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# Military Use of the Space Shuttle

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COL. ROBERT W. NORRIS\*\*

## I. INTRODUCTION

**T**HE FIRST GREAT ERA of the space age is over. The second is about to begin. It will come into its own with the new Space Shuttle, the heart of our new space transportation system —

President Jimmy Carter<sup>1</sup>

In the chronicle of man, new systems of transportation have inevitably led to greater heights of achievement. The development of land vehicles, locomotives, boats and aircraft each propelled man to levels of prosperity unthinkable prior to such development. Today with the Space Shuttle<sup>2</sup> we are on the threshold of another great advancement in transportation. The Space Shuttle functions in a new environment just as the first boat sailed on the water and the first aircraft flew in the air. The dramatic difference is that the Shuttle will permit man to more easily transit the bonds of earth while prior achievements in methods of transportation have been severely restricted by the earth's gravitational environment. Perhaps history will record that it is this difference that may cause the Space Shuttle to overshadow all prior developments.

The Space Shuttle is the first step in the evolution of a reusable spacecraft — one that can operate both in air space and outer space — a cargo craft, if you will, that can transport men and materiel into space and return them to earth. With its ability to lift thirty-two tons into orbit on mission after mission it will provide regular, frequent and economical access to space. Given this capacity, it is easy to envision large numbers of civilians and military personnel (astronauts, scientists, engineers) living in space while performing a wide variety of civilian and military functions. Mal-

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†The opinions and conclusions expressed in this article are those of the authors and do not necessarily represent the views of the Department of Defense, the Department of the Air Force or the United States Government.

<sup>1</sup> Remarks of President Carter at the Congressional Space Metals Awards Ceremony, 14 WEEKLY COMP. OF PRES. DOC. 1686 (Oct. 1, 1978).

<sup>2</sup> The term Space Shuttle is used throughout this article to include the Shuttle orbiter and the inertial upper stage vehicle, as integral parts of the Space Transportation System (commonly referred to as STS).

functioning satellites that heretofore would have simply been space junk can now be refueled and repaired or, if necessary, returned to earth and re-used. Space laboratories and stations and perhaps even factories and colonies may be constructed. It is this capacity that is the new dimension of the Space Shuttle.

There is little doubt that the Space Shuttle will provide a "quantum jump" in man's activity in space. It will provide the means to make the transition from primarily machine-oriented space activities to man-orientated activities. Man's activities will move from exploratory to exploitative. The purpose of this article is to examine the military aspects of this transition in the context of the legal regime of outer space that has evolved in the more than two decades since the orbiting of Sputnik I. Is the prospect of increased military activities and capabilities compatible with this regime or conversely, does the legal regime restrict military activities in space and if so, what are those restrictions? A discussion of this type must of necessity include, in addition to the legal principles involved, a discussion of our national space policy and our present and future military use of space. Moreover, since international law evolves from the practice of States and is attuned to the realities of world politics and power, any discussion of the military use of space would be incomplete without a discussion of the military space programs of the Soviet Union and its view regarding the legality of the military use of space.

## II. MILITARY USE OF SPACE

Military activities in space are fundamental to our national security. Space is the high ground, and effective control of it in any future conflict could be decisive. The unique characteristics of space have made practical the development of a multitude of systems to support and enhance military operations. These include systems for navigation, weather forecasting, communications, mapping and geodetic measurement, nuclear explosion detection and monitoring, ballistic missile early warning, photo reconnaissance and surveillance including arms control treaty monitoring. These systems are crucial to the employment of our military forces and provide a significant increase in the effectiveness of the force. They have been characterized as force multipliers, thus permitting the accomplishment of national goals and objectives with fewer, although more efficient, forces.

### A. *Military Satellite Communications*

Satellite communications systems have become an important national asset offering advantages of near-global coverage, service to isolated areas, wide transmission bandwidths, contingency operations and mobile platform connectivity.<sup>8</sup> Military uses of satellite communications fall into three fundamental areas:

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<sup>8</sup> Aeronautics and Space Report of the President, 1978 Activities, National Aeronautics and Space Administration, NAS 1.52:978 (July, 1979).

1. Command and control communications of strategic forces.
2. Secure voice and wideband, high capacity communications in support of the National Command Authority, military commanders in major headquarters around the world and the intelligence community. In addition to the Department of Defense, users include the Diplomatic Telecommunications System, the White House Communications Agency, selected allies and other United States agencies.
3. Beyond-the-horizon communications for mobile forces using a global space relay system. This system provides reliable, long-range, secure voice communications with military aircraft, ships, submarines and other mobile forces that may be operating in remote locations.

An excellent example of the use of satellite communications in crisis management is provided by the Mayaguez Incident<sup>4</sup> during which the President in Washington could communicate directly with the Marine commander of the landing forces off the coast of Cambodia.

The Soviet Union also uses satellites for communications having launched over 150 since 1965. These are linked to ground stations and Soviet ships in both the Atlantic and Pacific Oceans.<sup>5</sup> While the volume of military use of this system is not known, there are more Soviet communications satellites active than are actually needed for civil purposes.<sup>6</sup> One use that is known is the Washington-Moscow hotline which uses a United States and a Soviet communications satellite.

## B. Navigation

The Navy Navigation Satellite System (TRANSIT), designed originally as an essential element of the Polaris submarine and missile system, has provided navigational information for military and civil maritime use since 1964. The five satellite system provides a worldwide two-dimensional position-fixing system for maritime use which permits users to take a position fix every two hours or less depending upon latitude.

A new position-fixing system called NAVSTAR GPS is being developed and should be operational by the mid-1980's. This is an extremely

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<sup>4</sup> On May 12, 1975, a Cambodian gunboat captured the United States Merchant Ship, *Mayaguez*, and its civilian crew. After diplomatic efforts failed, the United States recovered the ship and its crew with a Marine helicopter assault. See, Behuniak, *The Seizure and Recovery of the S.S. Mayaguez: A legal Analysis of United States Claims*, 82 MIL. L. REV. 41 (1978).

<sup>5</sup> M. NORBY, *SOVIET AEROSPACE HANDBOOK*, DEPARTMENT OF THE AIR FORCE PHAMPHLET AFP 200-21 at 87 (May, 1978).

<sup>6</sup> STAFF OF SENATE COMM. ON AERONAUTICAL AND SPACE SCIENCES, 94th Cong., 2d Sess. 381, *REPORT ON SOVIET SPACE PROGRAMS, 1971-75; OVERVIEW, FACILITIES AND HARDWARE, MANNED AND UNMANNED FLIGHT PROGRAMS, BIOASTRONAUTICS, CIVIL AND MILITARY APPLICATIONS, PROJECTIONS OF FUTURE USES* (Comm. Print 1976) (hereinafter, *SOVIET SPACE PROGRAMS*).

accurate system that allows the user to determine his position within ten meters and speed to within .03 meters per second. Users could be ships, aircraft or even an individual soldier with a portable NAVSTAR receiver. Such users by the press of a button could determine their exact location anywhere in the world. When complete, NAVSTAR will consist of eighteen to twenty-four satellites in three orbital planes and have the capacity to accommodate 25 to 30 thousand users. Obviously this system will enhance almost every military mission. Importantly, the system will provide not only precision position-fixing and velocity information, but also the capability to deliver weapons (artillery, bombs, missiles) on target with a high degree of accuracy in all types of weather. It will also be used for precise worldwide time transfer and may be used as hosts for the Integrated Operational Nuclear Detonation Detection System.<sup>7</sup>

The Soviet Union, because it also maintains a long range submarine launched missile capability, is believed to have a satellite navigation system at least as advanced as the United States TRANSIT system. Although the Soviets have not described their system, it is likely that they have traveled the same technical route as the United States.<sup>8</sup>

### C. *Meteorology*

Detailed weather information for both military and civilian activities is provided through the coordinated efforts of the Defense Meteorological Satellite Program (DMSP) and the National Oceanic and Atmospheric Agency (NOAA). DMSP provides global visual and infrared imagery and other data four times daily using two satellites. The data is transmitted to the Air Force Global Weather Center for retransmission to United States military forces worldwide. It is also transmitted to transportable readout stations established in key locations throughout the world to support tactical operations. This information is also shared with NOAA which, in turn, provides the military users access to their Geostationary Operational Environmental Satellite System (GOES). This is a three satellite system designed primarily to provide weather data for the continental United States.<sup>9</sup>

The Soviet Union operates a worldwide satellite weather system similar in some respects to the system operated by the United States. It provides global data, including automatic picture transmission of clouds, ice cover, atmospheric radiation, weather fronts and jet stream currents to three ground stations located within the Soviet Union. Although there is no in-

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<sup>7</sup> See generally, *NASA Authorization for FY80, Part 3: Hearings on S.357 Before the Subcomm. on Science, Technology, and Space of the Senate Comm. on Commerce, Science, and Transportation*, 96th Cong., 1st Sess. 1686-1688 (1979) (statement of William J. Perry) (hereinafter, *Hearings on S.357*).

<sup>8</sup> SOVIET SPACE PROGRAMS, *supra* note 6, at 383-384.

<sup>9</sup> *Hearings on S.357*, *supra* note 7.

formation regarding military use of the system, it would not be unreasonable to assume that it is used for such purposes.<sup>10</sup>

#### D. *Mapping and Geodesy*

Accurate maps, geodetic measurement, and gravitational information are absolutely essential to military operations including planning, force deployment, navigation, and aiming and targeting. It is especially important with regard to long range missile targeting where maps of different parts of the world do not necessarily relate accurately to each other. It is illogical to develop a missile that is accurate to within several meters at intercontinental range and not be able to determine the location of the target within the same margin of error. Such accuracy is possible, however, using data gathered from satellites. With sophisticated triangulation techniques it has been possible to link worldwide grid patterns and to produce accurate maps and geodetic measurements. The Department of Defense, as well as NASA and NOAA, is engaged in this activity.

The Soviet Union has acknowledged the use of satellites for mapping and geodesy but has not disclosed particular flights or methods used. It must be presumed, however, that their geodetic work has kept pace with their military and scientific needs and requirements.<sup>11</sup>

#### E. *Surveillance*

Our primary means of alert in the event of a ballistic missile attack is provided by satellite. The early warning system consists of geostationary satellites with the capability of providing real time data on intercontinental and submarine launched ballistic missiles. Corroboration of missile launch and flight direction is provided by ground early-warning radar systems. In addition to missile launch data, surveillance satellites also detect and transmit information on nuclear explosions.

#### F. *Reconnaissance*

An important use of space by the United States is satellite intelligence. The Secretary of the Air Force, Dr. Hans Mark, spoke of strategic reconnaissance as one of the three major priorities that will dominate Air Force concerns in 1980. In his remarks, Dr. Mark considered strategic reconnaissance so important that he referred to it as the fourth leg of our strategic triad.<sup>12</sup> He cited two reasons for this importance: 1) to monitor and verify strategic arms limitation agreements; and 2) to perform strategic indications and warning functions which are best done from space. In an era of

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<sup>10</sup> SOVIET SPACE PROGRAMS, *supra* note 6, at 363-380.

<sup>11</sup> *Id.* at 382.

<sup>12</sup> The strategic triad, consisting of strategic bombers with cruise missiles, submarine launched missiles and intercontinental ballistic missiles, is the basis for our strategic deterrence.

"essential equivalence" it will be more important than ever to know precisely what our potential adversaries are doing, and the best place from which this can be done is from the space that surrounds the earth.<sup>13</sup>

President Carter publicly recognized United States' use of reconnaissance satellites in a speech at the Kennedy Space Center in October 1978 when he said:

Photo reconnaissance satellites have become an important stabilizing factor in world affairs in the monitoring of arms control agreements. They make an immense contribution to the security of all nations. We shall continue to develop them.<sup>14</sup>

The Soviet Union has made no official announcement of space reconnaissance activity, but such activity can be easily deduced by the number of launches in the Cosmos series and the time, duration and path of their orbits.<sup>15</sup>

### G. *Fractional Orbital Bombardment System Satellites (FOBS)*

By using space guidance and reentry technology it is possible to place an intercontinental ballistic missile in orbit at a depressed apogee and to guide it downward as it nears the target. Using this technique it is possible to approach the target from either direction of a great circle path thus complicating detection and reducing warning time. Since such devices fail to achieve full orbit they fall short of violating the prohibition against orbiting weapons of mass destruction.<sup>16</sup> They will be prohibited, however, by the SALT II Treaty should it become effective. The Soviet Union tested FOBS from 1967 to 1971 and apparently has the capability to employ such a weapon should it choose to do so.<sup>17</sup> The United States on the other hand does not consider such a system cost effective.<sup>18</sup>

Presumably both the United States and the Soviet Union possess the technology to develop the capability to orbit conventional (non-nuclear) bombs. Although such practice would not violate the prohibition in the Outer Space Treaty against orbiting weapons of mass destruction, it does not appear to be a practical application of technology.<sup>19</sup>

<sup>13</sup> Remarks of Dr. Hans Mark, Secretary of the Air Force, at the Air War College graduation ceremony, Maxwell A.F.B., Alabama (May 22, 1979), published in SUPPLEMENT TO THE AIR FORCE POLICY LETTERS FOR COMMANDERS, PUB. NO. 7-1979, AIR FORCE SERVICE INFORMATION AND NEWS CENTER, KELLY, A.F.B., TEXAS (1979).

<sup>14</sup> Remarks of President Carter, *supra* note 1, at 1686.

<sup>15</sup> See generally, SOVIET SPACE PROGRAMS, *supra* note 6, at 390-393, 457-478.

<sup>16</sup> See, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 at Article IV (effective Oct. 10, 1967) (hereinafter the Outer Space Treaty).

<sup>17</sup> SOVIET SPACE PROGRAMS, *supra* note 6, at 393-395, 418-423.

<sup>18</sup> *Id.* at 348-400.

<sup>19</sup> The Outer Space Treaty, *supra* note 16.

## H. *Satellite Survivability*

Most satellites are classified as "soft targets" because they are unprotected. If a satellite abruptly ceases to function, it could simply be a malfunctioning of the satellite or it could be something more sinister, such as an attack. It is this latter event where knowledge is vital. To provide this information the satellite may be equipped with sensors to warn of the approach of another space vehicle or with impact sensors to alert when the satellite has been damaged or destroyed. To be effective several independent impact sensors should be installed to insure that one may survive long enough to warn of the attack.

The satellite may also be hardened to withstand attack and may have redundant circuitry to take over in the event of damage. The satellite may also be equipped with countermeasures to prevent detection, or to take evasive action. Another method that may be employed to protect communication and command and control satellites is the use of so-called dark satellites. These are satellites that are launched into high orbits but not turned on thus making detection difficult. In the event of armed conflict they may be activated at the precise moment of need.

## III. THE SPACE SHUTTLE

### A. *Capabilities*

The Space Shuttle will provide the military services "routine access to space" with more reliability and at lower cost.<sup>20</sup> It will carry twice the weight and three times the volume of the Titan III and will change our method of designing and using satellites.<sup>21</sup> But more importantly, the Shuttle will permit emphasis on the human factor in space operations. Each Shuttle will have a crew of three or four and the capacity to carry four passengers who most probably will be scientists, engineers or technicians. These individuals will have the ability to launch new satellites, to inspect, repair and refuel old satellites or to retrieve them for return to earth for repair or modifications not possible in space. They may also perform tests and experiments in orbit or assemble large structures, such as orbiting space stations. Given this capability, it is not difficult to imagine large numbers of individuals, civilian and military, living and working in space.<sup>22</sup>

Internationally, a controversial aspect of the Shuttle is the perceived possibility of its use in an anti-satellite role. The Department of Defense

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<sup>20</sup> Mark, *The Impact of Our Enterprise in Space*, 1 TECH. IN SOC'Y 47, 47-50 (1979).

<sup>21</sup> Remarks of Brig. Gen. Brian D. Ward, Director of Science and Technology, Air Force Systems Command, to the 50th Shock and Vibration Symposium Springs (1979), reported in AIR FORCE POLICY LETTERS FOR COMMANDERS, PUB. NO. AFRP 190-1 (Dec. 15, 1979).

<sup>22</sup> Mark, *supra* note 20, at 51. In Dr. Mark's view, at some point it will be less expensive to repair spacecraft than to launch new ones and at that point permanent orbiting space stations capable of housing large numbers of people will be constructed.



however, has consistently maintained the Shuttle will not be used to interfere with any other nation's space program. The Shuttle is designed to serve as a transporter and not in an anti-satellite role.<sup>23</sup> Current Department of Defense plans concerning destruction of satellites involve using aircraft to launch an anti-satellite system at extremely high altitudes.<sup>24</sup>

One of the most important roles of the Shuttle will be to increase the survivability of our own space systems. More satellites may be launched, at a more reasonable cost, allowing us to proliferate our system thus making it harder to negate. Within the satellite itself we can add shielding and protective materials. We can also add redundant subsystems for reliability and sensors and countermeasures to make them less vulnerable to attack. Weight constraints have prevented this luxury in the past. Finally the Shuttle provides the capability to add more propellant or to replace batteries in order to increase mission duration and, importantly, to provide the capability of maneuverability.

#### B. *The Air Force Role*

The Air Force is the executive agent of the Department of Defense for Space Transportation System planning and operation.<sup>25</sup> In this capacity the Air Force has five tasks:

(1) Work closely with NASA to assure that the Shuttle will be designed to meet all military requirements.

(2) Transition all military space system pay loads from launch on current expendable boosters to launch on the Shuttle. A minimum number of Titan III boosters are being procured as backups for critical payloads in the event operational status of the Shuttle is delayed, or the Shuttle is grounded for a short period after it becomes operational.

(3) Develop the Inertial Upper Stage (IUS) for use with the Shuttle to boost military payloads into higher orbits than is possible with the Shuttle Orbiter alone. NASA will also use the IUS for synchronous orbit and for planetary missions. The IUS will be carried to initial orbit (150 to 160 miles) in the cargo bay of the Shuttle. Once in orbit the IUS with its solid propellant motors can place objects in higher orbits or into interplanetary trajectories.

(4) Develop a west coast launch and landing facility at Vandenburg AFB, California. The west coast facility is necessary for sun synchronous, polar and near polar orbits.

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<sup>23</sup> Washington Post, June 5, 1979, at 3.

<sup>24</sup> *Department of Defense Authorizations for Appropriations for FY80, Part 5: General Procurement and Civil Defense: Hearings on S.428 Before the Subcomm. of General Procurement of the Senate Comm. on Armed Services, 96th Cong., 1st Sess. 2642-2688 (1979)* (statement of Gen. Thomas P. Stafford) (hereinafter, *Hearings on S.428*).

<sup>25</sup> Remarks of Maj. Gen. Edwin A. Coy, Director of Space Systems and Command, Control, Communications, U.S.A.F., reported in AIR FORCE POLICY LETTERS FOR COMMANDERS, PUB. No. 11-1978 at 14 (1978).

(5) Build a space operation center for flight control of the military missions of the Shuttle.

#### IV. NATIONAL SPACE POLICY

On May 11, 1978, President Carter signed a Presidential Directive which established national policies regarding United States activities in and related to space.<sup>20</sup> In this directive President Carter reaffirmed that the United States is committed to:

- exploration and use of outer space for peaceful purposes and the benefit of all mankind.
- the increase of knowledge and development of useful commercial and governmental applications of space technology and maintain United States leadership in space technology.

The Directive also provides that:

- The United States is committed to the exploration and use of outer space in support of its national well-being.
- The United States rejects any limitations on the fundamental right to acquire data from space.
- The United States will pursue activities in space in support of its right of self-defense and thereby strengthen national defense, the deterrence of attack and arms control agreements.
- The United States will develop and operate on a global basis active and passive remote sensing operations in support of national objectives.
- The United States will develop, manage, and operate a fully operational Space Transportation System (STS) through NASA, in cooperation with the Department of Defense.
- Our national security related space programs will conduct those activities in space which are 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.
- The United States finds itself under increased 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 the opportunity 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 bilateral discussions on limiting certain activities directed

<sup>20</sup> Announcement of Administration Review, 14 WEEKLY COMP. OF PRES. DOC. 1136-1137 (June 20, 1978).

against space objects, which we anticipate will be consistent with the overall United States goal of maintaining any nation's right of passage through 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 United States Space defense program shall include an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems.

The Air Force Manual on Military Space Doctrine echoes this national policy and provides the following statement regarding the political-military environment:

Military space-related activities are authorized by and regulated according to our nation's laws. They are affected by treaty commitments and by this nation's adherence to customary international law. National policy sets the tone for military space operations.<sup>27</sup>

#### V. PEACEFUL USE OF SPACE

President Carter has observed that the first great era of the space age is over. During this period of twenty-two years significant progress has been made toward the establishment of a legal regime to govern man's activity in space. Woven into the fabric of this regime are the concepts that space activities shall be peaceful, for the benefit and interest of mankind and in accordance with international law.

With regard to the peaceful use of space the United States has always expressed the concern that space activities be *limited* to peaceful purposes. On April 2, 1958, President Eisenhower, in a special message to Congress requesting the establishment of the National Aeronautics and Space Administration (NASA), stated:

Moreover, a civilian setting for the administration of space functions will emphasize the concern of our Nation that outer space be devoted to peaceful and scientific purposes.<sup>28</sup>

When the National Aeronautics and Space Act was passed in July 1958, Section 102 expressly provided:

The Congress hereby declares that it is the policy of the United States that activities in space shall be devoted to peaceful purposes for the benefit of all mankind.<sup>29</sup>

<sup>27</sup> AIR FORCE MANUAL, MILITARY SPACE DOCTRINE at 1-6, para. 1-3, 8-12.

<sup>28</sup> Statements by Presidents of the United States on International Cooperation in Space, a Chronology: Oct. 1957-Aug. 1971, published in Senate Committee on Aerospace and Space Sciences, U.S. Government Printing Office at 12 (Sept. 24, 1971).

<sup>29</sup> National Aeronautics and Space Act of 1958, 42 U.S.C. § 2451(a) (1976) (hereinafter, NASA Act).

On a broader scale the concept of "peaceful purposes" from the outset was evident in the work of the United Nations. It was contained in the title of the *Ad Hoc* Committee on the Peaceful Uses of Outer Space when it was established almost simultaneously with NASA, and it was carried forward in the title to the permanent Committee on the Peaceful Uses of Outer Space (COPUOS) when it was created by a unanimous resolution of the General Assembly in 1959.<sup>30</sup> Two years later in the United Nations' first comprehensive resolution on outer space the term appeared both in the title and the body of the resolution which recognized that the common interest of mankind was served in furthering the peaceful use of outer space and established the United Nations as the focal point of international cooperation in the peaceful exploration and use of outer space.<sup>31</sup>

In 1963, the United Nations unanimously adopted Resolution 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space.<sup>32</sup> This resolution, which has been described as the Magna Carta of international space law,<sup>33</sup> declared that in the exploration and use of outer space states shall be guided by nine principles. Peaceful use, while not specifically mentioned in the nine principles, is recognized in the preamble as being in the interest of mankind.

#### A. *The Outer Space Treaty*

The Outer Space Treaty, passed by the General Assembly in 1967, was the first international agreement dedicated solely to the regulation of activities in outer space.<sup>34</sup> It amplifies and codifies principles previously expressed in United Nations Resolutions including the Declaration of Legal Principles. Even though the treaty is more declaratory than obligatory it is nevertheless a foundation document of guiding principles used in the formation of national policy with regard to space activities.

Articles I, II, and III of the Treaty established, in a broad sense, freedom for all nations to use outer space in accordance with international law including the Charter of the United Nations. Article IV<sup>35</sup> prohibits

<sup>30</sup> International Co-operation in the Peaceful Use of Outer Space, G.A. Res. 1472, 14 U.N. GAOR, Supp. (No. 16) 5, U.N. Doc. A/4354 (1960).

<sup>31</sup> International Co-Operation in the Peaceful Use of Outer Space, G.A. Res. 1721, 16 U.N. GAOR, Supp. (No. 17) 6, U.N. Doc. A/5100 (1962).

<sup>32</sup> Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962, 18 U.N. GAOR, Supp. 15, U.N. Doc. A/5515 (1964).

<sup>33</sup> O. OGUNBANWO, *INTERNATIONAL LAW AND OUTER SPACE ACTIVITIES* 14 (1975).

<sup>34</sup> The Outer Space Treaty, *supra* note 16.

<sup>35</sup> Article IV of The Outer Space Treaty, *supra* note 16, states the following:

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.

placing any nuclear weapon or any other weapon of mass destruction in orbit around the earth, in outer space or on the moon or other celestial body. Paragraph 2 of Article IV concerns the use of the moon and other celestial bodies exclusively for peaceful purposes and proscribes the establishment of military bases and fortification and testing of weapons on these bodies. Significantly, outer space is not included within the limitation of the second part of Article IV. The term "peaceful purposes" is mentioned only in relation to the moon and celestial bodies in Article IV and the pre-ambular recognition of the interest of all mankind in the use of outer space for peaceful purposes.

During the debate on the Outer Space Treaty in the General Assembly several delegations questioned the propriety of excluding outer space from the coverage of the second part of Article IV because to do so would create the implication that outer space may be used for non-peaceful purposes.<sup>36</sup> In this regard, Professor Dembling, then General Counsel of NASA provided the following explanation in a 1967 article on the evolution of the Outer Space Treaty:

However, it is a well known fact that both the United States and the Soviet Union have already launched satellites into outer space for military purposes, and examination of a ban on such satellites would have raised controversial issues presently within the purview of disarmament negotiations. The text of Article IV as agreed upon was concluded to be the most practical solution from the standpoint of expeditious conclusion of a treaty on outer space. As the Soviet delegate stated, "A number of questions would, of course, remain to be dealt with after the elaboration of the Treaty, particularly the use of outer space for exclusively peaceful purposes."<sup>37</sup>

The concerns of these delegates seems to be unfounded because Article III specifically provides that the exploration and use of outer space shall be carried out in accordance with international law including the United Nations Charter. Activities which would amount to threats to peace, breaches of peace or acts of aggression would thus be prohibited in outer space regardless of the omission in Article IV. Professor Dembling reached this conclusion in 1967 when he suggested:

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

<sup>36</sup> N. JASENTULIYANA & R. LEE, *MANUAL ON SPACE LAW*, vol. 1, chapter 1 (1979) (hereinafter, JASENTULIYANA & LEE).

<sup>37</sup> Dembling & Arons, *The Evolution of the Outer Space Treaty*, 33 *J. OF AIR LAW & COM.* 433-34 (1967).

In the interim, one might conclude that any military use of outer space must be restricted to nonaggressive purposes in view of Article III, which makes applicable international law including the Charter of the United Nations.<sup>38</sup>

### B. *Military Activities and Peaceful Purposes*

Perhaps one of the questions that the Soviet delegate had in mind was the extent of military activities permitted under the concept of "peaceful purposes." An examination of this question seems particularly appropriate in view of the increased capability provided by the Space Shuttle.

It should be noted at the outset that it is difficult to draw clear distinctions between the majority of military and civilian space programs. Communications satellites that relay civilian communications can also relay military communications. Similarly, satellites that provide navigational functions, weather data and mapping information are used in both military and civilian activities. Even remote sensing from space can serve not only a vital military purpose, but also can provide data on minerals, agriculture, forestry, natural disasters and environmental deterioration. Consequently, the technology of one generally benefits the other and vice versa. It is therefore impossible to "demilitarize" outer space completely.

Fortunately, drawing a clear distinction between military and civilian space activity has been unnecessary because, in the view of the United States, peaceful use of space does not equate to non-military use but rather non-aggressive use. This policy is reflected in the National Aeronautics and Space Act which specifically states that space activities shall be for peaceful purposes but provides in the same section for the conduct of space activities by the Department of Defense and the armed services.<sup>39</sup> In this regard, George Feldman, a principal architect of the National Aeronautics and Space Act, in an address to the International Aeronautical Federation in 1959 stated:

The word peaceful as used in the Act means non-aggressive rather than non-military. If peaceful means non-military and outer space can be used for peaceful purposes only, what happens to the inherent right of self-defense guaranteed by Article 51 of the United Nations Charter and by general international law.<sup>40</sup>

The American Bar Association Committee on the Law of Outer Space took a similar position by stating that peaceful is applied in contradistinction to aggression.<sup>41</sup>

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<sup>38</sup> *Id.* at 434.

<sup>39</sup> National Aeronautics and Space Act of 1958, 42 U.S.C. § 2451(a), (b) (1976).

<sup>40</sup> Beresford, *Surveillance Aircraft and Satellites: A Problem of International Law*, 27 J. OF AIR LAW AND COM. 109 (1960), quoting George J. Feldman address at 10th Annual Congress of the International Astronautical Federation, London, England (Sept. 4, 1959).

<sup>41</sup> Report of the Committee on the Law of Outer Space, American Bar Association (1959).

Moreover, the United States would not publicly pronounce that its space programs were intended for peaceful purposes while at the same time pursuing military space activities unless it considered these activities legitimately within the concept of peaceful purposes. Similarly, the United States would not have supported the United Nations resolutions and treaties concerning space activities, all of which have incorporated the "peaceful purposes" concept in some manner, unless it felt its military activities were in concert with that concept.

In addition, it seems clear that there is a consensus within the United Nations that "peaceful" equates to "non-aggressive." The United Nations has consistently woven the concept of "peaceful purposes" into its resolutions and treaties while being fully aware that the United States and the Soviet Union were engaged in military space activities. This view seems consistent with the Outer Space Treaty which provides in Article III that the use of outer space shall be in accordance with international law and the United Nations Charter. Neither international law nor the United Nations Charter prohibit nonaggressive military activities; consequently such activities are permitted. This analysis is supported by the fact that when the drafters of the treaty intended to prohibit an activity, they specifically did so, as was done in Article IV.

As discussed, military uses of space by the United States and the Soviet Union have been, and are, extensive. Discussing the extent of these uses is germane because it reflects the practice of States and this practice may be drawn upon in order to clarify any void or ambiguity that may exist in the Treaty.<sup>42</sup> The only serious objection to the space activities of the United States and the Soviet Union has been by several equatorial States regarding satellites in geostationary orbits. Even these objections were not directed at the military use of space, but rather the use of limited orbital locations.<sup>43</sup> Consequently State practice since the Treaty indicates that military use of outer space is subject only to the restrictions imposed by general international law including the United Nations Charter. These restrictions prohibit military activities only to the extent that they constitute aggression or a threat to or breach of the peace.<sup>44</sup>

Before leaving the discussion of State practice, some note should be taken of Soviet pronouncements as opposed to Soviet practice. Prior to 1963 their announced view was that "peaceful" meant "non-military" and

<sup>42</sup> Vienna Convention on the Law of Treaties, May 23, 1969, U.N. Doc. A/CONF. 39/27, reprinted in 63 AM. J. INT'L L. 875, 885 (1969).

<sup>43</sup> Gorove, *The Geostationary Orbit: Issues of Law and Policy*, 73 AM. J. INT'L L. 444 (1979).

<sup>44</sup> U.N. CHARTER art. 2, para. 4, states the following:

"4. 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."

that military use of space was illegal.<sup>45</sup> During this period the demilitarization of space was considered by the Soviets as only one element in the process of bargaining for global military advantage.<sup>46</sup> To this extent these pronouncements were largely political. After 1963 charges of illegality ceased to be mentioned; however, specific military use issues continued to be linked to disarmament.<sup>47</sup> The Soviets have always claimed that their space programs have been peaceful and scientific.<sup>48</sup> This is not to say, however, that they have been non-military. Their space programs, like those of the United States, in large measure, have been passive programs designed to render a supporting function, to provide strategic warning (defensive) capability, or to play an arms control role. To this extent they are "non-aggressive" and hence "peaceful."

### C. "Peaceful" as Non-Military

The scope of the "peaceful purposes" concept and the failure of the Outer Space Treaty to specifically define the concept or to include outer space in the peaceful purposes provisions of Article IV has been a popular topic of experts. The official United States view and the view of most experts is that military use of space is not prohibited by the Outer Space Treaty except to the extent that it constitutes aggression. State practice, reflecting as it does the realities of political power, has supported and reinforced this view.

A few experts, on the other hand, have taken a contrary view, concluding that "peaceful purposes" means "non-military purposes." They point to the fact that the Antarctica Treaty of 1959 and the Charter of the International Atomic Energy Agency defines "peaceful" to mean "non-military." Considering prior usage of the term in international conventions, together with Article I, paragraph 1, of the Outer Space Treaty,<sup>49</sup> and the applicability of the United Nations Charter and international law to outer space, they conclude that the "most convincing argument favors the non-military definition of peaceful purposes."<sup>50</sup> The obvious difficulty with this view is transposing the meaning of "peaceful" as specifically defined in the two conventions to the Outer Space Treaty. Although the term "peace-

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<sup>45</sup> LAY & TAUBENFELD, *THE LAW RELATING TO ACTIVITIES OF MAN IN SPACE* (1970) (hereinafter, LAY & TAUBENFELD).

<sup>46</sup> CRANE, *Soviet Attitude Toward International Space Law*, 56 AM. J. INT'L. L. 700 (1962).

<sup>47</sup> LAY & TAUBENFELD, *supra* note 45, at 99.

<sup>48</sup> W. H. SCHARER, *THE POLITICS OF SPACE*, 85 (1976).

<sup>49</sup> Article 1, para. 1 of The Outer Space Treaty, *supra* note 16, states the following:

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

<sup>50</sup> ZENDELIS & WADE, *Anti-Satellite Weapons and the Outer Space Treaty of 1967*, 8 CALIF. W. INT'L. L.J. 454, 474 (1978).



ful" is a common term in international relations, it lacks exact definition. It is a term more political than legal. It does not prohibit conduct as such, but rather describes a goal to be obtained. Its limits are those specifically defined by treaty or generally by international law and the United Nations Charter. This general limitation is non-aggression. As noted above, in two conventions it perhaps means "non-military" yet in the United Nations Charter, where it is used extensively, it obviously means "non-aggressive". In this regard Article III of the Outer Space Treaty would seem to argue for a "non-aggressive" meaning of "peaceful" rather than a "non-military" definition. Moreover, it seems reasonable that if the drafters desired to adopt the more restrictive definition of "peaceful" they would have done so. This is especially true when viewed from the standpoint of the specific prohibitions of paragraph 2 of Article IV. If the drafters had felt that the use of the term "peaceful purposes" was sufficient to proscribe all military activities then further elaboration of military activities would have been unnecessary.

Another view discussed in a recent article by Professor Markoff of the University of Fribourg, Switzerland, is that the misunderstandings and ambiguity inherent in the term "peaceful" can be avoided by application of the language of Article I providing that the exploration and use of outer space shall be carried out for the benefit of and in the interest of all countries.<sup>51</sup> In this regard Professor Markoff states:

In order to avoid misunderstanding and ambiguity inherent to "peaceful", a new principle implying a fixed obligation to use outer space exclusively for peaceful purposes, without specific reference to the language of "peaceful purpose" has been introduced into the text of the treaty. This has been accomplished through the provision in the Principles Treaty that the exploration and use of outer space shall be carried out for the benefit and in the interest of all countries. The principle of peaceful purposes has been achieved through a form of circumlocution in which several words are employed rather than the single word "peaceful." This has produced a prescription which is a logical derivation and which undoubtedly excludes all military uses of outer space.<sup>52</sup>

The premise upon which this view is based is that the first paragraph of Article I prohibits all military activity, aggressive and non-aggressive, because such activity cannot be carried out in a manner to serve the benefit and interest of all countries.<sup>53</sup> Using this premise it is possible to construe each article in conjunction with other treaty articles and thus define "peace-

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<sup>51</sup> Markoff, *Disarmament and "Peaceful Purposes" Provisions in the 1967 Outer Space Treaty*, 4 J. OF SPACE L. 3, 11 (1976).

<sup>52</sup> *Id.* at 11.

<sup>53</sup> Zendalis & Wade, *supra* note 50, at 474.

ful" in Article IV with reference to paragraph 1 of Article I, as meaning "non-military".<sup>54</sup> Once "peaceful" is defined as "non-military", it is an easy step to expand the "peaceful purposes" provision of Article IV to include outer space.<sup>55</sup>

The difficulty with such interpretative gymnastics is that they fail to consider the intent of the drafters of the Outer Space Treaty or the subsequent practice of States. It is quite clear that the delegates considered and refused to include outer space within the ambit of the peaceful purposes clause of Article IV.<sup>56</sup> It was simply not intended. The Outer Space Treaty is a historic document representing a great advancement in the legal regime of space but it is not a perfect document. It is the best agreement that could be obtained at the time leaving the several lacunae to be filled by future negotiation or by State practice. To go beyond the intent by legal interpretation of Article I, III and IV is not only pointless, but violates the cardinal rule of treaty construction.

In addition to the "intent of the drafter's" argument there is a serious flaw in the basic premise that military activity can only benefit the nation or group of nations engaged in such activity and therefore cannot benefit "all countries" as required by Article I. Peace, of course, benefits all nations and such arguments overlook the very real benefit to world peace served by some military activities. The verification of arms control agreements by military space activities is one that immediately comes to mind. Such activity is obviously stabilizing rather than destabilizing. Other examples that are essentially stabilizing and thus contributing to world peace are satellites that warn of ballistic missile launching and nuclear explosions. Without such satellites uncertainty would develop, generated by secret development of weapons or the suspicion of such activity. This uncertainty would be destabilizing and a threat to peace:

A strong case can be made that the avoidance so far of nuclear war over the last thirty years or more has depended heavily on the availability to the major nuclear power of precise information indicating the lack of preparation by potential opponents for such a war. Military surveillance and reconnaissance satellites have made major contributions toward providing such information. Neither the Nuclear Test Ban Treaty prohibiting the testing of nuclear explosive devices in the waters of the oceans, in the atmosphere or in outer space, nor the Strategic Arms Limitation Treaty could have been achieved without the availability of such satellites.<sup>57</sup>

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<sup>54</sup> *Id.* at 472.

<sup>55</sup> *Id.* at 477.

<sup>56</sup> JASENTULIYANA & LEE, *supra* note 36, at 8.

<sup>57</sup> Criswell, Clazer, Mayur, O'Leary, O'Neill, & Vajk, *The Rule of Space Technology in the Developing Countries*, presented at the N.G.O. Forum on Science and Technology for Development, Vienna, Austria (Aug. 19-29, 1979).

Finally, the argument overlooks the role of strategic deterrence in world peace and the role played by military space activities in enhancing the deterrence capability of a nation. While total demilitarization of space is unquestionably appealing, just as a total disarmament is appealing, it does not appear practical either politically or technically; nor was it intended by the framers of the Outer Space Treaty. Total demilitarization of space is inextricably tied to total disarmament. To demilitarize space without considering the effect of such demilitarization on the realities of the military environment would be extremely destabilizing. Consequently, for the foregoing reasons it appears that the better view from a political, practical and legal standpoint is that peaceful military activity is the equivalent of non-aggressive activity.

## VI. AGGRESSION

Having concluded that non-aggressive military activity is legally permissible in space it may be useful to briefly discuss aggression. Unfortunately, aggression is not easily defined. The difficulty is that acts considered aggression by the victim may be considered by the other party (State) as legitimate means toward the accomplishment of legitimate goals. This difficulty was reflected in the almost seven years of debate in the United Nations Special Committee on the Question of Defining Aggression in its attempt to formulate a definition. The definition, formulated by the consensus process, was adopted by the General Assembly in 1974,<sup>58</sup> and is as follows:

Aggression is the use of armed force by a State against the sovereignty, territorial integrity or political independence of another State or in any other manner inconsistent with the Charter of the United Nations, as set out in this definition.<sup>59</sup>

It also provides that nothing in the definition shall be construed to enlarge or diminish the scope of the United Nations Charter including its provision concerning cases in which the use of force is lawful.<sup>60</sup>

Consequently, by its terms the definition incorporates all of the uncertainties and ambiguities of the United Nations Charter in addition to adding many of its own.<sup>61</sup> It does not limit the right to maintain military forces, the location of these forces or the use of these forces so long as their use is permitted under the terms of the United Nations Charter. Consequently, for the most part "aggression" continues to reflect the meaning imposed on it by the parties to a conflict.

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<sup>58</sup> G.A. Res. 3314 (XXIX), 29 U.N. GAOR, Supp. 142, U.N. Doc. A/9631 (1975).

<sup>59</sup> *Id.* at Article 1.

<sup>60</sup> *Id.* at Article 6.

<sup>61</sup> See generally, Stone, *Hopes and Loopholes in the 1974 Definition of Aggression*, 71 AM. J. INT'L. L. 224, 224-246 (1977).

## VII. SELF-DEFENSE

Article 51<sup>62</sup> of the United Nations Charter specifically reserves to nations the inherent right of individual and collective self-defense. The language of Article 51 is somewhat ambiguous in that the inherent right of self-defense is preserved only in the circumstances of "an armed attack." Although this language seems to limit the right of self-defense to circumstances where an armed attack has already taken place, such a view is not particularly realistic. This is especially true in view of the massive destructive power of modern weapons and the ability to deliver these weapons on targets anywhere in the world within minutes. Such weapons systems leave little time for self-defense after an "armed attack." The better view is that the specific language does not detract from the traditional right of nations to react defensively to the threat of armed conflict.<sup>63</sup> Consequently, in response to the threat of an armed attack which is "imminent," defensive action in anticipation of such a threat would be justified and permissible under Article 51.<sup>64</sup> Obviously we are dealing here with an extremely dangerous situation which is directly related to a nation's view of what level of actions constitute a threat so serious as to cause them to respond. In this regard Professors McDougal and Feliciano offer the following guidance:

There is a whole continuum of degree of imminence or remoteness in future time from the most imminent to the most remote, which, in the expectation of the claimant of self-defense, may characterize an expected attack. Decision makers sought to limit lawful anticipatory defense by projecting a customary requirement that the expected attack exhibit so high a degree of imminence as to preclude effective resort by the intended victim to non-violent modalities of response.<sup>65</sup>

Obviously the application of this rule is subjective, depending to a large extent on the political circumstance prevailing at the time.

## VIII. MILITARY USE OF THE SHUTTLE

In the beginning of this article it was observed that the Space Shuttle is the first step in the evolution of a reusable spacecraft — one that can operate both in air space and outer space. It provides, for the first time in forty years, new technology for launch vehicles which will result in more convenient access to space, increased payload capacity and, importantly, the

<sup>62</sup> U.N. CHARTER art. 51, provides in part that:

"Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, . . ."

<sup>63</sup> MCDUGAL & FELICIANO, LAW AND MINIMUM WORLD PUBLIC ORDER — THE LEGAL REGULATION OF INTERNATIONAL COERCION 231-241 (1961) (hereinafter MCDUGAL & FELICIANO).

<sup>64</sup> See generally, DeSaussure & Reed, *Self-Defense - A Right in Outer Space*, 7 A.F. JAG. L. REV. 38, 38-45 (1965).

<sup>65</sup> MCDUGAL & FELICIANO, *supra* note 63, at 231.

capability to carry passengers.<sup>66</sup> The Department of Defense and NASA are working closely to insure that the Shuttle will be compatible with future military space requirements. Current plans call for a gradual phasing out of the more expensive expendable boosters now used for military space programs and switching to Shuttle use during the 1980's.

Military Shuttle activities seem logically to fall into at least two categories for the purposes of this discussion.

Category One - Activities that represent a continuation of the current military space programs.

Category Two - Activities that may be classified as defensive measures that heretofore have been impracticable because of weight and cost.

Included within the first category are the military space applications currently used by the United States and the Soviet Union.<sup>67</sup> These include communication, meteorology, navigation, mapping and geodesy, early warning, surveillance and photo reconnaissance to monitor arms control agreements. As noted earlier these are passive applications from the standpoint that they do not possess a direct offensive capability. This passive classification by no means lessens their military importance, and certainly in the event of armed conflict many would be prime military targets. They are passive in that they are supportive of self-defense military operations but are not the actual weapon system. So long as these activities are used within the terms of the United Nations Charter they are well within legal parameters of military space uses. The Space Shuttle will not change this classification. The Shuttle is merely a change in launch technology and while it may provide the means to place in orbit heavier, more sophisticated satellites, it will not affect their legality.

The second category includes applications designed to protect satellites not included within the first category. This second category recognizes the vital national importance of satellites contained in the first category and the need to protect them. It does not contemplate a change in mission or function. As was mentioned earlier in the section on satellite survivability, if a satellite ceases to function it could either be a simple malfunction of the satellite itself or it could be some interference with or destruction of the satellite. Knowing the difference is vital because the latter could signal the imminence or beginning of a massive attack.

The Space Shuttle could be used in a variety of ways to enhance survivability of satellites.<sup>68</sup> It could be used to launch a new generation of

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<sup>66</sup> For a general discussion on the technical aspects of the Shuttle and its ability to carry passengers, *see generally*, Mark, *supra* note 20, at 47-51.

<sup>67</sup> Not included within this category are the fractional orbital bombs and killer satellites that have been tested by the Soviet Union.

<sup>68</sup> *See generally*, *Hearings on S.428, supra* note 24.

hardened satellites designed to warn of interference or destruction. Satellites could also be equipped with redundant systems and systems that would permit it to take evasive action, all of which would enhance survivability. As the cost per launch is reduced it could place redundant or decoy satellites in orbit making total destruction of the system more difficult. In addition to new satellites, the Shuttle could transport men and equipment into space to modify existing systems to make them more survivable.

Even though the Shuttle may provide the capability and flexibility to provide more survivable satellites, it does not change the basic passive nature of these satellites. A communications satellite that is "soft" and one that is "hardened" nevertheless have the same communications function and consequently are well within the legal parameters of military space use. Even satellites equipped with some type of futuristic weapon to sense and destroy a "killer satellite" that may be on a collision course with it, are still within these parameters. The reason is that the weapon is designed for the defense of its host and remains inert until needed to repel an attack. For similar reasons satellites that are booby trapped to prevent interference or inspection are not illegal.

The mere placing of a non-nuclear weapon in space, even if it has the capability to be used offensively, does not exceed the parameters of military space use. Moreover, if the weapons are used, such use may be legally permissible if within the principles of self-defense found in the United Nations Charter.

### IX. MILITARY PERSONNEL IN SPACE

There is another aspect of military Shuttle activity that transcends the categories of military activities discussed in the previous section. This aspect is the shift from machine to man-oriented space activities. Each military Shuttle mission contemplates a flight crew and possibly engineers and technicians, all of whom could be military personnel. Their activities could span the entire range of military space activities. They could repair and refurbish military satellites, place new ones into orbit, experiment with and test new systems and techniques and, as technology permits, construct systems for space defense. Eventually such personnel could live and work in space from orbital space stations.

Two questions arise from such activity. First, would large numbers of military personnel performing military duties in space be within the parameters of permissible military space activity? The obvious answer is that manned military space activities, like unmanned military activities, are not prohibited so long as they are not conducted on the moon or other celestial body in violation of the Outer Space Treaty or of a nature that would violate the United Nations Charter. The governing factor is not whether an activity is manned by military personnel nor the number of such

personnel, but rather, the conduct of such personnel tested against the prohibition of the United Nations Charter.

The second and more difficult question involves the status of military personnel in space. Are they entitled to the protection and assistance which are available to astronauts under the humanitarian provisions of the Outer Space Treaty and the Agreement on the Rescue and Return of Astronauts?<sup>69</sup> Concern for astronauts first appeared in the 1963 United Nations Declaration of Legal Principles Governing Activities and Use of Outer Space in which astronauts were regarded as envoys of mankind and were to be rendered all possible assistance in the event of accident, distress or emergency.<sup>70</sup> This concern was also expressed in Article V of the Outer Space Treaty which again provided that astronauts shall be regarded as envoys of mankind and rendered all possible assistance. The article also provides that in carrying out activities in outer space, astronauts of one State party shall render all possible assistance to astronauts of other States parties. Neither of the above documents elaborate on or define the extent of the term "astronaut" nor is it defined in the more specific Rescue and Return Agreement of 1968. The term is defined broadly, however, in the first edition of the *NASA Dictionary of Technical Terms for Aerospace Use*, as "a person who rides in a space vehicle."<sup>71</sup> The same publication referred to a cosmonaut as a Soviet astronaut.<sup>72</sup> *The Soviet Encyclopedia of Space Flight*, published in 1969, defines a cosmonaut as "a person who has undergone special medical, biological and technical training and has taken part in a space flight as pilot or crew member."<sup>73</sup> Other United States publications of the period referred to astronauts as "one who flies or travels in a spacecraft,"<sup>74</sup> "a person who flies in space whether he navigates and/or controls the spacecraft, or is a passive passenger,"<sup>75</sup> and "passengers, pilots and crew."<sup>76</sup>

With regard to the Rescue and Return Agreement it is significant that the term "astronaut" is used only in the title of the agreement. In the substantive provisions the category of persons covered by the agreement are referred to as "the personnel of a spacecraft." Such language seems clearly designed to avoid any uncertainty that may be inherent in the

<sup>69</sup> Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, April 22, 1968, 19 U.S.T. 7570, T.I.A.S. No. 6599 (effective Dec. 3, 1968).

<sup>70</sup> Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962, 18 U.N. GAOR, Supp. 15, U.N. Doc. A/5515 (1964).

<sup>71</sup> DICTIONARY OF TECHNICAL TERMS FOR AEROSPACE USE 21 (1st ed. NASA, 1965).

<sup>72</sup> *Id.* at 69.

<sup>73</sup> PROFESSOR G. V. PETROVICH, *THE SOVIET ENCYCLOPEDIA OF SPACE FLIGHT* 85 (1969).

<sup>74</sup> R. TURNILL, *THE LANGUAGE OF SPACE* 9 (1971).

<sup>75</sup> J. L. NAYLER, *A DICTIONARY OF ASTRONAUTICS* 21 (1964).

<sup>76</sup> W. CAIDIN, *THE MAN IN SPACE DICTIONARY* 29 (1963).

term "astronaut." At least one commentator, on the other hand, is of the view that "personnel" refers only to pilots, crew members, scientists, technicians and physicians accompanying the flight and that "other passengers" must be excluded.<sup>77</sup> This appears to be much too narrow a view especially since the principal drafters of the agreement, the United States and the Soviet Union, chose to use the broader term, "all personnel," rather than "astronaut" or "cosmonaut." Additionally, by using the term "all personnel" no distinction is made between military and civilian personnel.

## X. CONCLUSIONS

The second great era of space will begin with the Space Shuttle which is the first step in the evolution of a reusable spacecraft. The Shuttle, employing new launch and recovery technology, will provide relatively easy access to space by man. It provides the opportunity to develop new space applications — to build and live in space. This will include not only civilian scientific and commercial development but military activity as well.

The Shuttle will be involved in all facets of military space activity. This activity involves both force enhancement and space defense. The use of space systems for navigation, communication, meteorology and strategic reconnaissance multiplies the effectiveness of our surface, sea and air forces. The use of space systems for defense provides the capability of detecting and analyzing threats and to provide timely warning and assessment of strategic attack to the National Command Authority. Space defense also involves the protection of space assets to optimize their capabilities and enhances deterrence by developing the capability to deny or nullify aggressive acts in or through space. These military space systems are vital to the national security of the United States and must be protected. Moreover, as civilian activity in space increases as a result of the Shuttle and other spacecraft of its gender, there will be a concurrent need for their protection as important national assets. The Space Shuttle will provide the flexible capability for this protection.

The nature and extent of the military activities of the Space Shuttle are limited only by the legal regime for space operations that has developed over the past two decades. The Shuttle itself is a space vehicle — a transporter of men and materiel. It is not unlawful. However, it uses must be within the parameters of the legal regime of space. Uses which may be totally for military purposes are not proscribed so long as they meet the test of peacefulness, that is non-aggressive. Moreover the Shuttle may be used in any manner that is consistent with the right of self-defense inherent in international law and the United Nations Charter. This may include

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<sup>77</sup> N. JASENTULIYANA & R. LEE, *MANUAL ON SPACE LAW*, vol. 1, (1979); *See, specifically, Chapter 2, "Assistance to and Return of Astronauts and Space Objects"* at 54.



as permissible activity the hardening of satellites to enhance their survivability and arming them in some manner so they may be defended in the event of attack.

The Space Shuttle while engaged in such military activity may transport military personnel in space either as support personnel or as operators of space systems. Their status, civilian or military, is not determinative. What is determinative is their conduct. They are not prohibited in space so long as their conduct is non-aggressive or is necessary for self-defense. Moreover, because they qualify as "personnel of a spacecraft" they are entitled to the humanitarian protection of the Rescue and Return Agreement.