond the territorial limits of states parties to it.[103] Methods of verification of this commitment are outlined in article III, the most extensive of the entire Treaty. Paragraph 1 of the latter provides that "each State Party to the Treaty shall have the right to verify through observation the

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99. Art. VII(2).

100. Art. VII(3).

101. Art. VII(4).

102. Treaty on the Prohibition of the Emplacement of Nuclear Weapons & Other Weapons of Mass Destruction on the Sea-Bed & the Ocean Floor and in the Subsoil Thereof, 23 U.S.T. 701.Opened for signature 11 February 1971; entered into force on 18 May 1972.

103. Art. I(1).

activities of other States Parties to the Treaty on the seabed...." Should this observation prove unsatisfactory, a State Party may enlist the aid of other parties, to "co-operate on such further procedures for verification as may be agreed, including appropriate inspection of objects, structures, installations or other facilities".[104] The only restraint upon such on-site verification is a requirement that it be "conducted with due regard for rights recognized under international law",[105] and in accordance with the UN Charter.[106]

The areas to which verification by on-site inspection is applied, would seem to parallel those where complete demilitarization and denuclearization have been achieved, such as Antarctica and the Moon. It is a truism that in arms control negotiations it has been

> relatively easy to achieve a general agreement to ban military uses of areas which were not yet utilized for such purposes and which showed a rather narrow range of possibilities for strategic use.[107]

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104. Art. III(2).

105. Art. III(6).

106. Art. III(4) & (5).

107. Markoff, M., "Disarmament and 'Peaceful Purposes' Provisions in the 1967 Outer Space Treaty" (1976) 4 J. Space L. 3, at 5.

4. Political Perspectives On Verification

> Verification has long been the nemesis of arms control. Indeed, the history of negotiations to limit strategic arms, from the proposal of the Baruch Plan in 1946 to the signing of the SALT II Treaty in 1979, is a record of intense and nearly continuous controversy over political and technical verification issues.[108]

a) Superpower Policies

The positions of the two Super-powers on arms control verification are quite distinct. In 1981, during a UN Committee on Disarmament meeting, the Soviet Union summarized the basic principles comprising its policy on verification as follows:

1. The conduct of verification should in no way prejudice the sovereign rights of states or permit interference in their internal affairs.

2. Verification cannot exist without disarmament but must stem from a precise and clear agreement on measures for the limitation of armaments and for disarmament.

3. The scope and forms of verification should be commensurate with the character and scope of the specific obligations established in the relevant agreement.

4. The detailed elaboration of the verification provisions is possible

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108. Potter, supra, note 38, 1.

> only after an agreement on the scope of the prohibition has been mapped out.
>
> 5. A state becomes party to a convention not in order to violate it but in order to abide strictly by the obligations it has assumed under it.
>
> 6. International forms of verification should be limited.
>
> 7. In the conditions of the present day development of science and technology, any fairly (or) less serious violation of an agreement in the field of technology has no chance of remaining undetected for very long.[109]

Of special note in the above, is paragraph 1, which is a reiteration of their xenophobia towards on-site inspection, exhibited consistently since the early 1960s. Paragraph 7 is a castigation of US policy on verification. The latter has been succinctly summarized by Professor Stephen Meyer, who states that

> many in government and in the broader defense and foreign policy community have come to accept the proposition that arms control agreements that are not completely verifiable pose a potential threat to U.S. national security. The logical implication is that arms control treaties, or individual treaty provisions, that are less than 100 percent verifiable cannot be in the national interest.[110]

This is confirmed from an unlikely source, the late premier of the Soviet Union, Konstantin Chernenko. The latter

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109. UN Doc. CD/PV.119, (1981), at 16-17.

110. Meyer, supra, note 40, 111.

observed on 11 June, 1984, in the context of a ban on ASAT weapons, that

> those who attempt to rule out any productive talks, by invoking in advance the 'impossiblity' of verifying agreements limiting an arms race in space, are consciously bent on having their hands free for pursuing the course of space militarization in the hope of gaining military advantages.[111]

Even allowing for the element of propaganda, the US commitment to the SDI programme, much of which will have ASAT applications, is a reality, and is perhaps self-perpetuating. Support for this conclusion can be drawn from a November 1983 report of the National Council of the Federation of American Scientists, in which it is concluded in the context of th ASAT verification that

> (i)t is difficult to avoid the impression that the [Reagan] Administration is simply not interested in an arms control option in this area and intends to proceed with deployment, regardless of the alternatives and consequences.[112]

A brief excursus into ASAT verification is apposite at this juncture, both as an illustration of the US viewpoint, and since this is the major obstacle to the conclusion of a

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111. Schmemann, S., "Soviet, Urging Talks, Insists Space Arms Can Be Verified", New York Times, 12 June, 1984, p. A-18.

112. Wicker, T., "Earthly Folly in Space", New York Times, 2 March, 1984.

treaty banning or controlling ASATs.[113]

b) **ASAT Verification**

As an introduction to this section, the comments of President Reagan, in his 31 March, 1984 report to Congress on "US Policy on ASAT Arms Control"[114] is instructive. It is therein stated that

> (e)ffective verification is fundamental to arms control. This applies to space arms control as it does to arms reductions in other fora. The Congressional language mandating ASAT arms control efforts has been uniformly specific on the matter of verification: any ban on ASAT systems is to be verifiable.[115]

The implication is that such verification is to be completely effective.

A number of considerations arise which are peculiar to ASAT weapons control. There are two levels to verification of a ban, of whatever extent, on ASATs. At the least the act of destroying a satellite would be banned.

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113. See infra, Chapter V, B.1 & 2.

114. "US Policy on ASAT Arms Control", 98th Cong., 2nd Sess., House Document 98-197, 3 April, 1984, US GPO, Wash. D.C.

115. Ibid., 11.

This is "readily verifiable"[116] since potential target satellites have on-board systems to assess their performance, and are sensitive enough to distinguish an internal malfunction from an externally induced one, by whatever means. What is less straightforward to verify, is the "capability to destroy"[117] satellites. The use of dedicated ASAT systems, i.e. those which have as their main and only purpose the destruction or disablement of satellites, can be verified. The US F15/MV ASAT can be tracked from its air launch site to its orbiting target. Due to its singular mission profile, the Soviet co-orbital ASAT system can also be monitored easily. In view of consistent Soviet silence concerning their military space systems, the fact that we are aware not only that the system exists, but also its exact performance record,[118] is proof of its verifiability in any forthcoming treaty banning its use.

There are several militarily significant stages before use, however, which could be separately banned or

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116. Arms Control in Space. Office of Technology Assessment (OTA), US Congress Workshop Proceedings, May 1984, 42.

117. Ibid.

118. See Johnson, N.L., The Soviet Year in Space: 1983, Teledyne Brown Engineering, Colorado Springs, 1984, 39 et seq.

controlled in any ASAT limitation treaty. The progression to an operational system involves laboratory research, development, testing and deployment. Research and development is virtually impossible to verify, and the only virtue of banning such activity would be to provide a buffer zone of illegality to discourage covert cheating in later more destabilizing stages. Verification of a ban on testing would involve the same considerations as those for use, and would thus be readily verifiable. A ban on deployment would necessitate use of space-based photo-reconnaissance capabilities. These would be ineffective in trying to detect US F15/MV ASATs, since the latter are unprepossessingly small and insignificant. However, the Soviet system is much larger, incorporating an F1m expendable launch vehicle. The latter is 30 feet longer than the SS-18 missile on which it is based, and can be so differentiated on the ground from space.[119] Thus it has been concluded that "a ban on the deployment of a significant and militarily useful [Soviet] ASAT force could be verified with

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119. See "Verification of Limits of the Soviet Anti-Satellite Weapon" - A staff study by John Pike, Staff Assistant for Space Policy, Federation of American Scientists, in, Arms Control in Outer Space, Hearings before the Sub-Committee on International Security and Scientific Affairs, Committee on Foreign Affairs, US House of Representatives, 98th Cong., 1984, 230.

a high degree of confidence".[120] Should a ban involve dismantling of existing systems, it would be extremely difficult, perhaps impossible, to confirm this with certainty. However, the military utility of stored systems is minimal when any use would be immediately detectable. A widely articulated fear is that the smaller number of US military satellites as compared to the more ubiquitous, shorter-lived and hence more easily replaceable, Soviet ones, would make even a limited amount of cheating a "prohibitive risk". However, the Soviet system is so unwieldy that a successful campaign against all 18 US military satellites in low earth orbit would take "several weeks to complete".[121] Any increase in the number, or change in the configuration of FIm launch pads, would be a clear Soviet announcement of it intention to commit a breach of treaty.

Residual or marginal ASAT capability is a further cause for concern. This is due to the fact that there are a large number of devices which can be used, with varying degrees of effectiveness, against satellites. The Soviet GALOSH ABM System, permitted by the ABM Treaty, could be used in an ASAT role, but the range of orbits to which the

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120. Ibid.

121. Ibid., 229.

system has effective access is severly limited.[122] Although a nuclear armed ICBM or ABM missile could be used as an ASAT,[123] this would be an ultimate last resort and thereafter space capability would probably cease to be of interest to anyone. Furthermore, even if this did not lead to full scale nuclear war, the effects of electromagnetic pulse (EMP) would mean that the aggressor's satellites would also be rendered useless.

ASAT arms control is perhaps the most technologically challenging to verify. However, a recent exchange between the Super-powers does not augur well for a successful commitment to take up the challenge. This occurred in the context of a proposed ban on underground nuclear testing, excluded from the prohibition in the 1963 PTB Treaty.[124] Mikhail Gorbachev, the Soviet Premier, proposed a moratorium on such testing, commencing on 6 August, 1985, to mark the 40th Anniversary of the bombing of Hiroshima.[125] However, the Reagan administration declined to participate in such a moratorium, which it felt

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122. Supra, note 116, at 43.

123. Ibid.

124. See supra, Chapter III C.1.

125. See "US, Soviets Make Arms Offers Other Can't Except", Montreal Gazette, 30 July, 1985, p. A-1.

was an unverifiable "propaganda ploy".[126] Instead, the Soviet Union was invited to send observers to the next nuclear tests in Nevada. Whilst the latter is certainly a step in the right direction, the US claim of unverifiability is highly questionable. As early as 1962, the Soviet Union defended its position on the verifiability of underground nuclear explosions in the face of Western skepticism, by stating:

> Very convincing in this connexion was the detection of the underground nuclear explosion, recently conducted by the Soviet Union, by the United States Atomic Energy Commission -- and not by any means of international control or the dispatch of inspection teams into USSR territory, but exclusively by means of national systems. This means that the United States has at its disposal detection systems which are adequate for recording underground nuclear explosions, however far from the United States these explosions are carried out. The Soviet Union also has such detecting systems at its disposal, as have many other states.[127]

Furthermore, Herbert York, the US SALT II negotiator testified in 1978 that, "with the political will, we could have had a verifiable ban in less than six months".[128]

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126. Ibid., p. A-2. See also Gelb, L.H., "Warming Trend - Helsinki Helps Lay the Groundwork for a Summit", New York Times, 4 August, 1985, A-1.

127. UN Doc. ENDC/PV.24 (1962), at 8.

128. Scoville, H., "A Freeze is Verifiable', Montreal Gazette, 25 October, 1984, p. A-27.

In conclusion, one can only echo the sentiments of former UN Secretary General Kurt Waldheim, who stated on 29 February, 1972, that

> all the technical and scientific aspects of the problem have been so fully explored that only a political decision is now necessary in order to achieve final agreement.... When one takes into account the existing means of verification by seismic and other methods, and the possibilities provided by international procedures of verification such as consultation, inquiry and what has come to be known as 'verification by challenge' or 'inspection by invitation', it is difficult to understand further delay in achieving agreement on an underground test ban.[129]

5. International Verification

In 1962, during the ENDC meetings at the UN, both the USA and the USSR submitted draft treaties on "General and Complete Disarmament". While the Soviet draft[130] was expressed to be only "under strict international control",

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129. United Nations, Report of the Committee on Disarmament, 37 UN GAOR, Supp. (No. 27), 23 UN Doc. A/37/27 (1982).

130. "USSR Draft Treaty on General and Complete Disarmament under Strict International Control", 15 March, 1962, as amended to 4 February, 1964, UN Doc. DC/205, Annex 1, Section D (ENDC/2 Add. 1) and UN Doc. DC/203 Annex 1, Section C (ENDC/2).

the American one[131] was entitled in the contemplation of "a peaceful world". Both drafts outlined a phased reduction to zero of all armaments, nuclear, chemical and conventional. Whilst this is no doubt a laudable objective, even during their preparation it was recognized that the drafts lent more to the Utopian than the pragmatic. Nevertheless, in the present context of verification, its control provisions are worthy of note.

Both proposals provided for the establishment of an "International Disarmament Organization" (IDO). Article 2 of the Soviet draft expresses it thus:

> 1. States parties to the treaty solemnly undertake to carry out all disarmament measures under strict international control and to ensure the implementation in their territories of all control measures.
>
> 2. Each disarmament measure shall be accompanied by such control measures as are necessary for verification of that measure.
>
> 3. To implement control, an International Disarmament Organization including all states parties to the treaty shall be established within the framework of the United Nations.
>
> 4. In all countries the IDO shall have its own staff, recruited interna-

131. "Outline of Basic Provisions of a Treaty on General and Complete Disarmament in a Peaceful World", 1962, UN Doc. DC/203 Annex 1, section F (ENDC/30) and UN Doc. DC/205 Annex 1 sections E & F (ENDC/30/Add. 1 & 2).

> tionally and in such a way as to ensure the adequate representation of all three existing groups of states. This staff shall exercise control, on a temporary or permanent basis, depending on the nature of the measure being carried out, over the compliance by states with their obligations to reduce or eliminate armaments and their production and to reduce or disband their armed forces.
>
> 5. The states shall in good time submit to the IDO such information about their armed forces, armaments, military production and military appropriations as are necessary to carry out the measures of the corresponding stage.
>
> 6. Upon completion of the program of general and complete disarmament the IDO shall remain in being to maintain supervision over the implementation by states of the obligations they have assumed, so as to prevent the reestablishment of the military potential of states.

The US draft adds in its article 5 that the IDO "and its inspectors would have unrestricted access without veto to all places as necessary for the purpose of effective verification". Furthermore, the IDO would control all rocketry and other space devices to ensure their use for peaceful purposes, through "inspection teams at the sites for peaceful rocket launchings who shall be present at the launchings and shall thoroughly examine every rocket or satellite before their launching."[132] Inspectors would

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132. UN Doc. ENDC/PV.37 (1962), at 28.

also monitor the production of all fissionable material, in order to ensure its application to peaceful purposes.

As will be recalled from the extensive review of verification provisions earlier in this chapter, no international verification system has been created in any arms control treaty to date, other than the IAEA safeguards system for peaceful dissemination of nuclear technology.[133] It is with this background, that the most recent proposal for international arms control verification will be discussed.

6. The International Satellite Monitoring Agency (ISMA)

During the first UN General Assembly Special Session on Disarmament in May-June 1978, the French delegation submitted a memorandum, which proposed the establishment of an international monitoring agency. ISMA, as it came to be called, was to operate within the current disarmament framework, and would place surveillance satellites at the service of the international community.

The French proposal was referred to the 33rd regular session of the General Assembly. The latter adopted

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133. See supra, this chapter, section A.3(h).

Resolution 33/71J, which requested the Secretary-General to undertake, with the assistance of a group of qualified governmental experts, a study of the technical, legal and financial implications of establishing such an agency. In pursuance of this resolution, the preliminary conclusions reached by the Group of Experts were submitted to the thirty-fourth session of the General Assembly. Following the recommendations of the Group of Experts, the General Assembly adopted Resolution 34/83 E. In the latter it requested the Secretary-General to carry out an in-depth study on the subject, and to submit a comprehensive report in time for the General Assembly to formulate a decision thereon, at its second Special Session on Disarmament, in 1982. The final report was in fact submitted on 6 August, 1981.[134] It is disturbing to note, however, that neither of the super-powers participated in the preparation of the reports, an expression of their disapproval of any interference with their verification duopoly.

Regarding the mandate of ISMA, the report cited two main missions, the monitoring of compliance with existing and future international arms regulations and disarmament agreements, and the monitoring of international crises.

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134. "Study on the Implications of Establishing an International Satellite Monitoring Agency", UN Doc. A/AC.206/14 (1981).

ISMA itself was conceived as a evolutionary, three-tiered organization. Phase I would establish an Image Processing and Interpretation Centre, which would obtain currently available imagery data from both existing civilian and military systems. In phase II, ISMA would set up its own network of Ground Stations, to receive such data directly. The final phase, the most challenging of all, would involve the development of ISMA space segments, i.e. a network of recsats, which could complete the independent, international monitoring capability. 1980 cost estimation for this project were in the $900-1200 million range, a paltry sum when compared to the billions of dollars expended upon armaments each fiscal year, or quinquennium, depending upon the super-power. However, the ISMA proposal was not taken up by the General Assembly.[135]

If ISMA, as presently configured, is unsatisfactory, further discussions should be undertaken, to bring it to fruition in a universally acceptable format. International verification would certainly be a recognition of the expanding number of nations taking their place among the space powers, and should be the eventual goal. The situation in which the two super powers are monitoring each

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135. See Dupuy, R.J., "Les structues et le rôle d'une agence internationale de satellites de contrôle", (1981) VI AASL 333.

other, being the only nations with such capabilities, is coming to an end,[136] and there would be less chance of dangerous misapprehension if a neutral international system performed this function.

B. PROBLEMS OF DEFINITION

The other area of special difficulty, which exerts an all-pervasive influence in the context of arms control treaty regulation, is that of definition of terminology. Definitional and semantic problems are inherent in the legislative process, be it in drafting national statutes, or international treaties. However, it will be readily appreciated that extending the rule of law to this area presents unique difficulties. Any ambiguity in the scope and effects of a treaty controlling weapons may have momentous and potentially dangerous consequences not anticipated during the process of drafting. It is beyond the scope of this thesis to attempt a review and assessment of the myriad ambiguities of all the terms used in arms

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136. See Matte, N.M., Space Policy and Programmes Today and Tomorrow [:] The Vanishing Duopole, Carswell Co. Ltd., Toronto, 1980.

control treaties.[137] At this juncture, it will suffice to discuss, arguably, the most important and recently emerged terms in the outer space arms control debate. The two terms, with their associated synonyms and antonyms, are "militarization" and "weaponization". They are not only significant intrinsically, and due to their topicality, but also as a prelude to the next chapter, in which treaty proposals to curb such activities in space are discussed. Since the latter use these terms extensively, in the interests of clarity, and the pursuit of uniformity in interpretation, some definitions of them will be presented and discussed.

The US position is succinctly summarized by Dr. R. Bowman, former Director of Advanced Space Programmes Development for the US Air Force, who states that

> (m)ilitary activities in space such as

137. For a comprehensive review of arms control terminology see, "Lexicon on Space Arms Control Terminology" prepared for the Canadian Department of External Affairs, by the Centre for Research on Air and Space Law (CASL), McGill University, March 1984, (unpublished) passim; see also "Arms Control and Outer Space: A Study of the Issue from the Aspect of Existing Agreements and International Law", CASL, McGill University, 1983 (unpublished), pp. 82-111; and Galloway, E., "International Institutions to Ensure Peaceful Uses of Outer Space", in, Jasentuliyana, N. (ed.), Maintaining Outer Space for Peaceful Uses, The United Nations University, Japan, 1984, 143 at 155 et seq.; and Gorove, S., "Article IV of the 1967 Outer Space Treaty and Some Alternatives for Further Arms Control", ibid., 77 et seq.

> communications, early warning surveillance and navigation...have been conducted by both superpowers for decades and have actually contributed to the maintenance of peace....In addition military surveillance satellites have made arms control possible by providing non-intrusive technical means of verification of arms control treaties. We must therefore be careful to distinguish between these stabilizing aspects of 'militarization' of space and the 'weaponization' of space which threatens the very military satellites helping preserve the peace.[138]

Thus, the term 'militarization' may be taken to denote the use of "space military support systems", which do not have any capability to damage, destroy or otherwise interfere with other space objects or objects on the earth or in atmosphere. At the same time they actively support such military operations and include satellites for communication, detection, early warning, intelligence gathering, navigation, reconnaissance and tracking.

Regarding the Soviet viewpoint, Professors Zhukov and Kolosov define its antonym, demilitarization.

> The demilitarization of outer space and celestial bodies implies the banning of activities that pursue military aims in peacetime, and may be partial or total. In the case of partial demilitarization, the ban covers the types of military space activities by states that have been strictly defined by international agreement; in the case of total demilitariza-

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138. In "The Militarization of Space? The Real Issue is the Weaponization of Space", 24 September, 1984, paper submitted to the International Progress Organization, at 2.

> tion it extends to all activities that pursue military aims in peacetime. The dimilitarization of outer space should be distinguished from its neutralization, which implies the total or partial exclusion of outer space and celestial bodies from the sphere of military operations in the event of an armed conflict.[139]

The Associated term, "neutralization", is further elaborated in a previous Soviet publication edited by Professor A.S. Piradov, in which it is stated that

> (t)he complete neutralization of space would preclude its use in wartime for:
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> 1. launching military space objects in or from space to strike at enemy targets;
> 2. conducting military operations directly in space, and
> 3. firing combat missiles with nuclear warheads via space at targets on the territory of other states.[140]

The contrast, the term "weaponization", which has gained currency in the UN Committee on Disarmament,[141]

> is meant to distinguish those military activities involving the actual deployment of weapons in space from other more benign military activities in space such as communications, early warning, surveillance and navigation....[The] "weaponization" of space refers to the introduction of (1) weapons, wherever based, directed at space objects and (2) weapons for

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139. Zhukov, G. & Kolosov, Y., International Space Law, Praeger, in association with the Novosti Press Agency, Moscow, 1984, 53-54.

140. Piradov, A.S. (ed.), International Space Law, Progress Publishers, Moscow, 1976, 93-94.

141. See supra, Chapter II A.2.

whatever purpose, based in space.[142]

In other words, the "weaponization" denotes the use of "space weapon systems", i.e. those space objects or devices which have the capability, though in rudimentary form, to interfere with, damage or destroy objects in space, in the atmosphere, or on the surface of the earth. They include anti-satellite devices, manned space bombers, orbital missiles and nuclear explosives. These systems initiate or add to the weaponization of outer space.

Finally, in this context, it is to be hoped that the militarization of space will be kept to a minimum consistent with the maintenance of international stability. And furthermore, that the weaponization of space may be averted, discontinued, and prevented from recurring in the future.

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142. Bowman, supra, note 136, at 7.

CHAPTER V

REGULATION BY AN INTERNATIONAL TREATY

> Weapons parity may of course in particular situations induce reciprocal abstinence, but in general only weapons which were militarily ineffective or inefficient, or which were of marginal or indecisive military value and obsolete, or which were not deemed vital to the military establishments of one or more great powers, have been successfully prohibited.[1]

A. FORMAT

1. Comprehensive Treaty or Specific Space Treaty

a) Comparison of Advantages and Disadvantages

The notion of a comprehensive treaty in this area is not novel. A leitmotiv to emerge during the Cold War of the late 1950s and early 1960s, was the concept of "general and complete disarmament." This was advocated as the ultimate goal for achievement by the super-powers. Thus, as noted in the previous chapter,[2] both the USA and USSR

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1. McDougal, M.S. & Feliciano, F.P., Law and Minimum World Public Order, New Haven, Yale University Press, 1961, 617.

2. See, supra, chapter IV A.5.

submitted draft treaties in 1962 before the Disarmament Committee of the UN. The Soviet "Draft Treaty on General and Complete Disarmament Under Strict International Control"[3] outlined a five-year-plan to achieve its goal of "general and complete disarmament". The plan comprised the phasing out of numerous areas of military activity, ranging from the "disbanding of all armed forces and the prohibition of their reestablishment", to the "prohibition and destruction of all stockpiles and the cessation of the production of all kinds of weapons of mass destruction" and means to deliver them to their targets. Other, more fundamental, steps envisaged were the "abolition of war ministries, general staffs, and their local agencies, ...elimination of all types of conventional armaments and military equipment", and most significantly, the "discontinuance of the appropriation of funds for military purposes, whether from State budgets or by organizations or private individuals".

The USA responded with an "Outline of Basic Provisions of a Treaty on General and Complete Disarmament in a Peaceful World."[4] Although referring to the same

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3. UN Doc. DC/203 Annex 1, section C ENDC/2 (1962).

4. UN Doc. DC/205 Annex 1, sections E & F ENDC/30/Add 1 & 2 (1962).

goals as the Soviets, the US draft incorporated more vague language, and impliedly assumed that there was little likelihood of there being a "peaceful world" in the forseeable future, in which to implement such an extensive programme. Although the world is, arguably, more stable today as compared with the dangerous posturing during the Cold War, the rampant weaponization of all nations militates against there ever being a total demilitarization of the scope envisaged in the above drafts.

It was with this realization that another, more modest, methodology was adopted by the international community. Thus, multilateral or bilateral accords have been promulgated to proscribe, ameliorate or otherwise control military activities with more specificity. Such partial arms control agreements can be classified into two categories, those dealing with specific geographical or legal areas, and those concerning a specific type of weapon.

Examples of geographically specific partial arms control agreements are the 1959 Antarctic Treaty[5] and the 1971 Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed

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5. 402 U.N.T.S. 71. Opened for signature 1 December 1959; entered into force 13 June 1961.

and the Ocean Floors and in the Subsoil Thereof.[6] The Antarctic Treaty declared that Antarctica, which from a legal point of view, has similar characteristics to the high seas, shall be used exclusively for peaceful purposes. The Treaty prohibits, inter alia, "any measures of a military nature, such as the establishment of military bases or fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapons."[7] In addition, there is a ban on nuclear explosions and prohibition of the disposal of radio-active waste material in Antarctica, subject to possible future international agreements on these subjects.[8]

In the preamble to the Seabed Treaty, "the prevention of a nuclear arms race on the seabed and ocean floor" is expressed to be "a step towards a treaty on general and complete disarmament under strict and effective international control." Article I(1) of the Treaty states the undertaking

> not to emplant or emplace on the seabed and ocean floor and in the subsoil thereof beyond the outer limit of the sea-bed zone ... any nuclear weapons or any other

6. (1971) 10 I.L.M. 145 (hereinafter cited as the Sea-Bed Arms Control Treaty of 1971). Opened for signature 11 February 1971; entered into force on 18 May 1972.

7. Art. I(1).

8. Art. V(1) and (2).

> types of weapons of mass destruction as well as structures, launching installations or any other facilities specifically designed for storing, testing or using such weapons.[9]

There have been many agreements dealing with specific weapons, a number of which will be referred to infra. At this juncture, the 1972 Convention on Bacteriological Weapons[10] will suffice as an example. In its preamble, the Convention is expressed to be promulgated "with a view to achieving effective progress towards general and complete disarmament, including the prohibition and elimination of all types of weapons of mass destruction". Article 1 of the Convention admonishes its signatories

> never in any circumstances to develop, produce, stockpile or otherwise acquire or retain (1) microbial or other biological agents or toxins...and means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Thus, a number of international agreements have been enacted, ostensibly to create a network of prohibitions

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9. Article II provides that "(f)or the purpose of this Treaty, the outer limit of the Sea-bed zone referred to in article I shall be coterminous with the twelve-mile outer limit of the zone referred to in Part II [of the Geneva Convention on the Territorial Sea and Contiguous Zone]" i.e. 12 miles from the outer limit of the territorial sea.

10. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, 26 U.S.T. 583. Opened for signature 10 April 1972; entered into force 26 March 1975.

and controls on military excesses with the ultimate aim of achieving a utopian "general and complete disarmament". The military potential of outer space was long perceived, and it was dealt with internationally as a distinct area for all purposes, including arms control. Just as general terrestrial demilitarization is now impracticable and impossible to achieve, so also is an effective general demilitarization of outer space. It is highly unlikely that an agreement as extensive as that for Antarctica could be reproduced for Outer Space, in view of the latter's virtually unlimited military potential.[11]

b) Mandatory or Recommendatory Nature

i) Arms Control Agreements as "Soft Law"

By their very nature, arms control agreements are of a specific character, as they represent encroachments

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11. The provisions of the Antarctic Treaty were made possible largely by the continent's minimal military utility, particularly for the USA and USSR. Any military activity based in Antarctica could be carried out more effectively and efficiently from some other point on the globe. The same cannot be said for space, as discussed, supra in Chapter I.

upon a state's sovereignty.[12] The rationale behind those agreements is mutual national self-interest and the maintenance of a balance of power.[13] However, arms control agreements are also international law, and thus can be said to have the "soft law" characteristics inherent in that designation.[14]

> ...A côté d'une hard law, constituée par des normes créatrices de droits et d'obligations juridiques précis, le système normatif du droit international comporte, relève-t-on de plus en plus de normes dont la substance est tellement vague, tellement peu contraignante que l'obligation de l'un et le droit de l'autre en deviennent presque insaisissables. De ce droit "fragile" et "faible", que l'on qualifie parfois de soft law, les exemples ne manquent pas...[15]

However, "soft" international obligations are still

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12. Gotlieb, A., Disarmament and International Law, Contemporary Affairs, No. 34, The Canadian Institute of International Affairs, Toronto, 1974, 33, at 47.

13. See Barton, J.H., The Politics of Peace. An Evaluation of Arms Control, Stanford, 1981, 50 et seq. and 112 et seq.

14. See Seidl-Hohenveldern, I., "International Economic Soft Law", (1979) 163 Receuil des Cours, at 165.

15. Weil, P., "Vers une normativité relative en droit international?", (1982) 86 R.G.D.I.P., 7; see also, Baxter, R.R., "International Law in 'Her Infinite Variety'", (1980) I.C.L.Q. 549; Dupuy, R.J., "Droit déclaratoire et droit programmatoire. De la coutume sauvage à la "soft law"", in, L'élaboration du droit international public, Pedone, Paris, 1975, at 140.

legal obligations and, as such, are subject to the basic rule pacta sunt servanda.[16] In comparison with soft international economic law, the obligations of the parties to arms control agreements appear more affirmative by their adoption of more emphatic language. Thus, treaties speak of "undertakings to prohibit, to prevent, and not to carry out"[17] a certain type of activity. However, this is by no means conclusive, and represents merely a prospective undertaking to perform an action. As part of international law, arms control treaties share its vulnerability, in that it lacks any real enforcement procedure.

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16. This customary rule of international law, which is enshrined in Art. 26 of the Vienna Convention on the Law of Treaties (1969) 8 I.L.M. 679 means that treaties, once in force, are binding upon the parties to it and must be performed by them in good faith. This principle, with stress on the concept of good faith in the observance of treaties, has been held in many arbitral and judicial decisions, see Elias, T.O., The Modern Law of Treaties, Leiden, 1974, 40 et seq.; Guggenheim, P., Traité de droit international public, Tome I, Genève, 1967, 166 et seq.; Oppenheim, L., International Law, Vol. I, (8th ed.), London , 1966, 880 et seq.

17. See art. I(1) of the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, 480 U.N.T.S. 43 (hereinafter cited as the Partial Test Ban Treaty), which states:
    Each of the Parties to this Treaty undertakes to prohibit, to prevent and not to carry out any nuclear test explosion, or any other nuclear explosion, at any place under its jurisdiction or control.... See, supra, chapter III C. 1.

ii) Compliance With Arms Control Agreements

Compliance with arms control agreements is based on the concept of national self-interest.[18] In fact, actual compliance with this kind of international agreement is largely determined by political factors. The more balanced and equal an arms control agreement is the more likely it will be complied with.[19] Notwithstanding this, arms control agreements can be avoided by a political mandate for covert derogation, or supervening technological developments which render them obsolete and/or legally avoidable. Nevertheless,

> ...violation is only rarely a severe problem for agreements since the Second World War. The shared interest in maintaining the arms control, together with the existing verification system, usually ensures that a treaty will be honored. The problems came mainly from changes in national regimes, which can produce a reevaluation of national goals, and from erosion by repeated minor violations. In general, however, today's relatively weak agreements are likely to be observed.[20]

The concept of self-interest can also be found in the abrogation clauses to many arms control agreements,

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18. Barton, supra, note 13, 105.

19. Ibid., 110.

20. Ibid., 123-24.

permitting the termination of the agreement on a specified short time (usually 3 to 6 months) after the Party in question gives notice that it believes its supreme interest could otherwise be jeopardized.[21] As Barton states, "the threat of abrogation amounts to a kind of enforcement."[22] The knowledge that a Party can abrogate the treaty in response to an opponent's violation, rather than formal sanctions, can serve as an effective enforcement. Attention has also been drawn to another aspect of a flexible system of abrogation:

> In fact, the ability to terminate an arms control agreement, by breach if necessary, might allay the fears of nations and overcome their reluctance to enter into

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21. For example, art. IV of the Partial Test Ban Treaty, supra, note 17, states:
> This Treaty shall be of unlimited duration. Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other Parties to the Treaty three months in advance.

See also art. X (1) of the Treaty on the Non-Proliferation of Nuclear Weapons, 729 U.N.T.S. 161 (hereinafter cited as the Non-Proliferation Treaty). Opened for signature 1 July 1968; entered into force 5 March 1970; and, Art. III of the Sea-Bed Arms Control Treaty, supra, note 4. Only the Treaty Between the USA, and the USSR on the Limitation of Anti-Ballistic Missile Systems, 23 U.S.T. 3435 (hereinafter cited as the ABM Treaty), signed 26 May 1972; entered into force 3 October 1972, provides for a more reasonable delay of six months.

22. Barton, supra, note 13, 106.

> arms control arrangements even tentatively. Indeed, there may be argument for a provision in the treaty permitting denunciation by any party upon a period of notice. The knowledge that they can retreat will encourage nations to enter. The knowledge that they can retreat legally and openly may help discourage them from clandestine violation. In course, although nations had gone in tentatively with an eye on the exit, experience might breed confidence and the power to abandon the agreement might never be exercised.[23]

One could question the advantage of an international agreement which parties could abrogate almost instantaneously. However, certain treaty provisions, depending on their form and structural relation with other treaty provisions and the "manifest intent" of the parties to create a new rule of law, can generate a customary international rule of law binding on non-parties.[24] Furthermore, arms control agreements may serve as evidence of the emergence of an international customary rule en dehors the treaty, such as in the framework of a UN General

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23. See Arms Control: A Survey and Appraisal of Multilateral Agreements, SIPRI, Taylor & Francis Ltd., London, 1978, 32-33.

24. See North Sea Continental Shelf Cases, (1969) I.C.J. Reports 4, at 95, and also D'Amato, A., "Manifest Intent and the Generation by Treaty of Customary Rules of International Law", (1970) 64 A.J.I.L. 892.

Assembly Resolution.[25]

c) **Reservations**

i) Reservations to Multilateral Treaties in General

Art. 2 of the Vienna Convention on the Law of Treaties defines a reservation as

> a unilateral statement, however phrased or named, made by a State when signing, ratifying, accepting, approving or acceding to a treaty, whereby it purports to exclude or modify the legal effect of certain provisions of the treaty in their application to that state.[26]

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25. See De Visscher, P., "Observations sur les résolutions déclaratives de droit adaptées au sein de l'Assemblée Générale des Nations Unies", in, Festschrift für Rudolf Bindschedler, Berne, 1980, 173 et seq. See also, supra, chapter III, B.3.

26. Supra, note 16; on reservations to multilateral conventions in general see, Anderson, D., "Reservations to Multilateral Conventions: a Reexamination", (1964) 13 I.C.L.Q. 450; Bowett, D.W., "Reservations to Non-Restricted Multilateral Treaties", (1976-7) B.Y.I.L. 67; Elias, supra, note 16, 27 et seq.; Fitzmaurice, G.G., "Reservations to Multilateral Conventions", (1953) 2 I.C.L.Q. 1; Gamble, J.K., "Reservations to Multilateral Treaties: A Macroscopic View of State Practice", (1980) 74 A.J.I.L. 372; Guggenheim, supra, note 16, 166 et seq.; Holloway K., Les réserves dans les traités internationaux, Paris, 1958; Imbert, P., Les réserves aux traités multilatéraux, Paris, 1979; Kyongun Koh, J., "Reservations to Multilateral Treaties: How International Legal

A reservation must be distinguished from an interpretative declaration. The latter raises an issue of treaty interpretation and does not cause any legal effects comparable to those of a reservation.[27] In recognition of this distinction, the UK delegation to the UN, in relation to a Yugoslavian declaration on their ratification of the Non-Proliferation Treaty, commented that:

> In so far as the statement may be intended to take effect as an interpretative declaration, Her Majesty's Government regret that they are unable to accept it...in so far as it may be intended to take effect as a reservation, Her Majesty's Government must place on record their formal objection to the statement, on the grounds that it is incompatible with the object or purpose of the Treaty.[28]

In international law the permissibility of reservations is governed by the principles set out in article 19 of the Vienna Convention on the Law of Treaties which provides that:

> A State may, when signing, ratifying, accepting, approving or acceding to a treaty, formulate a reservation unless:
> (a) the reservation is prohibited by the treaty;
> (b) the treaty provides that only

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Doctrine Reflects World Vision", (1982) Harvard Int'l L. J. 70.

27. See Bowett, ibid., 68.

28. See United Kingdom Treaty Series, No. 125 (1975) (Cmnd 6268, p. 10).

> specified reservations, which do not include the reservation in question, may be made; or
> (c) in cases not falling under sub-paragraphs (a) and (b), the reservation is incompatible with the object and purpose of the treaty.

This means that reservations expressly or impliedly prohibited by the terms of the treaty are excluded and reservations expressly or impliedly authorized are ipso facto effective. When the treaty in question is silent on reservations, the criterion to determine whether the reservation was permissible, and hence whether the party making the reservation can be considered as a party to the treaty, is the compatibility of the reservation with the "object and purpose of the treaty".[29] This principle had already been adopted by the International Court of Justice, in its advisory opinion entitled Reservations to the Convention on the Prevention and Punishment of the Crime of Genocide in 1951.[30] According to the traditional doctrine in international law, a reservation to a multilateral treaty

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29. In addition, the reservation must also be a true reservation and not an interpretative declaration. The reservation may also not seek to modify the effect of other articles of the treaty to which reservations are not allowed of other treaty rules or rules of customary international law in general; see Bowett, supra, note 26, 89.

30. (1951) I.C.J. Reports, at 15 et seq.; hereinafter cited as Genocide Convention Case.

had to be accepted by all the signatory states in order both to be an admissible reservation, and for the reserving state to be considered a party to the treaty.[31] In the Genocide Convention Case, the I.C.J. still recognized this "traditional doctrine" as being "of undisputed value", but the majority of the Court did not consider it to have been "transformed into a rule of law." Thus the I.C.J. rejected the doctrine requiring the unanimous acceptance by other treaty parties of reservations to a multilateral treaty in order for them to be valid. This doctrine was expressed to be no longer in accordance with the realities of international practice. With respect to the Genocide Convention, which the Court recognized to have singular characteristics, it was admitted that a reserving party would not be considered a party to the treaty vis-à-vis those states which had objected to the reservation as being incompatible with the object and purpose of the treaty. Instead, the reserving party would only be considered as a party to the treaty vis-à-vis those states which have accepted the reservation as being compatible with the object and purpose

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31. In 1931 the Assembly of the League of Nations adopted a resolution which declared that "a reservation can only be made at the moment of ratification if all the other signatory States agree or if such a reservation has been provided for in the text of the Convention", League of Nations O.J. Spec. Supp. 93, at 199 (1931), see further Kyongun Koh, supra, note 26, at 77.

of the treaty.[32]

ii) Reservations to Arms Control Agreements

The application of the general rule, that reservations are permissible provided they are compatible with the object and the purpose of the treaty, might be particularly difficult in the case of arms control agreements. There is no unanimity in international jurisprudence whether "object and purpose of the treaty" are distinct notions, or synonyms.[33] Furthermore, it might be a difficult exercise to determine "the object and purpose" of an arms control treaty, a fortiori the more complicated ones which may have "multiple objects and purposes".[34] Furthermore,

> the notion of object or purpose is itself not a fixed and static one, but is liable to change, or rather develop as experience is gained in the operation and working of

32. Supra, note 30, 26 et seq.

33. In the sense of distinct notions: Minority Schools in Albania, Advisory Opinion of April 6th 1935, P.C.I.J. Series AB, No. 64, at 67. In the sense of synonyms: Case of Certain Norwegian Loans (France v. Norway) Judgment of July 6th, 1957, (1957) I.C.J. Reports, at 24.

34. See also Hazou, L., "Determining the Extent of Admissibility of Reservations: Some Considerations With Regard to the Third United Nations Conference on the Law of the Sea", (1980) 3 Denver J. of Int'l L. & Policy 69.

the convention.[35]

As to reservations themselves, they have been divided into four categories:

1. reservations to dispute settlement provisions;
2. reservations to other final clauses;
3. reservations to the merits of treaties that single out a specific provision; and
4. reservations to the merits of the entire treaty.[36]

While reservations of category 1 and 2 might be permissible and may even have the advantage of attracting more parties to an arms control agreement, some attention should be paid to Judge Alvarez' dissenting opinion in the Genocide Convention Case.[37] Judge Alvarez made a distinction between four categories of multilateral conventions:

> a) those which seek to develop world international organization or to establish regional organizations...;
> b) those which seek to determine the territorial status of certain States...;
> c) conventions which seek to establish new

35. Fitzmaurice, G., "The Law and Procedure of the International Court of Justice: Treaty Interpretation and Other Treaty Points", (1957) B.Y.I.L. 208.

36. See Szafarz, "Reservations and Objections in the Treaty Practice of Poland", (1974) 6 Polish Y.B. Int'l L. 49.

37. Supra, note 30, 49.

> and important principles of international law;
> d) conventions seeking to regulate matters of a social or humanitarian interest with a view to improving the position of individuals.[38]

The Genocide Convention, and arms control agreements in general, could arguably be categorized under rubrics c) and d) above. The learned judge found reservations to these four categories of convention inadmissible;

> for that would be contrary to the purposes at which they are aimed, namely, the general interest and also the social interest. These conventions signed by a great majority of States ought to be binding upon the others, even though they have not expressly accepted them: such conventions establish a kind of binding custom, or rather principles which must be observed by all States by reason of their interdependence and of the existence of an international organization.[39]

Whilst one can sympathize with the position of Judge Alvarez, this does not represent the law as it now stands. It remains the sovereign right of all states to effect reservations to international agreements on ratification, if they so wish. In the present context of arms control agreements, due to their accommodating ambiguities and strong political implications, express reservations are rare. Such reservations, as there are, tend to clarify and not qualify. There are a number of Agreed Statements,

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38. Ibid., 51.

39. Ibid., 53.

Common Understandings and Unilateral Statements which are largely "interpretive declarations", initialled by the heads of both the US and Soviet delegations to the Strategic Arms Limitation Talks (SALT I). For example, Agreed Statement A to the 1972 ABM Treaty states that

> (t)he Parties understand that, in addition to the ABM radars which may be deployed in accordance with subparagraph (a) of Article III of the Treaty, those non-phased array ABM radars operational on the date of signature of the Treaty within the ABM system deployment area for defence of the national capital may be retained.

Having identified some of the general considerations of the law of treaties in the present context of arms control, we shall now proceed to a consideration of more specific matters. Thus, in the following section, both the major generic arms control treaty formats employed by the international community, and selection of the appropriate treaty category for outer space will be discussed.

2. Other Generic Treaty Types

a) The Non-Proliferation Treaty Solution; Military Uses Excluded for "Newcomers"

The purpose of non-proliferation treaties, is to ensure that dangerous weapons, now in limited use, do not become widespread. For outer space, this could mean at

least the containment of its weaponization.

The format of a non-proliferation treaty is such that it calls upon states possessing nuclear weapons to refrain from relinquishing control of nuclear weapons and from transmitting the information necessary for their manufacture to states not possessing such weapons. At the same time, they also agree to try to achieve arms control amongst themselves. The other parties to the agreement, those who do not already have the weapon systems, agree not to acquire control of such weapons. They also undertake not to develop these systems independently. This last undertaking creates asymetry in this format, making its viability dependant upon the promise of serious arms control resulting from negotiations amongst the natipns that have the weapons, thus giving hope for a more symetrical form of agreement in the future.[40] The prime example of the non-proliferation format, is the "Treaty on Non-Proliferation of Nuclear Weapons",[41] which entered into force on 5 March, 1970.

With the first use of atomic weapons during the Second World War, came the realization that the spread of

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40. See further Barton, supra, note 13, 101; Shaker, M.I., The Nuclear Non-Proliferation Treaty: Origin and Implementation 1959-1979, Vol. 1, New York, 1980, 214.

41. Supra, note 21.

such a weapon had to be limited. The United States made the first proposals, acting from its monopolistic position in the late 1940's, suggesting the establishment of an international atomic development authority to oversee, exclusively, the development and use of atomic energy. This proposal went nowhere, being unacceptable to non-nuclear nations.

The hope of a nuclear free world had vanished by 1953, when three powers had developed nuclear weapons.[42] The proliferation of nuclear weapons became a more pressing issue. Non-proliferation provisions were included in the arms control initiatives between the United States and the USSR in the late 1950's. This was considered insufficient, however, by many of the other nations, who agitated for a separate Non-Proliferation Treaty. The proposals they adduced were promulgated in the form of UN Resolutions in the early 1960's.[43] Finally, in 1965, the Eighteen Nation Disarmament Committee negotiated and drafted the Non-Proliferation Treaty, pursuant to a General Assembly Resolution requesting urgent consideration of the problem of

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42. Great Britain and the Soviet Union had joined the nuclear club and would be followed by France, China and India.

43. UNGA Res. 1665(XVI), 4 December 1961, for example, was an Irish resolution calling for the conclusion of an international agreement for states to refrain from the transfer of or acquisition of nuclear weapons.

nuclear weapons proliferation.[44]

The Non-Proliferation Treaty prohibits both the transfer of nuclear power, and the corresponding reception thereof by the non-nuclear powers.[45] Furthermore, non-nuclear weapon states undertake not to manufacture nuclear weapons independently. The effectiveness of these provisions in limiting the arms race to the existing nuclear powers is questionable. The asymetry of the treaty format is further emphasized, as only some of the non-nuclear powers have ratified the Treaty. Non-nuclear countries that might wish to possess a nuclear capability in the future are not willing to make these asymetrical commitments, curbing their nuclear potential. This seems to be what occurred in the case of India. The world community thus gives less than unanimous support for this approach.

The Non-Proliferation Treaty has also had to take into account the continued development of nuclear power for peaceful uses. This it does by laying down safeguards[46]

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44. UNGA Res. 2028(XX), 19 November, 1965.

45. Arts I and II.

46. Ibid., Paragraphs 1 and 3 of art. III state:
    1. Each non-nuclear-weapon State Party to the Treaty undertakes to accept safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency in Accordance with the Statute of the International Atomic Energy Agency and the Agency's safeguards system, for the exclusive purpose of

and permitting all parties to develop, research, produce and use nuclear energy for peaceful purposes.[47] The effect of this, however, has been to create potential loopholes that disqualify this Treaty from being considered a totally effective disarmament measure. Nevertheless, it has achieved a measure of acceptance, and consequently, carries some weight if applied to arms control violations.[48]

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> verification of the fulfillment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices. Procedures for the safeguards required by this article shall be followed with respect to source or special fissionable material whether it is being produced, processed or used in any principal nuclear facility or is outside any such facility. The safeguards required by this article shall be applied to all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.
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> ...
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> 3. The safeguards required by this article shall be implemented in a manner designed to comply with article IV of this Treaty, and to avoid hampering the economic or technological development of the Parties or international cooperation in the field of peaceful nuclear activities, including the international exchange of nuclear material and equipment for the processing, use or production of nuclear material for peaceful purposes in accordance with the provisions of this article and the principle of safeguarding set forth in the Preamble of the Treaty.

47. Art. IV.

48. See Arms Control and Outer Space: A Study of the Issue From the Aspect of Existing Agreements and

The form of a non-proliferation treaty directed at weapons in outer space should be similar to that of the Non-Proliferation Treaty. It should incorporate provisions obliging states that have developed outer space weapons to refrain from transferring them to states which have not done so. This could be supported by an obligation on the part of those nations not having developed such weapons not to accept them from the "have" nations, or develop them on their own.

These obligations are basic to a working non-proliferation treaty, but in the case of outer space weapons there is a potential conflict over the definition of the "have" and "have not" nations.[49] Space weaponry is in its infancy, still developing; and this could lead to difficulties in deciding which countries possessed these weapons and thus were eligible to maintain them while parties to the treaty. There is also no consensus as to the exact nature of a "weapon" in outer space - leading to confusion as to which nations have outer space weapons to

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International Law, Report prepared by the Centre for Research in Air and Space Law, McGill University, March 1983. (unpublished)

49. As indeed there was with the Nuclear Non-Proliferation Treaty. For details, see Shaker, supra, note 40, 214.

begin with. Consequently, a non-proliferation treaty would have to define an outer space weapon[50] and which were the "have" nations, as a prerequisite to establishing the rules of non-proliferation.

Provisions in a treaty for the non-proliferation of weapons in outer space should also address the transfer of technology for peaceful uses in outer space. Much like nuclear energy, aspects of this technology can be utilized for either peaceful or hostile purposes, and yet, its true use may be ambiguous. Provisions must be made that both allow for the advancement of peaceful uses of outer space, and yet safeguard the aims of the treaty. In the case of obvious weapons little difficulty is posed, but again, without a consensus on exactly what constitutes a space weapon, difficulties may arise in attaining agreement on these provisions.

If all nations comply, then such a treaty achieves its purpose, but it also creates an asymetrical situation where outer space is off limits to the weapons of some nations and a legitimate battleground for others. This situation has arisen in the wake of the Non-Proliferation

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50. As was the case for the Commission for Conventional Armaments which formulated in 1948, the first, and only existing and generally shared definition of the term "weapon of mass destruction"; UN Doc. S/C.3/30, 13 August 1948.

Treaty, but it is acceptable to the parties to that treaty because of the enormous costs and dangers involved with nuclear weapons.

A non-proliferation treaty concerning space weapons might be seen by "have not" nations as an attempt to create an exclusive club for those who have these weapons. Assurances by the "have" nations that they would "in good faith" negotiate arms control for outer space, would have to be stronger than those found in the Non-Proliferation Treaty to reduce this perception. Space weapons are not inexpensive nor innocuous in absolute terms, but they are in relation to nuclear weapons. They are easier to develop technologically and they are considered for the most part as belonging to a conventional weapons arsenal. A greater spirit of cooperation among European nations, Japan and even China, could act as a safeguard, pressuring the super-powers to negotiate arms control for outer space in the face of possibly even greater military activity in this region.

Another problem with the non-proliferation approach to arms control in outer space pertains to the fact that space weapons are in their early stages of development and are not fully established in outer space. There is still a good chance of achieving agreement curbing the militarization of outer space. One is reminded of the old adage, prevention is better than cure. In light of this, a

non-proliferation treaty could have the opposite effect of that desired. It might actually legitimize weapons in outer space. This would result because, although it effectively bans such weapons from use by "have not" countries, it recognizes the right of the "have" countries to possess, deploy and use space weapons.

The non-proliferation type treaty can only serve as a stop gap measure intended to defuse a sensitive situation until a more effective agreement can be achieved. In the case of weapons in outer space there may not be a need for such a stop gap. Putting time and energy into developing this half way measure when all the effort should be directed at preventing weaponization, may lose the possibility of achieving the latter. Non-proliferation is best left to be considered when all other possibilities for outer space have dissipated.

b) Bilateral or Regional Treaties

Outer space is recognized as the province of all mankind.[51] In light of this, the multilateral treaty format would appear to be the natural form for a treaty

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51. Art. I paragraph 1 of the Outer Space Treaty declares that:
The exploration and use of outer space, including

regulating activities in outer space. When the activities are purely military, however, other factors intervene.

A large percentage of current exploration and use of outer space is in the form of military activity. The large majority of these activities are, however, carried out by only two nations: the USSR and the US.[52] This, coupled with their adversarial relationship and super-power military status, makes the issue of regulating military activities in outer space a de facto bilateral issue, i.e., without agreement between these two, no real regulation is possible, even at the multilateral level. The bilateral treaty format may thus be as effective as the multilateral one.

The super-powers are not the only nations with concerns over regulating military activities in outer space. As has been stated, many nations have expressed desires for multilateral agreements or for bilateral agreement negotia-

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

52. See, supra, Chapter I A; see also, Clerc, J.-P., "The Militarization of Outer Space", World Press Review, October 1983, 23.

tions between both super-powers.[53] The dangers from unregulated military activities in space do not come only from super-power activity, however, and while a multilateral treaty could provide the needed regulation, widespread multilateral agreement is not easily attained. More limited multilateral agreement may be sought. Thus, the regional multilateral treaty format might be a viable alternative to the universal multilateral format.

i) The Bilateral Treaty

The bilateral format is commonly used by states in formalizing agreements. Many issues need only the agreement of the immediate parties for an effective settlement of differences. A network of interlinking bilaterals can also be used, however, to replace a multilateral agreement. One major example of this has evolved in the area of air transport freedoms. Supplemental to the Chicago Convention[54] a multilateral agreement was drafted with the aim of

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53. See statements by the delegates of Burma, Chile, Spain, Ireland and Ecuador in UN Docs A/C.1/39/PV.17, A/C.1/39/PV.19, A/C.1/39/PV.29 and A/C.1/39/PV.32 (1984).

54. Convention on International Civil Aviation, 15 U.N.T.S. 295. Opened for signature 7 December, 1944, entered into force 4 April 1947.

establishing certain freedoms of the air respecting scheduled international air transport. The International Air Transport Agreement[55] laid out five "freedoms" pertaining to the carriage of cargo and passengers.[56] The economic consequences flowing from these freedoms were seen by many states as being too great to be granted in such an omnibus treaty and it has never come into force. The freedoms delineated therein have, however, become an integral part of international air transport; each state granting the freedoms to other states through bilateral agreements.[57] Through the bilateral format, states have been able to grant the freedoms necessary for international air transport while at the same time tailoring the granting of those freedoms to the specific circumstances and immediate concerns between the particular states.

In the area of arms control the bilateral treaty is also commonly used. In recent years, they have become

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55. International Air Transport Agreement, ICAO Doc. 2187, 71. Signed at Chicago 7 December, 1944; not in force.

56. Ibid., art. I, Section 1.

57. In addition to the exchange of various freedoms of the air, bilaterals also deal with the designation of air carriers, delineation of air routes and capacities thereon, and the mechanisms of tariff setting for air transport between the parties.

important as the format for nuclear weapons control agreements. This is due to the overwhelming superiority of the USA and the USSR in nuclear weapons and the duopole nature of their relationship. Realistically, meaningful arms control can only result from initial agreement between these states.

The USA and the USSR have concluded a number of bilateral agreements concerning nuclear arms control. The most prominent of these have resulted from the Strategic Arms Limitation Talks (SALT). The SALT I negotiations[58] inter alia produced both the ABM Treaty[59] and the Interim Agreement.[60] The former agreement set limitations on anti-ballistic missile systems[61] and the latter created certain limitations with respect to strategic offensive

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58. Held over the period from November 1969 until May 1972.

59. Supra, note 21, and see supra, chapter III C. 2.

60. Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures With Respect to the Limitation of Strategic Offensive Arms 1972, 944 U.N.T.S. 3. (Hereinafter cited as the Interim Agreement). Signed 26 May 1972; entered into force 3 October 1972.

61. "For the purposes of this Treaty an ABM system is a system to counter strategic ballistic missiles or their elements in flight trajectory,..." supra, note 21, art. II(1).

arms. Both these treaties are in force.

In accordance with Article VII of the Interim Agreement, SALT II[62] negotiations began in November 1972. This resulted in the Offensive Arms Treaty.[63] The provisions of this treaty included the lowering of the ceiling limit on strategic nuclear delivery vehicles, the banning of several types of improved delivery systems, and verification by national technical means. This treaty was signed by both states but US ratification was not forthcoming. Thus, this agreement could be said to have been unsuccessful. The reason for this was not the bilateral format, but rather external political factors which drove a new wedge between the super-powers.

This is important when considering the use of the bilateral format for agreements on the regulation of military activities in outer space. As mentioned, outer space is the province of all mankind, but only certain states have the capability to exploit that province, and even fewer could conduct military activities there. With

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62. The Salt II talks were held from 1972 until 1979.

63. Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms, (1979) 18 I.L.M. 1112. Signed 18 June 1970; not in force. (Hereinafter cited as the Offensive Arms Treaty). See supra, chapter III C. 4.

the weaponization of outer space on the verge of realization, tentative negotiations have occurred between the USA and the USSR. In June 1978, bilateral negotiations commenced with the aim of concluding an agreement to control and eliminate ASAT capabilities.[64] These talks continued until the Soviet invasion of Afghanistan in December 1979 led to the breakoff of discussions. In 1984, the USSR made an offer to restart the negotiations. The USA, however, declined such advances and not until the January 1985 Schultz-Gromyko meeting did the USA agree to recommence talks concerning the weaponization of outer space.[65]

Even given a willingness among the super-powers to conclude bilateral agreements on the regulation of military activities in outer space, such bilaterals may have deficiencies. First, a bilateral is not a universal treaty. The United States and the Soviet Union could be joined in their duopoly of military space activities by a number of other states. Such activities would be outside the scope of

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64. For details, see, Outer Space Arms Control Negotiations, Report, US Senate, 98th Cong., 1st Sess., 18 November, 1983, 5; Blacker, C.D. & Duffy, G. (eds), International Arms Control: Issues and Agreements, Stanford University Press, Stanford, 1984, 122.

65. See, "Transcript of Statement on U.S.-Soviet Arms Control Talks", N.Y. Times, 23 November, 1984, at A-14.

the bilateral. The question then arises as to how one of the parties to the bilateral would react to a third party threat and still comply with the bilateral agreement. This problem would have to be dealt with separately, either through other bilaterals with the third party, or by the expansion of the bilateral to a multilateral. Provision could also be made within a bilateral to deal specifically with third party contigencies.[66] The bilateral format for a treaty can be a viable one in the regulation of military activities in space with advantages over the multilateral format, so long as particular disadvantages are addressed in the treaty.

ii) The Regional Treaty

The other treaty format under consideration here is the regional. This is essentially a multilateral treaty, the parties to which are limited to a specific geographical region. A sub-division of this format is one where the parties are limited to those with a specific interest in the subject of the treaty.

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66. Concerning the question of third parties to a bilateral agreement see, Jasani, B., (ed.), Outer Space - A New Dimension of the Arms Race, SIPRI, Taylor & Francis Ltd., London, 1982, 321.

The use of regional treaties to make arms control agreements can be advantageous. Regions may have a common culture permitting deeper understanding and better enforcement, specific points of conflict may be addressed more clearly and regional agreements may improve relations amongst regions and the super-powers.[67] Furthermore, there are some regions which, when speaking as one voice, are able to compete against the USA-USSR duopole and thus have a significant influence in the super-power relationship. On the other hand problems can arise. States within a region tend to reflect their regional tensions, deeply, as an integral part of their domestic politics. The interplay of super-powers interests in the region may also present obstacles that limit the scope of any such agreement.[68]

The Treaty of Tlatelolco[69] is an example of a regional arms control treaty. The aim of this treaty is the prohibition of nuclear weapons in Latin America. Under its conditions the contracting states undertake not to test,

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67. See, Barton, supra, note 13, 175.

68. Ibid.

69. Treaty for the Prohibition of Nuclear Weapons in Latin America 634 U.N.T.S. 281. Opened for signature 14 February 1967; entered into force 22 April 1968. (Hereinafter cited as the Treaty of Tlatelolco).

use, manufacture or acquire nuclear weapons.[70] The treaty comes into force for each ratifying state individually and has been ratified by most of the Latin American states. One significant exception is Argentina. To date this treaty has been successful.

The region is composed of states with a similar economic development and culture, and a history of mutual animosity. A nuclear arms race in the region could lead to severe economic harm, almost as great as from actual conflict. There is, thus, a willingness to adhere to such a treaty. The creation of this political will depends greatly on the regional context of the issues.

The regional format may also be considered for agreements regulating military activities in outer space. Whilst outer space is the province of all mankind, and, in theory, all states should have an equal say in its regulation, the reality of space activities dictates that there are a few states that are "more equal" than others. From the foregoing it will be readily understood that true regulation of military activities cannot take place without the participation and consent of those "more equal" states. Since these special states do not form part of one geographical region, any regional agreement would automatically

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70. Art. I(1).

exclude these states. Only another form of multilateral treaty can ensure that they all are parties, and thus achieve effective regulation.

The sub-division of the regional format, an agreement limited to those with specific interest and concerns in the issue,[71] presents an alternative. This type of treaty can bring together those parties that are indispensable to a successful agreement. In this way it is similar to the bilateral, except that it overcomes the problems with reference to outer space as the province of mankind and third parties that can arise in bilaterals.

The special interest format has been used for arms control agreements. The Partial Test Ban Treaty[72] and the Non-Proliferation Treaty[73] while opened for multilateral signature are, in effect, set out in the special interest format. The control of nuclear weapons testing regulated by the former treaty was only possible with the

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71. The special interest format is considered a sub-division of the regional format because of the analogy between the "interest" and "region" as creating a group having a common denominator. It is also a form of multilateral treaty.

72. Supra, note 17.

73. Supra, note 21.

agreement of the "Original Parties"[74] because they had the capability of testing nuclear weapons. The signatures of the other parties, while lending support to the purpose of the treaty are not vital to its success. Indeed, the absence of France, a state that is capable of nuclear weapons testing, from among the "Original Parties" of the treaty is probably more damaging to its purpose than absence of states without this capability. This was also true of the non-ratification by India and China, when they developed a nuclear weapons capability.

The special interest format for a treaty regulating military activities in outer space is viable. The format has the potential of combining the advantages of the bilateral with those of the universal multilateral, while still adequately addressing the realities of the situation. The number of states capable of utilizing outer space for military purpose is relatively small. The special interest format would allow them to negotiate. These negotiations would be amongst only a few states, those most concerned with the regulation of military activities. The chances of agreement would be improved and if agreement is reached effective regulation would have been achieved. Then, once

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74. Pursuant to the Partial Test Ban Treaty preamble, the "Original Parties" are: the USA, the UK, and the USSR.

such an agreement is reached, the resultant treaty can be opened up for signature and ratification by all states. This would ensure that the spirit of the principle of outer space as the "province of all mankind" is not violated.

B. NATURE OF THE PROVISIONS TO BE INCLUDED

Having reviewed the ameliorative methodologies employed in general and specific arms control treaties to date, we shall now proceed to a discussion of more radical approaches. Completing the transition from the abstract to the concrete, the following section concerns the major specific formulations proposed for prospective treaty control of space weaponization.

1. Prohibition of Space Weapons

In this section the range of proposals adopting prohibition as a solution will be discussed. Where significant potential treaty articles have been adopted, they will be reproduced in full because of the possible precedental effects of the exact semantic and syntactical formats employed. Proposals will be presented and commented

upon in chronological order.[75]

a) The 1979 Italian Proposal[76]

The Italian delegation to the UN Conference on Disarmament, concerned about the growing spectre of weaponization of space, advocated a protocol to the Outer Space Treaty. Article 1 of the Protocol provides that:

> outer space including the moon and other celestial bodies, shall be used for peaceful purposes only, States Parties to this protocol undertake to refrain from engaging in, encouraging or authorizing, directly or indirectly, or in any way participating in any measures of military or other hostile nature; such as the establishment of military bases, installations, fortifications, the stationing of devices having the same effect, the launching into Earth orbit or beyond of objects carrying weapons of mass destruction or any other types of devices designed for offensive purposes, the conduct of military manoeuvres as well as the testing of any type of weapons.

An initial point concerning the above is its multilateralism. Although in the short term, space weaponization would be conducted solely by the USA and USSR, a significantly strong response to ratify a multilateral

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75. Where several proposals have been offered within one year, their order may be juxtaposed for ease of exposition.

76. UN Doc. CD/9, 26 March 1979.

measure may well apply significant "peer pressure" to halt an arms race in space in its tracks. On the positive side, the draft fills the lacuna left by article IV of the Outer Space Treaty by including the outer space medium. It adopts an enumerative drafting approach, reminiscent of article 1 of the Antarctic Treaty, which is sufficiently wide to encompass all military activity in space. The latter would, however, also exclude National Technical Means (NTMs) of verification which, although undoubtedly military, arguably have ultimately peaceful purposes.[77] In its failure to prohibit stationing and testing of space-aimed weapons on the earth and in the air, the draft would permit current ASAT systems to continue unabated.[78] Furthermore, suborbital testing of new technologies would be permissible, and thus destabilizing, though, of course, their use would be outlawed.

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77. Danielsson, S., "Examination of Proposals Relating to the Prevention of an Arms Race in Outer Space", in, Jasentuliyana, N., (ed.), Maintaining Outer Space for Peaceful Uses, The United Nations University, Japan, 1984, 280.

78. Ibid.

b) **The 1981 Soviet Draft Treaty**

In response to the operational US Space Shuttle, and the announced plans for a US air-launched ASAT, Soviet Foreign Minister Andrei Gromyko presented "A Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space".[79] There are two important and innovative articles in the nine article draft. Article 1(1) advocates an undertaking

> not to place in orbit objects carrying weapons of any kind, install such weapons on celestial bodies or station such weapons in outer space in any other manner, including on reusable manned space vehicles of an existing type or of other types which States Parties may develop in the future. (emphasis added)

The use of the phrase "weapons of any kind" would incorporate a considerable degree of uncertainty, since virtually any military or civilian manoeuvrable space instrumentality could be used as a kinetic weapon.[80] Article 1 suffers from the same fault as the Italian proposal in its permission of testing and development of ground-based and air launched ASAT systems, and testing of components for future space-based systems. A specific mention of "reusable space vehicles" was gratuitous and calls into question the

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79. UN Doc. A/36/192 (1981).

80. Danielsson, supra, note 77, 281-82.

sincerity of the Soviet proposal, especially in view of its own development of such vehicles. This would have been totally unacceptable to the USA and thus was a dead letter from its inception.

Article 3 of the draft is somewhat more insidious and amounts to a serious derogation from international law.[81] The article states that

> (e)ach State Party undertakes not to destroy, damage, disturb the normal functioning or change the flight trajectory of space objects of other States Parties, if such objects were placed in orbit in strict accordance with article 1 paragraph 1 of this Treaty. (emphasis added)

The latter part seems to countenance the use of force against another's satellite believed to be a weapon and in contravention of article 1, even though that term is capable of differing interpretations, especially when applied prospectively to "other types" developed in the future! This right of attack on suspicion would have been highly destabilizing and totally unacceptable.[82] This provision has

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81. See Payne, K.B., (ed.), Laser Weapons in Space - Policy and Doctrine, Westview Press Inc., Boulder Co., 1983, 89 et seq.; also, Strode, R., Commentary on the Soviet Draft Space Treaty of 1981, in, Gray, C.S., American Military Space Policy, University Press of America, Lanham, 1982, 85, at 88.

82. Ibid.

been qualified as a "self-executing penalty clause".[83] Furthermore, the injunction of non-interference applies only to satellites of other nations. Thus a state's own satellites could be used as targets and could thus permit testing of ground based or even air-launched direct ascent ASATs which are not placed in orbit as such, but travel a ballistic trajectory to impact on their target.

c) The Pressler Resolutions

Senator Larry Pressler (R. South Dakota) introduced two bills into the US Senate, the first being R-129 in May 1981.[84] In its preamble, the latter states inter alia that

> the President should promptly resume negotiations with the [Soviet Union] on a balanced and verifiable agreement limiting the development, deployment or use of weapons systems designed exclusively to intercept, damage or destroy orbiting satellites. (emphasis added)

Section 2 advocates the promulgation of an agreement incorporating

> (1) a comprehensive non-use ban;
>
> (2) a moratorium on further testing in space of any weapons system designed

83. Strode, ibid.

84. The text of Resolution 129 is reproduced in, Payne, K.B., (ed.), supra, note 81, at 91-93.

exclusively to intercept, damage or destroy orbiting satellites;

(3) dismantling and destruction of all such currently operational ASAT interceptors,

and stringent verification. This resolution goes beyond the Soviet one and would prohibit, for the time being, all ASAT testing. However, in its application to weapons "designed exclusively" to attack satellites it is more limited than the Soviet formulation of "weapons of any kind" which envisages residual or marginal ASAT capability in other weapons systems such as BMD lasers. Furthermore, neither this nor the Soviet draft affect the testing for space of fixed ground-based laser systems which may ultimately be for use in space.[85]

The more recent Pressler resolution, S. Res. 43[86] is a less elaborate formulation with the more modest objective of "a verifiable ban on the development, testing, production, and deployment of antisatellite weapons as a first step toward prohibiting all space-based and space-directed weaponry". Part (c) of the resolution reiterates a position taken in its 1981 predecessor by advocating that no provision of a treaty on ASATs should "in any manner

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85. Ibid., 93.

86. Reproduced in "Controlling Space Weapons", Hearings before the Committee on Foreign Relations, US Senate, 98th Cong., 1st Sess., April/May 1983, 4-6.

restrict the development and operation of the Space Shuttle or impede legitimate activities permitted under the SALT I ABM Treaty". This obviously counterpoints the Soviet position taken in their 1981 draft and would be redundant in a correctly phrased ASAT limitation treaty.

d) The Tsongas Resolution

This February 1983 resolution, S.J. Res. 28,[87] was introduced by Senator Paul Tsongas (R. Massachussetts) and was a return to a universal prohibition rather than the more realistically achievable first step formula of the second Pressler resolution outlined above. The Tsongas resolution states, in part, that a comprehensive bilateral treaty should be negotiated between the USA and Soviet Union which would prohibit

> (1) the testing, production, deployment, or use of any space-based, air based, or ground-based weapons system which is designed to damage, destroy, or interfere with the functioning of any spacecraft of any nation. (emphasis added)

This is the most complete formulation to date, and would

87. Ibid., 7-9. See the Companion bill H.J. Res. 120 in the US House of Representatives, reproduced in "Arms Control in Outer Space", Hearings before the Sub-Committee on International Security and Scientific Affairs, Committee on Foreign Affairs, US House of Representatives, 98th Cong., 1984, 225-27.

successfully exclude all dedicated ASAT weapons, extant and for the foreseeable future. It may also extend to ground-based BMD systems capable of an ASAT role, since it avoids the phrase "exclusively designed" employed in the first Pressler resolution. At the least it would pre-empt testing of other systems in that role and so reduce confidence in such systems. Also, the injunction against any interference with the functioning of any spacecraft fulfils the Soviet objective in their article 3, and goes beyond it by including a nation's own satellites, to circumvent covert testing.

The Tsongas resolution goes on to proscribe

> the stationing in orbit around the Earth, or any celestial body, or at any other location in outer space of any weapon which has been designed to inflict injury or cause any other form of damage on the Earth, in the atmosphere, or on objects placed in space.

In its referral to "any weapon" this paragraph has a very wide scope indeed, and may at first glance be construed to exclude space-based BMD lasers contemplated in the US SDI. The latter would certainly be designed to inflict damage in the atmosphere, such as in boost-phase intercept of ballistic missiles, which would certainly be "damaged" in the atmosphere. However, this interpretation is too tenuous and is undermined by section 2 of the Resolution which instructs the President to request that the UN

> take the necessary steps to bring about

> multilateral negotiations aimed at an extension of article IV of the Outer Space Treaty ... [including] ... a ban on all weapons based in space for use against any target and all antisatellite weapons regardless of where they are based (emphasis added)

The phrase underlined would be the ultimate objective of non-weaponization of space, and would only be necessary if the previous section does not envisage BMD weapons.

e) The Union of Concerned Scientists (UCS) Draft Treaty

Entitled "A Treaty Limiting Anti-Satellite Weapons"[88] the UCS draft has the object of the second Pressler resolution, with the comprehensiveness of the Tsongas resolution. The first two articles of the 12 article draft are the most significant, and state as follows:

> I Each Party undertakes not to destroy, damage, render inoperable or change the flight trajectory of space objects of other States;
>
> II Each Party undertakes not to: place in orbit around the earth weapons for destroying, damaging, rendering inoperable, or changing the flight trajectory of space objects, or for damaging objects in the atmosphere or on the ground; ...install such weapons

88. See "Controlling Space Weapons", supra, note 86, 127-29.

> on celestial bodies, or station such weapons in any other manner; [and] ...not to test such weapons in space or against space objects.

This is similar to the Tsongas formulation, and many of the observations applied above also apply here. However, in one respect the UCS draft is inferior, in that it permits deployment of extant ASATs, though of course testing etc...would be prohibited. Nevertheless, this would leave the Soviets with an operable system, albeit of questionable dependability, whilst the US would have no operative system whatsoever. It is unlikely that such a measure would be accepted in this form.

f) The 1983 Soviet Draft Treaty

In view of the less than enthusiastic reception of their 1981 draft, including doubts as to its motives and sincerity, the Soviets promulgated another treaty, ameliorating some of the excesses of the preceding rendition. As is apparent from its title, the "Treaty on the Prohibition of the Use of Force in Outer Space and From Space Against the Earth"[89] attempts a universal non-weaponization of space. In the letter presenting the draft to the UN General Assembly, Soviet Foreign Minister Gromyko stated that "(i)n

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89. UN Doc. A/38/194, 23 August, 1983.

proposing this item, the Soviet Union [was] seeking to avoid the militarization of space". This is a legacy of the tenacious stand maintained by the Soviets that they conduct no military activities in space. This is of course a naive and objectively untenable position.

Article 1 of the draft in its prohibition of the "resort to the threat or use of force in outer space" is a reiteration of article 2(4) of the UN Charter, and is to that extent superfluous. Article 2 is a reformulation of the 1981 Soviet Draft and states several understandings:

1. Not to test or deploy by placing in orbit around the Earth or stationing on celestial bodies or in any other manner any space-based weapons for the destruction of objects on the Earth, in the atmosphere or in outer space;

2. Not to utilize space objects in orbit around the Earth, on celestial bodies or stationed in outer space in any other manner as means to destroy any targets on the Earth, in the atmosphere or in outer space;

3. Not to destroy, damage, disturb the normal functioning or change the flight trajectory of space objects of other States;

4. Not to test or create new anti-satellite systems and to destroy any anti-satellite systems that they may already have;

5. Not to test or use manned spacecraft for military, including anti-satellite, purposes. (emphasis added)

Like many of the versions mentioned above, this draft ignores ground or air-based systems, which are the existing and near-future ASAT and BMD systems. Paragraph 2 does, however, contemplate residual ASAT capability, and a non-use ban is the most verifiable expression of this goal. The third paragraph is an amalgamation of the phraseology employed in the Tsongas Resolution and the UCS draft. Although the latter two American proposals antedated the Soviet one, the Soviet Union gained international kudos through their presentation of the Draft Treaty in the UN. The fourth paragraph is innovative in its unification of an ASAT technology freeze and destruction of extant ASAT systems. This would both prevent the USA from perfecting their air-launched ASAT, and remove the influence of the inefficient Soviet co-orbital system. However, the larger the delay, the nearer the USA will be to perfecting their ASAT. The deployment of the latter is unverifiable, and the all-embracing language of paragraph 4 of the draft would become increasingly untenable for the Soviet Union, since covert treaty derogation by the USA would be virtually undetectable.

The final paragraph of article 2 recalls the 1981 draft, though in a less controversial form. However, to envisage proscribing all military manned missions in space is both unrealistic and contradicts the incontrovertible

fact of over 25 years of the military man in space.

g) **The 1984 "Bowman" Draft Treaty**

At a Round Table Conference on "Space Without Weapons" held in Moscow in April 1984, US and Soviet space experts agreed upon the principles for a Treaty on Weapons in Space. This proposal was revised by Dr. Robert M. Bowman, President of the Institute for Space and Security Studies, and is entitled "Proposed Revised Treaty on the Prohibition of the Use of Force in Outer Space and from Outer Space With Regard to Earth".[90]

This Draft Treaty combines elements of the UCS Draft and the 1983 Soviet Draft. Article 1 restates the prohibition found in Article 2(4) of the UN Charter not to "resort to the threat or use of force in outer space". Article 2 is a reformulation of the 1983 Soviet Draft, and states that

> (i)n accordance with the provisions of Article 1, the States Parties to the present Treaty shall undertake:
>
> 1. Not to test and not to deploy by putting in orbit around the Earth, placing on celestial bodies or placing in space in

90. Reproduced in, Bowman, R., "The Militarization of Space? The Real Issue is the Weaponization of Space", paper prepared for the International Progress Organization, 29 September 1984, 5-8.

> any other manner any weapons capable of attacking targets on Earth, in the atmosphere or in outer space.
>
> 2. Not to use space objects in orbit around the Earth, placed on celestial bodies or deployed in outer space in any other manner whatsoever as a means of hitting any target on Earth, in the atmosphere or in outer space.
>
> 3. Not to destroy, damage or render inoperable nor modify the flight trajectory of space objects of other states.
>
> 4. Not to test in space or against space objects or deploy new antisatellite systems and to eliminate such systems already in their possession.
>
> 5. Not to test nor use for antisatellite or any other military purpose prohibited by this Treaty any manned spaceship.

Paragraph 1 was an attempt to close the loophole found in article 2(1) of the 1983 Soviet Draft, which prohibited testing or deployment of "space-based weapons". By referring to "any weapons" the draft envisages that all ASAT systems, wherever based, would be banned.[91] Unfortunately, as the Draft Treaty contains no definition of the term "weapon", paragraph 1 incorporates a large degree of uncertainty. In this sense, it resembles article 1(1) of the 1981 Soviet Draft Treaty, and many of the commentaries made with respect to the latter also apply here.[92]

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91. Ibid., 3.

92. Supra, this chapter, section B. 1 (b).

Except for slight changes in the wording, paragraph 2 and 3 repeat almost verbatim the provisions of Article 2(2) and (3) of the 1983 Soviet Draft Treaty. Paragraph 4 is directed at banning the more readily verifiable testing of ASATs "in space or against space objects".[93] While this paragraph prohibits the testing and deployment of new ASAT systems, its counterpart in the 1983 Soviet Draft prohibited the testing and creating of new ASAT systems. The Bowman Draft is thus less demanding in that it would permit research and development of new ASAT systems. This would defeat the purpose of the entire Draft. Furthermore, this same paragraph calls for the destruction of all existing ASAT systems. This would be a useless gesture if a freeze on new ASAT technology was not required concurrently. Paragraph 5 was supposedly drafted to permit the use of the Shuttle for launching of military communications and surveillance satellites. The phraseology of this paragraph is rather confusing. While the testing or use of a manned spaceship for ASAT purposes is clearly forbidden, the scope of the terms "any other military purpose prohibited by this Treaty" is not readily understood. Apart from the impracticality, not to say naïveté of prohibiting all military purposes of any space instrumentality, let alone

93. Bowman, supra, note 90, 3.

the Space Shuttle, steady improvement in Shuttle capabilities would quickly render this phrase inoperative. Furthermore, specific reference to manned space vehicles would also be objectionable to the USA. Whatever the Shuttle's potential for carrying weapons, it is no greater than that of certain Soviet spacecraft, especially in view of their development of their own Shuttle capability.

Except for article 4, which deals with verification and has been discussed in a previous chapter,[94] the other provisions repeat those of the 1983 Soviet Draft.

Thus, there are basically five types of ASAT prohibition agreement which could be concluded,[95] though there are many more semantic formulations. The five are:

a. a ban on testing use and possession of all ASAT capability;

b. the same, but restricted to dedicated ASATs only;

c. a ban on the testing and use of ASATs, though ignoring those currently possessed by the superpowers;

d. a prospective ban on development of ASAT technology, leaving existing systems untouched; and

e. a simple prohibition of use, ignoring testing and possession.

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94. See, supra, chapter IV A passim.

95. See, Arms Control in Space, Office of Technology Assessment (OTA), US Congress Workshop Proceedings, May 1984, at 42.

2. Limitation of Space Weapons

The following proposals adopt less ambitious objectives than the prohibitions, comprehensive or selective, outlined in the previous section. Their conservative scope flows from the perception that militarization is a fact, inevitable, and in some cases desirable.

(a) The French Perspective

In a recent statement of the French delegation to the UN Conference on Disarmament,[96] after advocating the multilateral control of inter alia ASAT weapons, it was affirmed that "[t]oday it is already no longer realistic, and would not necessarily be desirable, to set ourselves the target of completely demilitarizing space".[97] This "realism" contrasts with the Soviet "idealism" as expressed in their two drafts, and is echoed within the UN Outer Space Affairs Division by Nandasiri Jasentuliyana who recently observed the

> fact that all military activities cannot

96. The 12 June, 1984 Statement is reproduced in Survival, Vol. XXVI, Sept/Oct. 1984, 235-37.

97. Ibid., 236.

> be prohibited and indeed the inviolability of some activities that are already in operation, particularly for surveillance and early warning purposes, might well have to be assured.[98]

The French advocate "early international consultation" or "very strict limitation" of ASATs. The latter envisages: a ban on high-orbit capable systems, a point to which we shall return later; a five-year ban on testing and deployment of ground-based, air-based and space-based "guided-energy" weapons systems; and strengthening of the notification provisions of the 1975 Registration Convention.[99]

As to the rest of the French proposal, it is both restricted to future technologies, and thus permits existing systems, and is limited to 5 years only. The latter would allow research on new systems to crystallize designs preparatory to a "break-out scenario" on the termination of the treaty. The relative permanency of a continuing illegality is more desirable.

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98. Jasentuliyana, N., "The Moon Treaty", in, Jasentuliyana, N. (ed.), Maintaining Outer Space for Peaceful Uses, supra, note 77, 135.

99. See, supra, Chapter III D. 2.

b) **Altitude/Orbit Operational Limitation**

Pierre Elliot Trudeau, former Prime Minister of Canada, proposed in December 1983 that ASAT weapons be limited to Low Earth Orbit (LEO). This was both a recognition of the impracticality of total demilitarization, and also a protection of the much more strategically significant geostationary and geosynchronous communications and early warning satellites. The Reagan Administration rediscovered this notion in April 1984.[100] In a report to Congress, President Reagan stated that

> the administration is exploring 'limited' agreements that could protect specialized, high altitude satellites, such as those used for arms control information and early warning of a strategic nuclear attack.[101]

It was thought that such a limited ban on ASATs would "help preserve and enhance stability". What such a ban would in fact preserve is a US capability to destroy LEO Soviet military satellites, more specifically electronic ocean surveillance satellites and nuclear powered radar

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100. See Goedhuis, D., "Legal Implications of the Present and Projected Military Uses of Outer Space", in, Jasentuliyana, N., (ed.), Maintaining Outer Space for Peaceful Uses, supra, note 77, 269.

101. Ibid.

ocean surveillance satellites.[102] The latter operate in LEO and are considered by US officials as "high-priority targets for U.S. anti-satellite weapon system in a war situation - should that US weapon ever be deployed."[103] Needless to say, the Soviet Union would never agree to ban only high-altitude ASATs.

Furthermore, the other space-faring nations may view the prospect of fully capable LEO ASAT systems with some circumspection. If the technology is perfected for LEO utilization, it is a simple step to increase booster capacity to raise the level of operations to geostationary orbital altitudes; this can be done under the guise of civilian operations.

c) Limitation to One Current or Generic Type[104]

Limitation to one current type would freeze technology at the Soviet co-orbital and the US F15/MV system. This would achieve the same as an altitude limit,

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102. See, supra, Chapter I A. 1 (c)(i).

103. "Soviets Orbit Large New Military Electronic Intelligence Satellite", Aviation Week & Space Technology (AWST) 14 January 1985, 19.

104. Terms used by Durch, W.J., "Anti-Satellite Weapons, Arms Control Options, and the Military Use of Space",

although it would be an abdication of responsibility for LEO. This would also prevent modernization of capability to, for example, laser systems. A limitation to one generic type of ASAT would set "common performance standards that treaty-permitted ASAT weapons could not exceed".[105] Thus, modernization would be permitted within the standards set. However, this would necessitate a highly complex treaty dealing with information on levels of technology which neither side wishes to disclose. Furthermore, the specificity envisaged would transcend the difficulties posed by evaluating the destructive merits of cruise missiles as compared to ICBMs and SLBMs, and who should or should not be included in the equation. The simplicity of a total test or use ban may be much more effective and certainly its abstraction would be less easy to circumvent.

(continued from previous page)
paper prepared for the US Arms Control and Disarmament Agency, July 1984, at 40 et seq.

105. Ibid.

d) The 1985 Dahlitz Draft

Entitled "Treaty on the Prohibition of the Use of Force Concerning Outer Space I",[106] this Draft is the first in a set of treaties to prevent weaponization of outer space. The outline, preamble and some now standard clauses are based on the 1983 Soviet Draft.

The preamble reaffirms the desire to avert an arms race in outer space and to explore and utilize outer space, including the Moon and other celestial bodies, for exclusively peaceful purposes. Article 1 contains several definitions, notably the word "weapon" which is "deemed to mean anything whose primary or subsidiary function is to cause damage",[107] and, "outer space", which commences at an altitude of 70 km above sea level.[108] The question of where sovereign air space ends and free outer space begins has been debated since the inception of the space age.[109]

(continued from previous page)

106. This draft was presented by Dr. Julie Dahlitz, Senior Research Fellow in the School of Peace Studies, University of Bradford, England, and is reproduced in, Dahlitz, J., "SDI Versus Arms Control", Space Policy, Vol. I, No. 2, May 1985, 148-50.

107. Art. 1(3).

108. Art. 1(2).

109. The Legal Sub-Committee of COPUOS has been concerned

The likelihood that a demarcation line between air space and outer space will be agreed upon in the future is slim. Both super-powers have delayed such a move for over 25 years lest an arbitrary boundary "could lead to complication" and could not only impede existing military programmes, but also preclude some future, as yet undefined, low-orbit defence activity.[110] Although the present minimum perigee is approximately 80 km,[111] it may be possible to orbit at lower altitudes in the future. It is therefore unlikely that states would approve of such a definition.

Article 2 is an amalgamation of articles 1 and 2(3) of the 1983 Soviet Draft. It is prohibited to resort to the

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for many years with "matters relating to the definition and/or delimitation of outer space and outer space activities, bearing in mind, inter alia, questions relating to the geostationary orbit". No consensus has been reached, due mainly to the opposing views of the USSR and the USA. The former favors an arbitrary delimitation (110 km.), coupled with the right of innocent passage; while the USA argues that delimitation at this time would be premature. Other countries have suggested a functional approach, i.e., asserting that the function of a particular object should determine whether the activity should be subject to international space law. See UN Doc. A/AC.105/C.2/L.141/ Add.6 (1983). See also, Matte, N. (ed.), Space Activities and Emerging International Law, CASL, McGill University, 1984, pp. 357-86 and authorities therein cited.

110. Vlasic, I., "Disarmament Decade, Outer Space and International Law", (1981) 26 McGill L.J. 135, 185.

111. Matte, supra, note 109, 378.

threat or use of force in outer space, and to interfere with the functioning of space objects "under the jurisdiction of other States, except with their consent". However, the latter would not preclude a state from carrying out testing on its own satellites.

Article 3 is innovative in that the prohibition of testing and deployment is limited to kinetic energy weapons. Article 3 states:

> The provisions of this Article refer only to 'weapons' or 'objects' utilizing kinetic energy as the damage causing mechanism. This limitation shall not be interpreted to mean that the testing or deployment of other damage causing mechanisms are approved but merely as a statement that no provision is contained in this Article regarding those other damage causing mechanisms.
>
> In accordance with the above qualification, the Parties to this Treaty undertake:
>
> 1. Not to test or deploy any weapon in outer space for the destruction of space objects.
> 2. Not to test or deploy any space object that could, in whole or in part, descend for the deliberate destruction of objects on the Earth.
> 3. Not to test or deploy in outer space any anti-satellite weapon or identifiable component of such weapon.
> 4. Not to test or deploy in outer space any anti-missile weapon or identifiable component of such weapon [except as provided in Article III of the ABM Treaty of 1972, modified by the Protocol to that Treaty which entered into force on 24 May 1976][notwithstanding any provision to the contrary contained in the ABM Treaty of 1972, modified by the Protocol to that Treaty which entered into force on 24 May 1976].

The purpose of the distinction between kinetic energy weapons and directed energy weapons, was

> to accelerate negotiations regarding the most urgent restrictions. Hence, the exclusion from this Article of weapons that may be difficult to identify at the testing stage and that are still at the early experimental stage.[112]

Paragraph one would successfully exclude extant ASAT systems, as well as the electromagnetic guns proposed by the SDI.[113] Paragraph 2 aims at prohibiting weapons targeted from space to Earth. In referring to "any anti-satellite" weapon, paragraph 3 would encompass ground-based, air-based and space-based ASATs. This would successfully exclude all dedicated ASAT systems, present and future. Because ASATs are specifically dealt with in this paragraph, it would appear that paragraph 1 was aimed at prohibiting other kinetic energy weapons. Paragraph 4 contains two alternative formulations enclosed in square brackets. The first alternative postulates preserving the status quo, as embodied in the ABM Treaty, while the other prohibits all BMD activity in outer space. The latter alternative represents an unachievable goal in view of the tremendous fiscal expenditures by the USA and the USSR in developing such a capability.

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112. Dahlitz, supra, note 106, 148.

113. See, supra, Chapter I C. 4.

Article 4 requires accounts of all dedicated ASAT weapons, past and present, to be submitted as an annex to the Treaty, and destruction of all such ASAT weapons.[114] The proposed time, place and manner of destruction are to be provided by the Parties. Compliance with this provision could not be verified, and would depend on the goodwill of all Parties involved. NTM of verification are to be used to monitor compliance with Treaty provisions.[115]

Because this Draft deals specifically with kinetic energy weapons, the testing of other weapons such as directed energy weapons would have to be prohibited by the "Replacement Treaty" envisaged in article 12,[116] and/or

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114. Article 4 provides that:

> Each Party submits, as an Annex to this Treaty, a brief quantitative and qualitative description of all dedicated anti-satellite weapons that it may possess or has possessed at any time.
>
> Regarding such weapons that have been destroyed or dismantled in the past, the Party indicates the approximate time and place of destruction.
>
> Regarding any dedicated anti-satellite weapons that it may still have, each Party agrees to destroy those within six months of ratification or accession to this Treaty and submits as a further Annex to this Treaty, the proposed time, place and manner of destruction of those weapons.

115. Art. 6.

116. Article 12 provides:

> 1. This Treaty shall be of unlimited duration or until such time when it is replaced by an act of ratification or accession to a Treaty designated "Treaty on the Prohibition of the Use of Force

by a treaty relating specifically to directed energy weapons.[117]

This type of treaty can only serve as a temporary palliative, intended to defuse what is presently perceived as the most critical situation. All efforts should be directed at preventing weaponization of outer space. In fact, an agreement dealing with weapons whose research is not as advanced, and are not therefore considered as "critical" weapons, should be more easily reached.

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Concerning Outer Space II", to be referred to in this Treaty as the "Replacement Treaty".

2. This Treaty shall remain binding between Parties until the Replacement Treaty has come into force and they have deposited their instruments of ratification or accession to it.

3. This Treaty shall remain of unlimited duration as between Parties to this Treaty and Parties to the Replacement Treaty until such time as all Parties to this Treaty have ratified or acceded to the Replacement Treaty, at which time this Treaty shall be automatically terminated for all Parties.

4. Paragraphs 1, 2 and 3 of this Article refer only to a Replacement Treaty that would contain the following provisions:

(a) An Article that states explicitly that the Replacement Treaty is intended to replace this Treaty;

(b) An Article identical with Article 13 of this Treaty.

117. Dahlitz, supra, note 106, 148.

3. Weapons Control by "Rules of the Road" Agreements

"Rules of the Road" agreements would seek not to limit the testing, production or deployment of space weapons as such, but to set up an information and clarification system whereby ambiguous acts in relation to space are explained. Thus, potentially escalatory and specifically hostile acts would not have disastrous consequences, and, theoretically, a stable weapons balance would be maintained. This is perhaps the most cynical viewpoint, in that it attempts no restrictions except those imposed by the necessity of mutual co-existence. Scenarios such as setting up minimum distances between satellites to pre-empt space mine emplacement, and prohibiting or explaining close approaches by one state's satellite to another's are advocated.[118] A few terrestrial examples are cited of such agreements already in operation. Thus the US-Soviet "Agreement on Prevention of Incidents at Sea" of May 1972[119] prescribes a series of guidelines to minimize the

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118. Durch, supra, note 104, 42-3; see also, Deudney D., "Unlocking Space", Foreign Policy, No. 53 (Winter 1983-84), 91-113.

119. The full title is: Agreement Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on the Prevention of Incidents on and over the High Seas.

risk of a dangerous confrontation occurring. Thus, surveillance ships must "stay at a distance which avoids the risk of collision and...avoid executing manoeuvres embarrassing or endangering to the ships under surveillance".[120] Article 6 of the Treaty provides a 3 to 5 day advance warning system to promote safety, and article 7 mandates the exchange of information on collisions at sea.[121]

Other treaties contain information-dissemination procedures to monitor performance of obligations contained therein. The most relevant in the present context, is that contained in Article 2 of the 1971 US/USSR bilateral "Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War",[122] which states the undertaking between the Parties

> to notify each other immediately in the event of an accidental, unauthorized or

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Reproduced in U.S. Dept. of State, United States Treaties and Other International Agreements, Vol. 23, Pt. 1, 1972, 1168-1170.

120. Art. 3(4).

121. For a discussion of the utility of this Treaty, see, Lynn-Jones, S.M., "A Quiet Success for Arms Control: Preventing Incidents at Sea", International Security, Vol. 9, No. 4, (Spring 1985), 154-85.

122. 807 U.N.T.S. 57. Signed 30 September 1971; entered into force 30 September 1971.

> any other unexplained incident involving a possible detonation of a nuclear weapon which could create the risk of outbreak of nuclear war.

Furthermore, article 4 provides for advance notification of "any planned missile launches if such launches will extend beyond its national territory in the direction of the other Party". Article 6 advises use of the "Hot Line" set up by Presidents Kennedy and Kruschev in 1963[123] "(f)or transmission of urgent information, notifications and requests for information in situations requiring prompt clarification." These measures could be expanded, to require advance notification of all missile tests and limits on multiple missile launches within brief intervals.[124]

The "Hot Line" Modernization Agreement of 1971,[125] is another confidence-building measure to increase the reliability of communication links between both super powers.

A new "Hot Line" Agreement should be signed by the USA and USSR to improve communications and reduce existing

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123. Memorandum of Understanding between the USA and USSR Regarding the Establishment of a Direct Communications Link, 472 U.N.T.S. 163. Signed 20 June 1963; entered into force 20 June 1963.

124. Lynn-Jones, supra, note 121, 183.

125. Agreement on Measures to Improve the USA-USSR Direct Communications Links, 806 U.N.T.S. 402. Signed 30 September 1971; entered into force 30 September 1971.

mistrust and tensions.

Those three agreements, remnants of an era that produced dozens of US-Soviet accords, demonstrate that important results can emerge from modest expectations. More generally, the success of these agreements indicate that

> confidence-building measures - constraints on military activities and improvements in communications that are intended to reduce the risk of inadvertent war or surprise attack - represent a workable alternative to traditional arms control proposals that impose quantitative or qualitative limits on weapons.[126]

Desirable as such an arrangement is, on its own it is a poor response to the clarion call for weapons control in space. Instead, it should be included in an agreement for more significant arms control. An arrangement such as the Standing Consultative Commission set up under the ABM Treaty[127] would certainly be a significant safeguard, and

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126. Lynn-Jones, supra, note 121, 154.

127. Article XIII ABM Treaty states as follows:

> 1. To promote the objectives and implementation of the provisions of this Treaty, the Parties shall establish promptly a Standing Consultative Commission, within the framework of which they will:
>
> (a) consider questions concerning compliance with the obligations assumed and related situations which may be considered ambiguous;
>
> (b) provide on a voluntary basis such information as either Party considers necessary to assure confidence in compliance with the obligations

might serve to break down the walls of ignorance and fear that threaten to be extended to the heavens.

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assumed;

(c) consider questions involving unintended interference with national technical means of verification;

(d) consider possible changes in the strategic situation which have a bearing on the provisions of this Treaty;

(e) agree upon procedures and dates for destruction or dismantling of ABM systems or their components in cases provided for by the provisions of this Treaty;

(f) consider, as appropriate, possible proposals for further increasing the viability of this Treaty, including proposals for amendments in accordance with the provisions of this Treaty;

(g) consider, as appropriate, proposals for further measures aimed at limiting strategic arms.

2. The Parties through consultation shall establish, and may amend as appropriate, Regulations for the Standing Consultative Commission governing procedures, composition and other relevant matters.

CHAPTER VI

CONCLUSION: THE MERITS AND DEMERITS OF THE TREATY FORMAT FOR THE CONTROL OF OUTER SPACE WEAPONIZATION

> Over the years, ... a considerable theology of arms control has evolved, a theology which embraces the gospel that arms control holds sacred value in the search for security. This is understandable enough - except that followers of this rite do not generally tie value to actual performance. Performance in arms control is measured by how well the treaty instrument succeeds in its goal of reducing the risk of war.[1]

A. TRACK-RECORD OF COMPLIANCE WITH ARMS CONTROL TREATIES - COULD THERE BE A SPACE NON-WEAPONIZATION TREATY?

> Compliance questions are bound to arise even during periods of détente, because no arms control agreement can regulate every eventuality and because there will always be those who wish to pursue activities that are not expressly forbidden. In the current political environment the impulse to hedge bets at the expense of arms control agreements is far greater and the checks against doing so are weakened.[2]

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1. Commander Bruce L. Valley, US Navy, "The Ultimate Defense" in, Proceedings, US Naval War Institute, February 1985, p. 30.

2. Krepov, M., "Decontrolling the Arms Race - The U.S.

Apart from the myriad difficulties in drafting and verifying even a partial outer space non-weaponization treaty, as discussed in the last chapter, there is another, more insidious, problem. This involves the question of the effectiveness of the treaty format in actually performing its expressed functions of arms prohibition, prevention, or control. State practice is one of the prime indicators of customary international law. Furthermore, treaties are subject to subsequent state practice in their interpretation.[3] Naturally, there is a cut-off point, beyond which such state practice is so at variance with the expressed objectives of a treaty, that the latter is abrogated. In the case of multilateral, or conceivably regional, treaties, the compliance threshold is low, due to the multiplicity of participants, and interests involved. However, in the case of US-Soviet bilaterals, the threshold is, as we shall see, inordinately high. Indeed, the level of tolerance shown

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and the Soviets Fumble the Compliance Issues", Arms Control Today, Vol. 14, No. 3, March/April, 1984, at 1.

3. Article 31(3)(b), of the Vienna Convention on the Law of Treaties, see supra, Chapter III A.1, states, that in interpreting a treaty,
   3. There shall be taken into account, together with the context:
   ...(b) any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation; ...

belies their stern political rhetoric and posturing.

The legal purist would consider little point in spending several years negotiating a treaty which is either a sham, replete with lacunae, or one which is not ratified at all, and inhabits a dangerous twilight world of ambiguity in international law. In contrast, the political pragmatist is cognisant of the fact that the diplomatic process is largely conducted by duplicity and bureaucratic inertia. There is no ultimate panacea, rather, this viewpoint sees the communication process as an achievement in itself. As a corollary to this, although a treaty will probably never be totally effective, it establishes a code of conduct where there was anarchy. As with domestic legal personalities, international legal personalities, such as states, will break the code from time to time. However, as long as there is enough consensus among their peers, that this is unacceptable conduct, pressure will be exerted to discontinue it. This, then is the essence of our fragile international law.

In view of the importance of state practice, it is apposite to conduct a review of state performance under existing arms control treaties. The compliance-rating of past treaties will undoubtedly have a precedental effect in the area/arena of outer space weaponization. In the ensuing discussion, a subjective compliance-rating (CR#) system will

be used, for additional clarity of exposition. Ratings of 1-3 denote poor compliance, 4-7 fair, and 8-10 good compliance. Those in the lowest category strain the utility of the treaty format, to the point where it may be destabilizing to this modality of arms control. This may potentially undermine those agreements in the higher categories, which are either merely functional, or are performing well.

As a final introductory point, in relation to the concepts of verification and monitoring, used in Chapter IV above, compliance herein

> refers to whether a particular party to an agreement is acquiescing to the terms of the agreement. Verification of compliance, then, refers to the political process of determining whether the behaviour of the other party is consistent with the agreement at issue, and monitoring provides the technical data for making such a judgment.[4]

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4. Caldwell, D., "Monitoring, Verification, Compliance: What's the Difference?", Arms Control Today, supra, note 2, 4.

1. The 1925 Geneva Protocol[5] and the 1972 Biological Weapons Convention[6] [CR 6]

The 1925 Geneva Protocol prohibits the use of inter alia bacteriological weapons, and expresses itself to be a codification of existing international law prohibiting the first use in war of asphyxiating, poisonous or other gases and of all analogous liquids, materials and devices. There are 106 parties to this convention, five more than the number which have ratified the associated Biological Weapons Convention of 1972.[7] The latter proscribes the development, production, stockpiling or other acquisition of biological weapons,[8] and embodies undertakings to destroy, or divert to peaceful purposes, existing

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5. Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, 26 U.S.T. 571. Opened for signature 17 June 1925; entered into force 8 February 1928.

6. See supra, Chapter IV A.3(c).

7. All statistics on ratifications are accurate to 31 December, 1984, and are quoted in World Armaments and Disarmament, SIPRI Yearbook 1985, Taylor & Francis Ltd., London, 1985, 503.

8. Art. I.

stocks,[9] and not to transfer any such weapons to another state.[10] In its 23 January, 1984 "Report on Soviet Non Compliance with Arms Control Agreements",[11] (hereinafter referred to as the 1984 Report), the Reagan Administration reported to Congress that

> (t)he Soviets, by maintaining an offensive biological warfare program and capabilities and through their involvement in the production, transfer and use of toxins and other lethal chemical warfare agents that have been used in Laos, Kampuchea and Afghanistan, have repeatedly violated their legal obligations under the BWC and customary international law as codified in the 1925 Geneva Protocol.[12]

This was reiterated in the 1 February, 1985 "Presidents Unclassified Report to the Congress on Soviet Non Compliance with Arms Control Agreements"[13] (hereinafter referred to as the 1985 Report). However, it was admitted therein, that no confirmed attacks have occurred. Further ambiguity surrounds this issue, since a UN team of experts was denied access to the three areas. Nevertheless,

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9. Art. II.

10. Art. III.

11. Report reproduced in Survival, Vol. XXVI #3 May/June 1984, 127-29.

12. Ibid., 127-28.

13. The White House, Office of the Press Secretary, Washington D.C., 1 February, 1985, 12 ff.

tests on refugees who had entered Thailand and Pakistan proved inconclusive.[14] Certainly, the evidence appears to be highly circumstantial, and the accounts of "yellow rain" in Indo-China have even been explained by other, admittedly bizarre, hypotheses.[15] This US allegation was countered by the Soviet Union in its 29 January, 1984 aide mémoire,[16] containing counter-charges to the 1984 Report. The Soviets alleged that the US were developing and deploying chemical weapons in Europe, in violation of the 1925 Geneva Protocol.[17]

There is so much uncertainty in this area, that a positive conclusion is impossible. Nevertheless, in view of their indiscriminate nature, and their particularly horrific

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14. Blacker, C.D. & Duffy, G. (eds.), International Arms Control - Issues and Agreements, (2nd ed.), Stanford University Press, California, 1984, 144-47.

15. See "A Review of Reagan's Report on Soviet Compliance", Arms Control Today, supra, note 2, 6 at 9, where Dr. Matthew Meselson of Harvard is reported to have attributed the toxic "yellow rain" to "pollen-laden bee excrement".

16. Excerpts of the Soviet Counter-Charges are reproduced in Survival, supra, note 11, 129-31.

17. This is a reference to the alleged US production of binary chemical weapons. The latter are composed of two chemicals, benign until mixed, but toxic when amalgamated prior to being unleashed on an enemy.

means of waging war, analogous to nuclear weapons, it is highly unlikely that chemical weapons would ever be used in situations other than as an ultimate last resort. Also, being weapons of mass destruction, they are prohibited from the outer space arena already, by article IV of the 1967 Outer Space Treaty.[18]

2. Antarctic Treaty 1959[19] [CR 10]

This Treaty has been singularly successful in its objective of preserving Antarctica for peaceful purposes, by prohibiting

> inter alia any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapons.[20]

Its apparent 100 percent record of success must, however, be tempered by the realization that Antarctica is of extremely limited strategic value to anyone, particularly the USA and USSR.

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18. See supra, Chapter III D.I.

19. See supra, Chapter IV A.3(h).

20. Art. I(1).

3. The Partial Test Ban (PTB) Treaty, 1963[21] [CR 2]

There are 112 parties to the PTB Treaty, not including such nuclear powers as China and France. From the mid 1960s, to the early 1970s, France was involved in controversy, due to its nuclear testing programme in the Antipodes. This resulted in the Nuclear Test Cases[22] before the International Court of Justice. Even though France was not a signatory to the PTB Treaty, their perilous political position persuaded them to desist.[23]

Although South Africa, widely believed to possess a nuclear capacity since the late 1970s, was one of the initial ratifiers of the PTB Treaty, there is considerable evidence to suggest that it has conducted nuclear testing off its shores.[24] The latter would be in clear violation of article 1 of the Treaty, which prohibits nuclear weapons testing inter alia beyond a state's territorial limits.

Regarding the latter point, the Soviet Union, in

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21. See supra, Chapters III C.1 and IV A.3(a).

22. Australia v. France, I.C.J. Reports, 1974, 253 et seq.; and New Zealand v. France, ibid., 457 et seq.

23. See Blacker & Duffy, supra, note 14, at 133.

24. See Vlasic, I., "The United Nations SSOD II and Beyond", (1983) 28 McGill L. J. 455, at 468 fn. 51.

its 1984 counter charges to the US 1984 Report, alleged that the US had leaked radiation from underground nuclear testing at its Nevada site.[25] In the US State Department reply to this charge, it was stated that

> (b)oth the United States and USSR have encountered some difficulty in totally containing all their underground nuclear tests. The United States, however, has had only a few problems in the past with the venting of radioactive debris from underground tests at the Nevada test site. As more experience was gained with the containment of underground tests, venting from US tests became even more rare. Over the past decade there has been only one incident of local and minor venting. The Soviets had not raised their concerns about US venting with us since 1976, until the latest reference to it.[26]

Furthermore, it is clear that the PTB Treaty did not involve a compromise of either the US or Soviet nuclear testing programme. By permitting underground nuclear explosions, both super powers were enabled to maintain vigorous programmes, which continue to this day. Clearly, the PTB Treaty was both fatally flawed, and is routinely violated.

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25. See Survival, supra, note 11, 131.

26. Ibid., 133.

4. The Treaty of Tlatelolco 1967[27] [CR. 9]

Ratified by all affected States, except Argentina and Cuba, the denuclearization zone of Latin America, which this Treaty creates, seems to have been maintained, since its entry into force in 1968. The nuclear powers agree, on ratification of Protocol II to the Treaty, to respect the denuclearization zone, and "not to contribute in any way to the performance of acts involving a violation of the obligations of [the Treaty]".[28] Nuclear powers which have ratified Protocol II include the UK,[29] the USA,[30] France,[31] China[32] and the USSR.[33] As a measure of its success, this is the only nuclear weapons control multilateral that both France and China have ratified.

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27. See supra, Chapter IV A.3(h).

28. Protocol II, art. 2.

29. Ratification was on 11 December, 1969.

30. Ratification was on 12 May, 1977.

31. Ratification was on 22 March, 1974.

32. Ratification was on 12 June, 1974.

33. Ratification was on 8 January, 1979. It is likely that Cuba will accede to the Treaty of Tlateloco, in view of the Soviet ratification; see, Blacker & Duffy, supra, note 14, 153.

5. The Outer Space Treaty 1967[34] [CR 2]

As far as it goes, this Treaty has apparently been largely successful in maintaining its article IV régime of partial demilitarization and complete denuclearization. Apart from a few fractional orbital bombardment system tests, which were probably infractions, there has been a general realization that having nuclear weapons in orbit is militarily counter-productive, in view of the impartiality of electro-magnetic pulse. However, there were too many inbuilt lacunae to make the Treaty more than minimally useful in fulfilling its purpose, expressed in the preamble, of acting in the "common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes."

6. The Non-Proliferation Treaty (NPT) 1968[35] [CR 2]

The NPT, with 124 parties thereto, is apparently a signal success as a control on the horizontal spread of nuclear weapons. Its preambular belief "that the proliferation of nuclear weapons would seriously enhance the danger

34. See supra, Chapters III D.1 and IV A.3(h).

35. See supra, Chapter IV A.3(h).

of nuclear war", finds its concrete expression in an article 1 undertaking not to transfer or encourage the acquisition of "nuclear weapons or other nuclear explosive devices". However, the reality is somewhat different. Of the eight probable nuclear powers, four are non-signatories, China, South Africa, India and Israel, and another, France, has merely declared that it would "behave like a state adhering to the Treaty".[36] India's May 1974 underground test of a "peaceful nuclear device",[37] and Pakistan's apparent development of a plutonium (U-235) enrichment plant without the assistance of a peaceful nuclear programme,[38] led to the conclusion that

> (t)echnology [has] spread so much that any country that [wants] nuclear weapons badly enough could probably develop its own enrichment plant or reprocessing technologies for that purpose. Restrictions could make the technology harder to get, but more and more it seems that persuasion will be an important means of preventing non-nuclear weapons states from obtaining these weapons. They would have to be convinced, for example, that they actually enhance their security by remaining non-nuclear.[39]

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36. See SIPRI Yearbook 1985, supra, note 7, 522. The other three nuclear powers are of course the USA, USSR, and UK.

37. See Blacker & Duffy, supra, note 14, 165.

38. Ibid., 169.

39. Ibid., 169-70.

7. The Sea-Bed Arms Control Treaty, 1971[40] [CR 10]

This Treaty is reminiscent of the Antarctic Treaty discussed above, in that "(t)he United States and the Soviet Union entered the Treaty for familiar reasons. Since such weapons had little current military value, it was easy to prohibit them."[41] The position remains unchanged.

8. The SALT I Interim Agreement 1972[42] [CR 6]

This Treaty, which expired legally in 1977, has not lapsed politically. In the US 1985 Report, it is stated that the Interim Agreement has "been extended by the parties by a series of mutual political commitments."[43] The 1985 Report goes on to allege two Soviet violations of this Treaty, which they "have told us they would abide by", and thus, "any actions by the USSR inconsistent with this

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40. See supra, Chapter IV A.3(i).

41. Blacker & Duffy, supra, note 14, 124.

42. Interim Agreement Between the USA and the USSR on Certain Measures with Respect to the Limitation of Strategic Offensive Arms 23 U.S.T. 3462. Signed 26 May 1972; entered into force 3 October 1972.

43. Supra, note 13, 5.

commitment are violations of its political commitment."[44] The "violations" concern: use of former SS-7 intercontinental ballistic missile (ICBM) sites, which they had agreed to dismantle, are now being used in relation to the new Soviet SS-X-25 ICBM; and upgrading Yankee-Class ballistic missile submarines, for use with long range cruise missiles. The Soviets have not replied to these charges. In view of its equivocal status, this Agreement must be viewed with some circumspection.

9. ABM Treaty 1972[45] [CR 5]

Expressed to be of unlimited duration, this US-USSR bilateral is on a much more secure international legal footing than its counterpart, the Interim Agreement. However, the equivocal political commitment to the ABM Treaty, particularly on the US side,[46] may seriously undermine it. In the past few years, there have been a series of mutually accusatory statements between the parties, relating to their compliance with this Treaty. In the US 1984 Report it was claimed that the Soviet large

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44. Ibid. (emphasis added).

45. See supra, Chapter III C.2.

46. See supra, Chapter II B.1.

phased array radar[47] at Krasnoyarsk, in Central Siberia, was a violation of article VI(b) of the ABM Treaty. The latter embodies the undertaking "not to deploy in the future radars for early warning of strategic ballistic missile attack except at locations along the periphery of its national territory and oriented outward." The USA claim that the Krasnoyarsk radar is neither "alopg the periphery", nor "oriented outward". In reply, the Soviets counter-claimed that

> (c)ontrary to its commitment not to deploy systems for the ABM defence of the country's territory and not to create a foundation for such defence, big new Pave Paws radar stations, the parameters of which have been brought up to the level of demands made on ABM radar stations and which can serve as a basis for providing radar backing for the ABM defence of the territory of the USA, are being deployed on the Atlantic and Pacific coasts of the USA and also in the southern direction. No measures have been taken by the American side to remove the concern aroused by its actions.[48]

The two existing PAVE PAWS phased-array radars, are situated in California and Massachusets. New sites for construction

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47. A phased array radar system, is one with no moving parts, the tracking elements are rotated electronically rather than mechanically, which results in greater accuracy and data collecting ability.

48. Soviet Aide Mémoire, supra, note 16, 131.

of such radars are in Texas and Georgia.[49] Added to these, are Soviet complaints about: alleged ABM radars on Shemya Island; testing of Minuteman I ICBMs in an ABM mode; and the March 1983 'Star Wars' commitment, which is tantamount to a political declaration of an intention to abrogate the Treaty. The US State Department rebuttal, stoutly maintained that

> (t)here is no merit whatsoever in these charges. The Shemya Island radar in the Aleutians is for national technical means of verification, and the Pave Paws radars are ballistic missile early warning (BMEW) radars located on the periphery of national territory and oriented outward, as specifically permitted by the treaty.[50]

Furthermore, in relation to the "Star Wars" commitment, it was observed that "the ABM Treaty does not prohibit research, and both sides have had research programs since the signing of the treaty." In addition, the 1985 Report supplements previous alleged violations, with the following: the creation of a new mobile land-based ABM system, in violation of the article V undertaking "not to develop, test, or deploy ABM systems or components which are...mobile land-based"; the testing of surface-to-air missiles (SAMs) in "an ABM mode", contrary to article VI(a); and an

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49. Longstreth, T.K., "Soviet Countercharges", Arms Control Today, supra, note 2, 10, at 11.

50. Supra, note 11, 132.

"aggregate" finding which suggests that the USSR may be preparing an ABM defence of its entire national territory, contrary to the limited ABM deployment areas permitted in article III.[51] The Soviets have not replied to these charges. Clearly, however, the ABM Treaty is becoming too restrictive, and thus effective, for the super-powers to retain it for much longer.

10. The 1974 Threshold Test Ban Treaty (TTBT) and the 1976 Peaceful Nuclear Explosions (PNE) Treaty[52] [CR 5]

Both treaties are unratified, the TTBT providing a 150 Kiloton (Kt) ceiling for military testing, and the PNE Treaty, the same for "peaceful nuclear testing". Not only do these treaties have equivocal status in international law, but also, during their negotiation, there was an agreed "understanding" that one or two slight unintended breaches per year of the 150 Kt limit would not be a violation... although they would be cause for concern".[53] In the US 1984 Report, it was averred that

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51. Supra, note 13, 7-9.

52. Supra, Chapter IV A.3(c).

53. See Blacker & Duffy, supra, note 14, 137.

> (w)hile the available evidence is ambiguous, in view of ambiguities in the pattern of Soviet testing and in view of verification uncertainties, and we have been unable to reach a definitive conclusion, this evidence indicates that Soviet nuclear testing activities for a number of tests constitute a likely violation of legal obligations under the TTBT.[54]

While censuring the US for its non-ratification of these Treaties, the Soviets, in their counter charges, stated that

> ...according to data in the possession of the Soviet side, there have been repeated instances of the American side exceeding the imposed ceiling on the yield of the nuclear devices being tested. Despite the assurances the the USA intends to observe the 150-kiloton restriction, the practice of exceeding the permitted yield of the nuclear devices that are being tested appears to be continuing.[55]

There is a plethora of vagueness, imprecision and ambiguity in these statements. In view of the 'flexibility' of the interpretation of 'violation', it is highly unlikely that either side will ever prove a breach by the other, at least without being hypocritical.

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54. Supra, note 11, 129.

55. Ibid., 131.

11. The ENMOD Convention 1977[56] [CR 10]

The Convention has been the subject of criticism by those who believe that it

> prohibits only those techniques which do not exist, or are the subject of scientific speculation, or which, if proved feasible, could hardly be used as rational weapons of war.[57]

Others maintain that the Convention is "pre-emptive arms control", the only effective way to control armaments.[58] Although there are only 47 parties to the Convention, not including China or France, the super-powers have ratified the Treaty, and it appears to have been observed faithfully.

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56. See supra, Chapter III C.3.

57. Goldblat, J., "The ENMOD Convention Review Conference", Disarmament - A Periodic Review by the United Nations, Vol. VII, No. 2, Summer 1984, 93, at 101.

58. See Christol, Carl Q., "The Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques", in, Jasentuliyana, N.(ed.), Maintaining Outer Space for Peaceful Purposes, The United Nations University, Japan, 1984, 189, at 212.

12. SALT II, 1979[59] [CR 5]

Although never ratified, "since 1981, the United States has observed a political commitment to refrain from actions that undercut the SALT II Treaty so long as the Soviet Union does likewise".[60] This, by now familiar, equivocality is as undesirable as it is pervasive in the area of arms control. Like the other quasi-treaties, a number of allegations and counter charges have been essayed. The US 1984 Report complains of: Soviet encryption of telemetry impeding verification; the development of a second new type of ICBM when only one new one was permitted; and the indefinitive conclusion that SS-16 ICBMs have been deployed in spite of a ban on such deployment.[61] On the Soviet side, there are allegations of violation by: deployment of Pershing II ballistic missiles in Europe; use of opaque shelters over Minutament soils, which interfere with verification; and the US intention to create two new ICBMs, the MX and Midgetman.[62] In rebuttal, the US Department of State explained that the Pershing II deploy-

59. See supra, Chapter III C.4.

60. 1985 Report, supra, note 13, 6.

61. 1985 Report, supra, note 11, 128-29.

62. Ibid., 130.

ment was a strategic counter to Soviet SS-20 deployment. Furthermore, it was observed that the shelter covers were for environmental protection during construction, and had since been discontinued, or replaced by transparent covers.

The Chairman of the US House of Representatives Foreign Affairs Committee, Rep. Dante B. Fascell (D-Fla), has expressed perturbation over "what appears to be persistent administration waffling on our commitment to SALT."[63] In a report which claimed that the USA could exceed the SALT II limits in the autumn of 1985, with the impending sea-trials of the Trident class submarine the U.S.S. Alaska,[64] Rep. Fascell stated that he took "very seriously recent administration reports on Soviet noncompliance. What we preach we must also practice." Clearly, since it is grounded in politics, SALT II is subject to political expediency.

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63. Pincus, W., "Rise in Soviet Missiles Likely", Washington Post, 23 April, 1985, p. A-8.

64. Ibid.

13. The Moon Treaty 1979[65] [CR 10]

In view of its comfortable distance away, the Moon and a fortiori other celestial bodies, were relatively easy to legislatively demilitarize. However, no state which has, or is likely to have, the capability to operate on or around the Moon, has ratified the Treaty.

The abiding impression from the above review, is that the treaties which are successful, are those which prohibit or control activities which states either cannot yet perform, or do not wish to do so. Another leitmotiv is that the USA and USSR have been singularly equivocal in their attitude to arms control. Furthermore, they have been irresponsible towards the rest of the world, especially emerging nations who look to them for guidance. With super-power status, comes super-power responsibility. Neither state has distinguished itself in the manner in which it has discharged this responsibility.

B. CONCLUDING REMARKS

> There is nothing more difficult to carry out nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer

65. See supra, Chapters III D.3 and IV A.3(h).

> has enemies in all who profit by the old order, and only luke-warm defenders in all those who would profit by the new order. The luke-warmness arises partly from fear of their adversaries who have the law in their favor; and partly from the incredulity of mankind, who do not truly believe in anything new until they have had actual experience of it.
>
> Machiavelli
> The Prince, 1513[66]

Exploring the universe and harnessing outer space for the benefit of mankind has been the fond desire of the human race for centuries. The rapid development of space science and technology has propelled man into space, onto the moon and on his way to discovering the mysteries of other planets. The accomplishments of a scant few decades, in areas such as telecommunications, remote sensing and space transportation, have shown the huge potential of the peaceful uses of outer space and have offered mankind the prospect of a bright future. Unfortunately, like other branches of advanced science and technology, space science has also been used for military purposes, from the inception of the space age. Fuelled by an intense rivalry for military superiority, the super-powers have transformed outer space into an arena where military interests dominate

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66. Cited in, Dolman, A. J., Resources, Regimes, World Order, Pergamon Press, New York, 1981.

all others. From playing a strictly supportive role, defense space technology has rapidly become an integral and essential part of earth-based strategic weapons systems.

Today, outer space is of paramount strategic importance. Satellites are performing vital functions in this respect, in reconnaissance, early warning, communications and navigation. These belong to the important "national technical means", which make it possible to monitor the observance of arms control agreements. Though they represent some degree of militarization, these military activities have greatly contributed to world stability and remain, for the moment, defensive in nature. The latest factor to enter the discussion, is the introduction of deliberately destructive weapons systems into space.

The security of the Western world has rested on the strategy of deterrence. This strategy is being progressively replaced by the present US administration, with a more defense-oriented strategy. An increase in US self-confidence, has re-ignited the leadership syndrome or personality cult, and has fuelled the US military programme. Contemporaneously, a concatenation of circumstances has been affecting the Soviet Union. Its totalitarian society has had to cope with threats to its hegemony in Eastern Europe, the death in a short period of time of three successive leaders, internal political restructuring, economic

breakdown, and poor public opinion, following the invasion of Afghanistan. Futhermore, the hardline position adopted by the Reagan administration, vis-à-vis the USSR, finds its expression in a new Soviet-style American propaganda campaign. Repeated denouncements of Soviet treaty violations, represent a form of obtuse diplomacy, which has been practiced in the Soviet Union since early post-Stalin times. This methodology is now being effectively used by the Americans. Futhermore, the US Strategic Defense Initiative (SDI) programme has successfully brought the Soviet Union back to the negotiating table at Geneva. While this certainly represents a step in the right direction, the USA has repeatedly stated that the SDI will not be used as a bargaining chip during the arms control negotiations. What may have begun as power politics in the mind of President Reagan, has now escalated, in the minds of top US officials and scientists, into an apparently achievable goal. Since history has a tendency of repeating itself, the Soviet Union can be expected to increase its research and development in space-based BMD technology, thus precipitating an arms race in outer space.

Apart from its destabilizing effect on the security and well being of all nations, the increasing militarization of outer space by both super-powers, has also brought about the proliferation of military space powers. As discussed in

Chapter I, China has recently acknowledged its own military reconnaissance programme. France, a space power in its own right, is also developing reconnaissance satellites, and is actively campaigning for further European co-operative military programmes. The US invitation to European countries to participate in the SDI programme has rekindled the desire and determination, notably of France, FRG and the UK, to unite and become an independent military force in outer space. This response to unite against a common threat also served as a catalyst in the creation of the European Space Agency (ESA) and before it, the European Economic Council (EEC). However, unlike ESA, a third military force could only lead to a sharp increase in the potential for conflict and mischief in outer space. Futhermore, unlike the EEC, there is no economic benefit in an alliance to weaponize outer space.

The justified upsurge in international concern at the possible further militarization of outer space, is partly due to the perception that this is an area which it is still possible to rationally control, before it becomes the latest arena for the perennial arms race. Since the adoption of the Outer Space Treaty, virtually no other measure of multilateral military restraint has been added to the body of international space law. The discussions in various international fora indicate that states are desirous

of reversing the process of militarization of outer space, and the most frequently advocated "solution" is the drafting of a treaty to regulate military activities in outer space. As examined in Chapter V, a number of proposals have been essayed to regulate space weaponization. All of them are unsatisfactory, in that they project a technological advance through the prism of political distrust strategy, to curb space weapon development. All the existing proposals try to limit space weaponization, when the only effective measure to prevent such a situation is the immediate ban on the development, testing and deployment of all space-based and space-directed weapons. Anything short of such a ban will necessarily leave exploitable loopholes.

As further outlined in Chapter V, the major stumbling block in negotiating an arms control treaty is the verification issue. The USA argues that only 100 percent fool-proof verification is adequate. The international community argues that verification should not rely solely on national techical means which, de facto, only both super-powers possess. In an attempt to rectify this inbalance, French President Valery Giscard d'Estaing proposed that an International Satellite Monitoring Agency (ISMA) be created to monitor arms control treaty compliance. While the ISMA concept gained much support at the UN, both the Soviet Union and the United States vehemently opposed the idea. Thus,

since 1980, ISMA has not been discussed in the UN. Opposition from both super-powers should not deter the General Assembly from considering ISMA as a viable solution to arms control verification, and it is hoped that this item will be re-introduced on the UN General Assembly's agenda in the upcoming months.

Throughout the years since World War II, Canada has played a leading role in all multilateral arms control discussions. Cognisant of the restricted ambit of influence a non super-power exerts, Canada has always strived for better understanding between the USA and the USSR, in order to define a comprehensive framework for viable arms control agreements between them.

With respect to outer space, Canada has encouraged peaceful and co-operative uses therein, while voicing concern about its growing militarization. In recent years, Canada has made several proposals to ban the development, testing and deployment of weapons for use in outer space, and has addressed itself to verification as one of the most significant factors in arms control negotiations in the 1980's. In this context, Canadian Ambassador to the Conference on Disarmament, Douglas Roche recently indicated that:

> Canada is studying the feasibility of developing a system of "space to space" surveillance to assist in monitoring compliance with any future agreement to

prevent an arms race in outer space.[67]

Under the sponsorship of the External Affairs Department, and with the participation of the National Defense Department, Spar Aerospace Ltd. has conducted a feasibility study on the PAXSAT concept. The latter is based on the belief that:

> A properly configured set of observations in space can determine the function of an unknown satellite to an acceptably high degree of confidence, such that it can contribute to the determination and control of the presence of weapons in space.[68]

PAXSAT, would signal an earth station with data needed to determine the intentions of orbiting satellites suspected of possessing hostile capabilities.

It is submited that this measure is not entirely satisfactory in that the technological impulse which drives the Soviet Union and the USA, will surely enable them to create effective and cost efficient counter-measures, such as jamming devices to interfere with the operations of PAXSAT. Furthermore, the costs involved in establishing a "space to space" surveillance system would be prohibitively expensive for the participating countries.

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67. UN Doc. A/C.1/39/PV./19 (1984), p. 8-10.

68. "PAXSAT - A Study of the Feasibility of a Space-craft Based System to Determine the Presence of Weapons in Space", November 1984, Contract Reference DSS 21ST-08011-4-2297, at 1.

Despite inherent flaws in past treaties, it is submitted that there could, and should, be an international treaty banning the development, testing, and deployment of weapons for use in outer space. Alone, Canada cannot come up with a viable solution. However, it is ideally placed, both politically and geographically to understand and represent countries other than the two super-powers. Thus, Canada should convene an international conference to discuss the negotiation of a treaty banning all space weapons, and where the verification procedure could be carried out by relay satellites, supplied by both super-powers, which would directly receive telemetry from Soviet and US national technical means of verification. The relay satellite system, perhaps called VERASAT, would be administered by an international inter-governmental agency, headquartered in Canada, which would disseminate all the accumulated data. As occured with aviation and telecommunications, technological imperatives necessitate the creation of a new order for outer space. The latter requires the edification of a new international arrangement, to perform channelling and controlling functions. Thus, the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU), were created to facilitate international cooperation and peaceful uses of the airspace, and of the orbit/spectrum resource. Unlike ICAO, which also has

its headquarters in Canada, the new international organization would be independent from the UN. In recent years, the latter has become too highly politicized and prone to bureaucratic inertia. Instead of basing it on the Gross National Product (GNP), the organization's funding could be based on a progressive rate of taxation levied on both space-oriented expenditures and military expenditures. Since the world has, for decades, been held hostage to the insecurity of the USA and the Soviet Union, the super-powers should bear particular responsability and consequently, be taxed the highest. As a quid pro quo for the super-powers supplying the relay satellites, not only would stability be ensured, but also they would have contributed to the development of an international instrument capable of providing a long lasting, secure world.

The shaping of our common future cannot be left to politicians and scientists alone. International lawyers must try to conduct their affairs in light of the present political and strategic complexities, and develop new rules to meet these challenges.

Canada should not be guided by the expected economic spin-offs from participating in the US SDI. The spin-offs from even limited military research contracts, pale before the potential achievements of devoting the same resources to ending our collective insecurity. Canada must

rise to the occasion and contribute to facilitating better communications between the USA and USSR. Futhermore, it must act as a conciliator and representative of other countries.

> The highest form of hope, said Bernanos, is the overcoming of despair. That is what is demanded of us by the millions of men and women who are alarmed by the arms race and the prospect of nuclear holocaust.[69]

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69. "Technological Momentum The Fuel that Feeds the Nuclear Arms Race", an address by the Right Honourable P.E. Trudeau, Prime Minister, to the Second United Nations Special Session on Disarmament, New York, 18 June 1982, at 7.

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