LEGAL ISSUES INHERENT IN SPACE SHUTTLE OPERATIONS

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As this nation proceeds into the Space Shuttle era, the agencies most directly involved, particularly the National Aeronautics and Space Administration (NASA), will need to address and resolve a number of interrelated legal issues. Many stem from the role NASA will assume—at least initially—as the principal operator of the Space Shuttle.

In this article, nine of the more significant issues inherent in Space Shuttle operations are defined and their implications and possible resolution discussed at some length. The order in which the issues are presented does not reflect a judgment on the part of the authors of their relative significance.

I. DOES NASA HAVE AUTHORITY TO OPERATE THE SPACE TRANSPORTATION SYSTEM (STS) ON A "ROUTINE" BASIS?

The National Aeronautics and Space Act of 1958[1] [hereinafter NASAct] provides adequate statutory authority for NASA to operate the STS on a "routine" basis.

The purpose of the NASAct as expressed in section 102 is "to carry out and effectuate" the policies stated in that section, among which are:

> (1) The expansion of human knowledge of phenomena in the atmosphere and space;
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> (2) The improvement of the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles;
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> (3) The development and operation of vehicles capable of carrying instruments, equipment, supplies, and living organisms through space;
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> (4) The establishment of long-range studies of the potential benefits to be gained from, the opportunities for, and the problems involved in the utilization of aeronautical and space activities for peaceful and scientific purposes;

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[1] 72 Stat. 426; 42 U.S.C. § 2451 *et seq* (1970).

> (5) The preservation of the role of the United States as a leader in aeronautical and space science and technology and in the application thereof to the conduct of peaceful activities within and outside the atmosphere;
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> . . . .
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> (7) Cooperation by the United States with other nations and groups of nations in work done pursuant to this Act and in the peaceful application of the results thereof; and
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> (8) The most effective utilization of the scientific and engineering resources of the United States, with close cooperation among all interested agencies of the United States in order to avoid unnecessary duplication of effort, facilities, and equipment.

Section 203 (a) of the NASAct provides that NASA, in order to carry out the purpose of this Act, shall:

> (1) plan, direct, and conduct aeronautical and space activities;
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> (2) arrange for participation by the scientific community in planning scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations; and
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> (3) provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

The term "aeronautical and space activities" is defined in section 103 (1) as "(A) research into, and the solution of problems of flight within and outside the earth's atmosphere, (B) the development, construction, testing, and operation for research purposes of aeronautical and space vehicles, and (C) such other activities as may be required for the exploration of space." Section 103 (2) defines "aeronautical and space vehicles" as "aircraft, missiles, satellites, and other space vehicles, manned and unmanned, together with related equipment, devices, components, and parts."

In the legislative history of the NASAct, the following was set forth to explain the scope of the term "activities" in the phrase "aeronautical and space activities" in Section 103:

> This section, which defines 'aeronautical and space activities' and 'aeronautical and space vehicles,' embodies the substance of both the House and Senate versions but does so in a way which will ensure that these expressions can be used throughout the act without further question as to their meaning, inclusions, or exclusions.
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> The purpose is to make clear that the act is concerned primarily with research, development, and exploration. The use of the word 'activities' is intended to be broad in the area of outer space because no one can predict with certainty what future requirements may be.
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> It is not the intention of Congress, however, to construe activities so broadly as to include such things as the operation of commercial airlines, the control of air traffic, the fixing of airworthiness standards, the setting of air fares, or the assigning of certificates

> of public convenience and necessity. Whether, in time, the new Administration will run a regular transport route to another planet or to the moon is not a matter of current concern. But the term 'activities' should be construed broadly enough to enable the Administration and the Department of Defense, in their respective fields, to carry on *a wide spectrum of activities* which relate to *the successful use of outer space.* These activities would include scientific discovery and research not directly related to travel in outer space *but utilizing outer space,* and the development of resources which may be discovered in outer space. (emphasis supplied)[2]

Thus, while NASA was not intended to be a regulatory agency like the Federal Aviation Administration (FAA) or the Civil Aeronautics Board (CAB), or to be a government-owned commercial transport service like most non-U.S. flag international airlines (e.g., Air France, Lufthansa, Aeroflot, etc.), there can be no question that the providing of space launch and associated services related not only to the exploration but also to the utilization of outer space for purposes beneficial to humanity was contemplated by the drafters of the NASAct. The reusable Space Transportation System will simply be a more economical, efficient, and versatile way of doing what NASA has been doing for nearly two decades under the authority of the NASAct of 1958.

NASA is authorized to establish and charge fees for launch and associated services and to establish service standards under section 203(c) of the NASAct. In the performance of its functions the Administration is authorized:

> (1) to make, promulgate, issue, rescind, and amend rules and regulations governing the manner of its operations and the exercise of the powers vested in it by law;
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> . . . .
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> (5)to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency or instrumentality of the United States, or with any State, Territory, or possession, or with any political subdivision thereof, or with any person, firm, association, corporation or educational institution . . .
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> (6) to use, with their consent, the services, equipment, personnel, and facilities of Federal and other agencies with or without reimbursement, and on a similar basis to cooperate with other public and private agencies and instrumentalities in the use of services, equipment, and facilities. Each department and agency of the Federal Government shall cooperate fully with the Administration, and any such department or agency is authorized, notwithstanding any other provision of law, to transfer to or to receive from the Administration, without reimbursement, aeronautical and space vehicles, and supplies and equipment other than administrative supplies or equipment.[3]

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[2][1958] U.S. Code Cong. & Ad. News, 3192.

[3]NASA's Shuttle services reimbursement policy for non-U.S. Government users appears at 14 C.F.R. § 1214.1, 42 Fed. Reg. 3829 (1977); for civil U.S. Government users and certain foreign users appears at 14 C.F.R. § 1214.2, 42 Fed. Reg. 8631 (1977); and for the Department of Defense users is incorporated in a Memorandum of Understanding dated March 7, 1977, NASA N.M.I. § 1052.204.

Finally, the Communications Satellite Act of 1962 [hereinafter the "Comsat Act"] provides that NASA shall:

> (3) assist the corporation [the Communications Satellite Corporation-Comsat] in the conduct of its research and development program by furnishing to the corporation, when requested, on a reimbursable basis, such satellite launching and associated services as the Administration [NASA] deems necessary for the most expeditious and economical development of the communications satellite system;
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> . . . .
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> (5) furnish to the corporation, on request and on a reimbursable basis, satellite launching and associated services required for the establishment, operation, and maintenance of the communications satellite system approved by the Commission [the Federal Communications Commission-FCC].[4]

The transition from expendable launch vehicles to the Space Transportation System will have no effect upon this statutory authority or responsibility. NASA will continue to have the necessary authority to develop and operate the STS routinely not only for launching its own payloads, but also for launching payloads of other U.S. Government agencies and departments, and for non-U.S. Government users, including users of foreign nationality and international organizations.

NASA has provided launch services on both a cooperative and a reimbursable basis for most of its nearly two-decade history. Many of the reimbursable launches have been among the most important in terms of the use or utilization (as opposed to the exploration) of outer space. On July 10, 1962, Telstar 1 was launched for the American Telephone and Telegraph Company (AT&T) from the Eastern Test Range (ETR) by an expendable Delta launch vehicle; it was the first satellite owned by a private concern. Telstar 2 was launched on May 7 the following year, also from the ETR by a Delta booster. On June 28, 1965, commercial telecommunications satellite service was begun, following the launch on April 6 of that year of Intelsat I, or "Early Bird," for the Communications Satellite Corporation (Comsat), operating as the manager of the global Intelsat system.[5] Since that time there have been 22 more launches of Comsat/Intelsat communications satellites,[6] plus six communications satellites for domestic United States service and three for maritime service.[7]

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[4]Communications Satellite Act of 1962, § 201(b), 76 Stat. 421, 47 U.S.C. §721(b) (1970).

[5]Under the Communications Satellite Act of 1962, Comsat acts as an agent to acquire launch services from NASA on behalf of the International Telecommunications Satellite Organization (Intelsat).

[6]This figure includes the launch of five spacecraft which for one reason or another failed to reach the proper orbit; the remainder were successful and consisted of the second, third, and fourth generations of Intelsat satellites.

[7]These satellites include two for Western Union, two for RCA, and five for Comsat General, a wholly-owned subsidiary of Comsat; two of the five Comsat General satellites are for domestic U.S. service, while the remaining three are for maritime service.

Throughout this time NASA has also provided reimbursable launch services to other U.S. Government agencies, such as the Department of Defense, the former Environmental Satellite Services Administration (ESSA), and the National Oceanic and Atmospheric Administration (NOAA). Also, launch services on either a cooperative or a reimbursable basis have been provided to foreign countries and to international organizations.

In recent years the reimbursable launches have begun to outnumber NASA's own launches (including NASA's cooperative launches with other countries or international organizations). In 1975, for example, there were 8 reimbursable launches out of a total of 19; in 1976 there were 12 out of 16.[8] In 1977 NASA expected to launch 17 out of 23 payloads on a reimbursable basis.[9]

All of NASA's activities, of course, are subject to the Congressional authorization and appropriation process, and Congress has each year specifically approved funds for NASA's launch activities, whether for NASA's own payloads or the payloads of other users, and whether such launches were done on a cooperative or a reimbursable basis. The reimbursable part of NASA's annual program is specifically delineated in the NASA budget and separated from the "direct" part (i.e., that part which is funded by NASA's own appropriations).[10]

The conclusion that NASA's authority under the NASAct is broad enough to cover both cooperative and reimbursable launch and related services is therefore reinforced by the annual Congressional approval of funding for such activities. It is a principle of statutory construction that while legislative acquiescence or inaction following a contemporaneous and practical interpretation of a particular statute may be *some* evidence that the legislature agrees with such an interpretation, positive action taken by the legislature based upon the interpretation is much more likely to be regarded as presumptive evidence of the correctness.[11] Furthermore, when such positive action takes the form of continuing annual appropriations based upon the interpretation in question, the probative force likewise increases, even in view of objections to the

[8]NASA Press Release No. 76-207, December 15, 1976, contains a list of the 1976 launches.

[9]NASA Press Release No. 77-2, January 7, 1977, contains a list of the planned 1977 launches.

[10] *See* The Budget of the United States Government 1978- Appendix, at 655, 659-660.

[11]Sutherland Statutory Construction, § 49.10 (Sands, ed., 4th ed., 1972) [hereinafter cited as "Sutherland"]. This principle was first applied by the U.S. Supreme Court in 1803 in the case of Stuart v. Laird, 5 U.S. (1 Cranch) 299, 309, 2 L.Ed. 115, 118 (1803), in which the Court, answering the objection that the Act of 1789 (1 Stat. 73, chap. 20) was unconstitutional insofar as it gave circuit powers to judges of the Supreme Court, stated that:

> practice and acquiescence under it for a period of several years, commencing with the organization of the judicial system, affords an irrefutable answer, and has indeed fixed the construction. It is a contemporary interpretation of the most forcible nature. This practical exposition is too strong and obstinate to be shaken or controlled. Of course, the question is at rest, and ought not now to be disturbed.

contrary.[12] Since the early 1960's Congress has been fully aware of NASA's interpretation of the NASAct as providing sufficient authority for NASA to launch non-NASA payloads on a cooperative or reimbursable basis; the resulting launch activities have been highly visible to the public and have taken place with full Congressional knowledge. Congress' continuing support of these activities through annual appropriations, therefore, has high probative value in establishing the correctness of NASA's interpretation of the NASAct in regard to such activities. Also, since the STS will be used to launch all such non-NASA payloads in the future, the annual

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In United States v. Midwest Oil Co., 236 U.S. 459, 472-73, 59 L.Ed. 673, 681, 35 S.Ct. 309 (1915), a certain long-continued practice of the President, with the acquiescence of Congress, relating to the disposition of public lands was at issue:

> It may be argued that while these facts and rulings prove a usage, they do not establish its validity. But government is a practical affair, intended for practical men. Both officers, lawmakers, and citizens naturally adjust themselves to any long- continued action of the Executive Department, on the presumption that unauthorized acts would not have been allowed to be so often repeated as to crystallize into a regular practice. That presumption is not reasoning in a circle, but the basis of a wise and quieting rule that, in determining the meaning of a statute or the existence of a power, weight shall be given to the usage itself—even when the validity of the practice is the subject of investigation.

Subsequent cases have reaffirmed this principle: Apex Hosiery Co. v. Leader, 310 U.S. 469, 84 L.Ed. 1311, 60 S.Ct. 982, 128 A.L.R. 1044 (1940); Sibbach v. Wilson & Co., 312 U.S. 1, 85 L.Ed. 479, 61 S.Ct. 422 (1941); Federal Trade Commission v. Bunte Bros., Inc. 312 U.S. 349, 85 L.Ed. 881, 61 S.Ct. 580 (1941); NLRB v. Seven-Up Bottling Co. of Miami, Inc., 344 U.S. 344, 97 L.Ed. 377, 73 S.Ct. 287 (1953); Alstate Const. Co. v. Durkin, 345 U.S. 13, 97 L.Ed. 745, 72 S.Ct. 565 (1953); Blau v. Lehman, 368 U.S. 403, 7 L.Ed. 2d 403, 82 S.Ct. 451 (1962). *See also* 73 Am. Jur. 2d *Statutes* §§ 169, 178, 179; (1970) and 82 C.J.S. *Statutes* §351, 357-360 (1970).

[12]In Tennessee Valley Authority v. Kinzer, 142 F.2d 833, 837 (6th Cir. 1944), the court upheld the Retirement System of the Tennessee Valley Authority partly on the basis of the subsequent and regular appropriation of funds by Congress:

> Moreover, Congress, by regularly appropriating funds to enable the Authority to make its contributions to the System, has demonstrated its intention that the statutory mandate is to be construed and understood in accordance with the settled construction placed upon it by the Authority, as disclosed by the Rules and Regulations setting up the Retirement System. The voting of such appropriations, in the face of the construction placed upon the Act by the Authority, has an effect similar to that resulting from the re-enactment of a statute, the provisions of which had, theretofore, been interpreted by regulations; they are deemed to have received legislative ratification and, thereby, to have become embedded in the law; and are to be given the same force and effect as the statute itself.

The repeated enactment by Congress of appropriations for a TVA project over objections that there was no legal authority to carry out the project supported the interpretation that such authority existed in United States ex rel. Tennessee Valley Authority v. Two Tracts of Land, 456 F2d 264 (6th Cir. 1972), *cert. denied* 409 US 887 (1972).

appropriations for the STS,[13] the purpose of which is and has been well known to Congress, have high probative value in establishing Congress' agreement with NASA's interpretation of the NASAct as providing adequate statutory authority to operate the STS on a routine basis. Finally, NASA's authority to provide launch services on a reimbursable basis to others under the NASAct has been recognized by the Department of Justice.[14]

II. WILL THE STS BE A "COMMON CARRIER"?

The Space Transportation System will not be a "common carrier" because it is not so authorized by federal statute and because it would conflict with international commitments already entered into by the federal government.

The NASAct, while providing NASA with authority sufficient to operate the STS on a "routine" basis, does not go so far as to give NASA authority to operate the STS, or any of the NASA expendable launch vehicle systems, as a common carrier. The legislative history of the NASAct makes this conclusion quite clear. Moreover, the Comsat Act does not in any way make NASA a common carrier. While the Comsat Act does create in section 201(b) a duty of NASA to provide "satellite launching and associated services" to Comsat, this duty relates only to Comsat and not to the general public. A common carrier, on the other hand, is one which holds itself out to the public

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[13] *See, e.g.*, Pub. L. No. 94-39 (89 Stat. 218), Pub. L. No. 94-116 (89 Stat. 581), Pub. L. No. 94-307 (90 Stat. 677), and Pub. L. No. 94-378 (90 Stat. 1095). Earlier NASA authorization and appropriations acts are cited in the Staff Report of the Committee on Aeronautical and Space Sciences, United States Senate, 94th Cong., 1st Sess. (Comm. Print March 11, 1975).

[14] In a letter to the Legal Adviser, Department of State, dated April 29, 1969, Mr. William H. Rehnquist, then Assistant Attorney General, Office of Legal Counsel, responded to a request for a Department of Justice opinion concerning two interrelated questions:

> (1) Under existing domestic law is there any legal obstacle or impediment to the provision of launch services by the National Aeronautics and Space Administration to a foreign government having a foreign operational domestic communications satellite system?
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> (2) If NASA has authority to provide such services under our law may it do so independently of the Communications Satellite Corporation, whether acting as an independent United States corporation or as an agent for Intelsat?

In his letter Mr. Rehnquist concluded that:

> Although not specifically so stated in your letter, I understand your questions assume that such launch services would be provided on a 100% reimbursable basis. In these circumstances, it is our opinion that (1) there is no legal impediment to the provision of launch services by NASA if the President should direct such action; and (2) that launch services pursuant to such Presidential directive may be furnished independently of the Communications Satellite Corporation (Comsat).

as engaged in a certain type of transportation or other service which is available to the general public for compensation.[15] Also, although NASA does receive reimbursement for the costs of providing these launch services, this compensation is not intended to result in profit for NASA. Lastly, there is no law which compels NASA to provide launch and related services for all who would apply.[16]

NASA is not an "air carrier" under the Federal Aviation Act of 1958[17] [hereinafter FAAct]. First of all, the Shuttle is not an "aircraft" under the FAAct (see Issue 4 below), but even if it were, NASA would not be an "air carrier" engaging in "air transportation" and thus subject to economic regulation under Title IV of the FAAct ("Air Carrier Economic Regulation").[18]

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[15]As developed extensively in case law, a *private carrier* is one who undertakes by special agreement in a particular instance to transport property without being bound to serve every person who may apply. 13 C.J.S. *Carriers* § 4; 13 Am. Jur. 2d *Carriers* § 8 (1970). A *common carrier* is one who as a regular business transports personal property from place to place for all persons who may wish to employ him and pay his charges. What constitutes common carriage is a question of law; but whether one holds himself out as a common carrier is a question of fact. 13 C.J.S. *Carriers* § 3(a) (1970); 13 Am. Jur. 2d *Carriers* § 2. (1970). *See also,* note 40, *infra.*

Furthermore, NASA's statutory launch duty to Comsat under section 201(b) of the Comsat Act, 47 U.S.C. § 721(b) (1970), applies only to communications satellites which are part of the International Telecommunications Satellite Organization (Intelsat), of which Comsat is the United States' representative. Section 102(a), (b), and (c) of the Comsat Act, 47 U.S.C. § 701(a) (b) (c) (1970). Domestic communications satellite systems are not covered by this statutory duty, although it should be noted that the Comsat Act does allow the global (Intelsat) system to be used for domestic communications services "where consistent with the provisions of this [the Comsat] Act" and, in addition, allows "the creation of additional communications satellite system, if required to meet unique governmental needs or if otherwise required in the national interest." Section 102(d) of the Comsat Act, 47 U.S.C. § 701(d) (1970).

[16]Where Congress intends that a statutorily created entity is to be a common carrier the statute is typically quite explicit on that point. *See* note 20, *infra.* It should be noted that although NASA is not a common carrier under the Comsat Act or any other law, Comsat *itself* is a "common carrier within the meaning of section 3(h) of the Communications Act of 1934. . . ." Section 401 of the Comsat Act, 47 U.S.C. § 741 (1970).

[17]72 Stat. 731, 49 U.S.C. § 1301 (1970).

[18]Section 401(a) of the FAAct, 49 U.S.C. § 1371(a) (1970), provides that "[n]o air carrier shall engage in any air transportation unless there is in force a certificate [of public convenience and necessity] issued by the [Civil Aeronautics] Board authorizing such air carrier to engage in such transportation."

An "air carrier" is defined in section 101(3) as "any citizen of the United States who undertakes, whether directly or indirectly or by a lease or any other arrangement, to engage in air transportation. . . ." A "citizen of the United States" is defined in section 101(13) to mean:

> (a) an individual who is a citizen of the United States or of one of its possessions, or (b) a partnership of which each member is such an individual, or (c) a corporation or association created or organized under the laws of the United States or of any State, Territory, or possession of the United States, of which the president and two- thirds or

That there is no United States statutory law which makes NASA a common carrier or would even allow NASA to operate the STS as a common carrier is consistent with the traditional governmental role as a regulator of non-U.S. Government entities which are

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> more of the board of directors and other managing officers thereof are such individuals and in which at least 75 per centum of the voting interest is owned or controlled by persons who are citizens of the United States or of one of its possessions.

Thus, a U.S. Government agency cannot be an "air carrier" under the FAAct. This fact is seen even more clearly vis-a-vis the definition of "foreign air carrier," which can include governmental entities of foreign countries:

> [A]ny person, not a citizen of the United States, who undertakes, whether directly or indirectly or by lease or any other arrangement, to engage in foreign air transportation. Section 101(19) of the FAAct.

"Person" is defined in section 101(29) to include a "body politic," so while "air carrier" cannot include agencies of the U.S. Government, "foreign air carrier" can include agencies of foreign governments.

Another aspect of the definition of "air carrier" which would not apply to STS operations is that air carriers engage in "air transportation," defined in section 101(10) of the FAAct as meaning "interstate, overseas, or foreign air transportation or the transportation of mail by aircraft." These terms are further defined in section 101(21):

> "Interstate air transportation," "overseas air transportation," and "foreign air transportation," respectively, mean the carriage by aircraft of persons or property as a common carrier for compensation or hire of the carriage of mail by aircraft, in commerce between, respectively—
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> (a) a place in any State of the United States, or the District of Columbia, and a place in any other State of the United States, or the District of Columbia; or between places in the same State of the United States through the airspace over any place outside thereof; or between places in the same Territory or possession of the United States, or the District of Columbia;
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> (b) a place in any State of the United States, or the District of Columbia, and any place in a Territory or possession of the United States; or between a place in a Territory or possession of the United States, and a place in any other Territory or possession of the United States; and
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> (c) a place in the United States and any place outside thereof;
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> whether such commerce moves wholly by aircraft or partly by aircraft and partly by other forms of transportation.

The NASA Shuttle, as already mentioned, will be neither a "common carrier" nor an "aircraft." The mode of conveyance in which the STS will engage is best described by the first two words of its name: *space transportation*, a *sui generis* method of conveyance.

common carriers.[19] Of course, the U.S. Government has in the past created common carriers, but such entities are specifically *not* parts of the U.S. Government and are created by statutory authority expressly stating that the newly created entities are to be common carriers.[20]

Some attention should be given at this point as to *why* NASA should not operate the STS as a common carrier, since it would be possible theoretically to amend the NASAct to provide NASA with such authority and responsibility. The United States has made several international commitments which conflict with the concept that common carriers must not discriminate among customers in offering and providing services, but must serve all members of the public equally. These include the Spacelab Agreement[21] with the European Space Agency (ESA) and the 1967 Outer Space Treaty[22], neither of which would allow the United States to operate the STS as a common carrier. [The 1972 President's Launch Policy applicable to foreign countries and international organizations, and why that policy does not express or imply that NASA is a common carrier are discussed in detail in Issue No. 3, *infra.*]

The Spacelab Agreement, for example, provides in Article 7(A) that the United States "shall, consistent with international agreements and arrangements, make the Space Shuttle available for SL (Spacelab) missions (experiments and applications) of the European Partners and their nationals on either a cooperative or cost-reimbursable

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[19]Exceptions to this may occur during war or other national emergency, such as when the U.S. Government took over the control of certain railroads and other transportation systems under the Federal Control Act of March 21, 1918, Chap. 25, 40 Stat. 451. See Missouri Pac R. Co. v. Ault, 256 U.S. 554, 41 S.Ct. 593, 65 L.Ed. 1087 (1921). *See also* Virginia Ry. Co. v. Mullens, 271 U.S. 220, 46 S.Ct. 526, 70 L.Ed. 915 (1926).

[20]Comsat and the National Rail Passenger Corporation (Amtrak) are examples. Comsat, created by the Comsat Act *(supra* note 4), is not "an agency or establishment of the United States Government" but is "deemed to be a common carrier within the meaning of section 3(h) of the Communications Act of 1934." Sections 301 and 401 of the Comsat Act of 1962, 47 U.S.C. §§ 731, 741 (1970). Amtrak, created by the Rail Passenger Service Act of 1970 (84 Stat. 1328, 45 U.S.C. § 501 (1970)), is also not "an agency or establishment of the United States Government" but is "deemed a common carrier by railroad" subject, with certain exceptions, to the Interstate Commerce Act. Sections 301 and 306(a) of the Rail Passenger Service Act of 1970, 45 U.S.C. §§541, 546(a) (1970).

[21]Agreement Between the Government of the United States of America and Certain Governments, Members of the European Space Research Organization, for a Cooperative Programme Concerning the Development, Procurement and Use of a Space Laboratory In Conjunction With the Space Shuttle System, done at Neuilly-sur-Seine August 14, 1973, entered into force for the United States August 14, 1973, 24 U.S.T. 2049; T.I.A.S. No. 7722. Since the agreement was concluded, ESRO has been succeeded by the European Space Agency (ESA), which is likewise bound by the Spacelab Agreement.

[22]Treaty on Principles Governing the Activities of States In the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, done at Washington, London, and Moscow, January 27, 1967; entered into force for the United States October 10, 1967. 18 U.S.T. 2410; T.I.A.S. No. 6347; 610 U.N.T.S. 205 (1967).

basis." Article 7(B) establishes in the following terms that the ESA countries involved in the Spacelab program with NASA shall be given preferential consideration for use of Spacelab:

> In regard to space missions of the European Partners, the Government of the United States of America shall provide access for use of SLs developed under this cooperative programme for experiments or applications proposed for reimbursable flight by the European Partners, *in preference to those of third countries* considering, in recognition of the participation of the European Partners in this cooperative programme, that this will be equitable in the event of payload limitation or scheduling conflicts. Experiments or applications proposed for cooperative flight will be selected on the basis of the merit of each proposal in accordance with continuing United States policy; such proposals of the European Partners *will be given preference over the proposals of third countries provided their merit is at least equal to the merit of the proposals of third countries.* The European Partners will have an opportunity to express their views with respect to the judgement of merit regarding their cooperative proposals. (emphasis added)

Lastly of interest at this point, Article 7(F) states that the United States will provide Spacelab flight crew opportunities to nationals of the ESA countries involved in the Spacelab program with NASA in connection with their space missions involving a Spacelab. Also, "it is contemplated that a European crew member will be included in the flight crew" of the first Spacelab flight. The United States has no such commitment to any other countries.[23]

The Outer Space Treaty provides in the first sentence of Article VI that States Parties:

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

Under this provision, the United States Government must bear responsibility for the activities of NASA and any other U.S. Governmental agency which conducts space activities, such as NOAA, as well as non-governmental entities, such as the Communications Satellite Corporation (Comsat) and corporations involved in domestic

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[23]Under NASA's Shuttle services reimbursement policies, *supra* note 3, foreign users "who have made substantial investment in the STS program, i.e., European Space Agency (ESA), ESA member or observer nations participating in Spacelab development, and Canada, when conducting experimental science or experimental applications missions with no near-term commercial implications" are treated the same for reimbursement purposes as civil U.S. Government users. Canada's investment in the STS program is made under an Agreement Between the United States of America and Canada concerning Space Cooperation: Remote Manipulator System, entered into force June 23, 1976, T.I.A.S. No. 8400.

U.S. communications satellite activities, such as Western Union, RCA, and Comsat General.[24]

Sentences two and three of Article VI of the Outer Space Treaty provide that:

> The activities of nongovernmental entities in outer space . . . shall require authorization and continuing supervision by the appropriate State Party to the Treaty.
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> When activities are carried on in outer space . . . by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

Sentence two requires the United States to insure that the necessary and proper steps are taken to authorize and continuously supervise any activities of U.S. nationals (i.e., "nongovernmental entities" like persons, partnerships, corporations, etc.) in outer space. Sentence three provides for concurrent responsibility between the United States and any international organization—as well as the other States participating in that organization—for activities in outer space conducted by such organization.

Article VI, in short, "is designed to ensure responsibility for space activities, inherently international in nature, at the governmental level."[25] If the United States launches a payload for either a U.S. national which is not a U.S. Governmental entity, therefore, or for an international organization in which the U.S. is a participant, the U.S. shall bear responsibility for any subsequent space activities of such national or organization just as it bears responsibility for space activities of entities which are part of the U.S. Government itself.

Article VII of the Outer Space Treaty provides as follows:

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

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[24] *See supra* note 20 on Comsat's legal status under U.S. municipal law. Internationally, under the Intelsat Agreement (opened for signature at Washington, August 20, 1971, 23 U.S.T. 3813, T.I.A.S. 7532), Comsat acts as technical and operational manager of Intelsat until February 12, 1979, six years after the date of entry into force of the Intelsat Agreement, after which a new technical and operational management arrangement must be worked out. *See* Articles XI and XII of the Intelsat Agreement; and Aviation Week and Space Technology, March 15, 1976, at 77. The satellites used by Intelsat are owned by Intelsat.

Western Union, RCA, and Comsat General (a wholly-owned subsidiary of Comsat) own and operate their own satellites, while a fourth corporation, American Satellite Corporation (owned by Fairchild Industries Inc.), leases capacity from the Western Union satellites. Business Week, May 31, 1976, at 25.

[25] Senate Committee on Aeronautical and Space Sciences, Report on Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Comm. Print, 90th Cong., 1st Sess. 28 (March 1967).

This provision indicates that the concern of the United States in launching any object into outer space extends beyond the successful insertion of such object into the desired orbit, even though the object is launched for a non-governmental U.S. entity (such as Comsat) or a foreign state or international organization. The 1972 Liability Convention elaborates upon this matter.[26]

Moreover, Article IX of the Outer Space Treaty requires the United States to consider the use to which any satellite which it launches is put, even if the United States Government itself will not own or operate the satellite in question. Thus, the United States, or any State providing launch services, has responsibilities beyond the successful launching of a satellite, responsibilities which may last the lifetime of the satellite.[27]

As a technical point, a common carrier's legal responsibilities generally end with the safe delivery of the goods to the final destination,[28] which for the STS would mean insertion into the proper orbit, but the United States has responsibilities beyond that even if the satellites are actually owned and operated by non- governmental entities of U.S. nationality (such as Comsat) or by foreign countries or international organizations.

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[26]Convention on International Liability for Damage Caused by Space Objects, done at Washington, London, and Moscow, March 29, 1972; entered into force for the United States October 9, 1973. 24 U.S.T. 2389; T.I.A.S. No. 7762. In the Liability Convention, the provisions prescribing liability are usually directed at the "launching State," which is defined as a "State which launches or procures the launching of a space object" and a "State from whose territory or facility a space object is launched." Article I (c). Subsequent provisions specify the types of liability which apply in various situations and the apportionment of liability in situations involving more than one launching State.

[27]Article IX of the Outer Space Treaty, *supra* note 22, contains further prescriptions relating to the general matter of State responsibility in outer space. States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance in the exploration and use of outer space and shall conduct all their outer space activities "with due regard to the corresponding interests of all other States Parties to the Treaty." They "shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose." A State Party which "has reason to believe that an activity or experiment planned by it or its nationals in outer space . . .would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space. . .shall undertake appropriate international consultations before proceeding with any such activity or experiment." If a State Party "has reason to believe that an activity or experiment planned by another State Party in outer space. . .would cause potentially harmful interference with activities in the peaceful exploration and use of outer space," it "may request consultation concerning the activity or experiment."

[28]The basic duty of a common carrier to make final delivery before being relieved of its legal responsiblities is very well-established. Gorton, *infra* note 40, at 101, 114. See Railroad Co. v. Manufacturing Co., 83 U.S. (16 Wall) 318, 21 L.Ed. 297 (1872); Railroad Co. v. Pratt, 90 U.S. (22 Wall) 123, 22 L.Ed. 827 (1874); Pratt v. Railway Co., 95 U.S. 43, 24 L.Ed. 336 (1877); Insurance Co. v. Railroad Co., 104 U.S. 146, 26 L.Ed. 679 (1881); and N. Pa. R. Co. v. Commercial Nat'l Bank, 123 U.S. 727, 31 L.Ed. 287, 8 S.Ct. 266 (1887). Further citations to cases discussing this basic rule, as well as its many nuances can be found at 13 Am. Jur. 2d *Carriers* §§ 395-414; and 13 C.J.S.*Carriers* §§ 159-86.

Since treaties to which the United States is bound are "the supreme law of the land,"[29] the commitments discussed above take precedence over any conflicting common law principles, such as common carrier status.[30] Therefore, the STS should not be operated as a common carrier in order that the United States be able to carry out most effectively its international commitments relating to activities in outer space.

III. HOW IS THE PRESIDENT'S LAUNCH POLICY OF 1972 RELATED TO THE SELECTION OF MISSIONS AND PAYLOADS FOR THE STS?

There are two aspects of this question: (a) the general applicability of the President's Launch Policy of 1972[31] [hereinafter the "Launch Policy"] to the STS and (b) the fact that no common carrier status is expressed or implied for NASA in the Launch Policy.

A. The General Applicability of the Launch Policy to the STS

On October 9, 1972, the President announced a policy whereby the United States would provide, on a nondiscriminatory, cooperative or reimbursable basis, satellite launch assistance to other countries and international organizations. This new policy, in effect, was actually an extension to other countries of the launch policy the United States had publicly announced in regard to the European Space Conference almost a year earlier.[32] It addressed four main points:

—the availability of launch services vis-a-vis
the conditions under which they will be provided;

—the location of launch sites involved;

—the financial conditions; and

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[29]U.S. Const. art. 6, cl. 2.

[30]It is true that if the STS were legally able to be operated as a common carrier (which, as stated earlier, would require amendment of the NASAct), common law principles would have to bow to any conflicting treaty provisions. *See e.g.*, Indemnity Ins. Co. of North America v. Pan American Airways, 58 F. Supp. 338 (S.D.N.Y. 1944) (public policy against contractual limitation of liability by common carriers must bow to the overriding policy of Warsaw Convention); and Block v. Compagnie Nationale Air France, 299 F. Supp. 801 (N.D. Ga. 1964) (Warsaw Convention limitations on liability of common carriers override state public policy).

[31]The Launch Policy can be found in the Department of State Bulletin, November 6, 1972, at 533-34.

[32]The public announcement of the European launch assistance policy was made on November 1, 1971, by the State Department; however, the U.S. policy was first formally presented to the European Space Conference in a letter dated September 1, 1971, from Under Secretary of State for Political Affairs U. Alexis Johnson to Minister Theo Lefevre, Chairman of the European Space Conference. Text of the announcement and letter, as well as of a "summary of amplifying comments" can be found at Department of State Bulletin, November 29, 1971, at 624.

—the matters of priority and scheduling.

Under Provision I of the Launch Policy, United States launch assistance will be available to interested countries and international organizations for satellite projects which are for peaceful purposes and are consistent with obligations under relevant international agreements and arrangements. The launch assistance is subject to these additional conditions:

> If the satellites to be launched are intended to provide international public telecommunications services, the United States will inquire of the International Telecommunications Satellite Organization (Intelsat) whether Intelsat makes a favorable recommendation in accordance with Article XIV of the Intelsat definitive arrangements.[33] If Intelsat does make a favorable recommendation, the United States will provide the launch assistance. If, however, there is no favorable recommendation by Intelsat, the United States will still provide the launch assistance if (1) the United States had supported the proposed system within Intelsat and (2) the country or international entity requesting the assistance "considers in good faith that it has met its relevant obligations under Article XIV of the definitive arrangements." Finally, if there is no favorable Intelsat recommendation and if the United States had not supported the proposed system within Intelsat, the United States will decide whether to provide the requested launch assistance "after taking into account the degree to which the proposed system would be modified in the light of the factors which were the basis for the lack of support within Intelsat."
>
> If satellites to be launched in the future are operational and are involved in applications "which do not have broad international acceptance," the United States will not favorably consider requests for launch assistance until "broad international acceptance has been obtained."[34]

Although there was no further elaboration of the provisions of the President's Launch Policy, a "Summary of Amplifying Comments" was provided with the text of the September 1, 1971, letter from the State Department to the European Space

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[33]Article XIV of the Intelsat definitive arrangements contains provisions on the rights and obligations of Intelsat members which desire to establish, acquire, or utilize space telecommunications facilities separate from the Intelsat facilities for various purposes, domestic or international in nature. Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), with annexes, done at Washington, August 20, 1971; entered into force for the United States February 12, 1973. 23 U.S.T. 3813; T.I.A.S. No. 7532.

[34]*Supra* note 31.

Conference when such letter was published on November 1, 1971, outlining the European launch policy.[35] Since the European launch policy was very similar to the President's Launch Policy announced less than one year later, the "Summary of Amplifying Comments" [hereinafter the "Summary"] may be used to elaborate upon the provisions of the President's Launch Policy.[36]

Provision II is addressed to the location of the launch sites involved. United States launch assistance under the Launch Policy will be available, consistent with U.S. laws, either from U.S. launch sites (through the acquisition of U.S. launch services on a cooperative or reimbursable basis) or from foreign launch sites (by purchase of an appropriate U.S. launch vehicle). In regard to launchings from foreign sites, the United States will require assurance that the launch vehicles will not be made available to third parties without prior agreement of the United States. The Summary's only comment in relation to this provision is that U.S. laws are intended to recognize existing treaty obligations, like the 1967 Outer Space Treaty, and domestic legislation such as that affecting exports. The Intelsat agreement is not a treaty and, therefore, constitutes an international undertaking of the United States which is consistent with existing U.S. law but does not create new U.S. law.[37]

Provision III deals with financial conditions for reimbursable launch services from U.S. launch sites and simply states that foreign users will be charged on the same basis as comparable non-U.S. Government domestic users for such services. The Summary had nothing to say in regard to this point, which is quite straightforward, with, perhaps, the only additional comment needing to be made about the word "comparable." This would mean that a foreign government or international organization would be charged on the same basis, all other things being equal, as domestic U.S. (non-governmental) users which have already purchased NASA launch services on a reimbursable basis.[38]

Provision IV, the last of the four main points of the Launch Policy, provides that the priority and scheduling for launching foreign payloads from U.S. launch sites will be dealt with on the same basis as that for U.S. launches. Each launching will be treated in terms of its own requirements and as an individual case. When it becomes known when a payload will become available and what its launch window requirements will be, the launching will be scheduled for that time. Should a conflict arise, the United States will consult with all interested parties in order to arrive at an equitable solution. The Summary provides no additional comments on this provision.

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[35] *Supra* note 32.

[36] *Supra* note 32.

[37] *Supra* note 32.

[38] *Supra* note 24.

In summation, regarding the general applicability of Launch Policy to the STS, it can be said that although only expendable boosters were in use at the time the Launch Policy was announced, there is nothing contained in the terms of the policy which would make it inapplicable to the Space Transportation System, which was being planned when the Launch Policy was announced.[39] In fact, the STS will provide the means for more launch assistance to other countries and international organizations and, hence, will most likely cause a greater use of the Launch Policy. The Shuttle's reuseability, versatility, and flexibility will be prime factors in regard to this increased use.

B. The Launch Policy Neither Expresses nor Implies Common Carrier Status for NASA

As was discussed in Issue No. 2, NASA is not a common carrier and would not be able to operate the STS as a common carrier under existing U.S. statutory law. It should, consequently, be made clear at this point that the President's Launch Policy also neither expresses nor implies that NASA is a common carrier, either in regard to the expendable launch vehicles (which have been used for nearly two decades) or to the new STS.

The President's Launch Policy, although a public statement of policy to all foreign countries and international organizations offering launch services on a generally nondiscriminatory basis, does require the United States to give certain consideration to the opinions of its Intelsat partners in situations involving proposed international public telecommunications services. The United States must also consider whether any future operational satellite applications have broad international acceptance before it will favorably consider requests for launch assistance for such satellite projects, namely, that the projects be for peaceful purposes, that they be consistent with obligations under relevant international agreements and arrangements, and that the launch assistance be consistent with U.S. laws. Launchings from foreign sites are subject to the additional requirement that the United States will require assurance that the launch vehicles will not be made available to third parties without prior agreement of the United States.

All of these conditions expressed in the Launch Policy are inconsistent with the general concept of common carrier, which involves, *inter alia,* a duty to provide the service in question to all who may apply *without discrimination.*[40] Also, these conditions require that NASA have the legal right to inspect the potential Shuttle payloads and

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[39]It should be noted that since no Shuttle missions will, for the foreseeable future, be launched from outside the United States, the language of Provision II relating to launchings under the Launch Policy but from foreign sites is inapplicable.

[40]This principle of the legal status of a common carrier is basic and well-established from seventeenth century England:

> The common carrier "is under a public duty to carry for every one, under certain conditions, usually of his own making, so that if he refuses to carry within these limitations he is liable." He is bound to receive and transport all freight tendered, according to the custom and usage of their business. To carry out his service duty the

obtain some type of assurance from those requesting the launch services as to the exact nature of the payloads and their true and complete functions in outer space; this, in fact, has been the case with STS.[41] Generally, common carriers, in absence of a special statute, do not have the right to require knowledge of the character of the goods offered

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> common carrier at common law is not allowed to refuse transportation for certain persons except in some cases (in other words he cannot freely choose his customers), he is not allowed to charge unreasonable rates (that would in fact be another way to refuse to carry) and he has to provide reasonable facilities (which is true particularly for the railways).
>
> The common carrier's basic duty is to accept and carry impartially for all who wish to engage his services. "Originally the common law courts treated actions for non-feasance and mis-feasance as based on tort which required the assumpsit that the defendant had set himself out to perform or to perform with skill, as the case may be, and that assumpsit might be represented by the fact that the defendant was exercising a common calling. But, by the seventeenth century a failure to perform the duties of serving all and sundry and of serving with skill came to be regarded as a breach of contract. Hence a person seeking redress had the opporutnity of proceeding by alternative course of action. He could bring an action on the case sounded in tort or he could allege breach of contract, for the duties of a person in a common calling came to be regarded as terms of an implied contract."
>
> Thus a common carrier may not carry for one and refuse to carry for another, but instead he must perform his duty without discrimination, and theoretically, at least, in the order in which the applications are made. (footnotes omitted)

Lars Gorton, *The Concept of the Common Carrier in Anglo-American Law* 103-105 (Gothenburg Maritime Law Association 1971). Beyond this basic duty, however, there have developed many and often complicated nuances which are beyond the scope of this discussion. See the cases collected in 13 Am. Jur. 2d *Carriers* §§ 174-224 (1964) and 13 C.J.S. *Carriers* §§348-97 (1939). The basic common law duty of a common carrier not to discriminate remains to this day, although the duty in the United States is usually enforced through federal regulatory agencies applying federal statutes addressed to common carriage. *See e.g.,* A.L. Mechling Barge Lines, Inc. v. U.S., 376 U.S. 375, 84 S.Ct. 874, 11 L.Ed. 2d 788 (1964), *reh. den'd* 377 U.S. 960 (1964); and American Trucking Assocs. v. Atchison, Topeka & Santa Fe, 387 U.S. 397, 87 S.Ct. 1608, 18 L.Ed. 2d 847 (1967), *reh. den'd* 389 U.S. 889 and 389 U.S. 892 (1967).

[41]Under NASA's reimbursement policies *(supra* note 3) all users "will be required to furnish NASA with sufficient information to verify peaceful purposes and to insure Shuttle safety and NASA's and the U.S. Government's continued compliance with law and the Government's obligations." 14 C.F.R. § 1214.104(b) (1977) and 14 C.F.R. § 1214.204(b) (1977). (N.M.I.) § 8610.8, ¶6(b) (January 21, 1977), and (N.M.I.) § 8610.9, ¶6(b) (February 11, 1977).

With respect to commercial users of the Shuttle, NASA's reimbursement policies specifically provide that:

> NASA will not acquire rights to inventions, patents or proprietary data privately funded by a user, or arising out of activities for which a user has reimbursed NASA under the policies set forth herein. However, in certain instances in which the NASA Administrator has determined that activities may have a significant impact on the public health, safety or welfare, NASA may obtain assurances from the user that the results will be made available to the public on terms and conditions reasonable under the circumstances. 14 C.F.R. § 1214.104(a) (1977). (N.M.I.) § 8610.8, ¶6a.

to them for transportation or to inspect such goods for themselves as a condition of receiving and transporting them.[42]

IV. WHAT WILL BE THE STATUS OF THE SPACE SHUTTLE UNDER THE FEDERAL AVIATION ACT OF 1958?

In its report on the "Status and Issues Relating to the Space Transportation System" (B-183134), the General Accounting Office (GAO) identified as an issue that needed to be resolved, the question of whether the Space Shuttle could be considered to be an aircraft within the meaning of section 101(5) of the Federal Aviation Act of 1958.[43] The NASA Office of the General Counsel had previously advised the NASA Office of Space Flight that, based upon the NASAct and other relevant authority, the Shuttle would be considered a space vehicle, and *not* an aircraft within the meaning of the FAAct. Given the GAO question, however, the matter was referred to the Chief Counsel of the Federal Aviation Administration (FAA). In his response to the NASA General Counsel of March 11, 1977, the FAA Chief Counsel concluded that for the purpose of the FAAct respecting applicability of the Federal Aviation Regulations (FARs), the Space Shuttle is not an aircraft. The statutory interpretation leading to and expanding upon this conclusion is set forth in the FAA response on 11 March 1977, as follows:

> You have raised a question respecting the status of the NASA Space Shuttle under the Federal Aviation Act of 1958 (FAAct). Specifically, you have inquired as to whether we consider the Shuttle to be an "aircraft" within the meaning of section 101(5). It is the view of this office that for the purposes of the FAAct respecting applicability of the Federal Aviation Regulations (FARs), the Space Shuttle is not an aircraft.
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> That section of the FAAct reads as follows:
>
> > "Aircraft" means any contrivance now known or hereafter invented, used, or designed for navigation of or flight in the air.
>
> While any man-made object moving through the air might arguably be called an aircraft, it is necessary to examine the legislative intent and purpose behind the

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Thus, any proprietary information to verify peaceful purposes and insure Shuttle safety, in order to be adequately protected, could be supplied to NASA as privileged and confidential under appropriate safeguards.

[42]There are exceptions to this general rule, such as when the common carrier has reasonable ground to suspect that the goods are of dangerous or illegal character. *The Nitroglycerine Case* (Parrot v. Wells Fargo & Co.) 82 U.S. (15 Wall.) 524, 535-36 (1872). *See also* other cases collected at 13 Am. Jur. 2d *Carriers* § 238 (1964).

[43]72 Stat. 731; 49 U.S.C. § 1301 (1970); 13 C.J.S. *Carriers* § 28 (1939).

> regulatory scheme in the FAAct. It is undoubtedly clear that a major purpose of the FAAct was to unify control and management of the air space in a single agency. Foremost in the minds of the drafters were military and civilian airplanes. The idea then that rockets or spacecraft would routinely traverse the air space was mere speculation only months after Sputnik I was launched. In fact, the statutory creation of NASA, as you are well aware, was barely one month earlier than the effective date of the FAAct.
>
> To date, the issue of whether a craft is a space vehicle or an aircraft for purposes of the FARs has been largely academic. The operational characteristics of the Space Shuttle and the amount of time it will be in the navigable air space have altered the circumstances somewhat. We understand that the Shuttle will have maneuvering characteristics similar to a glider. It will use control surfaces to navigate to a landing at a designated landing field. We understand further that its trajectory is far steeper than an aircraft and bears the characteristics one would expect of a vehicle re- entering the atmosphere from orbit. The length of time it will take to go from 42,000 feet to touchdown is only three minutes and eight seconds. The vast majority of its operational time is spent in a space, not air, environment.
>
> We further understand that the NASA Act of 1958 recognized the distinct categories of "aeronautical and space vehicles" in section 103. In that section, we construe "aircraft" to be the aeronautical vehicle, i.e., designed primarily for operation in the air. The other listed vehicles seem to be "space vehicles." The contemporaneous but different drafters of our legislation did not mention space vehicles as a distinct category. From our view of the operational characteristics of the Shuttle, we conclude it is, in fact, a space vehicle rather than an aircraft. This is especially apparent considering that, in general, the operating requirements of Part 91 are inappropriate for application to the Shuttle operation. Many would be unnecessary and even incompatible with the Shuttle mission. You have expressed the intention of NASA to comply with whatever air traffic and related safety procedures the FAA feels are necessary for the safe operation of this vehicle while in the air space. To this end, we understand that our regional personnel are already engaged in establishing the needed restricted air space and other operational conditions. In these circumstances, it seems entirely consistent with the intent of the FAAct not to apply the full panoply of our FAA regulations so long as we remain assured the safety of the U.S. air space will not be derogated. We acknowledge NASA's firm commitment to cooperate fully to that end.

The view of the Chief Counsel of the FAA is, of course, authoritative on this question.[44]

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[44]When faced with a problem of statutory construction, the courts show "great deference to the interpretation given the statute by the officers or agency charged with its administration." Udall v. Tallman, 380 U.S. 1, at 16 (1964). *See also,* Philadelphia Television Broadcasting v. FCC, 359 F. 2d 383 (D.C. Cir. 1965).

It should be noted in passing that even if hypothetically the Shuttle were considered to be an "aircraft" under the FAAct, it would be a "public aircraft" rather than a "civil aircraft" under the Act. A "civil aircraft" is defined as "any aircraft other than a public aircraft" (FAAct, § 101(14) (1958); 49 U.S.C. § 1301(14)(1970)). A "public aircraft" is:

> [A]n aircraft used exclusively in the service of any government or of any political subdivision thereof, including the government of any State, Territory, or possession of the United States, or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

On the question of safety, the Chief Counsel of FAA noted that the FAA regional personnel were "already engaged in establishing the needed restricted air space and other operational conditions" to carry out "the intention of NASA to comply with whatever air traffic and related safety procedures the FAA feels are necessary for the safe operation of this vehicle while in the air space."[45]

V. WHAT AUTHORITY WILL THE SHUTTLE COMMANDER HAVE TO ENFORCE ORDER AND DISCIPLINE DURING SPACE SHUTTLE MISSIONS?

The Shuttle commander will have full authority to enforce order and discipline during all phases of any STS mission, including the ascent, orbital, and descent phases. This authority extends to any and all persons on board the Shuttle, including federal officers and employees and all other persons whether or not they are U.S. nationals.[46] Furthermore, this authority extends to Spacelab, which, when used in an STS mission, will, of course, function only as a part of the Shuttle Orbiter and not as an independent spacecraft; it will also cover any Shuttle personnel engaged in Extravehicular Activity (EVA), which means any activity outside of the Orbiter cabin and Spacelab areas. Finally, this authority includes the use of physical force if reasonable and necessary under the circumstances without incurring either criminal or civil liability.

FAAct, §101(32) (1958); 49 U.S.C. §1301(32) (1970). Although aircraft owned by foreign governments are "civil aircraft" if "engaged in carrying persons or property for commercial purposes," a U.S. flag aircraft, even if owned and operated by a private corporation will be a "public aircraft" if it is engaged exclusively in U.S. Government business (e.g., under a contract to perform transportation services solely for the U.S. Government). United States v. Aero Spacelines, Inc., 361 F.2d 916 (9th Cir., 1966). Any NASA aircraft would be a "public aircraft" even if such aircraft is carrying cargo which might eventually have commercial value to a private corporation, since "[t]o come within the definition of 'public aircraft,' the aircraft need only be used exclusively in the service of any government. . . ." *Id.* at 922. The STS, owned and operated by the U.S. Government and used to fulfill the policies specified in the NASAct will not be "a major enterprise for profit," thus not making NASA a "commercial operator" under the FARs (14 C.F.R. § 1.1 (1976)). Payment to NASA for providing reimbursable launch services are not based upon making a profit but only upon covering NASA's expenses.

[45]The Federal Register, March 31, 1977, Vol. 42, Fed. Reg. 17,139 & 17,140 (1977) contains the proposed FAA rules for the alteration and establishment of several restricted air space areas (under 14 C.F.R. §§71, 73 (1977)) for Shuttle operations from Kennedy Space Center in Florida. Final rules are published in Federal Register, June 9, 1977, Vol. 42 Fed. Reg. 29,475 & 29,476 (1977).

[46]This authority would even extend to stowaways on board the Shuttle, although it is highly unlikely that such a situation would ever occur, due to the stringent security which will surround STS operations and the very small amount of room on board the Shuttle.

In regard to DOD personnel detailed to NASA, they will be subject to "all appropriate regulations and directives of NASA." Agreement Between the Departments of Defense, Army, Navy and Air Force and the National Aeronautics and Space Administration Concerning the Detailing of Military Personnel for Service with NASA, approved by the President on April 13, 1959. *See* (N.M.I.) §1052.11A, Sec. IV(a) (1959). Memorandum of Understanding (MOU) Between the Department of Defense, the Army, the Navy and the Air Force and the National Aeronautics and Space Administration Concerning the Detailing of Military Personnel for Service as Shuttle Crew Members. *See* (N.M.I.)§ 1052.202, Sec. IV(e) (1976).

This authority is based upon several provisions of the NASAct. Section 203(c)[47] provides that "[i]n the performance of its functions the Administration is authorized—(1) to make, promulgate, issue, rescind, and amend rules and regulations governing the manner of its operations and the exercise of the powers vested in it by law." Section 304 (a)[48] states that the Administrator "shall establish such security requirements, restrictions, and safeguards as he deems necessary in the interest of the national security." Finally, 18 U.S.C. 799[49] states:

> Violation of Regulations of National Aeronautics and Space Administration
>
> Whoever willfully shall violate, attempt to violate, or conspire to violate *any regulation or order* promulgated by the Administrator of the National Aeronautics and Space Administration *for the protection or security* of any laboratory, station, base or other facility, or part thereof, or *any aircraft, missile, spacecraft, or similar vehicle, or part thereof,* or other property or equipment in the custody of the Administration, or any real or personal property or equipment in the custody of any contractor under any contract with the Administration or any subcontractor of any such contractor, shall be fined not more than $5,000, or imprisoned not more than one year, or both. (emphasis added)

Under the above statutory provisions, the NASA Administrator can promulgate regulations, effective upon publication in the *Federal Register,* relating to the Shuttle commander's authority.[50] There can be no question that, aside from the commander's responsibility for the lives of those people on board the Shuttle, the "protection or security" of the Shuttle and its payload will be one of the commander's primary duties. Since the well-being of the people on board the Shuttle will be directly related to the operational condition of the Shuttle, its payloads (especially Spacelab), and its various parts and systems, the commander's responsibilities both in relation to the people on board and to the Shuttle itself must be considered together.

In regard to the international law, the Shuttle commander will have authority analogous to the authority which commanders of ships and aircraft have traditionally been accorded. International law recognizes that the ship or aircraft commander is the representative of the State of nationality of such ship or aircraft to whom the State's jurisdiction has been delegated to maintain discipline and protect the persons and

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[47] 42 U.S.C. § 2473(c) (1970).

[48] 42 U.S.C. § 2455(a) (1970).

[49] This provision, *mutatis mutandis,* is contained in S. 1437, 95th cong., 1st Sess., as § 892.

[50] Such has been done for other matters of great importance to NASA. *See e.g.,* 14 C.F.R. § 1203a.100 (1977) *et seg.* (establishment of NASA security areas) and 14 C.F.R. § 1211.100 *et. seg.* (NASA "quarantine" regulations).

property on board.[51] Article VIII of the 1967 Outer Space Treaty logically extends this principle to spacecraft:

> A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. . . .[52]

Any and all persons on board the Shuttle or conducting any EVA activities from the Shuttle, therefore, will be under the direct and complete authority of the Shuttle commander, whether or not he is a civilian employee of NASA or an officer or employee of DOD. The parameters of this authority may be specified in regulations promulgated by the NASA Administrator, if he so desires.[53]

VI. WHAT AUTHORITY DOES NASA HAVE TO ESTABLISH MEDICAL STANDARDS AND TRAINING REQUIREMENTS FOR PERSONS FLYING ABOARD THE SHUTTLE?

From the beginning of the U.S. manned space program, NASA has established physical, physiological and psychological standards [hereinafter referred to as "medical standards"] and training requirements for persons going into outer space aboard NASA spacecraft. So far, these people have all been U.S. nationals and U.S. Government (NASA or DOD) employees. In addition to these same types of people, the Shuttle will carry scientists and certain other persons who may be neither employees of the U.S. Government nor nationals of the United States. NASA will, however, have the same authority to establish personal standards for such new categories of people.

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[51]McDougal, Lasswell, and Vlasic, *Law and Public Order in Space* 670, and 668-74 (1963). *See also* Matte, *The International Legal Status of the Aircraft Commander* (1975); and Meyers, *The Nationality of Ships,* 110, 120, and 322 n. 3 (1967).

[52]"A State's 'registry' of spacecraft is a term similar to the 'registry' of ocean-going ships, such records being kept for the purpose of identifying ownership." Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Staff Report of the Committee on Aeronautical and Space Sciences of the United States Senate 31, 90th Cong., 1st Sess. (Comm. Print, March 1967). Details concerning the registration of space objects are set forth in the Convention on Registration of Objects Launched into Outer Space, opened for signature at New York January 14, 1975; entered into force for the United States September 15, 1976. T.I.A.S. No. 8480. Under Article II (1) the United States will be required to register the Shuttle Orbiter each time it is launched into orbit.

[53]Exercise of that authority, including the use of physical force, set forth in NASA regulations based upon the NASAct, §203(c) (1) and §304(a) as discussed earlier, would not involve a determination of criminal guilt, but only a determination that certain measures are reasonable and necessary to insure the safety of the persons on board the Shuttle (which includes Spacelab) as well as the protection and security of the Shuttle, any payloads, and any parts thereof. Violation of NASA regulations is addressed in 18 U.S.C. § 799 (1970) but the determination of guilt and punishment for such alleged violations is a matter for the appropriate United States court back on Earth.

Section 203(c)(1) of the NASAct[54] already discussed in connection with Issue No. 5 in relation to the authority of the Shuttle commander, gives NASA the authority, in performing its functions, "to make, promulgate, issue, rescind, and amend rules and regulations governing the manner of its operations and the exercise of the powers vested in it by law." NASA's functions include the: (1) planning, directing, and conducting of aeronautical and space activities and (2) the arranging for participation by the scientific community in the planning of scientific measurements and observations to be made through use of aeronautical and space vehicles, as well as the conducting or arranging for the conduct of such measurements and observations.[55]

Under the above statutory authority, NASA has established medical standards and training requirements for scientists and certain other professionals participating in flights aboard NASA research aircraft as part of the Airborne Sciences Program, conducted for many years by the NASA Ames Research Center. These professional people flying aboard NASA aircraft, often in international air space over the high seas, are usually referred to as "experiment operators" or "EOs," and have included non-U.S. Government employees and foreign nationals. For the purpose of this discussion, the EOs are analogous to the payload specialists who will conduct experiments in Spacelab aboard the Space Shuttle.[56] Examples of training requirements and medical standards which have been established by NASA for persons flying aboard NASA research aircraft are:

(1) high altitude indoctrination training at a suitable low pressure chamber every three years for NASA-Ames Research Center flight crew members;[57]

(2) completion within the preceding two years of a low pressure physiological training course, including a low pressure chamber run for crew members other than regular flight crew personnel who are scheduled to engage in flights above 45,000 feet, or a cabin altitude in excess of 14,000 feet;[58]

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[54] 42 U.S.C. 2473(c) (1) (1970).

[55] Section 203(a) of the NASAct; 42 U.S.C. § 2473(a) (1970).

[56] *See* Mulholland, "A Cost-effective Approach for Flight Experiments: Application of Airborne Science Aircraft Experience to the Shuttle Sortie Lab," paper presented at the 24th International Astronautical Congress, Baku, U.S.S.R., October 7-13, 1973; and Mulholland, et al., "NASA/ESA CV-990 Airborne Simulation of Spacelab," paper no. ASS 75-237, presented at the 21st Annual Meeting of the American Astronautical Society, Denver, Colorado, August 26-28, 1975.

[57] NASA/Ames Research Center, Flight Operations Manual Memorandum No. 70-2, sec. 302.3 Physiological Training (July 24, 1970).

[58] *Id.* Crew members other than flight crew personnel who are scheduled for high altitude flights are also required to visit an Ames Research Center approved physician immediately prior to beginning a series of such flights.

(3) freedom from heart disease, diabetes, chronic respiratory ailments, colds or sinus conditions.[59]

These same or similar standards, and more, may be established by NASA for payload specialists and other persons flying on board the Shuttle.[60] In addition, NASA may establish standards for foreign astronauts who fly in Shuttle missions.

VII. WHAT AUTHORITY DOES NASA HAVE TO CONTROL ARTIFACTS AND MEMENTOS BROUGHT ABOARD THE SHUTTLE OR FOUND IN SPACE BY SHUTTLE PERSONNEL?

NASA's basic authority "to make, promulgate, issue, rescind, and amend rules and regulations governing the manner of its operations and the exercise of the powers vested in it by law"[61] extends to the establishment of policy, procedures, and responsibilities governing the selection, approval, packing, storage, postflight disposition and public announcement of articles authorized to be carried on Shuttle flights. Such authority covers NASA employees,[62] as has already been manifested in relation to past missions,[63] and also non-NASA employees of U.S. nationality.[64]

With regard to foreign nationals participating in STS missions, NASA would have full authority to determine what objects could be brought on board the Shuttle in the first place, as well as how they must be stowed, etc., since such determinations would involve safety and related considerations. Once NASA had allowed an article to be brought on board the Shuttle and determined how such article should be packed, stowed, etc., enforcement of any policy regarding postflight disposition, if the article is the property of a foreign person or other entity and no longer in the United States, would have to be addressed on a case-by-case basis.

As far as objects found in outer space are concerned, the United States would need to reach agreement with the foreign States involved in order to establish appropriate policy and rules for its implementation. Again, however, any considerations relating to

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[59]NASA Learjet Airborne Observatory Investigator's Handbook, § 1.1.

[60]NASA Regulations regarding Payload Specialists are published at 14 C.F.R. § 1214 (1977).

[61]Section 203(c) (1) of the NASAct; 42 U.S.C. § 2473(c) (1) (1970).

[62] *See supra* note 46 regarding DOD personnel detailed to NASA.

[63] *See e.g.,* N.M.I. § 8020.19B (1974), establishing policy, procedures, and responsibilities regarding articles authorized to be carried on the Apollo-Soyuz Test Project mission.

[64]NASA regulations, published in the Federal Register, would establish artifact policy for non-NASA employees of U.S. nationality, unless the matter were to be controlled by the relevant contractual provisions. Both approaches would seem advisable.

safety on board the Shuttle or otherwise in connection with the Shuttle mission remain within the authority of the Shuttle commander and, ultimately, the United States.[65]

VIII. WHAT AUTHORITY EXISTS FOR THE CLEARING OF AND/OR THE WARNING FOR SOLID ROCKET BOOSTER, EXTERNAL TANK, AND SONIC BOOM IMPACT AREAS ON THE HIGH SEAS?

During the ascent-to-orbit phase of every Shuttle mission, the following events will occur on the high seas: the impact of the two Solid Rocket Boosters (SRB); the impact of pieces of the External Tank (ET); and the creation of a sonic boom footprint. While the exact parameters of these occurrences are still in the process of being determined by NASA,[66] the legal aspects of these occurrences in relation to the safety of other users of the high seas[67] within the areas in question are well known, since these occurrences are analogous to booster stage and sonic boom impact resulting from the launch of expendable launch vehicles, which the United States has been doing for nearly two decades.[68]

Basically, since the areas under consideration are within the international legal regime of the high seas, including the subjacent water column and the superjacent air space, the United States cannot legally exclude any vessels (surface ships and submersibles) or aircraft from these areas except vessels or aircraft of United States

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[65]Man-made objects of Earth origin which might be retrieved by the Shuttle, but not belonging to the United States, would most likely be legally the property of the State of registry, according to Article VIII of the 1967 Outer Space Treaty. *Supra* note 22. It would, therefore, be the duty of the United States to return such object to the State of registry on request, pending proper request for and identification of the object:

> A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.

This provision, of course, is binding only upon States Parties to the Treaty, and, furthermore, does not impose a duty on the United States to retrieve the foreign space object in the first place.

[66]The latest details available on the SRB and ET procedures appear in the amended version of the environmental impact statement on the Space Shuttle Program.

[67]It should be noted that although the SRBs will impact within a 200-mile coastal zone, for the purposes of this analysis they will be regarded as impacting on the high seas.

[68]The first United States satellite launched into Earth orbit was Explorer I on January 31, 1958.

nationality (i.e., registry).[69] It has long been the practice for both the United States and the Soviet Union for missile testing and spacecraft launch operations over the high seas to warn vessels and aircraft of the operations planned. To follow that accepted practice for Shuttle operations would not present any new questions of international law.[70] Specific aspects of the impact area designation and warning procedure can be formulated and announced as the first Shuttle Orbital Flight Tests (in 1979) draw nearer.

IX. WILL AN OCEAN DUMPING PERMIT BE REQUIRED FOR THE SRB AND ET PROCEDURES ON THE HIGH SEAS?

An ocean dumping permit will not be required to conduct the SRB and ET procedures.[71] The statute of concern is the Marine Protection, Research, and Sanctuaries Act of 1972[72] [hereinafter the "Marine Act"]. NASA will not be required to obtain such a permit under the Marine Act for either the temporary placement of the SRBs on the ocean surface off the United States coast or for the disposal of the ET in a remote ocean area during the ascent-to-orbit phase of each Shuttle mission, due to the fact that each such placment of the SRBs and disposal of the ET is incidental to the use and actual purpose of the SRBs and ET. The SRBs are booster stages for the Space Shuttle, and the ET is a fuel tank to contain and supply both fuel (liquid hydrogen) and oxidizer (liquid oxygen) for the Space Shuttle Main Engines (SSMEs) during the ascent phase. The disposal of the ET will be analogous to the ocean disposal launch vehicles or the testing over the ocean and impact into the ocean of missiles, both very common practices for over two decades.

The Marine Act predated the entering into force of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, with annexes[73] [hereinafter the "London Convention"] but was then amended to implement

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[69]The U.S. agencies most directly involved are the FAA and the Coast Guard. *See e.g.,* 14 C.F.R. §§91.91, 91.95, and 91.102 (1977), Federal Aviation Regulations, based upon section 307 of the FAAct, and 33 C.F.R. §72.01 (1976), Coast Guard regulations on "Notices to Mariners," to advise mariners on various facts relating to the safety of navigation.

[70]Past United States and Soviet practice regarding missile and launch vehicle booster stage impact can be found in 4 Whiteman, *Digest of International Law,* 619-33 (1965).

[71]Only the ET will be disposed in the ocean; the SRBs will be recovered on the ocean, towed back to shore, refurbished, and used again.

[72]Act of October 23, 1972; Pub.L. No. 92-532; 86 Stat. 1052; 33 U.S.C. § 1401 *et seg.* (1972).

[73]Done at London, Mexico City, Moscow, and Washington, December 29, 1972; entered into force for the United States August 20, 1975; T.I.A.S. No. 8165. The text can also be found in 11 International Legal Materials 1294 (November 1972).

the provisions of the London Convention in the United States.[74] Regulations to implement the permit system defined by the London Convention have also been created.[75]

The Marine Act states that:

> The Congress declares that it is the policy of the United States to regulate the dumping of all types of materials into ocean waters and to prevent or strictly limit the dumping into ocean waters of any material which would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.[76]

The purpose of the Marine Act is to regulate:

> (1) the transportation by any person of material from the United States and, in the case of United States vessels, aircraft, or agencies, the transportation of material from a location outside of the United States, when in either case the transportation is for the purpose of dumping the material into ocean waters, and (2) the dumping of material transported by any person from a location outside the United States, if the dumping occurs in the territorial sea or the contiguous zone of the United States.[77]

The specific provision of interest to Space Shuttle ET procedures is as follows:

> Except as may be authorized by a permit issued pursuant to section 1412 or section 1413 of this title, and subject to regulations issued pursuant to section 1418 of this title,
>
> (1) no person shall transport from the United States, and
>
> (2) in the case of a vessel or aircraft registered in the United States or flying the United States flag or in the case of a United States department, agency, or instrumentality, no person shall transport from any location, any material for the purpose of dumping it into ocean waters.[78]

"Person" includes "any officer, employee, agent, department, agency or instrumentality of the Federal Government"[79] and would, therefore, include NASA. "Transport. . .refers to the carriage and related handling of any material by a vessel, or

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[74][1974] U.S. Code Cong. & AD. News, 2792-93. The Marine Act's legislative history clearly indicates that the Act was drafted in anticipation of the London Convention. *Id.* at 2794. *See also* [1972] U.S. Code Cong. & AD. News, 4242-43.

[75]40 C.F.R. § 22 *et seg.* Supp. (1976).

[76]33 U.S.C. § 1401(b) Supp. (1972).

[77]33 U.S.C. § 1401(c) Supp. (1974).

[78]33 U.S.C. § 1411(a) Supp. (1974).

[79]33 U.S.C. § 1402(e) Supp. (1972).

by any other vehicle, including aircraft''[80] and might cover space launch vehicles, such as the Shuttle and the presently used expendable booster rockets; it would not be necessary to define the Shuttle or the expendable boosters as ''aircraft'' to come within the meaning of ''transport.'' Finally, the definitions of ''material'' and ''ocean waters'' might cover the SRBs and ETs and the areas into which NASA intends to place them during the ascent-to-orbit phase of each and every mission.[81]

It is the definition of ''dumping'' by which the SRB and the ET procedures would definitely be excluded from the proscription of the Marine Act. ''Dumping'' is defined as:

> a disposition of material: . . *Provided further*, That it does not mean. . .the intentional placement of any device in ocean waters or on or in the submerged land beneath such waters, for a purpose other than disposal, when. . .such placement. . .occurs pursuant to an authorized Federal or State program. . . .[82]

The dropping of the SRB and ET into ''ocean waters'' will only be incidental to their actual purposes, respectively, to provide a booster stage and a fuel and oxidizer tank for the Space Shuttle during the launch phase. The Space Shuttle program, of course, is an ''authorized Federal program.'' The same reasoning also applies to the use of expendable launch vehicles and the testing of ballistic missiles over and into the high seas.

The foregoing statutory interpretation is entirely consistent with the legislative history of the Marine Act. In a detailed, section-by-section analysis of the Proposed Marine Protection Act of 1971, one of the bills that led to the enactment of the Marine Act, the Environmental Protection Agency made the following statement about subsection 3(f), which contained the same basic definition of ''dumping'' (33 U.S.C. 1402(f)) quoted above:

> Special note should also be made of the fact that ''dumping'' as defined in subsection 3(f) would not include an activity which has as its primary purpose a result other than ''a disposition of material'' but which involves the incidental depositing of some debris or other material in the relevant waters. For example, material from missiles and debris

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[80] 33 U.S.C. § 1402(k) Supp. (1972).

[81] ''Material'' includes ''matter of any kind or description, including but not limited to, dredged material, solid waste, incinerator, residue, garbage, sewage, sewage sludge, munitions, radiological, chemical, and biological warfare agents, radioactive materials, chemicals, biological and laboratory waste, wreck or discarded equipment, rock, sand, excavation debris, and industrial, municipal, agricultural, and other waste. . . .'' 33 U.S.C. § 1402(c) (1974).

''Ocean waters'' are defined to mean ''those waters of the open seas lying seaward of the base line from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 U.S.T. 1606; T.I.A.S. 5639).'' 33 U.S.C. § 1402(b) (1972).

[82] 33 U.S.C. § 1402(f) (1972).

from gun projectiles and bombs ultimately come to rest in the protected waters. Such activities are not covered by this Act.[83]

X. CONCLUSION

In addition to the issues discussed in this article, there are, of course, other legal issues inherent in STS operations. Some of these have already been resolved. For example, patent and data policies applicable to activities conducted in connection with Shuttle flights on a reimbursable basis were addressed and resolved in connection with the issuance of the regulations concerning reimbursable launches.[84] Also, those regulations were issued only after a careful consideration and resolution of the legal elements of the financial issues.

Other issues are being addressed separately, including the complex issues of liability, and the availability of and requirements for insurance or indemnity provisions in connection with Shuttle operations. Also, enactment of the Congressional Code Reform Act of 1977[85] would establish an adequate jurisdictional structure for persons other than military astronauts aboard the Shuttle, to complement that now provided by the Uniform Code of Military Justice.

In enacting the NASAct of 1958, Congress wisely afforded the newly established NASA with a broad and flexible charter, one designed to serve the nation by fostering advanced programs which could only be imagined two decades ago. NASA's remarkable achievements in aeronautics and space are tributes to the foresight of the authors of that Act. While much work continues, in NASA and elsewhere, to determine whether additional legislation is necessary as we proceed into the era of the Space Shuttle, the conclusion is inescapable, as supported in part by the analyses in this article, that the NASAct provides a sound legislative basis for the next decade of space exploration and exploitation.

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[83][1972] U.S. Code Cong. & AD. News, pp. 4255-56.

[84]*Supra* note 3.

[85]S. 1437, 95th Cong., 1st Sess. (1977).