Furthermore, in the Earth-orbital regions most used by humans, if the number of orbiting objects was limited to that which has been previously catalogued, it would already constitute the beginning of a crowding problem. Approximately 23,000 orbiting artificial objects have been catalogued in the past three decades. Of these, 7,200 remain aloft. Objects in space seldom remain the same as they would on the ground. They actually create debris. It is estimated that for every trackable object, 20 untrackable 1 centimeter objects and 10,000 untrackable 1 millimeter objects are created. Because only objects of a certain size can be catalogued, only estimates can be made on the actual number of objects that exist in orbit. (See figure 2).[1]

The use of all three types of space orbits will continue to be in high demand for certain space activities. Consequently, continued space activities involving the launching of satellites and other space objects can only increase the number of satellites (and orbital objects created from their launching) already existing in these orbits. In this sense, low Earth, geostationary and elliptical orbital slots around the Earth are limited. These orbits are therefore valuable to those States and private parties wishing to use space for certain space related activities. To utilize space resources equitably in order to preserve outer space for future users and to lessen the possibility of disastrous space collisions,[2] it is essential to develop mechanisms for the concrete and comprehensive management of space.

In light of increasing public awareness of the state of the global terrestrial and space environment, there has been much discussion and debate on the overcrowding of space and the resultant creation of orbital debris. Because all nations of the world enjoy an equal right of access to space, overcrowding of orbits in space is a topic of interest to all countries and especially those that have not yet entered into the realm of outer space activities. States already engaged in space activities are expected to maintain space in a way that would not be detrimental to the interests of States, who in the future, may want to conduct space activities.[3] In fact,

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1 D. Portree and J. Loftus, *Orbital Debris and Near-Earth Environmental Management: A Chronology*, at 1 (NASA 1993). It must also be noted that billions of tiny aluminum particles sprayed by solid rocket motors and clouds of snowflakes formed from waste water are produced by the Space Shuttle. Because the smallest trackable item is about 10 centimeters across, these items are also too small to be detected by conventional tracking techniques. *Id.*

2 It is interesting to note that all objects in space have the potential to collide and cause great amounts of damage to other space objects. The average speed of collision in LEO is about 10km/sec. It is simple physics to calculate that a 1 centimeter object with a mass of a few grams traveling at such high speeds has as much force as that of a 250 kilogram object traveling at 100 kilometers per hour. *See generally id.*

3 See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, art. I, opened for signature, 27 January 1967, 67 UNTS 205 (hereinafter the Outer Space Treaty). The Outer Space Treaty entered into force 10 October 1967. Article I states: "Outer space, including the Moon and other Celestial Bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies." *Id.* Moreover, article II prohibits States Parties from appropriating outer space through national sovereignty,

all States currently involved in space activities have implemented various debris mitigation and prevention techniques intended to reduce the amount of objects jettisoned into outer space during space flight. Recently, the First European Conference on Orbital debris took place in Darmstadt, Germany, where various problems and solutions associated with orbital debris were discussed and analyzed.

Both the United States National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) have in place policies that seek to minimize the creation of orbital debris. ESA has adopted requirements that are specifically meant to minimize the creation of orbital debris during ESA space programs with the ultimate goal of environmental protection. These include fuel venting and removal of spent satellites to graveyard orbits. For ESA, reorbiting to a disposal or graveyard orbit is an *interim* measure. Ultimately, removal of the satellite will need to be performed.[4] The United States has also adopted policies to minimize the creation of orbital debris. These include measures designed to prevent launch vehicles from exploding or breaking up as well as special spacecraft design and construction to resist environmental degradation from atomic oxygen and solar radiation.[5] Moreover, the United States has a policy of encouraging "other space-faring nations to adopt policies and practices aimed at debris minimization."[6]

The purpose of this article is to examine the legal aspects of the concept of space salvage operations (otherwise known as "astrosalvage")[7]

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occupation, use or other means. *Id.*

4 *See* W. Flury, *European Activities on Orbital Debris, in* 1 PROC. EUROPEAN CONFERENCE ON ORBITAL DEBRIS, DARMSTADT, GERMANY, 5-7 APRIL 1993, at 27, 31 (1993).

5 U.S. Congress, Office of Technology Assessment, *Orbiting Debris: A Space Environmental Problem-Background Paper*, OTA-BP-ISC-72, at 22-23 (1990).

6 *Id.* at 33, citing White House Fact Sheet, *"Presidential Directive on National Space Policy"* (Feb. 11, 1988). In fact, this Office of Technology Assessment Background Paper goes on to state that some sort of concerted international action may be necessary in order to reduce the threat of orbital debris. *See id.* at 39. According to this report, it was appropriate for the United States to convene a working group of space-faring nations to discuss and reach agreement on mitigation efforts and then to expand those discussions to include other nations with an interest in space activities. *See Id.* At present in Japan, there are no national regulations on the management of space debris. The Government of Japan feels that it is still too early to even start considering establishment of such a regulatory framework. What is in place, however, is a process where both launching organizations in Japan, the National Space Development Agency (NASDA) and the Institute of Space and Astronautical Science (ISAS), must receive prior approval for every launch from the Space Activities Commission (SAC). In its evaluation during the approval process, the SAC considers the possibility of contamination of the space environment and the risk of damaging other spacecraft. This thorough review process to approve a launch can be considered as a way to provide good management of space debris without a fixed and specific legal framework. Information from officials from the Space Planning Division of the Japanese Science and Technology Agency and NASDA.

7 "Astrosalvage" is a term used by some authors to describe the possibility of salvors capturing and retrieving space objects, component parts and/or orbital debris of other launching States and then bringing a salvage claim asking for compensation for the capture and retrieval operation. *See generally,* 9 STUDIES IN AIR AND SPACE LAW 257-86 (K.-H. Böckstiegel ed., C. Heymanns Verlag 1990),

performed specifically to reduce the quantity of space objects, component parts and orbital debris in space. The legal framework of analysis for this article will begin with a discussion of existing space law concerning space objects, component parts and orbital debris, including a discussion on the rights and duties of launching States. In light of the potential for "astrosalvage" operations, it is also useful to consider laws and legal principles governing marine salvage operations of abandoned and derelict craft.

Although there are basic legal conceptual differences between the salvage of abandoned sea craft and the salvage of space objects, primarily due to their different technical characteristics, analyzing marine salvage law in terms of space salvage nevertheless can provide insight into possible new interpretations of the existing body of space law. The general concepts of abandonment at sea and the classification of derelict craft, therefore, may provide ideas and analogous situations to assist policy-makers in determining standards and practices for space salvage operations.

At present, the idea of "astrosalvage" as a means of space cleanup is not economically viable. In fact, although technically feasible, other potential solutions to overcrowding are less expensive and are therefore considered to be more practical in current economic terms. These include the use of higher (disposal or graveyard) orbits. However, it is possible that, in the future, a market for used space objects and used space parts may develop. Hence, commencement of international discussions on this issue in the context of space environmental maintenance would begin the process of deciding what should be accomplished to protect and preserve both the Earth and space environments for the benefit of future generations.

II. Major Provisions of International Space Law

A. Responsibility and Liability

Provisions concerning concepts of responsibility and liability of States for space activities are to be found in several treaties. Articles VI and VII of the Outer Space Treaty discuss responsibility and liability, respectively. Article VI states:

> States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. ...

According to this clause, it is the responsibility of a State Party to the Outer Space Treaty to insure that any space activity carried out by

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excerpts reprinted *in* C. Christol, SPACE LAW: PAST PRESENT AND FUTURE 249-261 (Kluwer 1991). *See generally* H. DeSaussure, *The Application of Maritime Salvage Law to the Law of Outer Space*, 28 PROC. COLLOQ. L. OUTER SPACE 127 (1986).

government agencies or nongovernmental entities is performed safely and in conformity with the Outer Space Treaty and existing regulations of that State. Space activities performed by non-governmental entities are also subject to continual supervision by that State Party.[8] In case of a space salvage operation by such bodies, it would be the responsibility of the State party to the Treaty to ensure that any space salvage activity is performed in compliance with the provisions of the Outer Space Treaty and, hence, according to Article III, with international law. Therefore, before any space salvage operation was to take place, a third party wishing to perform such an operation would have to fulfill any Outer Space Treaty requirements as well as other requirements established by the State Party to the Outer Space Treaty responsible for the activities of that third party. Among the most important would be the receipt of prior authorization to perform the salvage operation from that State Party.

Article VII of the Outer Space Treaty states:

> Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the earth, in air or in outer space, including the moon and other celestial bodies.

This article establishes international liability of States involved in the launching of an object into outer space which causes damage on the Earth, in air or in outer space, caused by an object launched into outer space from the territory of that State. These concepts are elaborated further in Articles II and III of the Convention on International Liability for Damage Caused by Space Objects.[9] Article II of the Liability Convention establishes absolute liability of a launching State for damage caused by its space object on the surface of the Earth or to aircraft in flight. Article III establishes liability of the launching State for damage to another space object of another launching State if the damage is due to the fault of the former launching State or persons or entities for whom that State is responsible.

An obvious question from a legal standpoint is proof or evidence of injury. How does an injured State prove that a space object, component part or orbital debris from a space object of another launching State has caused damage to persons or property from that State? According to Article II of

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8 Outer Space Treaty, *supra* note 3, art. VI.

9 Convention on International Liability for Damages Caused by Space Objects, opened for signature 29 March 1972, 961 UNTS 187 (hereinafter the Liability Convention). The Liability Convention entered into force 1 September 1972.

the Convention on Registration of Objects Launched into Outer Space,[10] launching States shall establish a registry to note the launching of objects into space and shall inform the Secretary General of the United Nations of the establishment of such a registry. Each State party to the Treaty determines the contents of the registry. Article IV asserts that each State of registry shall provide the Secretary-General with certain information concerning each launched space object noted in that State's registry. Particularly important to the general question of liability is the clause in Article IV concerning information provided by the launching State on the appropriate designator or registration number of the space object.[11]

The idea of registration does provide further incentive for launching States to remove space objects that can cause damage traceable back to the State of origin. However, although many space objects and their component parts and orbital debris can be tracked in space, it is not possible to track all pieces of debris that are also very capable of causing significant damage.[12] Furthermore, because of the untrackable and unidentifiable nature of most orbital debris, it is not known to whom all orbital debris belongs.

With respect to registration, if Articles II and III of the Liability Convention are read in conjunction with Article VII of the Outer Space Treaty, does the liability concept, with its resultant proof problems,

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10 Convention on the Registration of Objects Launched into Outer Space, opened for signature 14 January 1975, 1023 UNTS 15 (hereinafter the Registration Convention). The Registration Convention entered into force 15 September 1976.

11 *Id.* at art. IV, para. (b). Although chances are remote that the information provided by the launching State could be used to identify that a specific space object has in fact caused damage to another space object, the Earth or aircraft, if it were possible, albeit remotely at best, liability could be established against States responsible for the launching of the damage causing space object.

It has been argued that a failure of a State of registration to remove a hazardous space object in a timely manner or a failure of that State to allow another State to perform such a capture and removal operation should result in a finding of absolute liability of that State for damages. *See* H. Baker, ORBITAL DEBRIS: LEGAL AND POLICY IMPLICATIONS 71 (Nijhoff 1989). Determination of liability, provided the launching State responsible for that object is identifiable, could also be based on a theory of *res ipsa loquitur*. According to Black's Law Dictionary, Sixth Edition, *res ipsa loquitur* is defined as "the thing speaks for itself." It is a "[r]ebuttable presumption or inference that defendant was negligent, which arises upon proof that the instrumentality causing injury was in defendant's exclusive control, and that the accident was one which ordinarily does not happen in the absence of negligence." In the case of damage in space, the probability of actually witnessing the damage causing event is low. Hence, application of the res ipsa loquitur doctrine of liability to a set of facts where damage has occurred, would establish a rebuttable presumption of negligence to the State of registration thereby putting the burden of proof on that State to prove that it was, in fact, not its space object that caused the disputed damage. The caveat here, of course, is that the responsible launching State can be identified. *See* H. BAKER, ORBITAL DEBRIS: LEGAL AND POLICY IMPLICATIONS 71 (Nijhoff 1989). However to apply the *res ipsa loquitur* negligence theory, a duty of care must exist and the defendant must have exclusive control over the instrumentality, in this case, the space object. *See id.* Moreover, for all intents and purposes, this theory allows only for a reward of compensation to injured plaintiffs for damages suffered but, by no means does the theory provide practical solutions for the capture and removal of orbital debris. *Id.*

12 *See* figure 2 and refer to text accompanying footnote 1.

provide enough incentive to launching States to cleanup non-functional, damaged or destroyed space objects rather than incur costs resulting from subsequent damage to other functional space objects, the Earth or aircraft? Although not yet economically viable, capture and removal of nonfunctional, damaged or destroyed space objects could save a launching State the costs associated with liability if, of course, the responsible launching State is identifiable. In comparison with removal to higher (disposal or graveyard) orbits, in the case of nonfunctional satellites, capture and removal would at least assure the launching State that the retrieved object no longer poses a threat to other space objects, aircraft or the Earth.

B. Return of Space Objects of Another State

Article 5 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space[13] states that Contracting Parties that receive information about or discover a space object or its component parts in that State's jurisdiction, shall notify the launching authority and the Secretary-General of the United Nations. The launching authority may request that the State in which the space object or component part is discovered, take all necessary steps to recover that object or component part. The launching State bears the responsibility for reimbursing all monetary obligations incurred in the recovery and return of the space object or component part. For purposes of ownership therefore, as in maritime salvage law by analogy, launching States, as owners in fact, do not lose proprietary rights in any launched space object or component part even if those objects happen to fall in the territory of another State.

Paragraph 4 of Article 5 discusses the duty of a launching State to take effective steps to remove hazardous or deleterious space objects discovered in the territory or jurisdiction of another State. If that launching State is unwilling or unable to perform such an operation, the question arises as to whether that launching State loses certain possessory rights in the space object or component part. Can it be destroyed by the discovering State without the consent of the launching State to avoid possible grave consequences emanating from the satellite?[14]

C. Article VIII of the Outer Space Treaty: Jurisdiction, Control and Ownership of Space Objects, Component Parts and Orbital Debris

By their very nature, salvage operations of abandoned and derelict craft at sea require that present possessory interests in that property have been abandoned. In terms of space law, is it possible to declare a space

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13 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, opened for signature 22 April 1968, 672 UNTS 119 (hereinafter the Rescue Agreement). The Rescue Agreement entered into force 3 December 1968.

14 I.H. Ph. Diederiks-Verschoor, *The Increasing Problems of Orbital Debris and their Legal Solutions*, 32 PROC. COLLOQ. L. OUTER SPACE 77, at 79 (1990).

object or component part abandoned and derelict and, therefore, subject to capture and removal by another interested third party? To discuss this possibility, the interrelated concepts of jurisdiction, control and ownership of space objects and their component parts as laid out by Article VIII of the Outer Space Treaty must be discussed. Article VIII states:

> 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 Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.

The core issue of this Article is whether jurisdiction, control and ownership over space objects are permanent. Legal opinion favors permanency.[15] In terms of salvage of space objects, at present, removal of objects may not be performed without the consent of the State of registration based on the absolute nature of jurisdiction, control and ownership.[16] Some commentators argue that the absolute nature of jurisdiction, control and ownership can be circumvented in certain cases. Space refuse may be one of those cases if it is possible that "persons or property of innocent third-party States may be injured, lost or damaged."[17] Moreover, removal could occur without consent if the hazard presented by the space object, component part or orbital debris threatens the safety of spaceflight[18] or a satellite in the process of falling to Earth poses a threat of serious harm to the Earth.[19] Such unilateral action could

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15 BAKER, *supra* note 11, at 69. The author goes on to discuss the permanency of jurisdiction, control and ownership of "space refuse". In this context, permanency would impede attempts to minimize the quantity of space refuse. Certainly, some owners may consider some of their space objects that remain in space beyond their useful lifetimes to be space refuse. *Id.* However, when is an object to be considered space refuse even though, in terms of viability, it is still functioning? What is needed, of course, is a functional definition of orbital debris, space refuse and an agreed upon description or guideline of when space objects become orbital debris.

16 *See generally* BAKER, *supra* note 11, at 69-71.

17 *Id.*, citing C. Fishman, *Space Salvage: A Proposed Treaty Amendment to the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space*, 26 VIRGINIA J. INT'L L. 965 (1986).

18 *Id., citing* H. DeSaussure, *The Application of Maritime Salvage to the Law of Outer Space*, 28 PROC. COLLOQ. L. OUTER SPACE 127 (1985).

19 *See generally* H. DeSaussure, *An International Right to Reorbit Earth Threatening Satellites*, 3 ANN. AIR & SPACE L. 383, at 391-92 (1978).

also be construed, however, as an act of piracy.[20] To perform any type of space salvage operation with the intent of cleaning up the space environment, one must ask under what circumstances, if any, a State may either lose jurisdiction and control of a space object or cede any existing rights to that space object.

D. Article IX of the Outer Space Treaty

In the context of environmental protection of space, Article IX of the Outer Space Treaty provides the basic rules that States Parties to the Treaty must respect when undertaking space activities. It states:

> In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies *with due regard to the corresponding interests of all other States Parties to the Treaty* (emphasis added).[21]

Within this context, the issue of removal of spacecraft and other orbital debris can be considered. Because States Parties to the Outer Space Treaty have a general duty to conduct space activities with "due regard to the corresponding interests of all other States Parties to the Treaty," are launching States bound to capture and remove space objects that hinder the

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20 BAKER, *supra* note 11, at 70.

21 Outer Space Treaty, *supra* note 3, art. IX. The remaining portion of article IX states:

> States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose. If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with the activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the Moon or other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning the activity or experiment. *Id.*

right of access of other States to space orbits?[22] Effectively, the answer to this question is no because there is no positive duty placed on launching States to remove inactive objects from orbit.[23] Hence, a dichotomy emerges whereby a launching State must, on the one hand, acquiesce to the corresponding interests of all other States party to the Treaty while, at the same time, it has no obligation to remove nonfunctional space objects that may impede access to space by other States. Obviously, it is as if the interest that has priority is that of the "first come, first served," *i.e.*, that of the launching State able to place its space object in orbit before any other State takes that position.[24] However, because of the work of the World Administrative Radio Conference in the implementation of an *a priori* planning regime for nominal orbital positions and bandwidths, the authenticity of this idea may no longer be valid.[25] In this respect, guidelines for other space activities, based on the work of the WARC in the field of worldwide telecommunications services, could be adopted by an international group of experts, brought together specifically to formulate and recommend standards, practices and guidelines that may serve as a basis for national activities in space. Such proposed standards, practices and guidelines could effectively regulate access to certain orbits such as low Earth orbits to guarantee that both current and future users will have continual and nondiscriminatory access. Taking this one step further, these guidelines, upon proper consideration, could discuss effective means of removal of spent satellites from certain orbits so that the limited resource of practical orbits for many space applications does not become clustered and unmanageable. For present and future users, the advantage of guidelines adopted by an international group of experts is that such guidelines may be constantly revised and updated to reflect rapidly changing situations. They may also consider scientific and technical advances in the mitigation and removal of space objects, component parts

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22 Some commentators have made the argument that although the law of outer space does not require the removal of inactive satellites from orbit, the refusal to remove a derelict or non-functional craft from orbit could be the equivalent of misappropriation of outer space. That is prohibited by article II of the Outer Space Treaty. *See* P. Sterns and L. Tennen, *Orbital Sprawl, Space Debris and the Geostationary Ring*, 6 SPACE POL'Y 221, at 226 (1990).

23 Any attempt to remove such satellites has been on a purely voluntary basis. *Id.*

24 *Id.* at 224. Sterns and Tennen argue that a de facto order of priority has been put into place whereby the first state to occupy a specific orbit has the preemptive right to occupy the location of that orbit indefinitely. *See id.* However, it should be noted that a past World Administrative Radio Conference introduced an *a priori* planning regime for nominal orbital positions and necessary bandwidths. *See generally* C. Christol, *The Legal Status of the Geostationary Orbit in the Light of the 1985-88 Activities of the ITU*, 32 PROC. COLLOQ. L. OUTER SPACE 215 (1989). This plan does not require that a State be able to use the orbit/spectrum resource. This protects, therefore, the interests of developing countries in the use of the space resource of nominal orbital positions and bandwidths. *See id.* at 220. In essence because the ITU may make dispositions that allow for the exploitation and use of this resource, it has effectively clarified articles I and II of the Outer Space Treaty whereby no legal person, State, international organization or nongovernmental entity may assert sovereignty type proprietary claims over any area of space. *See id.*

25 *See generally* Christol, *supra* note 24.

and orbital debris.

In principle, a general legal framework exists that adequately governs space and space activities. What is needed to augment this, however, is the establishment of an expert panel endowed with the power to adopt universal standards and practices for specific space activities. Persons drafting these regulatory standards and practices, free from the elaborate and time-consuming procedure necessary for treaty formulation and ratification, could draw ideas from other international legal sources in the preparation of these regulatory and administrative guidelines. One of these sources could be maritime salvage law.

III. Maritime Salvage Law

A. What is a Derelict?

In maritime salvage law the term "derelict" is applied to a thing "which is abandoned and deserted at sea by those who were in charge of it, without hope on their part of recovering it *(sine spe recuperandi)* and without intention of returning to it *(sine animo revertendi).*"[26] For it to be considered a derelict, a ship, craft or vessel must be abandoned. To meet the requirements for abandonment, four criteria must be fulfilled:

1) The abandonment must take place at sea, not on the coast;

2) *Sine spe revertendi aut recuperandi* (without hope of return or recovery);

3) It must be *bona fide* and for the purpose of saving life;

4) By order of the master in the face of danger from damage to the ship and the state of the elements.[27]

In determining whether a vessel is derelict, one must look at the intentions and expectations of the master and crew at the time of abandonment.[28] A vessel is not abandoned if it is left temporarily by the master and the crew to obtain assistance if the master and the crew intend to return to the vessel.[29] Once abandoned with finality (no intention or expectation of return or recovery of the vessel), the vessel is in fact a derelict and may be salvaged by third parties.[30]

B. Salvage of Derelict Vessels

In the case of a derelict vessel, anyone may take possession of it. The one *caveat* is that the first salvors or the first person or persons to

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26 Kennedy, LAW OF SALVAGE 85-86 (Stevens & Sons 1985).
27 *Id.* at 198.
28 *Id.*
29 *Id.*
30 *See generally id.* at 85-86.

take possession of the vessel, have the right of exclusive possession.[31] That right may be enforced in court by injunction and/or an award of damages. While in possession of the salved property, salvors have some duties to the owners of the property. Among these is the duty not to be negligent with the property and the duty not to deliver the property to someone without a valid claim to it.[32] Moreover, salvors do not acquire proprietary rights in the derelict. These proprietary rights remain with the original owner. Salvors may sue in court to collect a salvage award for the work performed in the salvage of the vessel.[33]

C. The International Maritime Organization

The International Maritime Organization (IMO) has promoted the adoption of various conventions and protocols concerning maritime safety, the prevention of pollution and related matters. The IMO introduced the International Convention on Salvage of 28 April 1989.[34] This Convention has as its goal the drafting of uniform international rules regarding salvage operations. It discusses the duties of salvors, salvage of State-owned vessels, salvage awards and other relevant issues.[35] In terms of maritime salvage law, this will greatly increase the application of a uniform set of standards and practices to the salvage of derelict vessels or other vessels in distress in need of salvage assistance.[36]

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31 *Id.* at 518.

32 *See generally id.* at 415-17.

33 It must be noted that certain States maintain policies that exempt state-owned vessels from the category of salvable vessels. Other States permit suits for a salvage award for recovery of public property. *See generally* 9 STUDIES IN AIR AND SPACE LAW 257-86 (K.-H. Böckstiegel, ed., C. Heymanns Verlag 1990), excerpts reprinted *in* C. CHRISTOL, SPACE LAW: PAST, PRESENT, AND FUTURE 249-261, at 255 (Kluwer 1991).

34 IMO Doc. LEG/CONF.7/27 of 2 May 1989.

35 *Id.* The International Convention of Salvage, at the time of this writing, has not entered into force. It has been ratified by eight countries: Egypt, Mexico, Nigeria, Oman, Saudi Arabia, Switzerland, United States and United Arab Emirates. According to article 29 of this Convention, it will "enter into force one year after the date on which 15 States have expressed their consent to be bound by it." *Id.* Based on the past practices of IMO with other Conventions, IMO could adopt codes, guidelines or recommended practices that would be meant to supplement or assist the implementation of the Salvage Convention. These recommendations could incorporate further requirements that could be necessary and useful or they could serve to clarify questions that arise concerning the salvage of sea craft. The advantage in maritime salvage law would be that these recommendations could be acted upon quickly by Governments rather than having to rely on the elaborate and time-consuming adoption procedures used for formal treaty instruments.

36 It must also be noted that ICAO also has used this system of establishing technical standards and practices for aviation rather than formal treaty negotiation as a means of implementing guidelines in a quick manner that does not involve formal treaty procedures. This has been accomplished by adopting annexes to the Convention on International Civil Aviation.

IV. Application of Maritime Salvage Law Concepts to Space Objects, Component Parts and Orbital Debris

The question of what international law would apply to space salvage activities to ensure that they are performed lawfully without detriment to existing rights, the space environment or to existing or future space activities of other States, must be answered within a decision-making framework that is acceptable to all space-faring nations. Therefore, can relevant concepts taken from maritime law be adapted to space activities through international discussion and agreement on technical standards and procedures for space salvage operations geared toward the mitigation of space objects, component parts and orbital debris?[37]

Initially, it must be stated that by law, the proprietary rights of owners of space objects, their component parts and orbital debris as well as those of the owners of sea craft, vessels and ships are permanent. In a salvage award action, the salvor may not claim proprietary interests in the ship. A salvage claim is based on a claim for services rendered in the salvage of the vessel. In this respect, ownership of a space object, its component parts and even orbital debris, according to treaty, is also continuous and permanent. Capture and removal by a third party, if ever allowable, would result in a claim by the salvor for services rendered against the owner of the space object.

An issue therefore, is whether space objects, component parts and orbital debris may ever be abandoned and declared "derelict" and hence subject to salvage by third parties. At present, existing space law prohibits other parties from interfering with space objects including nonfunctional or "derelict" space objects.[38] In the future, if space salvage is to become a reality, what constitutes a derelict space object should be defined as well as situations where space salvors will be allowed to perform salvage operations.

One commentator has defined a derelict space object as:

> . . . one which is abandoned and deserted by those who were in charge of it, without hope on their part of recovering it and without intention of returning to it. Thus, manned spacecraft, abandoned by the crew without intention of returning to or recovering it, would be derelict. Unmanned satellites and other objects with a `active lifespan' would be considered derelict when this active lifespan is terminated, that is, in a permanent inactive state . . . [39]

Other commentators have advocated a legal rule stating that launching States must remove nonfunctional intact objects from orbital locations. To enforce this rule, these space objects would be declared

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37 For a general comparison of maritime and space law, *see generally*, H. DeSaussure, *Maritime and Space Law, Comparisons and Contrasts (An Oceanic View of Space Transport)*, 9 J. SPACE L. 93 (1981).

38 Article VIII, Outer Space Treaty. *See generally,* Sterns and Tennen, *supra* note 22, at 224-25.

39 BAKER, *supra* note 11, at 70.

derelict. The ultimate purpose of this proposal would be to keep orbital slots open for the benefit of all potential space users as well as to minimize dangers of collision. Once labeled derelict, the space object would be subject to salvage by third parties without fear of violating the jurisdictional and control rights of the state of registry.[40] Even relocation of the space object to a disposal or graveyard orbit would also result in classification of that object as derelict. However, a longer period of reactivation or retrieval would be permitted.[41] Still others have stated that rather than using the maritime analogy in the determination of derelict status, international space law should be expanded to include these issues through bilateral and multilateral agreements.[42]

There is no consensus on the definition or classification of orbital debris. Because it is not always possible to identify to whom debris belongs, especially for purposes of liability, is it possible then to salvage debris items without technically violating the jurisdiction and control of the launching State? Presently, launching States retain jurisdiction and control over all space objects including debris even without the possibility of identification. Without the possibility of identification, however, in which State does jurisdiction and control vest? This issue has far-reaching ramifications especially if such unidentifiable orbital debris causes damage or destroys another space object.[43]

The international community of nations, through the elaboration of a new space treaty or amendments to existing treaties, has the ability to arrive at consensus on an issue such as capture and removal of space objects, component parts and orbital debris. Certainly, it is an option to be considered. However, in light of the rapid and continuous changes that occur in the fields of space technology and science, it would perhaps be more beneficial to the community of nations to establish an international expert technical group to coordinate information and research and serve as a forum for advice and international consultation for all large scale programs likely to have long-term effects on the Earth and space environment. Such a group could create international standards and practices for various space activities in order to minimize the environmental impact of these activities. Because these technical solutions require continuous updating and revision as scientific knowledge and technology progress, one single international convention is not really the

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40 *Id.*

41 Sterns and Tennen, *supra* note 22, at 226-27.

42 Böckstiegel, *supra* note 33, at 255.

43 Damage to or destruction of the space property of another State could result in a joint and several liability action to be filed against all other launching States because of the fact that the debris would be unidentifiable and more than likely, untraceable to any State of origin. This is especially true for those launching States that have jurisdiction and control of only one space object. Assuming that the space object is the only piece of hardware in space owned and operated by that State, then, in the event of damage or destruction, it could be argued that another space object, component part or orbital debris from another space object in fact caused the injury. For a developing launching State without the financial means to effectively prove that someone else has caused the injury, the burden would be, therefore, placed on other launching States. For developing countries, this could save enormous amounts of time, energy and money if faced with just such a situation.

proper forum in which to continually discuss ever-changing technological solutions. Rather than relying on time-consuming international lawmaking, this group could set standards on a continual basis and react to situations that merit immediate attention rather than attempting to garner international consensus over a period of years. Upon release of these standards, States could opt out of them by filing notification with the group within 60 to 90 days as with IMO, for example. Moreover, the group could adopt recommended practices that, although not binding, would provide information on practices that should be followed to minimize the environmental impact of space activities.

In terms of salvage of space objects, their component parts and orbital debris, the group could consider the advantages and disadvantages of space salvage, taking into account rules and regulations and other technical factors governing maritime salvage operations. The group could adopt technical standards or establish recommended practices to govern, in a practical sense, space salvage operations. Reference to maritime definitions of derelict vessels could also be made to determine whether the same conceptual model could apply to space objects, component parts and orbital debris. Reference can also be made to existing orbital debris mitigation efforts such as those adopted by NASA and ESA.[44] Recommended practices, based on maritime law and adapted to space activities, could be adopted. This group could also produce technical standards and practices that cover the practical aspects of defining when a space object becomes derelict. Above all, and especially in this situation, regulatory standards and practices are far more flexible and adaptable to present situations than purely legal rules.

V. Conclusion

Space objects, their component parts and orbital debris are objects that will continue to exist in space and plague safe space navigation. Mitigation and removal of such objects require proper planning and international consensus on a manner in which to carry out any cleanup efforts. In the event that the concept of "astrosalvage" emerges as a possibility, international arrangements would have to be discussed and considered to develop standards and practices that are fair and equitable to all States (and even private parties) interested in utilizing the resource of outer space. It is within this framework that the international community of nations might wish to come to agreement on the creation of

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44 Reference can also be made to the launch approval process in Japan as a source of information on mitigation and prevention of space debris even though as of yet, no fixed national policy or specific legal regulations exist.

At present, it should be noted that in terms of capture and removal of space objects, the United States has used the Space Shuttle as a tool in the retrieval of space satellites but in terms of cost, such activities are as of yet, not economically viable even though available. Office of Technology Assessment, *supra* note 5, at 25. ESA has captured and removed the Eureca spacecraft from orbit with the help of NASA's Space Shuttle Endeavor. The Eureca spacecraft was designed for multiple flights and ESA in fact paid NASA $29 million for its launch and retrieval. Whether or not the spacecraft will be re-launched remains to be determined by ESA. *See* Harwood, *ESA Prepares Eureca for Retrieval by Endeavor Crew*, SPACE NEWS, May 24-30, 1993, at 9.

an international expert group of scientists and technicians who may review, assess and establish standards and can better provide guidelines for space activities which may have adverse environmental impacts rather than seek elaborate and time-consuming legal regulations (which take time to formulate and by their nature are static and often difficult to revise). All space-faring nations have given priority to the implementation of mitigation and removal procedures for orbital debris created during space activities. This is only the beginning but it is a positive step in the direction of maintaining space for future generations and future space activities.

THE INTERNATIONAL TELECOMMUNICATION UNION AND DEVELOPMENT

Francis Lyall*

Introduction

It is a matter of sadness to be contributing to an issue of a Journal honoring the memory of Judge Manfred Lachs. Having known his writings, it was both a pleasure and a stimulus to make his acquaintance at the annual gatherings of the International Institute of Space Law, and to see in person the sheer humanity that he embodied.

Thirty years ago, on 22 November 1963, introducing the final draft of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space to the Committee on the Peaceful Uses of Outer Space for its approval, Judge Lachs made it clear that the Principles were not a 'closed chapter' but part of a development. He went on:

> [Lawmaking] is a long and painstaking process. It is a continuous process in which the lawmakers must remain watchful, facing the existing and changing requirements of life. We have to welcome what has been achieved and strive for further agreements. The law of outer space is in its formative stage only. We must proceed with prudence and care - take the full benefit of agreements reached, work on them, extend them, make them a living reality and continue with our efforts for further agreements.[1]

Speaking in another place of the 1963 Principles, he underlined that:

> The paramount consideration by which States should be guided in this law-making process for tomorrow, is "the benefit and interests of all mankind". This is repeatedly emphasized in all relevant instruments and stressed by writers on the subject. It is amplified by the desideratum that the exploration and use of space serve 'the betterment of mankind.[2]

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* Professor of Public Law and Dean of the Faculty of Law, University of Aberdeen, Scotland, U.K. Director, International Institute of Space Law (IISL).

1 Additional Report of the Committee on the Peaceful Uses of Outer Space, A/5549/Add.1, Verbatim record of the Twenty-fourth Meeting. Annex, p. 4.

2 M. Lachs, *The International Law of Outer Space,* 113 RECUEIL DES COURS D'ACADEMIE DE DROIT INTERNATIONAL [R.C.A.D.I.] 1-115, at 100 (No. 3, 1964). The reference to 'betterment' is from the Preamble of the Declaration. The 'benefit and interests' comes in para 1.

Within three years, the Principles of 1963 had been developed into the Outer Space Treaty, 1967.[3] The 'betterment of mankind' and the 'benefit and interests of all mankind' had transmuted into the phraseology of Art. I, that '[t]he exploration and use of outer space ... 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.' Exactly what this means is, of course, uncertain, and the dissatisfaction of some non-spacefaring states with the implementation of Art. I has led to it being put on the COPUOS agenda.

In this article, I wish to outline how within both the law and practice of the ITU, there has been and will be benefit accruing to the developing world from space, in partial satisfaction at least of the 'benefit' language of Art. I of the Outer Space Treaty. The new Telecommunications Development Sector is major evidence. However, I will also warn lest the ITU itself be damaged by the emphasis now laid on such matters becoming undue. I hope Judge Lachs would have approved.

History

As its name implies, the International Telecommunication Union has been devoted to the technical facilitation of international telecommunication. Its germ was the bi- and tri-lateral accords of the 1840s in Europe respecting the telegraph.[4] In 1865 a more general agreement was arrived at,[5] and in 1868 in Vienna what is recognizably the Union was established with an official International Bureau to service its administration.[6] In due course the Telephone was added to its competence.[7] Later, and mainly because of the hostility of the cable operators to a potential competitor, a separate institution, the International Radio-Telegraphic Union, was created to deal with the needs

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3 18 UST 2410, TIAS 6347; 610 UNTS 205; (1968) UKTS 10, Cmnd. 3519; (1968) 6 I.L.M. 386; (1967) 61 A.J.I.L. 644.

4 I have laid out the history of the ITU more fully in my LAW AND SPACE TELECOMMUNICATIONS 313-25 (1989). *See also* GEORGE A. CODDING JR., THE INTERNATIONAL TELECOMMUNICATION UNION: AN EXPERIMENT IN INTERNATIONAL COOPERATION (1972); GEORGE A. CODDING & A.M. RUTKOWSKI, THE INTERNATIONAL TELECOMMUNICATION UNION IN A CHANGING WORLD (1982); D.M. LEIVE, INTERNATIONAL TELECOMMUNICATIONS AND INTERNATIONAL LAW: THE REGULATION OF THE RADIO SPECTRUM (1970).

5 International Telegraph Convention, Paris, 17 May 1865, 130 CTS 198.

6 International Telegraph Convention, Vienna 21 July 1868; 1366 CTS 292.

7 Regulations in Execution of the International Telegraph Convention of 22 July 1875, Berlin, 17 September 1885; 165 CTS 212.

of radio when that came upon the scene.[8] Curiously but sensibly, the new Union used the Telegraph Union's International Bureau for its administrative requirements, but it was not until 1932 that the logical step was taken and the 'wire' and 'wireless' Unions united to form the International Telecommunication Union, the ITU.[9]

The ITU, renewed, became a specialized agency of the United Nations in 1947.[10] The structure then agreed persisted more or less intact for forty-five years although over the period the relative balance between the organs of the Union was subject to considerable change. Plenipotentiary conferences of the ITU were held at Buenos Aires in 1952,[11] Geneva in 1959,[12] Montreux in 1965,[13] Malaga-Torremolinos in 1973,[14] and Nairobi in 1982.[15]

By the time the Nairobi arrangements were due to be considered by the Nice Plenipotentiary of 1989 it was recognized that the ITU needed significant revision to cope with modern requirements. The globalisation of telecommunications, the increasing pace of technological change, the development of the information economy and its interactions around the world, had rendered the slow mechanisms of the ITU obsolescent, if not obsolete. The Nice Conference itself took some steps to meet known problems and difficulties.[16] However, it recognized that these were only palliative, and more radical surgery was necessary. To that end it

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8 Radio-telegraphic Convention, Final Protocol and Regulations, signed at Berlin 3 November 1906; 203 CTS 101; 1906 (UK) Parl. Papers HC 368.

9 Telecommunication Convention, General Radio Regulations, Additional Radio Regulations, Additional Protocol (European), Telegraph Regulations and Telephone Regulations, Madrid, 9 December 1932; 151 LNTS. 4; 6 MANLEY O. HUDSON INTERNATIONAL LEGISLATION 109 (1932-34).

10 International Convention on Telecommunications, Atlantic City, 2 October 1947; 63 Stat. 1399, TIAS 1901.1950 UKTS. No. 76, Cmd. 8124.

11 International Telecommunication Convention, Buenos Aires, 22 December 1952; (1952) UKTS No. 36, Cmnd. 520.

12 International Telecommunication Convention, Geneva, 21 December 1959; (1958) UKTS No. 74, Cmnd. 1484.

13 International Telecommunication Convention, Montreux, 12 November 1965; (1967) UKTS No. 41, Cmnd. 3383.

14 International Telecommunication Convention, Malaga-Torremolinos, 25 October 1973;28 UST 2495, TIAS 8572; 1209 UNTS 32; (1975) UKTS No. 104, Cmnd. 6219.

15 International Telecommunication Convention, with Final Protocol, Additional Protocols I to VII and Optional Additional Protocol, Nairobi, 6 November 1982; 1985 UKTS No. 33, Cmnd. 9557 (not yet published in the UST or TIAS Series).

16 ITU, Final Acts of the Plenipotentiary Conference, Nice, 1989 (Geneva 1990).

established a High Level Committee to review the structure and functioning of the Union, which reported to the Administrative Council of the ITU in April 1991.[17] The Committee's recommendations were therefore available before more than a handful of countries had ratified the Nice documents. Notwithstanding, the ITU Administrative Council decided to press ahead, and an Additional Plenipotentiary Conference was held in Geneva in December 1992 at which the ITU constitutional documents were revised in the light of the High Level Committee's counsel.[18,19]

The Geneva Conference, 1992, will doubtless come to be seen as a watershed in the history of the ITU. For this article its most important action was the creation of a Telecommunications Development Sector as part of a reordering of the main executive organs of the Union into three sectors whose function is epitomized in their titles. The other two are the Standardization Sector and the Radio-Communication Sector.[20] Each Sector will be appropriately staffed, and be headed by a Director elected by the plenipotentiary conference of the Union. But this is not the place fully to discuss the Geneva changes, or even further to detail them.[21]

The Development of Development

When one thinks of 'Development' within the context of the UN family of agencies, the United Nations Development Programme (UNDP)

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17 ITU, Tomorrow's ITU: The Challenges of Change': the Report of the High Level Committee to review the structure and functioning of the International Telecommunication Union (Geneva 1991).

18 ITU, Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992 (Geneva 1993). The ITU documentation has been split between the Constitution, containing principles unlikely to be modified, and the Constitution dealing with the detailed working of the Union, but which is likely to be modified by later plenipotentiary conferences. I refer to these below as CS (Constitution) and CV (Convention).

19 In the light of the decision of the Administrative Council to hold the Geneva Conference, no other countries ratified the Nice documents. The Nice revisions of the ITU constitution will therefore never have legal effect, important though they undoubtedly were in the production of the Geneva Constitution and Convention of 1992.

20 The International Frequency Registration Board is reduced in function and reconstituted as a nine member part-time Radio Regulations Board within the Radio-Communications Sector.

21 See F. Lyall, *'The International Telecommunication Union Reconstructed,* IISL paper No. 1-93-804, a revised version of which will appear in 36 PROC. COLLOQ. L. OUTER SPACE (in print, 1994). See also the ITU section of F. LYALL, SPACE LAW (forthcoming, 1995?).

comes immediately to mind. By Resolutions 27 and 30 of the Montreux Plenipotentiary Conference of the ITU, the Union decided fully to participate in the UNDP. This has continued.[22]

More directly, however, over the years the ITU itself devised its own assistance programs, for example partly through the International Frequency Registration Board whose training courses for the staff of new administrators in the developing countries must be praised. But the clearest manifestation in law of first, the introduction, and then the evolution of 'development' as a significant part of ITU responsibilities can be easiest highlighted by comparing the Preamble and the 'Purposes' article of successive manifestations of the ITU Convention. These mirror practice.

Neither the Preamble, nor art. 3 (Purposes) of the Atlantic City Convention of 1947[23] or the Buenos Aires Convention of 1952[24] mention development. The change comes with the Geneva Convention of 1959.[25] Such matters do not there appear in the Preamble nor in the generality of the Purposes of art. 4.1. However, in the specification of the particular actions the Union is to take to attain the general aims, art. 4.2.(d) calls on it to: 'foster the creation, development and improvement of telecommunication equipment and networks in new or developing countries by every means at its disposal' including taking part in UN programs. This language is retained at the same points in the Montreux Convention of 1965,[26] and that of Malaga-Torremolinos of 1973.[27] Under the aegis of this provision the ITU played an important but facilitating role, putting developing countries in touch with providers of telecommunications aid and expertise in the developed countries.

A further change comes in the Preamble of the Nairobi Convention, 1982.[28] '[H]aving regard to the growing importance of telecommunication for the preservation of peace and the social and economic development of all countries', is inserted as an express motivation of the parties, and, presumably to underscore the point, 'economic and social development' is repeated as a motive three clauses later. Further, in the Purposes article, art. 4.1(a) is added to. Not only is the Union to maintain and extend international cooperation; on an equal basis to that purpose it is 'to promote and to offer technical assistance to developing countries in the

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22 *Cf.* Resolution No. COM6/15 of the Nice Conference, 1989.

23 *Supra* note 10.

24 *Supra* note 11.

25 *Supra* note 12.

26 *Supra* note 13.

27 *Supra* note 14.

28 *Supra* note 15.

field of telecommunications. And, while art. 4.2(c) still retains the language of the former art. 4.2(d), use of the Union's own resources is added as a way by which the Union may foster telecommunications in the developing countries. Nice, 1989,[29] and Geneva, 1992,[30] (where the Purposes Article is recited as art. 1 of the Constitution) retain this phraseology in both Preamble and Purposes.

Of course all this must be seen in the context of the time. I would not claim the ITU as unique. It was part of the growing North-South dialogue, and similar arguments were being heard elsewhere. The ITU was not alone in being seen as a forum through which development and technical assistance might be channeled. But in the case of telecommunications, the need for assistance was clear. The question was the best method of its delivery. Thereafter a number of documents are significant, including 'The Missing Link' (the Report of the Maitland Commission), 1985, and 'The Report of the Secretary General's Advisory Group on the Changing Telecommunications Environment', (the Report of the Hansen Committee)(February 1989). These contributed to an awareness within the Union, and, perhaps equally importantly, a willingness (even if sometimes reluctant) by the richer ITU members to contribute to such development actions by the Union.

Be that as it may, Geneva 1992 is a further step.[31] The new Telecommunications Development Sector (TDS) is to deal with all telecommunications development matters within the purview of the Union. The concentrating of development matters in the new Sector is significant. It recognizes the importance of Development within the responsibilities of the Union, gathers much that was already under way under different wings of the Union, places that work on a much more coherent basis, and gives it significant standing within the Union.

Chapter IV of the Geneva Constitution, (CS arts. 21-24) deals with the broad principles of the TDS, arts. 16-18 of the Convention giving further specification to its activities. Headed by a Director elected by the Plenipotentiary Conference (CS arts. 8.2.g and 21.3) the TDS is to work through world and regional telecommunication development conferences, through study groups and is serviced by a bureau, the Telecommunication Bureau. Members of the TDS include as of right the administrations of all members of the Union, along with any entity or organization authorized by the appropriate procedures to be a member of the sector (CS art. 21.4).

Telecommunication development conferences are to be fora for discussion and consideration. They may be held on a world or regional

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29 *Supra* note 16.

30 *Supra* note 18.

31 What is written is accurate in law, however, it should be noted that the policy decision was taken at the Nice Conference in 1989. *See* art. 11A of the Nice Constitution, *supra* note 16.

basis, in a cycle of one world conference per four year Union cycle, and within that period such regional conferences as may are desirable in terms of resources and priorities (CS art. 22.3) Conferences will not produced final acts, only resolutions, decisions, recommendations or reports. These must, of course, conform with the Constitution, Convention and administrative regulations. The foreseeable financial implications must be taken into account and conferences should not adopt resolutions and decisions which may cause expenditure in excess of limits set down by Plenipotentiary Conference (CS art. 22.4).

World conferences are to establish work programs and guide-lines for the Sector (CV art. 16.1.a). Regional conferences will deal with matters specific to the region concerned (CV art. 16.1.6). Telecommunication Development Conferences are to fix objectives and strategies for a balanced world-wide and regional development of telecommunications (CV art. 16.1.c). This paragraph goes on to indicate that the conferences should give 'particular consideration to the expansion and modernization of the networks and services of the developing countries as well as the mobilization of resources required for the purpose. They shall serve as a forum for the study of policy, organizational, operational, regulatory, technical and financial questions and related aspects, including the identification and implementation of new sources of funding' (CV art. 16.1.c). Channels of technical assistance and financial aid are therefore being opened up and existing channels deepened.

Space

The creation of space telecommunications services has been of immense benefit to many developing countries, some of whose national telecommunication networks depend on access to satellite systems. Here 'the benefit of all countries' is attained, even though use of the systems has to be paid for. Indeed in systems such as that of INTELSAT, the developing countries have a voice, as they share in the governance of the system, albeit through a 'shared governor'.[32]

But one area developing countries' concern lies in principle of the freedom of use of outer space of Art. I of the Outer Space Treaty. They fear that freedom could be used by the space-competent states to establish a priority of use and exploitation. This they might exhaust a resource. Or, almost equally objectionably, the currently space-competent might establish themselves in space in ways most convenient both scientifically and economically, leaving the resources more difficult to exploit for those who might come later. Two aspects particularly encapsulate the problem: the 'first come first served' basis on which the ITU procedures for the international protection of radio frequencies operate, and the analogous position as to orbital positions. In connection with the latter, there is, of

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[32] *See* F. LYALL, LAW AND SPACE TELECOMMUNICATIONS, *supra* note 4, at 97-104.

course, the extraordinary claim contained in the Declaration of Bogota, 1976.[33] In this Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda and Zaire, (most, but not all, the states through which the equator runs), stated that, by virtue of their terrestrial position, they each had sovereign rights over that part of the geostationary orbit over each of their territories, but they made no claim to any part of 'space' lower or beyond that orbit. The claim festers on, and it is time that other states gave it its quietus.

Be that as it may, the problems of 'first come first served' whether of frequency or of orbit, remain. But they have been ameliorated. The ITU has never adopted a wholly firm position as to 'first come first served' for frequencies, for in the ultimate a state may assign any frequency it wishes to a station under its jurisdiction. International compliance with ITU procedures and the concepts of frequency allocation and the Master International Frequency Register depends as much on the laws of physics as upon the uncertain sanctions of International Law.

That said, the outcome of the World Administrative Radio Conference dealing with the Geostationary Orbit and the Services utilizing it, WARC-ORB 1985-88,[34] is the allotment to each state (whether or not a participant in the ITU system) of a nominal orbital position within a predetermined arc of the geostationary orbit, a band width of 800 MHz for up and down links, and a service area for national coverage and generalized parameters. These allotments may be used by others, but, when a state wishes to use its 'position' it has a right to take it over from any prior occupant. The position of the non-spacefaring countries is therefore secured for national services.

Problems

So far I have indicated ways in which the developing countries are directly or indirectly benefited through the ITU. Unfortunately the position is not wholly unclouded, and in a dark mood, one could foresee ways in which the ITU system could be damaged by ill-considered action by developing countries.

First, there is the matter of Tongasat.[35] In 1990 the Kingdom of Tonga filed notice with the IFRB of its intention to use a number of geostationary orbital slots additional to its allocation under the WARC-

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33 Printed in 2 MANUAL ON SPACE LAW 383-87 (N. Jasentulyana & R.S. Lee, eds., 1979-82).

34 ITU, Final Acts Adopted by the Second Session of the World Administrative Radio Conference on the Use of the Geo-stationary-Satellite Orbit and the Planning of the Space Services Utilizing it (ORB-88) (Geneva 1988).

35 M.L. Smith, *Legal and Policy Developments in International Satellite Communication,* 34 PROC. COLLOQ. L. OUTER SPACE 342-7, at 345 (1992).

ORB-88 provisions. *Ex facie*, under the ITU procedures notification gave it, as it were, a prior claim to these positions. The fact was that Tonga did not require those slots for its own national telecommunications purposes, but was willing to make financial gain through assigning their use to commercial entities, whose connection with Tonga was purely one of mutual profit. This matter is not yet finished, although Tonga has not persisted with all the notifications. US and other companies have seen it as a way to get access to space. In my view this is perhaps a bald (and bold) attempt to bypass the supervisory jurisdiction of the states with which these companies have a genuine link, and which are under a duty so to supervise under Art. VI of the Outer Space Treaty. Further, it is an attempt to use what was designed as a procedure to impose order upon the use of a natural resource in the interests of all,[36] into a 'claim' like that of a prospector of old, but one who leases his staked-out area to another and does not work it himself.[37] That is a perversion. Why should other more scrupulous countries give credence to such a claim by respecting it? And, if the system does operate to shelter such claims, why should such states continue to respect and comply with such a system?

The other area of the ITU and the developing countries that worries me is that of the financing of the Union and its decision-making processes.

The usual method by which members' contributions to UN agencies are assessed is on the basis of gross national product. By contrast ITU financing is voluntary on the part of its members, each member choosing a class of contribution from a scale of units.[38] This funding method which evolved last century, is under attack within the ITU by the developing countries. The general UN method is more favorable to them, affords no discretion to contributors, and is therefore difficult for the major countries to avoid without patently going into arrears of contribution. Yet there is much to recommend the 'contributory unit' concept in such as the UPU and the ITU, which are, after all, organizations with limited financial

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36 The geostationary orbit is a natural resource which it is in the interests of all rationally, efficiently and economically to use. Geneva CV, *supra* note 12, at art. 44.2.

37 Properly staked claims used to have to be worked by their claimants if their validity was to be recognised in law. Some might argue it is proper for a state to lease the use of its WARC-ORB-88 allocation, thereby securing some financial 'benefit' from space albeit that seems not to have been in contemplation by the WARC. I am not so sure. In any event such a step is different from the Tongan action.

38 The Universal Postal Union is the only other UN Specialised Agency financed in this way. In the UPU, under art. 125 of the General Regulations applicable since Hamburg 1984 (in force 1976) and carried on by the Washington Regulations of 1990, there are nine contribution classes ranging from 50 units down to 1/2 unit, the latter being available only to 'the least advanced countries' as listed by the United Nations. See below for the ITU equivalent scale, which has a wider range.