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PRIVATE MANAGEMENT AND OPERATION OF THE SPACE SHUTTLE: SOME LEGAL PROBLEMS RELATED TO MARKET ENTRY

GEORGE S. ROBINSON*

I. ESTABLISHING A PRIVATE SPACELINE - THE FIRST OBSTACLE

MOST OF THE private enterprise constituency interested in participating in the commercial exploitation of near and deep space will be subject to a multitude of new laws and entire legal regimes, ranging in scope from public and private international law¹ to domestic legislation,² implementing regulations and, even the old and new anti-trust laws.³ The majority of the interested business community has no idea that an amalgam of specific legal principles and regimes already exists of sufficient distinction to be called "space law."⁴

There are comparatively few professionals in the legal community who are competent to guide the private sector around the pitfalls and entanglements in various international fora which relate to the commercial exploita-

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¹ Examples of the prevailing public international law documents are those treaties negotiated under the auspices of the United Nations and its expert organizations and include the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967) (hereinafter the Outer Space Treaty); the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, April 22, 1968, 19 U.S.T. 7570, T.I.A.S. No. 6599 (effective Dec. 3, 1968); and the Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 (effective Oct. 9, 1973). Private international law would include contractual arrangement among space industry representatives, universities, and the like, which are participating in a given space project, program, or venture.

² Examples are the National Aeronautics and Space Act of 1958, *as amended*, 42 U.S.C. §§ 2471 *et. seq.* (1976) (hereinafter the NASAct) the Federal Aviation Act of 1958, *as amended*, 49 U.S.C. §§ 1301 *et. seq.* (1976) (hereinafter the FAAAct); the Communications Satellite Act of 1962, 47 U.S.C. §§ 701 *et. seq.* (1976). Another special area of interest is product liability. *See*, Donnelly, *A Space-Age Revisit to the Principles of MacPherson v. Buick*, 49 A.B.A.J. 878 (1963), and *Product Liability Costs May Spur Legislation*, 106 Av. Wk. & SPACE TECH. 17 (Jan. 10, 1977).

³ *See*, Antitrust Enforcement Act of 1979, S. 300, 96th Cong., 1st Sess. (1979), which purports to amend the Clayton Act.

⁴ It was not until about 1970 that the legal profession began to feel comfortable using the term "space law." Prior to that time, lawyers with an eye to the potential of space exploration's involvement of the legal profession made tentative public reference to "space activities and international law." However, the International Institute of Space Law, consisting of prominent jurists worldwide, became a respected affiliate of the International Astronautical Federation. Also, within the graduate law faculty of McGill University, Montreal, Canada, is the highly respected Institute and Center of Air and Space Law, which has been training practicing attorneys from around the world in air and space law for approximately twenty-five years.

tion of space. A very sensitive litmus to these pitfalls and obstacles will be the efforts of private industry to enter the service market which provides management and operation of the United States designed and manufactured space shuttle;⁵ presently manned and operated by the National Aeronautics and Space Administration.⁶ If a corporate decision were taken somewhere in private enterprise to manage and operate a commercial space shuttle venture, one of the first considerations would be the legal status of the existing competition, i.e., NASA.

II. NASA'S SHUTTLE: THE UNCOMMON COMMON CARRIER⁷

All I can say is we are organizing to operate like an airline . . . The idea is we are trying to recognize its business-like operation.⁸

As part of the private corporate decision-making process to enter the commercial market of space shuttle services, the question must be put and resolved as to whether there really is any future for private enterprise to participate in the opportunities of a manned space transportation system (commonly referred to as STS). Will circumstances permit, say, the airlines or related industry to expand into spacelines?⁹ Will the United States government invoke a combined political, economic, and military theory of *parens patriae* to protect such an industry from stepping into an area in which it presently has no operational and financial capability? Put more directly, will NASA continue to develop, manage, and operate exclusively the free world's only access to a commercially viable, manned space transportation system?¹⁰

⁵ The Space Shuttle is only a component of a much broader and highly sophisticated space transportation system concept. For a detailed review of this concept, see, *Space Transportation System: Hearings (Including Report) Before the Subcommittee on Space Science and Applications of the Committee on Science and Technology of the House Committee on Science and Technology*, 95th Cong., 1st Sess. 19 (1977).

⁶ The management and operation of the Shuttle at this point in time is carried out by the National Aeronautics and Space Administration (hereinafter referred to as NASA); purportedly under the authority of the NASAct of 1958, *supra* note 2.

⁷ For one comprehensive view that the shuttle management and operation by NASA in a commercial market does not contravene any domestic or international law, see, Sloup, *The NASA Space Shuttle and Other Aerospace Vehicles: A Primer for Lawyers on Legal Characterization*, 8 CALIF. W. INT'L L.J., 403, 403-453 (1978).

⁸ Statement by Jon M. Smith, NASA Director of Pricing, Launch Agreement and Customer Service Engineering, at the Space Shuttle Workshop, NASA Headquarters, Washington, D.C. (July 15, 1977).

⁹ For a brief discussion of the only attempt to date to determine the fiscal and management capability and interests of airlines industry to enter the arena of space transportation, and the current attitudes of several airline corporate managers and officers, see, W.A. Good, *Strategy, Structure, and Environment in Multinational, Multimodal Transportation Under Deregulation in the Age of Space Industrialization* (April 2, 1979) (Unpublished Outline of a Proposed Dissertation for the Ph.D. Degree, New York University Graduate School of Business Administration).

¹⁰ For one view to the effect that high costs of innovative research and development by the government do not require the marketing and/or management by the government of the end product in a commercial market, see, Stevenson, *The New Era in Space*, 7 J. CONTEMP. BUS. 7, 7-12 (1978). In this context, an interesting discussion of the history of governmental support of private airlines can be found in Report of the Cab Special Staff

No credible effort is being made presently by NASA to induce significant private participation in the management and operation of the space transportation system, particularly with respect to the shuttle component. Although one can only speculate as to why NASA asserts and follows a "policy" of strict management control and operational exclusivity, it is possible to make a more definitive evaluation of the legality of such a policy under existing legislation and implementing regulations. Inherent in such an evaluation are determinations of whether the shuttle is an "aircraft" so as to fall within the legislative and regulatory ambience of the Federal Aviation Act of 1958 (FAAct),¹¹ whether it will be operated routinely, and whether it can be considered as operating *de facto*, if not *de jure*, as a common carrier.

NASA is a research and development administration of the executive branch of the Federal Government. The expenditure of NASA appropriations can be either as a partner of private enterprise, by contracting research and development requirements out to the private sector; or the expenditures can take the form of competition with the private business community: e.g., "it can support construction, staffing and operation of government-owned facilities."¹² In fact, NASA has retained control over the management and operation of the space shuttle for the time being, apparently deciding that ultimate industrialization of space through the use of the shuttle can best be accomplished by governmental competition with the private sector, or at least some form of competition within the context of a quasi-partnership.

Although the market risks to potential private developers, manufacturers, and service operators are considerable, NASA could help the private business community overcome the significant difficulty of finding sufficient risk capital in the public market place by "contracting out" for research and development services in a way that is supportive of private sector in-house capabilities, rather than competitive. NASA, however, has elected to be competitive in managing and operating the shuttle, thereby eliminating the effective development of private sector capabilities and capital from the space transportation system: e.g., in the area of shuttle crew—selection and training which ignores the experience and capabilities of the commercial airlines industry.

As noted by Harold S. Becker of The Futures Group, a management consulting firm specializing in policy analysis, located in Glastonbury, Connecticut:

on Regulatory Reform (July 1975). For an excellent recounting of the history of NASA's involvement with, and relationship to, the design, fabrication, management, and operation of the shuttle, see, Logsdon, *The Space Shuttle Decision: Technology and Political Choice*, 7 J. CONTEMP. BUS. 13, 13-29 (1978).

¹¹ 49 U.S.C. §§ 1301 *et. seq.* (1976).

¹² Becker, *Industry Space Shuttle Use: Considerations Besides Ticker Price*, 7 J. CONTEMP. BUS. 148 (1978).

[g]rowth of government-accomplished R&D (research and development), especially under the auspices of NASA programs, seems to have engendered a growing spirit of competition between scientists and engineers in the public and private sectors. Government employees often seek out ideas for new technologies from the private sector but are reticent to share insights. This is because such insights are employed to justify federal budget requests for R&D programs that maintain employment levels at various government centers.

The search for personal recognition in the pursuit and development of technologies is not an insignificant factor in inhibiting communications about and exploitation of technology.¹³

Not just the scientists and engineers are in competition with their vested interests; management representatives of NASA who are connected with research and development and operations aspects of the space transportation system have a vested interest in seeing that their careers with NASA are secured by cornering the market on operations management of the shuttle.¹⁴

III. IMPORTANCE OF DETERMINING WHETHER THE SPACE SHUTTLE IS AN AIRCRAFT

At some point prior to March 1977, NASA officials asked the Federal Aviation Administration (FAA), within the Department of Transportation, to render a legal opinion whether the shuttle would be an "aircraft" as defined in Section 101(5) of the FAA Act.¹⁵ Presumably, NASA was concerned that the shuttle might be subject to the airworthiness, operational, navigational, and economic regulations of the FAA and the Civil Aeronautics Board¹⁶ to the extent it might function as a scheduled or charter

¹³ *Id.* at 149.

¹⁴ The pricing methods for shuttle use by users in government and the private sector seem to support this possibility, regardless of whether it was a considered factor in establishing the pricing procedures. In this context, see generally, Jordan, *Commercial STS Prices: An Economic Analysis*, 7 J. CONTEMP. BUS. 41, 41-62 (1978); and Gibson, *Macroeconomic Implications of Space Technology*, 7 J. CONTEMP. BUS. 81, 81-97 (1978).

¹⁵ The opinion requested was rendered in letter from the Chief Counsel of the FAA, Bert Goodwin, to the General Counsel of NASA, S. Neil Hosenball (March 11, 1977). § 101(5) of the Federal Aviation Act of 1958 defines "aircraft" to mean "any contrivance now known or hereinafter invented, used, or designed for navigation of or flight in the air." [Emphasis added] 14 C.F.R. 1.1 presently defines "aircraft" as "a device that is used or is intended to be used for flight in the air." "Airplane" is defined as "an engine-driven fixed-wing aircraft heavier than air, that is supported in flight by the dynamic reaction of the air against its wings." The space shuttle fits both definitions. "Navigable airspace" means "airspace at and above the minimum flight altitude prescribed by or under this chapter, including airspace needed for safe takeoff and landing." There is no question whatever that the Congress was speculating about any and all technological innovations that might be designed in the future and used in navigable airspace. There is no indication the definition was limited to "military and civilian airplanes," as asserted by the FAA's Chief Counsel in the March 11, 1977 memorandum. Whether this legal opinion is the official view of the Department of Transportation is unimportant since it is the opinion relied upon by NASA to exempt itself from the mandates of the FAA Act of 1958.

¹⁶ Under President Jimmy Carter's airline deregulation policy, the Civil Aeronautics Board is subject to a "sunset provision," which means it is subject to termination in 1985. See, *Airline Deregulation Act of 1978*, 49 U.S.C. § 1551 (a) (4) (Supp. 1978).

aircraft for hire, at least while in navigable air space, as distinguished from near-Earth or outer space.

The opinion from the Chief Counsel of the FAA was in the form of a letter, dated March 11, 1977, to the General Counsel of NASA, S. Neil Hosenball, and it could easily be interpreted to have been formulated by NASA. Certainly, the conclusion supported NASA's desire not to be hindered by the Federal Aviation Administration, the Civil Aeronautics Board, and the commercial airlines industry in the development, management, and routine operation of the shuttle.

According to the FAA, the space shuttle is not an aircraft "for the purposes of the FAAAct respecting applicability of the Federal Aviation Regulations. . . ."¹⁷ Starting with the premise that "any man-made object moving through the air might arguably be called an aircraft," the Chief Counsel of the FAA turned to the "legislative intent and purpose behind the regulatory scheme of the FAAAct," and determined "that a major purpose of the [Act] was to unify control and management of the air space in a single agency." This is erroneous reasoning since FAAAct specifically refers to *navigable* airspace, thereby confining its scope not to geophysical delimitations, but rather to a *function*, i.e., aerodynamic navigation and anything related to the safety and efficiency of that function in the ambience of air space.¹⁸ It is clear, then, that given at least the operational aerodynamics and navigational characteristics of the shuttle while departing from and returning to Earth's surface through navigable air space, and its very impact on the safe and efficient use of air space by simply being present in it, would render the shuttle an aircraft for that period of time.

Compounding this misinterpretation of the FAAAct, the Chief Counsel of the FAA stated that "[f]oremost 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." (emphasis added) In one careless sweep, the Chief Counsel of the FAA dismissed all the other functional equipment which is regulated under the FAAAct: e.g., hot-air balloons, anchored kites, rocketry, model aircraft, and military ordnance, such as heavy artillery, laser tracking techniques, ground-to-air missiles, and the like. All of these activities were taking place in navigable air space throughout the world, as well as the United States, many years prior to the launching of Sputnik I.

"In fact," continued the Chief Counsel, "the statutory creation of

¹⁷ Unless otherwise cited, the ensuing quotations are from the March 11, 1977 letter from the FAA Chief Counsel to NASA's General Counsel. *See Id.*

¹⁸ Federal Aviation Act of 1958, *supra* note 2 at § 1348(a), provides that the Administrator of the FAA: is authorized and directed to develop plans for and formulate policy with respect to the use of the navigable airspace; and assign by rule, regulation, or order the use of the navigable airspace under such terms, conditions, and limitations as he may deem necessary in order to insure the safety of aircraft and the efficient utilization of such airspace.

NASA . . . was barely one month earlier than the effective date of the FAA Act," apparently reasoning that rocketry and traversing air space to near and outer space was not seriously contemplated prior to passage of the NASA Act and the FAA Act of 1958. It was convenient to forget that the first "A" in "NASA" refers to aeronautics and that the NASA Act is derived in large part from the transfer of certain functions previously carried out by the Department of Defense,¹⁹ and further, that the FAA Act flowed from the Civil Aeronautics Act of 1938.²⁰ Rockets were being tested and launched long before the creation of NASA, and non-aircraft equipment was navigating in air space long before the Federal Aviation Agency was established.²¹

Another argument put forth to establish that the shuttle is *not* an aircraft under the FAA Act, and therefore, not subject to the airworthiness and navigation regulations of the FAA and the economic regulations of the Civil Aeronautics Board, is that upon returning to Earth through air space the shuttle operates like a glider. As a result, its trajectory is far steeper than an aircraft, and the length of time it functions in navigable air space is only three minutes and eight seconds. "The vast majority of its operational time is spent in a space, not air, environment."²² In this respect, it should be noted that gliders are subject to the Federal Aviation Regulations, return trajectory and glide angles of the shuttle in air space are often more shallow than many noise abatement procedures imposed on commercial aircraft by Federal Aviation Regulations and *time* in navigable air space is not an exclusive criterion; safe separation of aircraft from other aircraft and users of navigable air space can be, and often is, only a matter of seconds.²³

It should be kept in mind that ultimately the shuttle will be re-oriented to a launching in one country with a return landing from space in another country, or perhaps even another continent.²⁴ An integral facet of the Soviet

¹⁹ For the legislative history and purpose of the National Aeronautics and Space Act of 1958 (P.L. 85-568), see (1958) U.S. CODE CONG. & AD. NEWS at 3160.

²⁰ The Civil Aeronautics Act of 1938 created the Civil Aeronautics Board, the functions of which were subsequently incorporated into the Federal Aviation Act of 1958. These functions were then again transferred to the National Transportation Safety Board in 1966 by P.L. 89-670, 80 Stat. 931, [codified at 49 U.S.C. §§ 1655 (d), 1657 (g) (1976)].

²¹ The Federal Aviation Agency, an independent agency of the executive branch of the Government, became the Federal Aviation Administration when all duties and functions were transferred in 1966 to the Secretary of Transportation pursuant to P.L. 85-726, 72 Stat. 731, and P.L. 89-670, 80 Stat. 931 [codified at 49 U.S.C. §§ 1655(c), 1657(f) (1976)].

²² See, March 11, 1977 letter from the FAA's Chief Counsel to NASA's General Counsel, *supra* notes 15, 17.

²³ During peak hours at major metropolitan airports around the world, observers can note that commercial air carriers mixed with general aviation aircraft are taking off or landing on the same runway in as little time as every 30 seconds.

²⁴ It is interesting to note that under the auspices of the Sabre Foundation in Santa Barbara, California, a Space Freeport Project has been initiated whereby a space port would be established in an equatorial country to provide the first international launching site for manned and unmanned vehicles in a "free trade zone" environment and outside the manned spaceflight launching facilities of the United States and the Soviet Union. For example, the government of Liberia has been approached by representatives of the

shuttle design is a long return glide capability over several countries or continents to fulfill the military requirements of the U.S.S.R.²⁵ Further, there is nothing either in the NASAct or the FAAct to prohibit the shuttle from being under the jurisdictional control of both the FAA and NASA at different times according to its shifts in operational modes from spacecraft to aircraft.²⁶

Finally, the FAA legal opinion asserts that NASA legislation combines "aeronautical vehicles" with "space vehicles" because the drafters of the NASAct did not mention in Section 103 that "space vehicles" were a separate and distinct category. On the other hand, the NASAct, like almost all Federal legislation establishing Executive Branch departments and agencies, is *functional* in essence, and not *definitional*. The primary function of NASA, according to its enabling legislation, is to carry out basic research and development in the field of advanced aeronautics and space exploration. If the shuttle is not operated routinely and/or commercially as NASA asserts,²⁷ it is still subject to the Federal Aviation Regulations as an experimental craft operating in navigable air space.

For these reasons, as a matter of law, the shuttle must be considered an aircraft while functioning in navigable air space and, therefore, subject to the appropriate operational and airworthiness regulations promulgated pursuant to the authority and jurisdiction established by the FAAct. The next question to decide is whether management and operation of the shuttle by NASA is subject to other legislation and implementing regulations oriented toward the provision of a service to the public for compensation.

IV. NASA'S SHUTTLE: THE UNCOMMON COMMON CARRIER

In an August 18, 1977 memorandum from NASA Deputy General Counsel, Gerald J. Mossinghoff, to NASA General Counsel, S. Neil Hosenball, the opinion was asserted that there was no need for substantive amendments to the National Aeronautics and Space Act of 1958 (NASAct) for NASA to proceed into the day-to-day operations of the space shuttle

Space Freeport Project for the purpose of establishing within a 200 square mile area, a space freeport to be administered by a Free Zone Authority as the designated development agent of the Liberian government. Chances of success are slim at this time, but serious thought and planning is being given to the international movement of goods, products, and equipment through the intervening medium of space.

²⁵ See, P.N. JAMES, *SOVIET CONQUEST FROM SPACE* (1974); See, specifically, Chapter 11, "The Soviet Space Shuttle Program" at 125-142.

²⁶ Another obvious example is the nautical as well as the aeronautical jurisdiction exercised over the various operations of seaplanes. Also, the flying automobile is another example of a multiple function piece of equipment that operates in air as well as on public roads. For a comprehensive article discussing the operational and definitional nature of the shuttle, see, Sloup, *supra* note 13.

²⁷ See, Space Transportation System, Hearings (Including Report), 95th Cong., 1st Sess. 19 (1977) (Memorandum from Deputy General Counsel of NASA to General Counsel of NASA (Aug. 18, 1977), setting forth arguments in support of these assertions).

and other elements of the overall space transportation system.²⁸ The memorandum did conclude, however, that this opinion should be reviewed at the time NASA submits its fiscal year 1979 legislative program; presumably in the event shuttle development and the sale of its use to the public had proceeded to the point where clarifying legislation would be prudent.

NASA has taken the position that its enabling legislation provides adequate authority for it to operate the STS on a routine basis. Sections 102 and 103 of the NASAct, as amended, make it perfectly clear that NASA's authority, except where it specifically refers to military weapons and national security, is for the research which relates to the use of aeronautics and space activities for peaceful and *scientific* purposes.²⁹

The legislative history of the NASAct shows that the purpose of Section 103 is "to make clear that the Act is concerned primarily with research, development, and exploration." This history emphasizes that the definition of "activities" in this context is intended to be broad because no one can predict with certainty what the future requirements of space or aeronautical research will be.³⁰ However:

[i]t is not the intention of Congress . . . to construe activities so broadly as to include such things as the operation of commercial airlines . . . 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 (DOD), in their respective fields, to carry on a wide spectrum of activities which relate to the successful use of outer space.³¹

The legislative history specifically emphasizes that "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."³² (emphasis added)

It is reasonable to interpret the NASAct as permitting routine STS operations by NASA for non-commercial and non-competitive research and development. NASA is authorized to establish and charge fees for the launching and services associated with a research and development project. But the real issues are the nature of the service provided, how the charges ultimately will be determined, and whether *routine* launchings of scientific research satellites are translatable into operations and services which are

²⁸ *Id.*

²⁹ 42 U.S.C. §§ 2451, 2452 (1976).

³⁰ *See*, [1958] U.S. CODE CONG. & AD. NEWS at 3160.

³¹ *Id.* at 3192.

³² *Id.*

clearly of commercial viability and which have potential for management and operation by private industry.³³

NASA has made the assumption that adequate authority already exists for it to develop and operate the STS routinely, not only for launching its own payloads, with federal appropriations; but also for launching payloads of other United States government agencies and departments, foreign countries and alien citizens, and for international public and private organizations on a reimbursable basis.³⁴

On July 20, 1962 the Telstar I satellite was launched for the American Telephone and Telegraph Company with an expendable Delta launch vehicle. It was the first satellite owned by private enterprise.³⁵ Telstar II was launched on May 7, 1963. On June 28, 1965 commercial telecommunication satellite service was started following the launching on April 6, 1963 of Intelsat I ("Early Bird") for the Communications Satellite Corporation (hereinafter, Comsat). Since that time, there have been at least 22 additional launchings of Comsat/Intelsat communication satellites, plus six communications satellites for domestic U.S. service and three for maritime service.³⁶

In recent years, the reimbursable launchings conducted by NASA have begun to outnumber NASA's own launchings, including cooperative launchings with other countries or international organizations. For example, in 1975 there were eight reimbursable launchings out of a total of nineteen,

³³ Speech by Gilbert W. Keyes, Deputy Manager, Strategy Planning and Market Development, Boeing Aerospace Company, before the American Astronautical Society (March 29, 1979). Mr. Keyes stated that a number of as yet undefined alternatives are being considered by Boeing regarding private management and operation of the shuttle . . . "among them are the operation of the shuttle fleet at one or both sites through private operation, as well as the possible acquisition of space shuttle orbiters."

³⁴ The Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 (effective Oct. 9, 1973) (hereinafter the Liability Convention) will have a substantial impact on market entry of foreign countries and alien citizens, and for international public and private organizations. Specific provisions of the Liability Convention that will have an affect on market entry are: (1) Article II—which places on the launching State absolute liability for damage caused by its space objects; (2) Article I—which defines "launching state"; (3) Article V—which deals with joint and several liability when two or more States jointly launch a space object; and (4) Article VII—which deals with the issue of damage caused to the Nationals of the launching state by a space object of the launching state or to its Foreign Nationals while participating in the operation of the space object which causes the damage. As a result of these provisions an extensive insurance and indemnification Agreement will have to be developed between the United States and any foreign states or foreign nationals which plan to contract for U.S. Shuttle use.

³⁵ An extensive insurance and indemnification program will also have to be developed before private enterprise will be able to enter the market on any type of substantial basis. The reason being that international law requires States that are a party to the Outer Space Treaty, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967), see, *supra* note 1, assume international responsibility for activities carried on in outer space by its nationals; *Specially see*, The Outer Space Treaty at Article VI. *Also see*, the Liability Convention, *Id. See Generally*, Mossinghoff, *Managing Tort Liability Risks in the Era of the Space Shuttle*, 7 J. OF SPACE L. 121 (1970).

³⁶ These statistics and those more current are available from the Office of External Affairs, NASA Headquarters, Washington, D.C.

and in 1976 there were twelve launchings out of sixteen. In 1977 NASA launched only four major payloads of its own out of twenty-four launchings.

The reimbursable portion of NASA's annual program is specifically delineated in the NASA budget and separated from that portion of the program budgeting that is funded by Congressional appropriations. The view of NASA that it can operate both unmanned and manned shuttle launchings routinely on a reimbursable basis seems to be reinforced by the annual Congressional approval of the funding for these activities. But that does not necessarily mean that Congress has confronted the question of whether NASA is, or will be, operating legally on a reimbursable basis in an area of commercial viability and potentiality for operation by private industry. In fact, NASA may well be planning to use the shuttle to operate as a common carrier in spite of its lack of authority to do so.

It should be kept in mind that reimbursement of actual costs for services provided by the government can sustain the management and operational staff for so long as the market remains. In other words, a "corner on the market" is ensured for such government programs, unless challenged by private entrepreneurs or the threat of reduced appropriations.

While the NASAct provides NASA with authority sufficient to operate the shuttle on a routine basis for scientific research and space exploration purposes, it does not provide the authority necessary for NASA to operate the shuttle routinely for compensation or otherwise as a common carrier. Neither the FAAct nor the Communications Satellite Act of 1962 (hereinafter Comsat Act)³⁷ legislatively authorizes NASA in any way to serve as a common carrier.

The Comsat Act does create a duty for NASA to provide "satellite launching and associated services" to Comsat, but it is a duty which relates only to this corporation and not to the general public. A common carrier, however, is one which is required to hold itself out to the public as engaged in a certain type of service available to the general public for compensation. The type of reimbursement NASA receives for launching services relates to actual costs of providing the services, but the compensation in no way is intended to provide NASA with a common carrier's profit. As of yet, there is no law which compels NASA to provide launching and related services for all who would apply. Although the United States government has previously created common carriers, such entities are specifically not entities of the United States government and are created by statutory authority expressly stating that the newly established entity is to be a common carrier.

V. CONCLUSIONS

It seems that NASA has taken steps designed to isolate the manage-

³⁷ 47 U.S.C. §§ 701 *et. seq.* (1976).

ment and operation of the space shuttle from effective participation by private, competitive, free enterprise. NASA has not encouraged the involvement of airlines and airline personnel in the management and operation of the space shuttle. It has shown no inclination to hire airline pilots as astronauts or to provide specifically for air transport pilots to qualify for shuttle pilot astronaut type-ratings. NASA is closely tied to the Department of Defense in selecting shuttle astronauts, the vast majority of whom are in active military service.³⁸ Also, in March, 1977, NASA requested and received from the FAA a determination that the shuttle would not be considered an "aircraft" for purposes of the FAAct.

This approach of isolationism and exclusivity seems to fit into the apparent strategy of NASA to maintain permanent monopoly rights over space transportation; and the failure of the airlines or other private businesses to show a significant interest or confront NASA on this point has encouraged both NASA and the Department of Defense to ignore the parallel evolution of responsible private industry involvement in both air and space transportation. Airplanes, like space vehicles, are potential instruments of war, so military arguments regarding the placement of sophisticated missiles in the hands of private industry have a very weak foundation.

It may be that the military logistical and tactical capabilities of the manned space shuttle, as well as the costs of fabrication of the shuttle and other components of the space transportation system (STS), are critical considerations in the present monopolistic approach of NASA and the Department of Defense with respect to government ownership and management of the space transportation system; all of which is perceived by NASA management as its lifeblood for the future existence of that agency. But operating in one fashion and calling it something else is not legally acceptable. NASA cannot do by the back door what it is not permitted to do by the front door.

Finally, if a segment of private enterprise can overcome at the outset the obstacles of government competition through management and operational control of the space transportation system, the greatest market entry obstacle is still yet to be overcome. Despite exemplary deregulation of the air transport industry under the Administration of President Carter, the costs of managing and operating the shuttle component of the transportation system are so great that the industry mergers are critical to amassing the necessary risks and operating capital. If this is true, in fact, we are apt to see the emergence of space law firms which are expert in obtaining anti-trust exemptions for the space industry.

³⁸ See, Memorandum of Understanding 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 (signed by all parties in 1976).

