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## Final Frontier: A Voyage Requiring a World Enterprise, The

Christopher L. Brinkley

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# THE FINAL FRONTIER: A VOYAGE REQUIRING A WORLD ENTERPRISE

## I. INTRODUCTION

With the end of the Cold War, the world has entered an unprecedented era of international cooperation. The collapse of the philosophical conflict between the West and the East has allowed the nations of the world to come together for the benefit of mankind. Such collaboration has included preservation of both international peace<sup>1</sup> and human rights,<sup>2</sup> actions primarily centered around maintaining the world's status quo. Can these nations now come together to pull mankind, scientifically and technologically speaking, into the 21st Century? The area of scientific research where the most definitive answer to this question lies and where the world stands to gain the most benefit from cooperative efforts is perhaps the most pure international domain of all, "Space, the final frontier."

## II. THE BENEFITS OF SPACE EXPLORATION AND UTILIZATION

In a time when the entire world seems to be trying to make budget reductions, one of the first cuts inevitably seems to be in the space program.<sup>3</sup>

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1. The Persian Gulf War of 1991 is an example of the U.N. acting in the interest of international peace. For many years, the efforts of the U.N. Security Council were hampered by the veto power of the five permanent members; a veto most often exercised by the United States and the Soviet Union to frustrate each other's goals. See BARRY E. CARTER & PHILLIP R. TRIMBLE, *INTERNATIONAL LAW* 63-64 (1991). The collapse of the philosophical conflict allowed the Security Council, for the first time since the Korean War, to take major consolidated action to expel Iraqi forces from Kuwait. *Id.* at 1293, 1317-1318.

2. Examples of U.N. humanitarian and peacekeeping actions include efforts in Somalia, Bosnia, and Cambodia; William Pfaff, *Somalia Spotlights U.N. Crisis*, *STAR TRIB.*, Dec. 7, 1992, at 12A; and the protection of the Kurds in northern Iraq. Denise Natali, *Kurds in Northern Iraq Badly Need Help*, *CHRISTIAN SCI. MONITOR*, Mar. 12, 1993, at 19.

3. The U.S. space station, as originally conceptualized, was to carry a crew of eight. However, \$8 billion in budget cuts over the next five years forced the redesign of the station so that it would accommodate only

The reason is simple; the average person, including an elected representative, tends to feel that he receives no benefit from the space program unless he actually gets to go into space. However, on further reflection, most people do come to the realization that television broadcasting, global telecommunications and meteorological forecasting, all products of space research,<sup>4</sup> have direct impacts on their daily lives. But, in the minds of most people, such limited direct benefits do not justify the tremendous financial and technological investment required for an aggressive space program. If such justification exists, then it must come from the indirect benefits of the program.

Though most people are unaware of it, the indirect benefits of the space program are present in almost every facet of daily life. The multitude of disciplines required for space flight offers an eye-opening glimpse of this pervasiveness.<sup>5</sup> Perhaps the single most persuasive example of space technology reaching the average person is the personal computer. The need to process the massive amounts of data incident to space flight led directly to the computer age.<sup>6</sup> Techniques developed for photographing objects from space are now applied in medical x-rays to study circulatory disorders, brain tumors, and artery damage.<sup>7</sup> Space technology is finding applications in the management of roadway and aviation traffic, medical monitoring, crime detection, industrial controls, power generation, and banking.<sup>8</sup> The derivatives of space technology are not limited to merely the practical and necessary aspects of life. The composite materials found in modern racquetball and tennis rackets, as well as many other sporting goods, were originally developed for the space program.<sup>9</sup> Given these indirect benefits, suddenly the allocation of billions of dollars to the space program does not appear to be such a bad investment.

Other benefits also exist which relate to mankind's terrestrial life but on a much wider scale. The use of satellite technology for studying the Earth, a process known as remote sensing, has applications in a wide variety of forms. Such technology is used in locating natural resources, in predicting crop yields, in studying pollution, in mapping, in studying and charting oceanic and

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four crewmen. Robert W. Stewart, *NASA Chief Says Future Is Tied to U.S. Space Station*, L.A. TIMES, June 25, 1992, at 20. It is unsurprising that so little concrete work has come from the space station project [which is the usual justification for reducing appropriations to the project], when one considers the numerous times the station has had to be redesigned in order to accommodate budget cuts.

In addition to the \$8 billion in space station budgets cuts, the Clinton Administration plans on cutting another \$7.7 billion from other NASA programs over the next five years. See James R. Asker, *Clinton Offers \$15 Billion for NASA with R&D Boost*, AVIATION WK. & SPACE TECH., Apr. 12, 1993, at 25-26.

For an update on the severity of NASA's continued financial woes, see James R. Asker, *NASA's Budget Woes Will Threaten Station: Never mind the space station, will there even be a National Aeronautics and Space Administration five years from now?*, AVIATION WK. & SPACE TECH., Mar. 14, 1994, at 77.

4. R.C. Seamans, Jr., Returns From Space Exploration Overview on Space Achievements, in ORGANIZING SPACE ACTIVITIES FOR WORLD NEEDS 24 (Ernst A. Steinhoff ed., 1968).

5. Among the areas of expertise involved in spaceflight are hydraulics, electronics, mechanics, metallurgy, aeronautics, chemistry, physics, dynamics, and fluid mechanics. *Id.* at 7.

6. *Id.* at 29.

7. *Id.* at 30-31.

8. *Id.* at 32-33.

9. See James F. Glass, *Perspective On Space Exploration*, L.A. TIMES, July 20, 1993, at 7.

atmospheric patterns, and in a host of other manners.<sup>10</sup> Thus, space technology plays a significant role in the enhancement of life for all mankind.

### III. THE ADVANTAGES OF INTERNATIONAL COOPERATION

Space research has yielded tremendous dividends despite being carried on by several separate entities who have only occasionally joined together in their pursuits. Is there any real reason why the nations of the world should now break from this trend and join together to form an International Space Agency (ISA)? The simple answer is that cooperation and its conjunctive benefits are no longer precluded by conflicting political ideals and military overtones. Thus, it is only now that any advantages to cooperative efforts may be explored.<sup>11</sup>

The first advantage to international cooperation is the elimination of duplication of efforts in the interest of efficiency.<sup>12</sup> Duplicative efforts unnecessarily waste natural, financial, and human resources, as well as time, in order to derive the same answers to the same questions. These wastes could be avoided by coordinating space research through an international space organization. The resources saved may be applied to additional projects, thus allowing both a greater number of projects and a greater commitment of resources to each project.

10. MAN IN SPACE 214-17 (H.J.P. Arnold ed., 1993).

11. While some international cooperation in space is currently taking place, most efforts are only piecemeal projects with the individual nations providing only discrete services (usually based on the nation's location or specialized knowledge) to the overall effort. The ISA envisioned by this article would be more in the nature of a multinational "corporation" whose board of directors happens to be national governments. The purpose behind such a scheme is to place the space-faring nations and the NSFNS in positions of relative parity with respect to management, responsibility, and potential return.

For an extensive discussion of the implications of international cooperation in space, see generally José M. Filho, *About the Legal Definition of International Cooperation in the Exploration and Use of Outer Space*, PROCEEDINGS OF THE THIRTY-FIFTH COLLOQUIUM ON THE LAW OF OUTER SPACE 355-59 (1993) [hereinafter PROCEEDINGS ON THE LAW OF OUTER SPACE].

12. The following list is illustrative of the duplication of effort by the US and USSR during the last four decades:

Project	US	USSR
Initial Satellites	Explorer Vanguard	Sputnik
Moon Probes	Ranger Surveyor	Luna
Mars Probes	Mariner Viking	Mars
Manned Orbiters	Mercury Gemini	Vostok
Space Stations	Apollo Skylab	Soyuz Salyut Mir
Reusable Orbiters	Space Shuttle	Buran

See generally MAN IN SPACE, *supra* note 10.

A correlative benefit to eliminating duplicative efforts is the pooling of intellect, facilities, and experience. With the top scientific minds of multiple nations working on common goals, solutions to problems should be found more expeditiously. By giving the ISA access to facilities in various nations, each nation is not required to build facilities to meet all of their individual needs.<sup>13</sup> Furthermore, the experiences of the various nations could be applied to future situations. As an example, the Russians could lend valuable insight regarding extended stays in space from their Salyut and Mir programs to the Space Station Freedom project.

A second benefit to international cooperation in space is the dispersion of costs. As mentioned earlier, many nations are trying to cut their budgets, and space programs are frequently among the first programs placed on the chopping block. With the ISA, each nation does not have to meet the entire cost of every project. Rather, each nation would only need to contribute a portion of the funding for each project.<sup>14</sup> Simple mathematics illustrates the economy of a joint approach. Assume a space goal requires the investment of 100 monetary units. Each of two nations contributes 100 units to their separate space programs and each reaches the goal. In reaching the goal, the two entities have expended a total of 200 units. Now assume that the two nations each contribute seventy-five units to a joint space program. The ISA receives 150 units and after expending 100 units to reach the goal, has fifty additional units for other projects. Furthermore, since each partner only contributed seventy-five units, each nation in effect has twenty-five additional units to be used at the domestic level.

The dispersion of liability<sup>15</sup> for damage resulting from space activity provides a third reason for international cooperation. The reasoning is the same as that for the dispersion of costs; each nation need not contribute as much to settle a liability incurred by the ISA, as it would if each member operated independently.

The fourth major reason for forming an international space agency is that the legal regime covering space related activities is in great need of improvement.<sup>16</sup> The ISA could develop a comprehensive and evolutionary system of

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13. Consider a space program's need for worldwide tracking stations, research facilities, and launch and mission control facilities. The same argument can be extended to the tracking and data relay system satellites [TDRS] used by the U.S. for navigation and positioning of space vehicles.

14. Admittedly, there will be substantial bureaucratic costs in terms of both man hours and financial resources. However, these are factors associated with any cooperative effort, international or otherwise, and they would be more than offset by the benefits to be had. Furthermore, the bureaucratic interaction would be only at the highest levels of the agency's management and would thus, have very little impact on the daily operation of the agency. See *infra* parts V.B.3-5.

15. Under one current space treaty, a nation is held to strict liability for terrestrial damage and fault liability for extraterrestrial damage resulting from its space activities. Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, arts. II, III, 24 U.S.T. 2389 [hereinafter Liability Treaty].

16. The U.N.'s Committee on the Peaceful Uses of Outer Space (COPUOS) has led the way in the development of space law. While the ISA would not displace COPUOS entirely, by having the institution most involved in space activity also involved in the formation of space law, the principles so derived would not arise purely in the abstract but would rather have a foundation in concrete situations. COPUOS would still retain

law, which would represent the interests of the major space faring nations, as well as those nations seeking access to space. Among the legal issues that need to be addressed in the near future are the development of a binding and compulsory forum for dispute resolution,<sup>17</sup> the development of a system of environmental protection regulations,<sup>18</sup> the development of a system regulating the use of nuclear power in space,<sup>19</sup> and the resolution of the dispute over sovereignty regarding geostationary orbital positions.<sup>20</sup>

The final two reasons for worldwide cooperation in space are related to improving international intercourse. First, the ISA would lead to increased participation in space programs.<sup>21</sup> While many nations currently participate in space agreements with the major space powers, such agreements are usually directed toward a need of the space power with only incidental benefits to the assisting nation.<sup>22</sup> Under the ISA, these assisting nations would have an input

a vital role in representing those nations not involved in the ISA, particularly those not participating in any space activity, in terms of their relationship to those nations which are engaging in space activity through the formulation of treaties covering such topics as liability for damage as a result of the space activity of other nations. See *infra* part IV.

See generally Karl-Heinz Böckstiegel, *Developing a System of Dispute Settlement Regarding Space Activities*, PROCEEDINGS ON THE LAW OF OUTER SPACE, *supra* note 11, at 27-35.

17. Several space treaties establish liability for damage resulting from space activities, but none of these agreements establishes a forum or system for dispute resolution. See, e.g., 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, arts. VI-VII, 18 U.S.T. 2411 [hereinafter Space Treaty] and Liability Treaty, *supra* note 15.

18. These regulations are needed to protect both the earth's environment from damage from space-related activities as well as the space environment. A major issue revolves around the use of space as a commons for waste disposal. At first glance, it seems that space would be a limitless receptacle for waste disposal, particularly if waste was to be placed on a trajectory out of the solar system or into the sun, but the solution is not so simple. This same casual attitude regarding the seemingly limitless areas of the earth which could be used for waste disposal has led to many of the severe environmental problems that mankind faces today.

19. Nuclear power use in space has already generated a significant controversy. In 1978, a Soviet nuclear powered satellite, COSMOS 954, reentered the earth's atmosphere, broke up, and scattered radioactive debris over a significant portion of northern Canada. MAN IN SPACE, *supra* note 10, at 122.

Banning the use of nuclear power in space does not present an acceptable solution however. The coming space research programs, such as the Mission to Mars, will require vast amounts of power, amounts which only nuclear power sources can provide.

20. The conflicting positions on this issue are: 1) the general principle from space law which states that space is the common province of all mankind; Space Treaty, *supra* note 17, art. II; and 2) the claims of equatorial nations that the geostationary orbits are a natural resource subject to national sovereignty; see THE BOGOTA DECLARATION, DEC. 3, 1976, reprinted in CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 891-96 (1982).

21. The concept of increasing international participation in space involves an interesting twist with regard to the former Soviet Union. Due to the collapse of the USSR, the extensive Soviet space program has been scattered among a host of nations, most of whom are unable to effectively utilize those space related properties. An international space organization may be the only way to again reach the full potential and value of those sites. See generally Frans G. von der Dunk, *Towards a European Space Agency, Mark II?*, PROCEEDINGS ON THE LAW OF OUTER SPACE, *supra* note 11, at 172-82. See also E. Kamenskaya et al., *Legal Regulations of Space Activities in Russia and Commonwealth of Independent States*, PROCEEDINGS ON THE LAW OF OUTER SPACE, *supra* note 11, at 86-90.

22. The United States launched the first international satellite in 1962 in conjunction with the United Kingdom. ROBIN KERROD, THE ILLUSTRATED HISTORY OF NASA 246 (1986). The U.S. has participated in space related agreements with many nations including: Argentina, Agreement for Cooperation in the Civil Uses

in the formation of primary goals of space research without being forced to develop their own complete space program, which in most cases would be beyond the financial and technological capability of those nations.<sup>23</sup> Second, the formation of the ISA would provide a forum for greater dissemination of the benefits of space research and its spin-offs. Thus, the ISA would bring more nations into the scientific process, both in the formulation of questions and in the application of answers.<sup>24</sup>

The ISA would be the ideal forum to meet the goals of cooperation and mutual assistance. The ISA would provide extensive benefits to the space powers as well as the non-space-faring nations [NSFNs].<sup>25</sup> However, problems and details concerning such an organization must also be considered. In

of Space, Aug. 6, 1991, U.S.-Arg., Hein's No. KAV 3020, Temp. State Dep't No. 91-184 [hereinafter Argentina Agreement]; Australia, Agreement Concerning the Navstar Global Positioning System, Feb. 7, 1991, U.S.-Austl., Hein's No. KAV 2856, Temp. State Dep't No. 91-77; Thailand, Agreement on Cooperation in Science and Technology, Apr. 13, 1984, U.S.-Thail., T.I.A.S. No. 10,991; France, Agreement Concerning Emergency Use of the Combined Forces Base at Hao, Sept. 6, 1984, U.S.-Fr., T.I.A.S. No. 11,163; Senegal, Agreement Regarding the Establishment and Operation of a Space Vehicle Tracking and Communication Facility, Dec. 26, 1991, U.S.-Sen., Hein's No. KAV 3133, Temp. State Dep't No. 92-26 [hereinafter Senegal Agreement]; China, Memorandum of Agreement on Liability for Satellite Launches, Dec. 17, 1988, U.S.-P.R.C., 28 I.L.M. 609; Mongolia, Memorandum of Understanding on Cooperation in the Collection of Radiometer Image Data, Mar. 9, 1993, U.S.-Mong., Hein's No. KAV 3520 [hereinafter Mongolia Agreement]; and Ecuador, Agreement Relating to Observation and Tracking of Satellites and Space Vehicles, Feb. 24, 1960, U.S.-Ecuador, 11 U.S.T. 179.

The former Soviet Union had entered into similar agreements including one establishing an astronaut exchange program with several of its cold war allies. Agreement on Co-Operation in the Exploration and Use of Outer Space for Peaceful Purposes, July 13, 1976, 16 I.L.M. 1 [hereinafter INTERCOSMOS Treaty]. See also MAN IN SPACE, *supra* note 10, at 107-08. The Soviet Union has also participated in extensive cooperative programs with Austria. W. Riedler, *The Joint Austro-Soviet Space Project AUSTROMIR-91*, SPACE TECH., Mar. 1993, at 175.

The most notable case where several nations have come together for a cooperative space program has occurred in western Europe. Originally formed as the European Space Research Organization [ESRO]; Convention for the Establishment of a European Space Organization, June 14, 1962, 4 I.L.M. 306 [hereinafter ESRO Treaty]; the organization changed its name to the European Space Agency [ESA] and its organizational structure in 1975; Convention for the Establishment of a European Space Agency, May 30, 1975, 14 I.L.M. 855 [hereinafter ESA Treaty].

On several occasions, broad multilateral treaties with a space component have been concluded to meet certain needs such as global telecommunications. See *e.g.*, Agreement Establishing Interim Arrangements for a Global Commercial Communications Satellite System, Aug. 20, 1964, 514 U.N.T.S. 25; Agreement Relating to the International Telecommunications Satellite Organization "INTELSAT", Aug. 20, 1971, 23 U.S.T. 3813; Agreement Relating to the International Telecommunications Satellite Organization "INTELSAT" Operating Agreement, Aug. 20, 1971, 23 U.S.T. 4091.

23. For example, if a nation wished to have a satellite to obtain natural resources information, the nation would have to construct the satellite, develop a launch vehicle and the attendant facilities, and develop a means of data transmission and processing. Under the current state of affairs, the only alternative to developing an entire space program for a non-space-faring nation is to purchase such services from a space power. See Mongolia Agreement, *supra* note 22.

24. On a more philosophical note, an international organization with a purely scientific goal transcending national boundaries may have the benefit of opening up international communications, bringing the nations of the earth closer together in other respects.

25. The NSFNs would consist of all nations except the United States, the United Kingdom, France, Russia, China, Italy, Germany, Canada, and Japan. These nations represent both those which would contribute the majority of the financial support to the ISA and those which have the most advanced space programs.

addressing those issues, the logical starting point is with the primary principles of space law.

#### IV. THE IMPLICATIONS OF SPACE LAW

Understanding the intricacies associated with an international space organization requires a basic familiarity with the fundamental concepts of space law. The foundations of space law are rooted in the United Nations (U.N.). Under the U.N. Charter, members have expressed the purposes of maintaining international peace<sup>26</sup> and of achieving "international co-operation in solving international problems of an economic, social, cultural, or humanitarian character[.]"<sup>27</sup>

The launching of Sputnik by the Soviet Union in 1957 prompted the U.N. to take the initial step towards the formation of principles of space law. The U.N. was guided by the precepts of peace and cooperation contained in the U.N. Charter.<sup>28</sup> In 1958, the General Assembly adopted Resolution 1348 which established the ad hoc Committee on the Peaceful Uses of Outer Space (COPUOS)<sup>29</sup> for the purposes of promoting cooperation in outer space,<sup>30</sup> of exploring the possible legal problems relating to space activities,<sup>31</sup> and for the benefit of all mankind.<sup>32</sup>

The work of COPUOS led to the adoption of five principal treaties defining the law of outer space: the Space Treaty,<sup>33</sup> the Rescue and Return Treaty,<sup>34</sup> the Liability Treaty,<sup>35</sup> the Registration Treaty,<sup>36</sup> and the Moon Treaty.<sup>37</sup> These treaties establish several fundamental principles:

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26. U.N. CHARTER art. 1, para. 1.

27. *Id.* art. 1, para. 3.

28. ROBERT E. RIGGS & JACK C. PLANO, *THE UNITED NATIONS* 166 (1988).

29. G.A. Res. 1348, para. 1, *reprinted in* Henning K. Krakau & Andreas G. Wedel, UN-General Assembly Resolutions 333-334 (1975).

30. *Id.* pmbl., para. 1(b).

31. *Id.* para. 1(d).

32. *Id.*

33. Space Treaty, *supra* note 17.

34. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570 [hereinafter Rescue and Return Treaty].

35. Liability Treaty, *supra* note 15.

36. Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695 [hereinafter Registration Treaty]. The purposes of the Registration Treaty are to facilitate operation of the Liability Treaty and to minimize the potential of two objects being placed into conflicting orbits. It may seem that in the vastness of outer space the likelihood of two objects colliding would be remote, however, the number of objects launched into space is staggering; between 1958 and 1980 over 11,360 objects had left the Earth. Jochen Pfeifer, *International Liability for Damage Caused by Space Objects*, ZEITSCHRIFT FUER LUFT UND WELTRAUMECHT 215 (Sept. 1981).

37. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Nov. 12, 1979, 18 I.L.M. 1434 [hereinafter Moon Treaty].



- 1) Space is to be used solely for peaceful purposes;<sup>38</sup>
- 2) Space is the province of all mankind and not subject to national appropriation;<sup>39</sup>
- 3) The exploration and use of space shall be conducted in the spirit of cooperation and mutual assistance;<sup>40</sup>
- 4) States are to bear liability for damage resulting from their activities in space;<sup>41</sup>
- 5) The exploration and use of outer space is to be conducted in an environmentally safe manner;<sup>42</sup>
- 6) Space activity is governed by international law;<sup>43</sup>
- 7) These principles apply to intergovernmental organizations as well as state parties.<sup>44</sup>

These principles, which may be said to have risen to the level of customary international law,<sup>45</sup> define the primary rules of law that must govern the exploration and exploitation of space. By virtue of the seventh principle, they apply to any international organization to which the treaty parties are members. Thus, these principles should be furthered by the ISA. Furthermore, it can be seen that these treaties would not only form constraints on the ISA, but in fact, an international space program is the only way to meet the obligations imposed by these principles.

The ISA would also perform a reciprocal function by facilitating efficient operation of the treaties. The ISA would further the principles of international cooperation, especially in the area of dissemination of project results and information, and of making space open to all of mankind. The dispute resolution forum of the ISA<sup>46</sup> would be a tremendous aid in the administration of the

38. Space Treaty, *supra* note 17, arts. III, IV; Moon Treaty, *supra* note 37, arts. 2, 3.

39. Space Treaty, *supra* note 17, pmbl., art. II; Moon Treaty, *supra* note 37, arts. 4, 6, 11.

40. Space Treaty, *supra* note 17, pmbl., arts. III, V, VIII, IX; Rescue and Return Treaty, *supra* note 34; Liability Treaty, *supra* note 15, art. XXI; Moon Treaty, *supra* note 37, art. 10.

41. Space Treaty, *supra* note 17, arts. VI, VII; Liability Treaty, *supra* note 15; Moon Treaty, *supra* note 37, art. 14.

42. Space Treaty, *supra* note 17, art. IX; Moon Treaty, *supra* note 37, art. 7. A lack of foresight is one of the most significant reasons mankind is facing a myriad of environmental problems on earth, problems which are the result of its actions, the consequences of which it failed to consider. With the relative pristine state of the extra-terrestrial environment at stake, mankind has another chance to look before leaping. Just as importantly, space activities can have an effect on the earth's environment, including damage to the ozone layer from rocket exhaust and nuclear contamination. STEPHEN GOROVE, *DEVELOPMENTS IN SPACE LAW* 127-29 (1991).

43. Space Treaty, *supra* note 17, art. III; Moon Treaty, *supra* note 37, art. 2.

44. Space Treaty, *supra* note 17, art. XIII; Rescue and Return Treaty, *supra* note 34, art. 6; Liability Treaty, *supra* note 15, art. XXII; Registration Treaty, *supra* note 36, art. VII; Moon Treaty, *supra* note 37, art. 16.

45. Principles can attain the status of customary international law where they demonstrate the requisite *opinio juris* and practice. Although not every nation has accepted the principles of the treaties as law, *opinio juris* is demonstrated by the fact that the vast majority of nations engaging in space activity have signed onto the various treaties. The practice element is demonstrated, even though the treaties have been in existence for a comparatively short period of time (less than thirty years), by the fact that the principles have existed for most of the time that mankind has been involved in space activities.

46. See *infra* part V.B.14.

Liability Treaty, and the provisions of the Rescue and Return Treaty would be better facilitated by an agency with worldwide membership. Finally, the Moon Treaty, the provisions of which space activities have yet to begin to truly challenge, would also be better administered by a worldwide space agency. Therefore, it can be seen that the various space treaties can only reach their full potential by operating in conjunction with an ISA.

## V. *THE ISA - "ONE GIANT LEAP FOR MANKIND"*<sup>47</sup>

Having come to the conclusion that broad international cooperation in space<sup>48</sup> presents the most practical solution to the problem of the world's lagging space initiative, and having explored the international principles regarding space activity which must govern the solution to that problem, the next step is to decide "where" and "how" to organize such a cooperative effort. "Where" is not used in a geographical sense, but in a political context. Can existing political mechanisms accommodate the diverse issues surrounding international space activity, or must the ISA develop a new infrastructure? The real difficulty arises, however, in the "how" portion of the solution. In drafting an agreement to form an international organization, particularly one in such a high technology area as space activity, great care must be taken to balance the goals and benefits of such an organization against the national rights and interests of the various member states.

### A. *The Political Setting*

The political setting question is easily solved by reexamining the purposes and benefits of the ISA. The overriding goals of the ISA are to increase participation in space on a global level, to give the space powers a larger support base, to increase efficiency through conjunctive actions, and to give the NSFNs a greater role and interest in space activities. An organization with a relationship to the U.N., such as a specialized agency, presents the most practical solution. Such a relationship offers substantial benefits. First, in the event of a dispute arising among member states, a tie to the U.N. presents access to the Internation-

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47. The words spoken by Neil Armstrong as he stepped onto the lunar surface in July 1969 are, perhaps, those most identified with space exploration. However, they could be no more appropriate to any endeavor than they are to an attempt to bring mankind together on what would be the greatest voyage of all time and to the challenges to be overcome. *MAN IN SPACE*, *supra* note 10, at 74.

48. It is important to recognize that the ISA would not replace all domestic space activity. Private corporations could be expected to compete with the ISA in the commercial exploitation of space. Unfortunately, space technology is likely to also play a significant military role for some time. These military uses include rocketry as a weapons delivery system and surveillance satellites. Furthermore, it is also likely that nations may want to individually pursue projects not on the ISA itinerary. Thus, organizations such as NASA are not likely to be entirely replaced.

al Court of Justice.<sup>49</sup> Second, given the dual purpose use<sup>50</sup> of the technologies involved in space activity, the value of the Security Council in maintaining international peace will be especially significant.<sup>51</sup> Third and perhaps most importantly, a relationship with the U.N. also brings with it a relationship to specialized agencies, many of which have an interest in space activity.<sup>52</sup>

### B. *The International Space Agency Treaty*

As with any treaty designed to facilitate the aims of many nations, great care must be taken in the drafting of the ISA Treaty. Each provision must balance the interests and financial stake of the major space powers, without whom such an agency cannot exist, against the interests of the NSFNs, who have previously been unable to gain access to the benefits of space. The treaty should cover as many specific details as possible, as well as providing guiding principles to resolve unforeseen difficulties.<sup>53</sup>

#### 1. Purpose, Guiding Principles, and Legal Personality

The purpose provision of the ISA Treaty would provide the best opportunity to lay down a concept governing the agency. Plainly stated, the ISA would operate to facilitate international cooperation and promote respect for the rights of other nations in the exploration and exploitation of space. To this end, the treaty should provide that all agency actions should be consistent with the interests of both the space powers and the NSFNs. This declaration of purpose must be supported by guiding principles paramount to any actions taken by the agency, including its programs, operations, regulations, and decisions. These

49. This assumes the dispute would arise between nations. Statute of the International Court of Justice, June 26, 1945, art. 34, 59 Stat. 1055 [hereinafter ICJ Statute].

Furthermore, member nations should be required in signing the ISA Treaty to agree to submit to the compulsory jurisdiction of the ICJ. *See id.* art. 36(2).

50. "Dual purpose use" refers to the ability of many of the technologies involved in space activity to be applied in both civilian and military manners. *See generally* RONALD A. FINKLER ET AL., TECHNOLOGY TRANSFER IN A CHANGING NATIONAL SECURITY ENVIRONMENT (1990).

51. *See* U.N. CHARTER ch. VII. In this respect the ISA would be similarly situated to the International Atomic Energy Agency. Due to the usability of the technologies involved in both peaceful and military methods, the Security Council would have to play a prominent role in the control of those technologies. *See* Statute of the International Atomic Energy Agency, Oct. 26, 1956, arts. III, XII, 8 U.S.T. 1093. *See also infra* part V.B.10.

52. The United Nations Educational, Scientific, and Cultural Organization [UNESCO] operates to disseminate all types of scientific information throughout the world. The International Civil Aviation Organization [ICAO] would play a major role in defining the legal regulation of the aerospace plane. The International Telecommunication Union [ITU], the World Meteorological Organization [WMO], and the International Maritime Organization [IMO] all rely on satellites for data and communications. The World Intellectual Property Organization [WIPO] would provide an international forum for the registration of patents covering the technologies involved. The International Atomic Energy Agency [IAEA] would play an important regulatory role in the use of nuclear power in space. *See generally* STEPHEN S. GOODSPEED, THE NATURE AND FUNCTION OF INTERNATIONAL ORGANIZATION 420-65 (1967).

53. For an extensive discussion of the potential difficulties to be considered in drafting the ISA Treaty, *see generally* FREDERIC L. KIRGIS, JR., INTERNATIONAL ORGANIZATIONS IN THEIR LEGAL SETTING (1977).

guiding principles may be included by incorporating the language of the fundamental treaties of space law<sup>54</sup> and fundamental precepts of international law. The necessary principles of international law include the customary norms of maintenance of international peace, recognition of space as the province of all mankind, and its corollary, cooperation among nations in space.<sup>55</sup>

Finally, in order for the ISA to act under these principles and to conduct its business, the ISA Treaty must establish the agency as an entity with legal personality under international law. The statement of legal personality would also facilitate other aspects of the operation of the ISA by allowing it to enter into contracts, to maintain claims against its members, and to accept liability for its actions.

## 2. Membership

The membership conditions of the ISA would present the first major balancing test between the goals of the ISA and the principles of international law. A major purpose of the ISA would be to involve as many nations as possible in the exploration and exploitation of space. When considered in conjunction with the principle that space is the province of all mankind, it becomes obvious that nations should be given a presumption of fitness for membership. However, a critical consideration of membership would be the dual-use potential of the nation's technologies. Nations which have exhibited a predisposition to exercising military uses of such technology<sup>56</sup> should be susceptible to a more rigorous standard for admission.

Thus, a method must be developed to allow membership in the ISA subject only to the qualification that a nation use the technologies solely for peaceful purposes. Subsequent to the fitness presumption, a Security Review Committee should examine each nation's request for admission so as to exclude those nations considered a threat to international peace if they were in possession of such data and technology. Because this committee's purpose would be to maintain control over the technologies so they are used only for peaceful purposes, a mission similar to that of the U.N. Security Council, the logical choice for the members of this committee would be representatives from the permanent members of the Security Council.<sup>57</sup>

However, the procedure for membership review by the committee would have to be decidedly different from the procedure of the Security Council.

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54. *See supra* part IV.

55. These fundamental principles of international law, necessary for the operation of an ISA, are included in the primary space law agreements. However, they are significant enough to bear specific inclusion.

56. Iraq's use of its nuclear power technology in an attempt to develop nuclear weapons is an example.

57. The permanent members of the Security Council are the United States, the United Kingdom, France, Russia, and China. U.N. CHARTER, art. 23. Coincidentally, these same five nations are among the world leaders in space technology and would be among the major financial contributors to the ISA, lending additional support to their selection for membership in the review committee.

There is likely to be little opposition to the membership of these nations in the ISA and they are likely to seek to become members. Thus, this committee could perform its function even with regard to those nations seeking to become the initial members of the ISA.

Security Council action can be vetoed by any one of the permanent members of the Security Council.<sup>58</sup> The Review Committee should prohibit admission only by a unanimous vote. Exclusion should be the exception rather than the rule.

### 3. The Governing Council

The representative body of the ISA should provide the primary means by which the member nations would maintain control over their financial and technological investment in the ISA. It would also serve as the forum through which the members conduct the business of reaching the goals of the ISA. This representative body would be the Governing Council. Among the issues to be considered in devising the Council provision are member nation representation, the scope of control, and the voting methodology.

Council representation and procedure would present relatively minor issues. Representation on the Council of each member would be most easily facilitated by providing that each member nation appoint one person to act as the official representative of that member's interests. Appointment or election of the representative would be left to the individual member nation. This representative would speak and vote on behalf of the member nation in Council proceedings. Each representative would be permitted assistance by a staff as needed to adequately perform his duties. Council procedure could be adopted from virtually any international organization, such as the U.N. General Assembly<sup>59</sup> or the Council of the European Space Agency.<sup>60</sup>

The Council, as the primary governing body of the ISA, would have control over a broad range of matters. The Council would elect the task group committees and direct the distribution of work to such groups.<sup>61</sup> One of the Council's most significant duties would be to conduct the final approval stage of the budgetary process.<sup>62</sup> The Council would also elect the Agency Director,<sup>63</sup> the Technical Director,<sup>64</sup> and the judges on the dispute resolution panel.<sup>65</sup> The Council would have the final approval of agency procurement<sup>66</sup> and approval of sales of information to non-members.<sup>67</sup> The Council, in its

58. *Id.* art. 27.

59. See U.N. CHARTER, ch. IV.

60. See ESA Treaty, *supra* note 22, art. XI.

61. These task groups would be charged with the daily operation of the ISA. See *infra* part V.B.5.

62. See *infra* part V.B.6.

63. See *infra* part V.B.4.

64. *Id.*

65. See *infra* part V.B.14.

66. The ISA would have to procure products or services from private individuals or firms. The Council should distribute the economic benefits among member nations in accordance with their relative financial contributions. Purchases from non-members should be allowed, but preference should be given to members as an economic benefit of membership.

To ensure that member nations are treated fairly, the Council should establish an Auditing Committee to examine the distribution of economic investment. At the request of a member, an audit [assuming such audit indicates that member's derived economic benefits to be less than that nation's equitable share] should be prima facie evidence in a claim by that member against the agency before the agency dispute resolution panel.

67. See *infra* part V.B.8-9.

agency oversight rule, would also establish and administer auditing committees for supervising both the financial and technical matters of the agency. The worst case example of the Council's duties would be dissolution of the agency.<sup>68</sup> The Council's main duty would be to provide a forum for members to propose agency actions and to approve such actions at the "project level."

Council sanction should be required for all agency actions at the project level. Thus, the key question would be, what should be the definition of a "project"? Should a project be a broad goal, such as the development of a heavy lift launch vehicle [HLLV], or something more narrow, such as the development of materials for an HLLV's skin? Defining "project" narrowly would force the Council to be involved in the approval of minuscule details which would limit efficiency. However, defining "project" too broadly would relieve the Council of much of its power, which would be the primary method through which the member states would retain control over their participation. Thus, "project" should be defined as a major expenditure of funds and expertise for the accomplishment of a significant goal. A significant goal should not include the development of materials, propulsion systems, control and data management systems, or similar component systems. However, an agency action which would be the result of a sum total of these component developments would be a significant goal. Thus, a program for the remote sensing of third world countries, including the launching of a new remote sensing satellite, would be a significant goal, and therefore designated a "project" requiring Council approval. Development of a new type of imaging for remote sensing use would not be a significant goal.

Perhaps the most difficult issue in the structuring of the Council would be the voting methodology. This provision would require the most significant balancing of the interests of the space powers and the NSFNs. This issue would have two facets: 1) the distribution of voting power among the members, and 2) the majority requirements for given issues.

The distribution of voting power could proceed along one of two traditional routes. The first possibility would be a voting scheme of one vote per member nation.<sup>69</sup> This option would provide for the greatest amount of input from the NSFNs, but consequently, would subject the space powers, who would bear the majority of both the financial and technical burdens of the ISA, to the whims of the NSFNs. The second option would allocate voting power based on each member's respective financial contribution.<sup>70</sup> However, while this possibility would maximize control by the space powers over their significant investment, it would also minimize the interests of the NSFNs. Neither of these options alone presents a satisfactory solution.

A voting system which would be a hybrid of the above two systems could yield an acceptable methodology. This method would involve conducting two simultaneous votes. Each member would vote for or against an issue. The votes

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68. See *infra* part V.B.12. Accession would be subject to the membership review committee. *Id.*

69. ESA Treaty, *supra* note 22, art. XI.

70. See *infra* part V.B.6.

would then be tabulated in two separate ways. First, votes would be counted on a one ballot per member basis. The tally would then be compared to the given majority requirement for that issue. If the ballot total failed this first test, the proposal would be defeated. Second, votes would be counted on the basis of financial contribution. Again the tally would be required to pass a certain percentage of financial control. If the vote passed this second test, the proposal would be approved.<sup>71</sup>

Having devised a voting methodology, the issue becomes what threshold levels of ballots and financial backing should be required for project approval. For most issues, such as agency internal affairs, third party dissemination, and project approval, a simple majority on both counts would be sufficient. For some issues with particular significance, such as budget approval and dissolution, super-majorities of two-thirds or three-fourths should be required.

#### 4. Agency Director and Technical Director

The Agency Director would be the figurehead of the agency. Within the agency, the Director would conduct meetings of the Council, present the budget proposal,<sup>72</sup> and serve as a guiding force in the direction of the agency with regard to its programs and goals.<sup>73</sup> The Director would also be the principal extra-agency figure when acting as its legal representative. The Director would conduct the ISA's relations with foreign governments and with private individuals. Chief among the Director's duties would be contractual dealings on behalf of the agency, including both procurement contracts and sales of information to non-members.

In order to fulfill his mission as overall agency figurehead and due to his vast influence in directing the ISA's programs, the Director must: 1) be accepted by a substantial majority of the agency members, and 2) be vested with a large degree of independence from his nation. The simplest way to meet the first criterion would be to elect the Director from nominations by the Council representatives by a two-thirds majority. By giving the Director a term in office of five years, subject only to removal by a two-thirds majority of the Council, the agency would be given some continuity of direction over time. The logical way to meet the second criterion would be to provide that upon election, the Director may not be responsible to his national government.

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71. The criticism of this method is that combining two voting requirements which have antithetical aims, neither of which is sufficient standing alone, cannot possibly yield anything but gridlock within the Council decision process. The response to this criticism is that one must not overlook the inevitable politics of an organization such as the ISA. For example, an NSFN whose proposal carries sufficient pro rata ballots but does not meet the financial contribution requirement, could make a voting agreement with a space power, who has a proposal that carries sufficient financial votes but an insufficient number of pro rata ballots and vice versa. Thus, the politics of the ISA would force both the space powers and the NSFNs to reach mutually acceptable decisions through cooperation and concession.

72. See *infra* part V.B.6.

73. These goals establish the next "leap" in technology to be taken. These "leaps" trickle down to the average person and generate the ultimate value of the space program. One way to reach the average person would be to require the Director to give a yearly state-of-the-agency address.

The second principal officer of the ISA would be a Technical Director. The Technical Director's purpose would be to coordinate the various agency task groups. Coordination would be extremely important given the interrelation required among the various committees in conducting major projects.<sup>74</sup> Because the Technical Director would perform only a coordinating function, the concerns regarding the leadership nature of the Agency Director's position would not apply. Therefore, election of the Technical Director from the Council members by a simple majority, for a one year term, would be sufficient.<sup>75</sup> Again, the Technical Director should be chosen from among nominees submitted by the Council representatives.

## 5. Scientific, Technical, and Legal Programs

To better organize the efforts of the ISA, a division of labor into specialized departments would be required. These departments should, on one hand, consist of the continuing developmental areas of space activity including a Launch Services Group,<sup>76</sup> a Satellite Services Group,<sup>77</sup> an Astronomy and Interstellar Research Group,<sup>78</sup> a Space Resource Exploitation Group,<sup>79</sup> and an Earth Missions Group.<sup>80</sup> In addition, specialized divisions should be established with regard to each of the "banner projects," including the space station, the aerospace plane, the mission to Mars, and the return to and exploitation of the moon, in both their developmental and operational phases. Groups may be added or terminated in order to meet the needs of the ISA.

Organization of the ISA in this manner would create greater efficiency in the organization. It is, however, a departure from the precedent set by the European Space Agency (ESA). The ESA is organized on a project by project basis.<sup>81</sup> Some projects are mandatory and are included in the mandatory funding scheme of the ESA.<sup>82</sup> Other ESA projects, however, are voluntary with

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74. See *infra* part V.B.5.

75. Removal would likely not be important with regard to the Technical Director's position. However, to give the office stability, removal should be only by a super-majority vote of the Council.

76. The Launch Services Group would be responsible not only for conducting launchings and mission support for the ISA, both in an agency role and in a commercial role, but also for development of new launch technologies.

77. The Satellite Services Group would be responsible for construction of satellites for all phases of the ISA missions including space probes, meteorological satellites, telecommunications satellites, and remote sensing satellites.

78. The Astronomy and Interstellar Research Group would be responsible for the formulation and conduct of studies in the areas of astronomy and interstellar research. Among the duties of this group would be research using radio and optical telescopes and monitoring and interpretation of data from interstellar probes.

79. The Exploitation Group would be responsible for areas such as development and utilization of solar power, development of extraterrestrial mineral procurement, exploitation of geostationary orbits, and the use of space as a method of waste disposal.

80. The Earth Missions Group would be responsible for all space missions conducted in near-earth orbits. Among these would be remote sensing, global communications, and meteorological monitoring.

81. ESA Treaty, *supra* note 22, art. V.

82. *Id.* arts. V, XIII.



project funding required only from members who opt to participate.<sup>83</sup> In the interests of encouraging nations to join the ISA and of providing the benefits of space technology to the entire world, the ISA should make all of its projects mandatory.<sup>84</sup> Mandatory participation would lend strong support to the principle of balancing the interests of the space powers and the NSFNs.

Two additional specialized divisions should be formed: an Environmental Monitoring Group [EMG]<sup>85</sup> and a Legal Development Committee. The EMG should not have a veto over the programs of the other specialized committees, but rather would serve to keep the environmental aspects of the ISA under consideration. The task of balancing the environmental considerations against the benefits of the proposed program should be left to the individual task committees, who would make the ultimate decision whether to proceed with a given project. The Legal Development Committee would be charged with expanding the legal guidelines of space activities. These guidelines would include not only broad principles of space law, but also the regulations applicable within the agency. The legal committee would not legislate such guidelines, but would study the issues and develop drafts of such guidelines to be submitted to the Council for adoption.<sup>86</sup>

The division of labor calls for two additional considerations. First, inevitably some projects would fall within the purview of multiple groups<sup>87</sup>. This overlapping would require coordination between task groups for the successful completion of the project. This coordinative function should be performed by the Technical Director.<sup>88</sup> Second, the function of each group would be to carry out projects within its scope. Thus, each group would be charged with the daily administration of the agency's projects. Each group, however, should be allowed to formulate concepts and submit them to the

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83. *Id.*

84. An additional reason to make all ISA projects mandatory would be the ISA's goal of disseminating not only information and results from space research, but also of distributing the technologies used. Members opting to participate in only some of the ISA's projects could receive substantial benefits from programs in which they chose not to participate. This would be a result of the nature of the ISA. Technology developed for one agency project is likely to cross over to other agency projects.

85. The Environmental Monitoring Group should not be confused with the remote sensing functions of the Earth Missions Group. Rather, the Environmental Group would monitor the environmental effects of the actions of the ISA. Among its concerns would be the effects of launchings on the earth's atmosphere, the effects of the use of nuclear power on board space objects, and the disposal of wastes generated on earth and in space. Each of these areas presents a plethora of complicated issues which are beyond the scope of this paper, but include problems of launch malfunction and the uncertainty regarding environmental effects on space and the stellar bodies. As the exploitation and utilization of space continues to expand, further issues may arise as to man's responsibility to protect the pristine state of extra-terrestrial environments. As an example, mankind should consider whether a rocket powered probe of Saturn's moon Titan would disrupt its unique atmosphere. See WILLIAM J. KAUFMANN, III, UNIVERSE 292-94 (2d ed. 1988).

86. See *infra* part V.B.3.

87. As an example, the development, deployment, and operation of a new geostationary communications satellite would require efforts from the Satellite Services Group, the Launch Services Group, the Earth Missions Group, and the Space Resource Exploitation Group.

88. See *supra* part V.B.4.

Council for approval.<sup>89</sup> But, they should only be allowed to carry out Council approved projects.

The groups must take care that they do not exceed their authority and do not intrude within the domain of the Council. To facilitate this, any member nation should be permitted to request from the agency judicial panel<sup>90</sup> a ruling regarding whether a decision must be submitted to the Council for approval. The decision of the judicial panel should be binding and final.

Finally, the question arises as to the composition of the committees administering<sup>91</sup> each of the groups. Each committee should be representative of the overriding goals of the ISA and thus recognize the interests of both the space powers and the NSFNs. A five-member committee would satisfy this goal by requiring two members to be from NSFNs, one member from the Security Review Committee,<sup>92</sup> one additional space power member, and a fifth at-large member.<sup>93</sup> Voting on matters within the group's control should be carried out strictly on a majority basis with each committee member having one vote. This voting mechanism would equalize the NSFN's voting power with that of the space powers at the implementation level and would serve to counterbalance in part the financially-based weighted voting process of the Council.

## 6. Agency Funding

The funding scheme of the ISA must reflect the ability of each member nation to contribute financially in order to further the goal of increasing the participation of NSFNs in space. Thus, establishing a percentage contribution schedule based on the annual gross domestic product<sup>94</sup> of each participating nation ensures a fair allocation of the costs of the ISA.<sup>95</sup> This method of cost allocation also reflects the fact that the developed nations, which would bear the majority of the agency's financial burden, stand the most to gain from the space program because the space powers would have the most diverse economies to which the technologies and results could be applied.

The accompanying table illustrates a potential contribution schedule. The 1994 NASA budget is approximately \$15 billion.<sup>96</sup> Consider an ISA budget

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89. It would be critical for the groups to provide feedback to the Council since the task groups would be intimately associated with the actual work of the ISA.

90. See *infra* part V.B.14.

91. The committees discussed in this section are merely the top level management personnel for each task group. It is contemplated that the agency would maintain a permanent staff which would comprise the agency's employees. These employees would, like those of any other "corporation," be hired and retained based on their abilities to fulfill the needs of the agency.

92. The United States, United Kingdom, France, Russia, and China. See *supra* part V.B.2.

93. A committee member need not be a given nation's Council representative but could be a member of the representative's staff.

94. In determining the gross domestic product, the average gross domestic product over the previous three years should be used to obtain an accurate measure of a member's GDP and to take into consideration economic fluctuations. This would be particularly important in the case of NSFNs.

95. This is the same type of funding scheme employed by the ESA. ESA Treaty, *supra* note 22, art. XIII.

96. See Asker, *supra* note 3, at 25.

ISA FINANCIAL CONTRIBUTIONS <sup>97</sup>		
NATION	GROSS DOMESTIC PRODUCT (\$BILLIONS)	PERCENTAGE (%) OF TOTAL ISA NATIONAL PRODUCT
THE SPACE POWERS		
United States	5600	30.25
United Kingdom	915	4.94
France	1000	5.40
Russia	2500	13.50
China	393	2.12
Italy	965	5.21
Canada	521	2.81
Japan	2300	12.42
Germany	1331	7.19
THE NON-SPACE-FARING NATIONS [NSFNs]		
Australia	311	1.68
Austria	164	0.89
Brazil	388	2.10
Senegal	5	0.03
Ecuador	12	0.06
Israel	55	0.30
Sri Lanka	7	0.04
Ukraine	48	0.26
All other NSFNs	2000	10.80
TOTAL	18,515	100%

97. See generally ROBERT FARNIGHETTI, THE WORLD ALMANAC AND BOOK OF FACTS 1994 (1993).

Note that the difference in percentage contribution between China and Brazil would be only 0.02%. The reason for classifying China as a space power, but Brazil as an NSFN, would be the fact that China has a more technologically advanced space program. MAN IN SPACE, *supra* note 10, at 196-99.

250% as large, a total of \$37.5 billion; under the schedule, the United States contribution would be \$11.3 billion. In effect this would be a savings to the United States of \$3.7 billion. This is an outstanding example of the principal economic benefit of forming the ISA.

The second dimension of the financial question would deal with setting the total agency funding goal. Again, a balancing of the interests of the space powers and the NSFNs must be performed. The space powers, who would bear most of the financial burden of the ISA, would be resistant to having the total funding goal subject to the pro rata vote of the entire ISA membership in a Council setting, where most representatives would be from NSFNs. On the other hand, allowing the space powers to control the total goal might cause them to hold down the total budget and thus, their individual contributions. This conservative action could undermine the confidence of both the NSFNs and the space powers in the ISA concept of broad multilateral participation.<sup>98</sup>

This dilemma can be resolved by splitting the funding process into two stages. The first stage would be the budget proposal process. In this phase each member nation would submit a budget proposal to the Agency Director. The Director would then synthesize an agency budget proposal, taking into account each member's proposal, and submit the final proposal to the Council for approval.

At the Council approval stage, voting should be modified to reflect the interests of mankind in an aggressive space program. In spite of the likely objection of the space powers, in order to maintain the spirit of equality of nations, voting should be conducted on a one vote per nation basis and require a super-majority of the vote for approval. However, to reflect the interests of the space powers in maintaining a greater degree of control over the budget, at least six of the nine space powers should be required for approval of the budget, in addition to receiving affirmative votes from nations contributing at least two-thirds of the total budget. In the event that a budget proposal is rejected, the member nations should submit revised budget proposals to the Director with the synthesis and the voting process should be repeated.

Approval of the budget by the agency does not end the necessity for agency control over the budget. Just as important as budget approval by the agency would be member governments' domestic appropriations to the ISA, consistent with the agency budget. The simple way to avoid any potential difficulties at the domestic level is to require, under the ISA Treaty, that member nations enact domestic legislation necessary for them to meet their financial obligations under the treaty.

One final funding point must be made with regard to the form of a member's contribution. The usual case would be for members to make their contributions in a monetary form. However, particularly in the initial formation

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98. Undermining the confidence in international participation could be one of the greatest potential undoings of the ISA. Unless a belief could be maintained that cooperation is the most beneficial method of conducting space activities, NSFNs may see it to be in their best interests to continue conducting space activity by contract with individual space powers, and the space powers may see it to be in their best interests to pursue space objectives under individual programs.

of the agency, provisions should be made for contributions to the agency in the form of property, including real property, laboratory and tracking facilities, equipment, and in other non-monetary forms. Property contributions should be discounted against a member's financial obligation at the property's fair market value. In order for the property contribution to be valid, legal title should be transferred to the ISA.<sup>99</sup> Transfer of title to the agency would eliminate any problem of a member nation placing its programs ahead of those of the agency and would give the agency priority in use of the property.<sup>100</sup>

In spite of a provision requiring domestic implementation of each member's obligations, there is no doubt that situations would arise where member states would fail to meet their contribution requirements. In such a case, the agency must turn to dispute resolution under the treaty.<sup>101</sup>

## 7. Ownership and Use of Facilities and Systems

The ISA would have facilities scattered among a number of countries. This could lead to several potential controversial situations which could for the most part be eliminated by establishing a uniform system of ownership and priorities in use.

The ISA could acquire facilities and systems in a number of ways. Members could make their financial contributions in the form of facilities and systems. The ISA Treaty should also provide for the purchase of properties from members at their fair market value.<sup>102</sup> The ISA should not, however, be prevented from renting facilities and services where the agency cannot acquire title in the properties. Such rentals should be made for a reasonable fee from member nations where possible<sup>103</sup> and feasible.<sup>104</sup> In any case, other than rental of property and systems by the agency, title in the property should be vested in the agency.

The agency should not be prevented from leasing its properties for a reasonable fee for use by agency members, as long as there would be no conflict with the ISA's agenda. A more difficult question would arise regarding whether the agency should rent its properties to non-member nations. Allowing rentals to non-members would decrease the incentive for nations to join the ISA.

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99. The consideration given by the ISA in exchange for the property would be the return of information to the member from the agency's projects. *See infra* part V.B.8-9.

100. Allowing a member government to place its agenda ahead of that of the agency in effect would also put the interests of all other members in a subordinate position. Clearly, this could lead to a great deal of conflict within the agency. Minimizing conflict among member states would be crucial to the success of such a broad multilateral organization.

101. *See infra* part V.B.14.

102. Purchase from non-members should also be permitted, but where possible, preference should be given to facilities within member nations in the interest of providing an economic return to the ISA members.

103. Rental from non-members, where necessary, should be permitted, but priority should be given to member nations in the interest of providing economic return to the ISA members.

104. "Feasible" would include a balancing of several factors including whether the property would be used on multiple occasions, whether the cost is prohibitive, and the significance of the agency having priority in the use of the property.

However, denying rentals to non-members would be to ignore the scientific, cooperative, and worldwide goals of the agency. Thus, rentals should be allowed to non-members, but for a price reasonably in excess of the amount a member would be charged.<sup>105</sup>

Furthermore, the ISA should be permitted to generate income by engaging in commercial space activities with private firms and individuals. Among the potential forms of commercial activity would be the launching of objects into space, the sales of remote sensing data, and the sale of agency satellite utilization shares.<sup>106</sup> Commercial activities with firms operating in non-member nations would not present the same problems as rental to non-member governments.<sup>107</sup> Thus, the agency should be permitted to rent to any private individual or firm unless an issue exists regarding national or global security.

## 8. Rights to Information from Agency Projects

A substantial issue would arise as to the dissemination of information and the results from agency projects. A member would make its funding contribution in exchange for which the agency would disseminate to the member the information resulting from agency actions. Thus, members should not be charged an additional amount for acquiring such information. Should such information also be available to nations who are not ISA members? Consistent with the goal of opening space to the entire world, the obvious answer would be that, as a general rule, non-members should be able to acquire such information. However, access to information should be at a discount to agency members. Thus, in selling information to non-member governments, the agency should charge a fee in excess of the amount contributed by member nations.<sup>108</sup>

## 9. Intellectual Property Rights

The ownership of the intellectual property generated by the agency would present one of the more delicate issues facing the ISA. [The distinction being made here is between the data and results from ISA projects and the technologies used to obtain such data and results.] While the data and results generated by the agency could have an adverse effect on international peace, a far greater danger would exist with regard to the systems used to carry out space related activities. Thus, while the agency should act to disseminate data and results as widely as possible, the intellectual property should be more closely held.

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105. This would place a premium on agency membership without ignoring the fundamental purpose of the ISA.

106. An example of sales of satellite utilization shares would be a case where the agency operates a maritime communications satellite and allows its use by an international shipping company.

107. Failure by the agency to rent to private individuals and firms in non-member nations would have only a secondary and minimal effect on discouraging the non-member from joining the ISA.

108. This would encourage nations to join the ISA since the information could be obtained through a membership contribution in a proportionately smaller amount, and a membership contribution would also be in exchange for a significant amount of other information.

The question of who or what entity should own the intellectual property rights of the agency must also be resolved. Should the rights vest in the person who was the key in the development of the property, or perhaps, the member nation which is home to such individual? The most logical answer of course would be to vest the intellectual property rights in the agency. Since every member of the agency would be contributing financially to the development of the technology, title should be vested in all of the members collectively. Giving the property rights to the agency would also make security of the property an easier task.

Property contributed by a member nation as part of its financial contribution would present a different issue. The member nation which developed the property should rightfully retain the intellectual property rights. As a condition of its contribution, however, the agency should receive a perpetual license to use the property.<sup>109</sup> The amount paid by the agency for the right to use such property should be the fair market value of the technology involved.<sup>110</sup>

Another facet of the intellectual property issue would revolve around those nations which would desire to obtain use of the rights held by the agency. The agency's purpose would be to distribute data and technologies which can be used in a non-military manner.<sup>111</sup> Thus, some of the technologies must be distributed to the member nations subject to security restrictions.<sup>112</sup> Such technologies would represent a portion of the return on a nation's financial contribution. As such, no additional financial charge should be required for a member's acquisition of such technology.

The sale of such technologies to non-members would present another opportunity to generate income for the agency. Again, subject to security restrictions, these technologies should be available for sale to non-members. The charge to non-members for acquiring such technology should be a reasonable amount, but should also exceed the amount that nation would have contributed to the development project had that nation been a member of the ISA. This greater charge would place a premium on ISA membership and would encourage the non-member to join the ISA.

## 10. Protection of International Security

Space research, perhaps more than any other area of science, has the potential both to be used in weapons of a devastating caliber and to provide

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109. This perpetual license would prevent any problems in using the technology in the event the contributing nation should leave the ISA. Without such a license, a nation leaving the ISA could withhold the rights to use the technology from the agency, thus hampering continuing agency programs.

110. Charging the agency the cost of development of the property would be inequitable because the developing nation would have produced the property for its own benefit, rather than for the benefit of the agency.

111. These non-military technologies, particularly the derivative technologies suitable for everyday use by the average person, represent perhaps the greatest benefit from an aggressive space program.

112. See *infra* part V.B.10.

critical military intelligence.<sup>113</sup> Among the potential types of information which could be implicated in security restrictions are remote sensing data<sup>114</sup> and rocket technology.<sup>115</sup> Thus, the ISA must have some procedure for restricting the flow of information, both in the form of project results and technology, which could have an adverse effect on international peace. At the initial level, this restriction would be accomplished by the screening of potential members by the Security Review Committee. However, as the work of the agency progresses, information could arise which would be critical in certain situations that could lead to a threat to the peace. In such a case, a method must exist for restricting the flow of information from the ISA to the member governments.

The best way to meet this restricting function would be for the Security Review Committee to screen the dissemination of data and technology. As stated earlier, the Security Review Committee should be composed of representatives from the permanent members of the U.N. Security Council. Because the committee's purpose would be to review the fitness of the information for dissemination, the committee members must have access to the information. By utilizing the U.N. Security Council members, the Review Committee would consist of nations which would already be in possession of the information through domestic sources. For this same reason, any action by the committee of withholding information should be non-reviewable.

The procedure for committee review of information should be the same as it would be for the membership process. All data and results should be presumed fit for dissemination to all members, but should also allow for rebuttal of the presumption. Great care must be taken not to restrict the flow of information unnecessarily. It must be kept in mind that a primary purpose of the ISA would be to facilitate the flow of information for the betterment of all mankind. Thus, in the interest of efficiency, information should be reviewed only when at least two members of the Review Committee propose such screening.<sup>116</sup> Data and results should be withheld only with such a vote by at least four of the five committee members.<sup>117</sup>

The dissemination of the agency's intellectual property should be more broadly restricted. The technologies must be supplied to the ISA members to the extent necessary for a given member to meet their agency obligations. Additional technologies must also be distributed to the ISA members, because

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113. For an example of how the U.S. restricts potential military technologies through the Military Critical Technologies List, *see generally* FINKLER ET AL., *supra* note 50.

114. Remote sensing data can be used to reveal the locations of troops and military hardware.

115. Rocket technology would be particularly dangerous since it could be used as a delivery system for a variety of weapons including chemical and nuclear devices.

116. Requiring two nations to propose review would eliminate the inefficiency that could result from a single overly sensitive nation making constant objections, thus frustrating the purposes of the ISA.

117. In the membership scenario, in the interest of opening space to the entire world, membership would be denied only by a unanimous vote. By requiring only four committee members to vote for withholding information, the committee could restrict information from a given project which the majority feels would be damaging to international peace, but such restriction would not affect the restricted nation's access to information resulting from other ISA projects.



the acquisition of spin-off technologies would present one of the primary reasons for nations to participate in the ISA. Thus, when at least two of the members of the Review Committee vote to withhold technology, such information should be restricted.<sup>118</sup> This balancing recognizes that some technologies, such as that in communications satellites, presents significantly less danger to international peace than other technologies, such as advanced rocketry.

### 11. Non-member Cooperation

A major issue would arise regarding whether non-members should be permitted to participate significantly in agency projects without joining the agency. Many of the same considerations applicable to the sale of project results to non-members would apply to participation by non-members. In the interest of opening space to all nations, cooperation with non-members should be allowed, but a financial premium should be retained for ISA members. Results, information, and intellectual property rights distributed in such cooperative efforts should be limited to the scope of participation and be subject to an appropriate financial contribution from the non-member. Cooperating non-members should be permitted access to facilities and systems consistent with the cooperative program. Additionally, in furtherance of cooperative programs, the ISA should be permitted to offer and to receive both information and personnel with respect to the joint program.

### 12. Accession, Withdrawal, and Dissolution

The ISA would no doubt undergo changes in its membership, or it could even cease to exist. These contingencies should be dealt with in the ISA Treaty.

As the ISA begins to fulfill its purposes and begins to meet its goal of opening space to the entire world, other nations would likely seek to accede to the agency. As mentioned earlier, any nation seeking to join the ISA should be presumed fit for membership subject to review by the Security Review Committee.<sup>119</sup> A nation could begin the process of accession by appealing to the Director to be considered for membership. The Director would then present the request to the Security Review Committee for approval.<sup>120</sup> The candidate would become a member at the beginning of the next agency financial year, at which point the new member would be incorporated into the funding process and would be given their seat on the Council. One final condition should be placed

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118. Requiring two members to vote to withhold the intellectual property from dissemination would prevent arbitrary withholding. However, the two member vote would also place emphasis on withholding potentially dangerous intellectual properties in the interest of international peace.

119. See *supra* part V.B.2.

120. In the interest of meeting the goal of opening up space to all nations, the Council should not be required to approve the accession of any candidate. The Security Review Committee should have the sole right to reject the request for membership. Conditioning accession on an affirmative vote by the Council would merely reinject the political positions of the members and the candidate into the operation of the agency, frustrating the goal of making space the province of all mankind.

on accession. Because any acceding member would be benefitting from the previous work of the agency and the previous financial contributions of its members, the acceding member should also be required to contribute an initial sum equal to the total which the nation would have contributed the previous three years had they been a member.<sup>121</sup>

Withdrawal from the agency would present few difficult issues. When a nation chooses to end its membership in the ISA, it should be required to give notice to that effect at least one year prior to the effective date.<sup>122</sup> In that interim period, the member should be required to continue fulfilling its ISA obligations. The agency should pay in full any amount owed to the withdrawing member as of the effective date of termination. The issues of primary concern would be the member's right to retain information and technology obtained from agency participation and the disposition of agency facilities within the withdrawing member's jurisdiction. Recovery of information and technology would be next to impossible. Imposition of a termination fee would be unreasonable given that the member's financial contributions were in exchange for such information and technology.<sup>123</sup> Thus, withdrawing members should not be charged an additional fee to retain and use information and technology acquired as an agency member. The resolution of the property issue would be equally straightforward. If the withdrawing government had no objections to the agency remaining within its jurisdiction, the agency should be allowed to continue to own or to rent the properties in question. If the withdrawing member would prefer the agency to leave its jurisdiction, the member should be compelled by the ISA Treaty to purchase all agency property at its fair market value.<sup>124</sup>

Dissolution would involve many of the same issues as withdrawal. Dissolution should be conditioned on a super-majority vote of the Council based on a pro rata tally and on a financial contribution basis. The dissolution should go into effect at the end of the first fiscal year following the vote. The first step the agency should take would be to distribute all information and technology to all members.<sup>125</sup> The agency should then settle all debts with its member nations and the agency properties within each member nation should be turned

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121. If the ISA has existed less than three years, the candidate's initial contribution should equal what their contribution would have been over the previous years of the agency's existence. Also, acceding members should be permitted to make both their initial and yearly contributions in the form of property.

122. The implications of withdrawal would require a significant amount of time to wind up the member's agency affairs including disposition of property, conclusion of projects in progress, and collection of outstanding debts.

123. Furthermore, it should be kept in mind that a former member seeking to rejoin the ISA would be subject to the initial accession contribution required of all acceding members. In the event that a former member would rejoin the ISA, its initial accession fee should not exceed its financial contributions due had it remained a member without interruption. *See supra* text accompanying note 120.

124. This would include having the member buy out the remaining terms on any leases held by the agency.

125. Such dissemination should, of course, be subject to the approval of the Security Review Committee. *See supra* part V.B.10.

over to the members.<sup>126</sup> Finally, the remaining agency funds should be distributed among the member nations in accordance with the most recent financial contribution percentages.

### 13. Privileges and Immunities

As with all international organizations, the privileges and immunities of the agency within each member nation must be clearly defined within the ISA Treaty.<sup>127</sup> The privileges and immunities may be divided into two types: those of the agency as an entity and those of the agency's personnel. The privileges and immunities should facilitate the operation of the agency. Thus, the agency should cooperate at all times with domestic authorities in complying with police and safety regulations, health and labor regulations, and in the prevention of abuses of the privileges and immunities.

The agency privileges and immunities would deal with considerations of the agency as a whole. Principal among the privileges would be the right of the agency and its personnel and equipment to travel between the various member nations without paying customs and duties. A second major privilege would be the exception of the agency from paying taxes at the agency level.<sup>128</sup> Among the immunities of the agency should be the inviolability of the agency's facilities and records. The property of the organization should be immune from expropriation. Furthermore, national member governments should not be

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126. This may seem a bit inequitable given that a nation with a great deal of agency property within its jurisdiction would stand to gain a great deal more than members which have little or no agency property within their jurisdiction. However, nations where significant agency property is located would have most likely expended significant domestic funds to support those facilities, such as roadway maintenance, fire and police protection, and communications and power service maintenance. In light of these additional domestic expenditures, the inequity would not be as pronounced.

An alternative distribution method would require distribution of property to those nations where the property is located, coupled with financial compensation to nations receiving less than their equitable share. In order to balance the financial return to the members upon dissolution, total distributions should be in accordance with the latest financial contribution percentages. This would require nations, receiving property in excess of their contribution share, to be compelled to "purchase" the excess value. The total financial balance of the agency would then be distributed to those members who receive no property or property of less value than that called for by their contribution share.

127. See generally Protocol on Privileges and Immunities of the European Space Research Organization, Oct. 31, 1963, 805 U.N.T.S. 279; ESA Treaty, *supra* note 22.

128. Requiring the agency to pay taxes on the amount contributed by the members would in effect be a requirement that the agency pay taxes on money the members raised by domestic taxes in the first place. Also, requiring the agency to pay taxes on the contributions by other members would allow one member to profit from those contributions, a potential violation of state sovereignty. The most significant problem, of course, would be the likelihood of multiple taxation. A domestic requirement that agency personnel pay taxes on their salary and possessions should also not be allowed due to the different tax structures of the various nations where agency facilities would be located.

Note that the agreement should only prohibit taxation on the contributions of the members. Agency income generated by sales of information or technology within a national jurisdiction should be taxable. (In respect to sales, the agency would be functioning like any other business and thus, should be subject to taxation.) This of course would mean that a nation could entice the agency to locate facilities within its jurisdiction by providing tax incentives.

allowed to restrict the flow of information to or from the agency and its members.

The personnel privileges and immunities should be those generally accorded to diplomatic personnel. The personal immunities should include, for example, immunity from arrest and detention, immunity from jurisdiction arising from agency acts, inviolability of official papers and documents, importation and exportation of belongings for personnel use in a duty free manner, and other immunities necessary to facilitate complete independence in the exercise of agency functions. These immunities should not be absolute, however. Member states should be required to waive the immunities where such waiver would be necessary for the execution of justice and where the waiver would not defeat the purpose for which the immunities were given.

#### 14. Dispute Resolution

As with any international agreement, particular attention must be paid to the dispute resolution provisions of the ISA Treaty. In the case of the ISA, disputes could occur between member nations, between the agency and a member, between the agency and a non-member, or between a member and a non-member arising from an agency action. Since the ISA would lead to persons of many nations interacting together, the dispute resolution provision should also be applicable to disputes involving nationals of agency members arising from agency activity.<sup>129</sup> Each of these possible combinations would involve potentially different methodologies.

Dispersion of liability for damage resulting from actions conducted by the agency would present one of the major reasons for joining the ISA. At the outset it should be kept in mind that conducting space activities is very hazardous. The potential damage from the agency's programs would include property damage from errant launchings and nuclear contamination.<sup>130</sup> Thus, when damage results from actions conducted by the ISA, the liability should be charged to the agency rather than to the member nations involved.<sup>131</sup> Agency members should not be precluded from bringing actions against the agency for damages resulting from agency actions. Finally, the dispersion of liability would occur at the funding level where the budget process could take into account any

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129. This would provide a single system of law applicable to all agency individuals rather than leaving the form of private law open to question. However, note that the agency dispute resolution panel should only have jurisdiction arising from activities arising from agency action. As an example, a tort committed by an individual on another, both of whom are associated with the agency, during an agency project (ie. on an agency space station), would be subject to the panel's jurisdiction. However, where an individual associated with the agency commits a tort against a person not associated with the agency, the dispute should be left to domestic legal procedures.

130. There have been numerous instances of launches which have caused terrestrial damage, including a June 1969 incident where a Japanese cargo ship was damaged and several sailors injured. Pfeifer, *supra* note 36, at 215-16. See also *supra* note 19.

131. This should not be the case where the damage resulted from the actions taken by one member and where such action was not in pursuance of an ISA program.

liabilities incurred by the agency with the corresponding apportionment among agency members.

The first stage in the resolution of any dispute arising from ISA activities should, of course, be negotiation between the parties. Mediation or conciliation should also be attempted where feasible.

When these methods fail to resolve disputes between the agency and a member or between two members, the situation should be referred to the agency's dispute resolution panel. The panel should be given jurisdiction under the ISA treaty of all disputes arising from agency matters.<sup>132</sup> The awards made by the panel could include monetary damages, injunctive relief backed by other remedies, and suspension of privileges.<sup>133</sup>

The panel membership should reflect the interests of the space powers and the NSFNs. This balancing could be accomplished by having seven members on the panel consisting of three space power representatives, three NSFN representatives, and one at-large member. The space powers and the NSFNs, both collectively, should each prepare a list of prospective panel members with each member nominating one person to their respective list. The space powers would then elect their representatives from their list on a majority basis with each nation having one vote, and the NSFNs would do likewise with respect to their nominees. The at-large member of the panel should be elected by the Council<sup>134</sup> requiring both a majority of the pro rata votes in favor of the candidate and a majority of the financial support of the organization.

In order to lend some consistency to the panel's decisions, panel members should be elected for seven year terms with one panel member being replaced each year.<sup>135</sup> Once a person is named to the panel, removal should be allowed only on a super-majority vote by the Council based both on a pro rata and a financial contribution basis. In a situation where a party in the dispute at issue has a national on the panel, that panel member should be excused from ruling on that dispute, and a temporary replacement should be chosen by the remaining panel members.

The procedure used by the panel should be well defined. Procedure similar to that of the International Centre for the Settlement of Investment Disputes,<sup>136</sup> the International Chamber of Commerce,<sup>137</sup> the United Nations Commission

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132. Non-members should have the option of submitting to the jurisdiction of the panel for any dispute to which they are a party and which arises from agency action.

133. See *infra* part V.B.15.

134. For the at-large spot, sitting members of the panel would each nominate one person. However, no nation should have more than one member on the panel.

135. It is likely that resolution of some disputes would last several years. In cases where a dispute is before the panel at a time when a panel member is to step down, that member should be required to conclude that case before leaving the panel.

136. Convention on the Settlement of Investment Disputes Between States and Nationals of Other States, Mar. 18, 1965, 17 U.S.T. 1270.

137. International Chamber of Commerce (ICC) Rules of Arbitration. See generally THOMAS E. CARBONNEAU, RESOLVING TRANSNATIONAL DISPUTES THROUGH INTERNATIONAL ARBITRATION 233-82 (1984).

on International Trade Law Arbitration,<sup>138</sup> or the American Arbitration Association<sup>139</sup> could be adopted. All decisions should be made by a majority vote. The law to be applied should consist of agency regulations, agency agreements, and the ISA treaty, as well as customary international law and the general principles of law of civilized nations.<sup>140</sup> In cases where all parties to the dispute are either the agency itself, members of the agency, or their nationals, the decision of the panel should be final and binding. In cases where non-member governments or their nationals are before the panel, appeal should be allowed to an arbitral board. Enforcement, where necessary, of panel decisions could be accomplished by requiring ISA members to accede to the New York Convention on the Enforcement of Foreign Arbitral Awards.<sup>141</sup>

One final dispute resolution problem arises. It would be likely that a non-member nation injured by agency action would not submit to agency jurisdiction. It should be anticipated that non-members would make their claims in an international arbitral tribunal or the International Court of Justice.<sup>142</sup> In such a case, the agency should be required to attempt to intervene in place of the member or should be committed to indemnification of the member to the extent that member would not have to bear the burden of liability under the ISA Treaty.

## 15. Suspension of Privileges

In the event of a dispute arising within the agency, the suspension of privileges should be permitted as a method of ensuring compliance with agency programs. The conditions leading to suspension should include, among others, failure to meet the financial contribution requirement, failure to conduct the work of the agency's programs, and violations of the ISA Treaty or regulations. The progression toward suspension should begin with an opportunity for the member, upon notice, to correct the deficiency within a reasonable time. If the deficiency continues, in the case of minor violations, the member's voting rights in the Council could be suspended until the member's obligations are met. In the case of major violations the agency could terminate the transfer of information to the member until the situation is corrected. Only in the most serious cases should

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138. *Arbitration Rules of the United Nations Commission on International Trade Law*, G.A. Res. 31/98, U.N. GAOR, 31st Sess., Supp. No. 17.

139. AMERICAN ARBITRATION ASSOCIATION, *COMMERCIAL ARBITRATION RULES* (1992).

140. This would nearly adopt the same sources of law as used by the ICJ. ICJ Statute, *supra* note 49, art. 38. Obviously, any agreements between the agency and a member or between members would have to be included as sources of law, as well as any agency regulations laid down by the Council. Because the dispute resolution panel would also have authority over disputes involving individuals arising in connection with agency actions, the applicable law would also include a minimum of private law. Thus, there exists the need for customary international law and general principles of law. More stringent private legal standards should be established by the Council because stricter requirements could otherwise be a substantial obstacle in the formation of the ISA Treaty.

141. New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, June 10, 1958, 21 U.S.T. 2517.

142. The ICJ would be available to non-member nations who make their claims against member nations rather than the agency itself. See ICJ Statute, *supra* note 49, art. 34.

the agency completely suspend a member from the agency. The complete suspension of a member should be initially decided by the dispute resolution panel. However, due to the severity of the penalty, complete suspension should also require a super-majority vote of the Council based on both pro rata votes and financial contribution. In such a case, the suspension should be dealt with as an involuntary withdrawal and as a withdrawal.<sup>143</sup>

## 16. Amendments and Ratification

The final matters that should be dealt with in the ISA Treaty would be the process of amendment and entry into force of the treaty. Amendment of the treaty would be necessary for the agency to evolve over time.<sup>144</sup> Any potential amendment could be proposed by a national representative or by the Agency Director subject to approval by the Council. As with other significant acts within the agency, approval of an amendment should require a super-majority of both the pro rata votes and the financial contribution shares. The amendment should enter into force at the end of the first fiscal year after the approval of the amendment.

Ratification and entry into force of the ISA Treaty would be the final provision needed to complete the treaty. After the preparation of the treaty, ample time should be allowed for domestic ratification under a given member's foreign relations law. The treaty should enter into force one year following the signing or, if required, the ratification of the treaty by five of the nine space powers. The delayed entry into force allows ample time for the member nations to make preparations for domestic implementation.

## VI. OTHER ACTIONS INCIDENT TO FORMING AN ISA

This comment addresses the reasons for broad international cooperation in space and the major issues which must be addressed in drafting a treaty forming a worldwide space agency. These questions alone, however, do not even begin to scratch the surface of all the matters that must be covered to form and operate such an agency.

Once the ISA Treaty comes into being, before the operation of the ISA can begin, several hurdles must be cleared. The location of the ISA headquarters,

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143. See *supra* part V.B.12.

144. Perhaps more than any other area of science, aerospace technology has developed at an astounding rate. While the Chinese experimented with rocketry as long ago as 1232, modern rocketry did not come about until Robert Goddard developed liquid-fuelled vehicles in 1926. *MAN IN SPACE*, *supra* note 10, at 11-14. The first airplane flew in the early twentieth century; less than forty-five years later, man was walking on the surface of the moon. *Id.* at 74. Flight has gone from a novelty to a fact of everyday life. Spaceflight, not just beyond the earth, but also flight regimes such as that of the Orient Express, will surely follow the same path. The ISA must be structured to deal with the inevitable evolution of space research.

the election of officers, Council representatives, dispute resolution panel members, and the definition of initial rules of operation are all matters which would have to be addressed. Once these are in place, the agency's budget process could be initiated. The agency could begin obtaining properties from members, obtaining control over space projects currently being conducted by members, and expanding the rules of procedure governing the agency's operation. Also, any privileges and immunities beyond those in the ISA Treaty would need to be developed.

Once the agency begins making plans for the future, one of the most difficult tasks would be the consolidation of duplicative projects. Should the ISA proceed with the National Aerospace Plane project of the United States, the French Hermes project, or the British HOTOL project?<sup>145</sup> Which nation's Mission to Mars project should be continued, that of the United States or that of Russia?<sup>146</sup> In the area of manned space stations, should the multinational Space Station Freedom be given preference over the Russian Mir?<sup>147</sup>

The agency would also need to immediately attack the problem of the deficiencies in current space law. A consolidation of the various treaties defining space law would have to be modified to reflect the presence of the ISA, and the ISA would be forced to tackle the unresolved legal problems surrounding space activity. Finally, the agency would have to establish the regulations governing the procedure of the agency and the regulations governing persons under agency control.<sup>148</sup>

These steps alone, with their complexities, could last several years. Thus, once the preparatory program of the agency has been laid out, it should be expected that the agency would not begin effective operation for at least four or five years.

## VII. DOMESTIC IMPLEMENTATION PROBLEMS

The domestic implementation of the treaty would be the cornerstone of the ISA.<sup>149</sup> In order for such a broad multilateral organization to operate effectively, a nation signing the ISA Treaty should be bound to take such domestic action as would be necessary for that nation to fulfill its membership obligations.

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145. MAN IN SPACE, *supra* note 10, at 234.

146. *Id.* at 230, 232.

147. *Id.* at 228-30, 232.

148. For an excellent discussion of the legal problems which must be addressed, see Harry H. Almond, Jr., *Standardized Terms and Conditions and the Implementation of Common Objectives in Outer Space*, PROCEEDINGS ON THE LAW OF OUTER SPACE, *supra* note 11, at 3-12. Even the definitions of the terms of the prior space treaties are subject to dispute. See Stephen Gorove, *Major Definitional Issues in the Space Agreements*, PROCEEDINGS ON THE LAW OF OUTER SPACE, *supra* note 11, at 76-79.

149. This issue would have particular importance in the context of the budget process. See *supra* part V.B.6.



Addressing this commitment in the ISA Treaty would greatly facilitate the formation of the ISA by making each member's obligations clear and by eliminating any opportunity for a nation to back out under a claim of inability to meet the treaty obligations at the domestic level.<sup>150</sup> Such a binding provision would instill confidence among agency members in each other's dedication to the agency, confidence which would be critical to the success of the agency.

Furthermore, many nations currently engaged in space activities have broad pieces of legislation covering such activities. This domestic legislation is beyond the scope of this comment, but as an example, the United States has legislative provisions dealing with the space program covering remote sensing,<sup>151</sup> intellectual property,<sup>152</sup> commercial launch activities,<sup>153</sup> space trade and cooperation,<sup>154</sup> international cooperation,<sup>155</sup> appropriations,<sup>156</sup> expenditures and contracts,<sup>157</sup> TDRS use,<sup>158</sup> biomedical research,<sup>159</sup> and the various launch systems.<sup>160</sup> Not only would such domestic legislation have to be reconciled with the aims of the ISA, but additional legislation would likely be needed to implement the aims of the Treaty.

### VIII. CONCLUSION

Though it may seem that the Golden Age of space exploration has drawn to a close, the future holds wonders even greater than the Voyagers' tour of the solar system,<sup>161</sup> manned moon landings,<sup>162</sup> and small space stations.<sup>163</sup>

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150. Vienna Convention on the Law of Treaties, May 23, 1969, arts. 18, 27, 1155 U.N.T.S. 331 (the U.S. has not signed the Vienna Convention but has accepted it as a statement of customary international law).

151. 15 U.S.C. §§ 5621-5625 (1988).

152. 42 U.S.C. §§ 2454-2457 (1988).

153. 15 U.S.C. §§ 5801-5808, 42 U.S.C. § 2465, 49 U.S.C. §§ 2601-2623 (1988).

154. 22 U.S.C. §§ 5871-5874 (1988).

155. 42 U.S.C. §§ 2451, 2471-2472, 2475, 2484 (1988).

156. 42 U.S.C. §§ 2459-2459(a), 2460 (1988).

157. 42 U.S.C. §§ 2459(c)-(d), 2473(b) (1988).

158. 42 U.S.C. § 2463 (1988).

159. 42 U.S.C. §§ 2487(a)-(g) (1988).

160. 42 U.S.C. §§ 2464, 2464(a), 2465(a), 2465(d)-(e), 2466(b)-(c) (1988).

161. Voyagers I & II conducted a grand tour of the outer planets leaving Earth in 1977 and concluding when Voyager II passed Neptune in 1989. Voyager II has been given a new mission name, the Voyager Interstellar Mission, as it races toward the edge of the sun's magnetosphere [the edge of the solar system]. MAN IN SPACE, *supra* note 10, at 162-66.

162. The Apollo lunar landings began on July 20, 1969 when Apollo 11 touched down in the Sea of Tranquility. The sixth and final manned lunar mission, Apollo 17, left Taurus-Littrow on December 14, 1972. KERROD, *supra* note 22, at 63, 248-49.

163. The United States Skylab project was no more than a minor stint in the space station field. The entire project consisted of only three crews, the first one arriving on May 25, 1973 and the final one leaving the station on February 8, 1974. *Id.* at 249. The nations of the former Soviet Union have far more experience with

Coming astronomical and interstellar research will continue to feed the voracious appetites of the scientists and the hobbyists.<sup>164</sup> As mentioned earlier, the multinational Space Station Freedom is one of the banner projects of the near future. The largest technological leap since the United States Apollo project will lead to the most thrilling achievement, the National Aerospace Plane.<sup>165</sup> A return to the moon opens up the possibility of a new resource base,<sup>166</sup> as well as a jumping off point for interplanetary travel.<sup>167</sup> The next step, of course, would be the highly touted Mission to Mars.<sup>168</sup>

Perhaps, the most important mission of all however, will be the Mission to Planet Earth. The objective will be to provide a better understanding of our home planet, which all too often we forget is an interstellar body itself.<sup>169</sup> The principal aspect of this mission will be the utilization of remote sensing.<sup>170</sup> Zero gravity laboratories may yield dividends in areas including materials processing and biomedical research.<sup>171</sup> Other projects in the Mission to Planet Earth include expanded and enhanced global telecommunications and improved meteorological systems.

Clearly, man has not exhausted the capacity of space research to yield rewards, not only of a purely scientific nature, but also of future spin-offs.<sup>172</sup> Thus, it is imperative that mankind continue its attempt to unravel the mysteries of the unknown.

Most of the world's nations are in no position to take these next steps in space exploration alone. However, with the changing political structure of the

space stations from their Salyut and Mir programs. MAN IN SPACE, *supra* note 10, at 100-09, 146-49, 174-85.

164. The Galileo project, which will drop a probe into the Jovian atmosphere in 1995, is in route to Jupiter; Ulysses is on a mission to the sun; a mission to Saturn and to Cassini is planned for 1997; and the Hubble Space Telescope, with its recently installed "contacts", will allow man to see to the edge of the universe. MAN IN SPACE, *supra* note 10, at 156, 170-73. See also David L. Chandler, *Shuttle Sends Repaired Hubble on Way Mission Accomplished, Astronauts Turn Over Telescope to Ground Scientists*, BOSTON GLOBE, Dec. 11, 1993, at 8.

165. The National Aerospace Plane, in one incarnation commonly referred to as the Orient Express, would takeoff from a conventional runway, whisk passengers from New York to Tokyo in two hours, and land on a conventional runway. Another version would be a single-stage-to-orbit launch vehicle. George A. Keyworth & Bruce R. Abell, *How to Make Space Launch Routine*, TECH. REV., Oct. 1990, at 24.

166. See KAUFMANN, *supra* note 85, at 211-13.

167. Among the advantages of using a lunar base as a jumping off point for interplanetary travel include the reduced energy needs to reach the lunar escape velocity [which is less than 25% of the earth's escape velocity] due to the lesser lunar gravitational force. See JOHN D. ANDERSON, JR., INTRODUCTION TO FLIGHT 411 (2d ed. 1985). The decreased amount of energy needed to get a given vehicle into orbit allows the vehicle to carry a greater payload.

168. In 1993, a summit was held in Wiesbaden, Germany to discuss international cooperation between the U.S., the former Soviet Union, Japan, and the ESA as it relates to the mission to Mars. Craig Covault, *Mars Exploration Invites Global Space Cooperation*, AVIATION WK. & SPACE TECH., Apr. 12, 1993, at 56-57.

169. MAN IN SPACE, *supra* note 10, at 232-33; Christine Nielsen & Dirk Werle, *Do Long-Term Space Plans Meet the Needs of the Mission to Planet Earth*, SPACE POL'Y, Feb. 1993, at 11-16.

170. MAN IN SPACE, *supra* note 10, at 232-33; Nielsen & Werle, *supra* note 169, at 11-16.

171. A 1992 space shuttle mission carried a pharmaceuticals experiment which achieved results in two weeks that would have taken two years to produce on Earth. Daniel S. Goldin, *Space Station: Build It for America*, WASH. POST, July 28, 1992, at A19.

172. Spin-offs is a term of art used to refer to second generation products and processes with applications outside the space program which have their genesis in space technology.

world, this inability to act in space can be circumvented. The western nations, the United States, Japan, members of the European Space Agency, and others, along with the eastern nations, China and Russia, as well as its former territories, satellites, and neighbors, have at last reached a point where they can come together in the area of space research.

Such a cooperative effort would have wide ranging benefits. It would lead to increased financial and intellectual resources, therefore decreasing the duplication of effort and promoting the efficient exploration of space. However, the biggest benefit would be that space would truly be opened up as the province of all nations. Nations which have been denied access to space would have the opportunity to place their needs on the space agenda. Finally, the information and technologies from the space program could be distributed worldwide in an effort to further the lot of all mankind.

The process of establishing such an agency would be fraught with obstacles. Aside from the negotiation of the ISA Treaty, problems would arise at the domestic level and at the international level in terms of conflicting treaties. However, such difficulties are substantially outweighed by the need for and the benefits from an international space agency.

One of the great advocates of international cooperation in space, on pondering the wonders that lay before mankind, has had the following to say on the subject:

In putting forward this proposal, we proceeded from the premise that all peoples, all mankind, are concerned with the task of exploring outer space and putting it to peaceful uses and that the gigantic scale of this task, and the difficulties which have to be overcome, make it imperative for States to pool their scientific, technical and material ability and resources to a considerable extent. Even now, . . . it can be seen how much man has to accomplish.

If today the genius of man has created space-ships capable of landing on the surface of the moon with the greatest accuracy and carrying . . . astronauts into orbit around the earth, tomorrow space vehicles controlled by man could travel to Mars . . . , and as they go further, man's prospects of penetrating the farthest reaches of the universe will become greater and vaster.

The exploration of space in the interests of all mankind will be more rapid the greater the number of countries making a contribution to this very complicated task, which also involves considerable expenditure. And this means that all States should be given equal opportunities to take part in international co-operation in this field.<sup>173</sup>

Nikita Khrushchev  
March 20, 1962

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173. This quote is taken from a letter from Chairman Khrushchev to President John F. Kennedy *reprinted* in NICOLAS M. MATTE, *SPACE POLICY AND PROGRAMMES TODAY AND TOMORROW* 139-40 (1980).

For the sake of mankind, let us hope that in the intervening thirty years we have learned the crucial lesson required for the conquest of space.<sup>174</sup>

*Christopher L. Brinkley*

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174. The author would like to thank Professor Karl Bergey, ret. of the University of Oklahoma, Department of Aerospace, Mechanical, and Nuclear Engineering for fostering and developing the author's love of the aerospace field. More importantly the author would like to point out that such love has not been lost, in spite of leaving engineering and going on to law school.

