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MANAGEMENT OF INTERPARTY AND THIRD-PARTY LIABILITY FOR ROUTINE SPACE SHUTTLE OPERATIONS

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I. THE UNITED STATES SPACE TRANSPORTATION SYSTEM

The Enterprise is no longer science fiction. It is a 175,000 pound space shuttle that takes off like a rocket and lands like an airplane. The Enterprise, and later her sister ships, will begin carrying their 65,000 pound payloads into orbit in 1979. This will give American research and industry unprecedented access to the unique manufacturing environment of space. The age of space industrialization will have begun.

The Shuttle, together with the European spacelab and the spacetug, comprise the United States Space Transportation System. The spacelab is a pressurized module big enough to hold an intercity bus, combined with an unpressurized pallet large enough to hold four Volkswagens and 900 cases of beer.[1] These facilities nest into the Shuttle orbiter's 65' x 15' cargo bay. The tug

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1. R. Hammel, Payload Concepts, Summary Report of the American Astronautics Society Space Processor User Developer Exchange Program Working Meeting 26 (May 18-19, 1977) (unpublished report). The pallet has a volume of 1130 cubic feet (32 cubic meters) and an inner surface area of 183 square feet (17 square meters). *Id.* For future uses of the Shuttle, *see* FUTURE SPACE PROGRAMS 1975: HEARINGS BEFORE THE SUBCOM. ON SPACE SCIENCE AND APPLICATIONS OF THE HOUSE COMM. ON SCIENCE AND TECHNOLOGY, 94TH CONG., 1ST. SESS. 15 (statement of Jack M. Campbell).

will boost satellites and space probes from the 100 mile high "low earth" orbit reached by the Shuttle to the 24,000 mile high "geosynchronous" orbit used by communication and weather satellites.

The Shuttle-space lab system will allow industry to use the vacuum and microgravity of space to manufacture products that cannot be made on earth. Semiconductor crystals and pharmaceuticals have already been identified as products that can be cost-efficiently manufactured in orbit.[2] An intense program of ongoing development is now being funded by the American government and industry to identify other economically feasible space applications.[3] Like other new industrial environments, however, space itself is expected to yield new and unexpected products once industry begins large scale research and development on the Shuttle.

Because the Shuttle carries a large payload and can stay in orbit for long periods of time, it can simultaneously or sequentially perform many tasks for different users on the same mission. Because it is a unique national resource, and virtually a government monopoly, it will be used both by foreign and domestic industry and by the United States and foreign governments. Because its operations will be routine and will be relatively inexpensive, the Shuttle will attract and carry civilian payload specialists employed by user industries and governments in addition to its United States government crew. Thus, the same Shuttle flight that General Electric uses to grow crystals may find Abbott Laboratories doing experimental kidney cell separations while the German government launches a communications satellite. Such a mission could also incorporate dozens of small unmanned automatic experiments.[4] As more uses are found for space, it should be anticipated that the Shuttle will grow to its limiting capacity.

These interacting parties and their varied activities make the questions of

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2. For a detailed technical and economic analysis of silicon ribbon production in space, *see* McDonnell Douglas Astronautics Company-East, Feasibility Study of Commercial Space Manufacturing, Phase II—Final Report, Vol. II—Technical Analysis (Jan. 15, 1977) (unpublished report, submitted under NASA Contract No. NAS8-31353).

For a thorough analysis of business prospects for products that could be made in space, *see* General Electric Space Division, Study for Identification of Beneficial Uses of Space, Phase III—Final Report, Vol. I—Executive Summary (Nov. 30, 1975) (unpublished report, submitted under NASA Contract No. NAS8-28179).

3. Battelle Columbus Labs, 1 Executive Summary of the Full Scale STS User Development Program Plan (March 25, 1977) (unpublished, submitted under NASA Contract No. NASw-2964).

4. *See* 42 Fed. Reg. 3830 (1977) (to be codified in 42 C.F.R. § 1214.102), which provides:

> Packages under 200 pounds and smaller than five cubic feet which require no Shuttle services (power, deployment, etc.), and are for R&D purposes, will be flown on a space-available basis during both phases of Shuttle operation. The price for this service will be negotiated based on size and weight, but will not exceed $10,000 in 1975 dollars. A minimum charge of $3,000 in 1975 dollars will be made. If Shuttle services are required, the price will be individually negotiated. Reimbursement to NASA will be made at the time the package is scheduled for flight.

These packages are also known as "Yardley Getaway Specials" after Mr. John Yardley, NASA's Associate Administrator for Space Flight.

risk and liability on the Shuttle very complex. In addition, because potential liability is largely dependent upon where and when the incidents will occur and upon what parties are involved, principles of law which can be widely applied cannot be created. This further magnifies the complexity of the questions of risk and liability. Nonetheless, it will be necessary to make an identification of the risks involved and the potential liabilities which would result, as well as to attempt to devise principles of law to successfully insure against these risks and liabilities, before private industry will be able or willing to utilize the Shuttle. This Article is an attempt to do just that.

II. Nature Of Shuttle Liabilities—The Problem

The question of Shuttle-related liabilities divide naturally into two areas: the liability of the parties using the Shuttle to each other—interparty liability—and liability of the parties using the Shuttle to non-users—third-party liability. Before examining the manner in which the risks incident to these liabilities can be managed, it is necessary to describe the origin and extent of these potential liabilities.

A. *Third-Party Liability*

In May of 1962 the U.S.S.R. introduced a draft treaty on legal principles that would have excluded private industry completely from space.[5] Space would have been exclusively the domain of sovereign states. Soviet legal scholars stated that their reason for this action was a fear that United States corporations would engage in acts of "space piracy."[6] Congress reacted in the

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5. Declaration of the Basic Principals Governing the Activities of States Pertaining to the Exploration and Use of Outer Space, 17 U.N. GAOR, Committee on the Peaceful Uses of Outer Space (1st Mtg.), U.N. Doc. A/AC.105/C.2/L.1 (1962), *reprinted in* 1 International Legal Materials 100 (1962). This proposal stated that "All activities of any kind pertaining to the exploration and use of outer space shall be carried out solely and exclusively by states. . . ."

For a complete and well-organized review of all United Nations space activities, *see* United Nations Department of Political and Security Council Affairs, *Space Activities and Resources* (1972) (U.N. Doc. No. A/AC.105/100).

6. *See, e.g.*, Mezhdunarodnoye komicheskoye pravo, Izdatel'stvo Mezhdunarodyye otnosheuiya (International Space Law) 84 (A. Piradov ed. 1974) (NASA technical translation No. TT-F-15912), which states:

> The Soviet Union originally suggested including in this declaration [*i.e.* the 1967 Treaty on Principles] the proposition that activities in outer space be carried out only by states, acting with complete understanding of the responsibility they bear. This Soviet proposition was dictated by the completely justified fear that granting "freedom of arms" in outer space to private companies could lead to encouragement in this sphere if the kind of activity which the French professor E. Pepen correctly characterizes as piracy.

Nonetheless the Soviet Union has now recognized the rights of private companies to operate in space:

> Thus if any state because of the social characteristics of its structure authorizes the activities of private companies in outer space, then that is its internal affair.
>
> Even if in any country private companies are authorized activity in outer space . . . nevertheless, all international liability for their activities is borne by the state.

Id.

same year by chartering the Communications Satellite (COMSAT) Corporation,[7] whose success proved that private industry could operate profitably in space.

By 1967 an amended treaty of principles—called the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies—was adopted which recognized the right of private non-governmental entities to operate in space.[8] Under this treaty, however, states were to bear international responsibility for and to authorize and supervise all private space activities.[9]

As a result of the 1967 Treaty on Principles and the 1972 Convention on International Liability for Damage Done By Space Objects,[10] it is now accepted international law that launching states bear unlimited international liability for any damage done by space objects launched from their territory or any launching they have procured.[11] The 1967 Treaty further provides that this liability to pay compensation for damage or death caused by space objects is absolute if the damage is done on earth's surface[12] or to an aircraft in flight, but requires fault to be proven if the damage occurs elsewhere—in other words, in space or on the surface of another celestial body.[13] The Liability Convention is the most complex single international space treaty presently in force as the

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7. In the Communication Satellite Act of 1962, 47 U.S.C. §§ 701-744 (1970), which created the COMSAT Corporation, Congress declared its intent to provide for the "widest possible participation by private enterprise," *id.* at § 701(c), in a "communication satellite corporation for profit which is not an agency or establishment of the United States government." *Id.* at § 731. COMSAT's initial $200,000,000 stock issue was oversubscribed and it has always made a profit.

8. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, — Stat. —, T.I.A.S. No. 6347, — U.N.T.S. —, *reprinted in* 6 INTERNATIONAL LEGAL MATERIALS 386-88 (1967) [hereinafter cited as 1967 Treaty on Principles].

9. 1967 Treaty on Principles, *supra* note 8, Article VI, which reads:

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

10. Convention on International Liability for Damage Caused by Space Objects, *opened for signature* ————, — Stat. —, T.I.A.S. No. 7762, — U.N.T.S. — [hereinafter cited as 1972 Convention on Damage].

11. *See generally*, F. NOZARI, THE LAW OF OUTER SPACE, 66-88 (1973).

12. 1972 Convention on Damage, *supra* note 10, Article II, which states that "A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight."

13. *Id.* at Article III, which reads:

> In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

positive law of the United States. It sets forth a detailed claims' procedure[14]

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14. *Id.* at Articles VIII to XX. Article VIII states:

1. A State which suffers damage, or whose natural or juridical persons suffer damage, may present to a launching State a claim for compensation for such damage.

2. If the State of nationality has not presented a claim, another State may, in respect of damage sustained in its territory by any natural or juridical person, present a claim to a launching State.

3. If neither the State of nationality nor the State in whose territory the damage was sustained has presented a claim or notified its intention of presenting a claim, another State may, in respect of damage sustained by its permanent residents, present a claim to a launching State.

Article IX of the 1972 Convention on Damage reads:

A claim for compensation for damage shall be presented to a launching State through diplomatic channels. If a State does not maintain diplomatic relations with the launching State concerned, it may request another State to present its claim to that launching State or otherwise represent its interests under this Convention. It may also present its claim through the Secretary-General of the United Nations, provided the claimant State and the launching State are both Members of the United Nations.

Article X of the 1972 Convention on Damage states:

1. A claim for compensation for damage may be presented to a launching State not later than one year following the date of the occurrence of the damage or the identification of the launching State which is liable.

2. If, however, a State does not know of the occurrence of the damage or has not been able to identify the launching State which is liable, it may present a claim within one year following the date on which it learned of the aforementioned facts; however, this period shall in no event exceed one year following the date on which the State could reasonably be expected to have learned of the facts through the exercise of due diligence.

3. The time-limits specified in paragraphs 1 and 2 shall apply even if the full extent of the damage may not be known. In this event, however, the claimant State shall be entitled to revise the claim and submit additional documentation after the expiration of such time-limits until one year after the full extent of the damage is known.

Article XI of the 1972 Convention on Damage reads:

1. Presentation of a claim to a launching State for compensation for damage under this Convention shall not require the prior exhaustion of any local remedies which may be available to a claimant State or to natural or juridical persons it represents.

2. Nothing in this Convention shall prevent a State, or natural or juridical persons it might represent, from pursuing a claim in the courts or administrative tribunals or agencies of a launching State. A State shall not, however, be entitled to present a claim under this Convention in respect of the same damage for which a claim is being pursued in the courts of administrative tribunals or agencies of a launching State or under another international agreement which is binding on the States concerned.

Article XII of the 1972 Convention on Damage states:

The compensation which the launching State shall be liable to pay for damage under this Convention shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred.

Article XIII of the 1972 Convention on Damage reads:

Unless the claimant State and the State from which compensation is due under this Convention agree on another form of compensation, the compensation shall be paid in the currency of the claimant State or, if that State so requests in the currency of the State from which compensation is due.

Article XIV of the 1972 Convention on Damage states:

If no settlement of a claim is arrived at through diplomatic negotiations as provided for in Article IX, within one year from the date on which the claimant State notified the launching State that it has submitted the documentation of its

and mandates that the measure of compensation for damages be that amount required to make a damaged party whole,[15] the same measure of damages utilized by the tort laws of the United States.[16]

Under this treaty, therefore, it is clear that the United States government bears unlimited international liability for any damage done to international

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claim, the parties concerned shall establish a Claims Commission at the request of either party.

Article XV of the 1972 Convention on Damage reads:

1. The Claims Commission shall be composed of three members: one appointed by the claimant State, one appointed by the launching State and the third member, the Chairman, to be chosen by both parties jointly. Each party shall make its appointment within two months of the request for the establishment of the Claims Commission.

2. If no agreement is reached on the choice of the Chairman within four months of the request for the establishment of the claims Commission, either party may request the Secretary-General of the United Nations to appoint the Chairman within a further period of two months.

Article XVI of the 1972 Convention on Damage states:

1. If one of the parties does not make its appointment within the stipulated period, the Chairman shall, at the request of the other party, constitute a single-member Claims Commission.

2. Any vacancy which may arise in the Claims Commission for whatever reason shall be filled by the same procedure adopted for the original appointment.

3. The Claims Commission shall determine its own procedure.

4. The Claims Commission shall determine the place or places where it shall sit and all other administrative matters.

5. Except in the case of decisions and awards by a single-member Commission, all decisions and awards of the Claims Commission shall be by majority vote.

Article XVII of the 1972 Convention on Damage reads:

No increase in the membership of the Claims Commission shall take place by reason of two or more claimant States or launching States being joined in any one proceeding before the Commission. The claimant States so joined shall collectively appoint one member of the Commission in the same manner and subject to the same conditions as would be the case for a single claimant State. When two or more launching States are so joined, they shall collectively appoint one member of the Commission in the same way. If the claimant States or the launching States do not make the appointment within the stipulated period, the Chairman shall constitute a single-member Commission.

Article XVIII of the 1972 Convention on Damage states that "The Claims Commission shall decide the merits of the claim for compensation and determine the amount of compensation payable, if any."

Article XIX of the 1972 Convention on Damage reads:

1. The Commission shall act in accordance with the provisions of Article XII.

2. The decision of the Commission shall be final and binding if the parties have so agreed; otherwise the Commission shall render a final and recommendatory award, which the parties shall consider in good faith. The Commission shall state the reasons for its decision or award.

3. The Commission shall give its decision or award as promptly as possible and no later than one year from the date of its establishment unless an extension of this period is found necessary by the Commission.

4. The Commission shall make its decision or award public. It shall deliver a certified copy of its decision or award to each of the parties and to the Secretary-General of the United Nations.

Article XX of the 1972 Convention on Damage states that "The expenses in regard to the Claims Commission shall be borne equally by the parties, unless otherwise decided by the Commission."

15. *Id.* at Article XII.

16. "In theory at least, and apart from rare punitive damage situations, the damages awarded in personal injury claims are aimed at compensating the victim or making good his losses." D. DOBBS, THE LAW OF REMEDIES § 8.1 (1973).

third parties by the Shuttle or anything it puts in orbit. Furthermore, this liability may be joint and several with another state.[17] However, this liability does not extend to any damage done by the Shuttle to United States citizens or their property.[18] Instead, the liability of Shuttle-users to third parties who are United States citizens is presently governed by United States tort law.

Where the Shuttle-user whose liability is being established is the United States government, there are two possible avenues of relief. One possibility, usually pursued where the amount of damage is small, is to seek relief through NASA's (National Aeronautics and Space Administration) administrative channels. This avenue of relief was created by a statute which gave NASA the authority to itself decide certain classes of claims against the United States government resulting from NASA's actions.[19] A second possibility for damage

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17. 1972 Convention on Damage, *supra* note 10, Articles IV and V. Article IV reads:

> 1. In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, and of damage thereby being caused to a third State or to its natural or juridical persons, the first two States shall be jointly and severally liable to the third State, to the extent indicated by the following:
>
> (a) If the damage has been caused to the third State on the surface of the earth or to aircraft in flight, their liability to the third State shall be absolute;
>
> (b) If the damage has been caused to a space object of the third State or to persons or property on board that space object elsewhere than on the surface of the earth, their liability to the third State shall be based on the fault of either of the first two States or on the fault of persons for whom either is responsible.
>
> 2. In all cases of joint and several liability referred to in paragraph 1, the burden of compensation for the damage shall be apportioned between the first two States in accordance with the extent to which they were at fault; if the extent of the fault of each of these States cannot be established, the burden of compensation shall be apportioned equally between them. Such apportionment shall be without prejudice to the right of the third State to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable.

Article V of the 1972 Convention on Damage reads:

> 1. Whenever two or more States jointly launch a space object, they shall be jointly and severally liable for any damage caused.
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> 2. A launching State which has paid compensation for damage shall have the right to present a claim for indemnification to other participants in the joint launching. The participants in a joint launching may conclude agreements regarding the apportioning among themselves of the financial obligation in respect of which they are jointly and severally liable. Such agreements shall be without prejudice to the right of a State sustaining damage to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable.
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> 3. A State from whose territory or facility a space object is launched shall be regarded as a participant in a joint launching.

18. *Id.* at Article VII, which reads:

> The provisions of this Convention shall not apply to damage caused by a space object of a launching State to:
>
> (a) Nationals of that launching State;
>
> (b) Foreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent, or during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation by that launching State.

19. 42 U.S.C. § 2473(b)(13) (1970), which provides:

is to bring an action under the Federal Tort Claims Act.[20] To recover under this Act, an injured party is required to establish both the government's fault and proximate causation between the government's action and the resultant damage.[21]

Similarly, each non-governmental entity flying on the Shuttle may be subject to liability to an injured third party. Applying traditional tort law, the private Shuttle-user would be liable if its fault could be proved and causation established, although a court could possibly hold that the Shuttle is an inherently dangerous instrumentality and impose strict liability on the government or other Shuttle-users, or even both.

As this discussion reveals, it is clear that any damage done during Shuttle operations by the government or private industry would be fertile grounds for damage suits. Furthermore, it is predictable that these suits probably would be long and complex since Shuttle-users are, almost by definition, very solvent parties.

B. *Interparty Liability*

Another question which might arise as a result of the Shuttle flights relates to the liability which might exist between Shuttle-users. Liability between parties on the Shuttle may arise in either of two situations—as a result of United States government actions in operating the Shuttle and its attendant ground and space support systems or as a result of the actions of Shuttle-users, whether United States or foreign governments or United States or foreign companies.

As to the first situation, it will be NASA who will be responsible for operating the Shuttle and its support systems and therefore it will be NASA who might be liable for any harm which occurs. However, present NASA policy disclaims liability for any damage to payloads, even if caused by NASA's negligence,[22]

(b) In the performance of its functions the Administration is authorized—

(13) (A) to consider, ascertain, adjust, determine, settle, and pay, on behalf of the United States, in full satisfaction thereof, any claim for $5,000 or less against the United States for bodily injury, death, or damage to or loss of real or personal property resulting from the conduct of the Administration's functions as specified in subsection (a) of this section, where such claim is presented to the Administration in writing within two years after the accident or incident out of which the claim arises; and

(B) if the Administration considers that a claim in excess of $5,000 is meritorious and would otherwise be covered by this paragraph, to report the facts and circumstances thereof to the Congress for its consideration.

This authority is implemented by NASA regulations, 14 C.F.R. §§ 1204.303-.312 (1977).

20. Federal Tort Claims Act, 28 U.S.C. §§ 2671-2680 (1970). The administrative aspects of the Federal Tort Claims Act are the subject of NASA regulations. *See* 14 C.F.R. §§ 1204.900-.915 (1977).

21. *See generally* W. PROSSER, THE LAW OF TORTS §§ 28-45 (4th ed. 1971); F. HARPER & F. JAMES, JR., THE LAW OF TORTS §§ 16.1-20.6 (1956).

22. 42 Fed. Reg. 3832 (1977) (to be codified in 14 C.F.R. § 1214.106), which provides:

The price does not include a contingency or premium for damage that may be caused to a payload through the fault of the U.S. Government or its contractors. The U.S. Government, therefore, will assume no risk for damage or loss

as a condition precedent to providing launch services. Therefore, it appears that any action brought against NASA for damage which occurred on the Shuttle would first have to surmount this contractually imposed barrier in order to succeed. When confronted with similar agreements in the case of common carriers, some courts have held, as a matter of public policy, that liability for actions amounting to gross negligence cannot be waived by agreement.[23] This is especially true when one of the parties is the only supplier of a highly regulated or government controlled service and where the purchaser is inexperienced in the field.[24] In this situation, the supplier of the service, having special expertise, could be held to owe a duty of reasonable care to the purchaser. Although the Shuttle is not a common carrier,[25] its function is sufficiently similar to a conventional transportation system that it could be argued that such principles should apply by analogy to its operations.

Where the incident was the result of the actions of Shuttle-users rather than NASA, the liability of Shuttle-users to one another will be dependent upon a number of factors. Probably the most important factor is the question of which body of law will govern liability. Determination of this question is largely dependent upon the location of the parties at the time of the incident and the identity of the Shuttle-users involved. This is so as a result of the 1967 Treaty on Principles. Under this treaty, jurisdiction and control over objects launched into outer space and over any personnel thereof is retained by the state which has registered the object.[26] A framework for registration of space objects is provided for under the 1976 Registration Treaty,[27] which requires that each object

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to the user's payload. The users will assume that risk or obtain insurance protecting themselves against that risk.

Accord, 42 Fed. Reg. 8633 (1977) (to be codified at 14 C.F.R. § 1214.206), which contains an identical provision with respect to government users.

23. *See, e.g.*, Barker v. Colorado Region-Sports Car Club of America, Inc., 35 Colo. App. 73, 532 P.2d 372 (1974).

24. *See* McTighe v. New England Tel. & Tel. Co., 216 F.2d 26 (2d Cir. 1954); Gas House, Inc. v. Southern Bell Tel. & Tel. Co., 289 N.C. 175, 221 S.E.2d 499 (1976).

25. Private communication from Mr. Gerald Mossinghoff, NASA Deputy General Counsel, to Arthur M. Dula (July 22, 1977), which states:

> Congress has a very specific manner of creating a regulated common carrier and it did not do so in the National Space Act. NASA does not hold the National Space Transportation System out indiscriminately to all users, but rather requires a specifically negotiated contract, thus eliminating an essential common law requirement of a common carrier.

26. 1967 Treaty on Principles, *supra* note 8, Article VIII which provides:

> A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to 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.

27. Treaty on Registration of Objects Launched into Outer Space, *opened for signature* ————, — Stat. —, T.I.A.S. No. 8480, — U.N.T.S. —. Article II of the Treaty on Registration provides:

> 1. When a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate reg-

launched into outer space be registered by the launching state. Where more than one country is involved—for example, the launching vehicle is owned by one state while an object contained therein is owned by another state—the parties must mutually agree on whose registry an object will be carried.[28] Consequently an American Shuttle which is American registry might carry a Brazilian satellite which may be of Brazilian registry.

As a result of the jurisdictional principles established by these treaties, the stage of the flight at which the damage-causing incident occurred and the location of the objects and people involved will determine the interparty liabilities which will result. For example, if the incident occurs while the object and people involved are yet aboard the Shuttle, which will be of American registry, United States law will govern the interparty liabilities. Because all present Shuttle launch centers are federal enclaves,[29] it would be federal tort law which would apply. However, if a spacelab is registered in Germany or some other foreign country and separates from the Shuttle to operate as an independent space object, it would be a separate space object subject to German jurisdiction and law until such time as it was retrieved by the Shuttle for return to earth.

Interparty liability on the Shuttle could be especially complex because the pilot and crew will be employees of the United States government while the several payload specialists who operate experiments or space factories will be employees of private industry or foreign governments. When there are so many people working with such highly complex and largely experimental equipment in a new environment, it becomes inevitable that accidents will occur on the Shuttle, even with foolproof apparatus.[30] Because traditional tort law would apply, it would be necessary to prove fault in order to recover and yet fault in such situations will be very difficult to establish.

Another problem incident to the application of traditional United States tort law to the issues of interparty liability on the Shuttle is that the issues of liability which will probably arise between users on the Shuttle will be resolved only through protracted and complex lawsuits. It is submitted that the probability of these types of suits will discourage industrial participation in a Shuttle-

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istry which it shall maintain. Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry.

2. Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object in accordance with paragraph 1 of this article, bearing in mind the provisions of article VIII of the Treaty on Principles governing the activities of States in the exploration and use of outer space, including the moon and other celestial bodies, and without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object and over any personnel thereof.

3. The contents of each registry and the conditions under which it is maintained shall be determined by the State of registry concerned.

28. *Id.*

29. U.S. CONST. art. I, § 8, cl. 17.

30. Here "Murphy's Law" applies, *i.e.*, anything that can go wrong will. Especially apt are the two corollaries: *In any given miscalculation, the fault will never be placed if more than one person is involved* and *It is impossible to make anything foolproof because fools are so ingenious.*

based program of space industrialization and that an alternative procedure is required.

C. *Extent of the Liability*

Regardless of whether it is third-party liability or interparty liability which is to be imposed in a given case, it seems clear that the potential amount of liabilities in the event of a damage-causing incident would be large. It is submitted that the potential risks and liabilities will appear so great that prospective insurers either will refuse to insure Shuttle operations or will do so at a cost prohibitive to private industry.

Although the Shuttle is not an aircraft, but rather a "vehicle" under the National Space Act,[31] it lands as an unpowered glider. If a launch is aborted at a high enough altitude after takeoff, the Shuttle orbiter can then glide back to earth. This raises the possibility that in such an emergency situation the Shuttle could collide with an aircraft or land in a populated area. Such possibilities make the Shuttle a natural candidate for risk analysis by accepted aircraft underwriting methods.

Aircraft underwriters calculate premiums in terms of operating experience and maximum probable accidents. One maximum probable aircraft accident is the head-on collision of two fully loaded 747's over a city such as Miami, Florida. Underwriters could construct a maximum probable Shuttle accident by simply replacing one 747 with the Shuttle. It appears clearly evident that, in this type of situation, the insurer's underwriting calculations would result in very large premiums.

However, it is possible that the Shuttle might be viewed as such a high risk that no insurance company would agree to insure its operations. When the Shuttle takes off, the orbiter is lifted by the controlled detonation of thousands of tons of the most explosive materials known to man. In orbit, the Shuttle and its users will be relying on high powered fuels and explosives for many operations. To land, the Shuttle orbiter must make an unpowered glide to a single

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31. 42 U.S.C. § 2452(2) (1970), which defines the term "aeronautical and space vehicles" as "aircraft, missiles, satellites, and other space vehicles, manned and unmanned, together with related equipment, devices, components, and parts."

The Chief Counsel of the Federal Aeronautics Administration has issued a detailed opinion holding that the Shuttle is not an aircraft. Letter from Bert Z. Goodwin, Chief Counsel of the Federal Aeronautics Administration, to Neil Hosenball, General Counsel of the National Aeronautics and Space Administration (March 11, 1977). In this letter, it is stated:

> [T]he NASA Act of 1958 recognized the distinct categories of "aeronautical and space vehicles" in section 103 [42 U.S.C. § 2452(2) (1970)]. 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.

runway at a landing speed of over 200 knots. All of these factors may initially cause Shuttle ventures to be avoided as ultra high risks by commercial insurance firms and possibly cause the Shuttle to be classified as an inherently dangerous instrumentality by the courts.

III. How Can the Risks Be Managed?

Thus, clearly, a large number of potential risks are associated with the routine space Shuttle operations. Fortunately, most can be controlled by creating or shaping principles of law which follow a few simple touchstones.

A. *Touchstones*

Successful risk management for the Shuttle must allow industry to evaluate the nature and extent of the risk it is assuming. This risk must be perceived as low enough to encourage industry to participate on the Shuttle. Finally, all possible means should be employed to avoid long and complex litigation.

B. *Past and Present NASA Policy*

In the past, reimbursible launches have been performed by NASA using expendable vehicles such as the McDonnell Douglas Delta rocket. If an expendable vehicle went off course or otherwise malfunctioned, the range safety officer transmitted a coded radio signal that destroyed it. This destruct capability has minimized third-party liability for expendable launches, but is not practical for use with a manned Shuttle.

As late as 1975 NASA was satisfied with very general contract language to the effect that all parties would give each other "all assistance practicable" in the defense of third-party claims for injury, death or damage to property associated with launching expendable vehicles.[32] This level of protection was quite adequate when NASA could make and enforce safety rules, perform detailed safety inspections, and blow everything up without liability if anything went wrong.

NASA is currently evolving a new set of insurance standards that will apply to all future launches. Current contracts still include the 1975 general lan-

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32. *See, e.g.*, Agreement between the United States National Aeronautics and Space Administration (NASA) and the National Space Development Agency of Japan (NASDA) for Spacecraft Launching and Associated Services to be Furnished by NASA in Connection with the Launching of NASDA Spacecraft (executed July 19, 1975), which contains a provision which reads:

> *Article XI—Third Party Claims*:
>
> 1. NASA and NASDA agree that, in the event third party claims are asserted against NASA or NASDA as a result of patent infringement, use of proprietary information, *bodily injury, death or damage to or loss of real or personal property, including claims of contractors or subcontractors of the U.S. Government, arising from or in connection with the spacecraft launching and associated services furnished by NASA under this Agreement, NASA and NASDA will provide each other with all assistance practicable in the defense against such claims.*

Id. at 44-45 (emphasis added).

guage, but by early 1977 NASA also required that the user purchase a very large—for example, $100,000,000—policy of third-party liability insurance.[33] The user had to agree to purchase this policy of insurance, payable to NASA, as a condition precedent to NASA's providing launch services on a McDonnell Douglas Delta.[34]

However, this level of private insurance would be neither available to nor affordable by most private industrties that will use the Shuttle.[35] Furthermore, if a $100,000,000 policy of third-party liability of insurance is presently required by NASA for a series of flights on an inexpensive, proven and safe expendable vehicle such as a Delta, it seems reasonable that much more insurance will be

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33. *See, e.g.*, Contract Between the United States National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) for Spacecraft Launching and Associated Services to be Furnished by NASA in Connection with the Launching of OTS Spacecraft (executed May 24, 1976), which contains the following provision:

ARTICLE XI-THIRD PARTY CLAIMS

1. The parties to this contract shall be covered by insurance indemnifying the payment of claims, judgments or contractual obligations arising from third party liability actions. The total cost of premiums for such insurance covering both ESA and NASA shall constitute a portion of the reimbursable costs for launch services to be paid by ESA under its first progress payment, due after the effective date of their contract set forth in Annex E. Furthermore, any amounts paid by the United States pursuant to claims, judgments, or contractual obligations arising from third party liability actions which are outside, exceed or after expiration of the aforementioned insurance coverage shall be reimbursed to the United States by ESA as an additional cost under this contract. ESA shall reimburse the United States Government for the above costs with the sole exception of such costs arising out of claims of third parties to the extent that the injury, death, damage, or loss were, (a) caused by the willful misconduct of an employee of the United States Government or its contractor or subcontractor, and/or, (b) occurred prior to the start of assembly of the spacecraft with any stage of the launch vehicle. However, if, after start of such assembly, the spacecraft is disassembled from any stage of the vehicle, ESA's obligation to reimburse the United States Government for such costs shall be suspended upon completion of such disassembly, and shall resume only after the above described start of such assembly.

2. Paragraph 1. above is not intended to subject the U.S. Government to liability to the extent arising out of acts or omissions of ESA, or of ESA's contractors or subcontractors; to preclude the U.S. Government from seeking contribution in an appropriate case from ESA, ESA's contractors or subcontractors, or other persons; or to obligate the U.S. Government to reimburse, indemnify or hold harmless ESA or ESA's contractors or subcontractors for sums they have paid to each other or third parties as damages.

3. For the purposes of Paragraph 1. and Article XII, the ESA and the U.S. Government's employees and ESA's and the U.S. Government's contractors and subcontractors and their employees shall also be deemed to be third parties.

Id. at 44-46.

34. *Id.* at Amendment I (executed March 25, 1977), which states:

Whereas, the European Space Agency (ESA) signed the OTS Launch Contract on May 24, 1976, and returned the signed contract to NASA on the following day accompanied by a cover letter dated May 25, 1976, signed by the Director General of ESA. Said letter expressed a formal reservation to the provisions under Article XI to the contract; and

Whereas, NASA responded in a telex dated June 7, 1976, that because of the reservations expressed by ESA in its May 25 letter, NASA considered itself not to be under contract for OTS launch services; and

Whereas, in a letter, dated August 16, 1976, culminating a series of negotiations between the parties, NASA agreed to affirm the OTS Launch Services Contract with the exclusion of Article XI, but with the condition that prior to final launch preparation, the parties will have agreed to the terms of Article XI and will have incorporated it into the contract by amendment.

required for flights on the Shuttle. Yet less insurance must be required of private Shuttle-users or many potential users will not fly.

C. *The Future —Some Recommendations*

1. *Third-Party Liability*

NASA will continue to make safety rules and inspect payloads to see they are safe, but will not be able to blow up the Shuttle if it goes off course. This increases third-party liability exposure for the Shuttle. Increased liability can best be met by the indemnification of developing space industry by a combination of private insurance and government action, as was provided earlier for the nuclear industry.

The Price-Anderson Act[36] was enacted in 1957 to protect the emerging nuclear industry and the public by assuring the availability of funds for payment of claims in the unlikely event of a catastrophic nuclear accident.[37] Under this Act, the funds are provided by a combination of private insurance and governmental indemnification. The Act requires that private industry must obtain $60,000,000 of third-party liability insurance. The government then grants industry an indemnification of $500,000,000. In 1962, Congress extended a portion of the indemnity coverage to claims arising outside the United States' territorial limits[38] and in 1975 the Act was renewed for another ten-year period.[39]

A similar program of private insurance and governmental indemnification for space industrialization on the Shuttle would allow industry to face a known and acceptable risk while at the same time protect third parties and also meet United States treaty commitments for international liability. This mechanism for risk management would also allow industry to assume more liability as its experience increases and risks become better defined. In addition, this could often produce quick adminstrative settlement of claims, which could have the benefit of lessening the possibility of drawn-out lawsuits arising from Shuttle accidents.

2. *Interparty Liability*

In addition to paying for all or part of the third-party liability coverage

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35. It is, of course, available at great cost, *i.e.*, $100,000 to large aerospace companies, but it is submitted that these companies will not be the major user of the Shuttle. Economic history teaches that new technological frontiers are usually developed by *small* high risk companies.

36. Price-Anderson Act, Pub. L. No. 85-256, § 4, 71 Stat. 576 (1957), *as amended by* Act of Sept. 29, 1965, Pub. L. No. 89-210, § 1, 79 Stat. 855 (codified at 42 U.S.C. § 2210 (1970)).

37. *See generally* [1957] U.S. CODE CONG. & AD. NEWS 1803.

38. Act of Aug. 29, 1962, Pub. L. No. 87-615, § 7, 76 Stat. 410 (codified at 42 U.S.C. § 2210(d) (1970). However, the amendment placed a limit of $100,000,000 on indemnification provided by the Commission in the event of nuclear incidents occurring outside the United States. *Id.*

39. Act of Dec. 31, 1975, Pub. L. No. 94-167, §§ 4-10, 89 Stat. 1113-14.

required by NASA, business users of the Shuttle will want to insure their investments against casualty loss. If private insurance firms are reluctant to offer insurance at reasonable rates in an area where they have so little experience, the government would be justified in underwriting special policies of insurance for Shuttle-users. Likewise, if a Shuttle-user could not locate sufficient commercial insurance to adequately cover its investment in a space laboratory or factory, the government should underwrite sufficient coverage to fill the gap.

NASA and all parties flying on the Shuttle should mutually contract to bear their own risks as joint adventurers on each mission. No-fault should be the rule on the Shuttle. Furthermore, NASA would make inspections of all payloads and certify their safety. Since NASA has both great technical expertise and an enviable record of safety, such inspection should be sufficient to satisfy an insurance company that insuring a space payload is a good risk.

Personnel on the Shuttle might be insured by the Travelers Insurance Company, which has already ventured into the field by insuring the astronauts. Standard aviation life and injury insurance may also cover such personnel. If commercial carriers are unwilling to make such insurance available, the government should underwrite special space life insurance, analogous to that purchased by military personnel on active duty, and make it available through NASA for the duration of the mission.

Such a program of private no-fault insurance, combined with governmental underwriting of special life and property insurance when and if necessary, would allow industry to accurately assess the interparty risks involved in Shuttle operations. It would also minimize the government's cost while enhancing the Shuttle's attractiveness as a research and manufacturing tool. Similar to the anticipated future of governmental indemnification for third-party liability, this public underwriting could be phased out as private insurance companies move into the market after gaining experience and confidence in the safety of space Shuttle operations.

3. *Centralization of Claims—Procedure*

As was suggested earlier in this Article, it is likely that lawsuits arising from Shuttle-related accidents would be long and complex. A possible solution to this problem is the centralization of all Shuttle-related interparty and third-party claims before one court or administrative agency. It is within the authority of Congress to require that all claims dealing with a given governmental instrumentality, such as the Shuttle, be brought before one court[40] and such might be a

40. Congress has been granted considerable latitude by the Constitution with regard to the jurisdiction of federal courts. Article III of the Constitution sets out the role of the Supreme Court in deciding controversies and leaves the establishment of the lower federal courts to the discretion of Congress. U.S. CONST. art. III, § 1. This congressional power to ordain and establish inferior courts allows Congress the option of "investing them with jurisdiction either limited, concurrent, or exclusive, and of withholding jurisdiction from

desirable approach toward Shuttle-related claims. Congress also has the authority to require that administrative remedies be exhausted prior to bringing suit,[41] which might also be advantageous in Shuttle-related claims.

One possible manner in which the centralization of interparty and third-party claims could be accomplished would be by providing for special jurisdiction and venue in the Court of Appeals for the District of Columbia. This would place Shuttle-related claims before a court having skill and experience in the resolution of complex administrative matters.

Concurrently a claims commission could be established within NASA to administratively settle all claims arising out of Shuttle operations. Exhaustion of this avenue of relief before permitting appeal to the federal courts would tend to discourage long and costly litigation. This claims commission should not be just a passive body, but should include agents who seek out injured parties and attempt to settle with them. The commission would then be subrogated to the rights it had extinguished in the third parties.

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them in the exact degrees and character which to Congress may seem proper for the public good." Cary v. Curtis, 44 U.S. (3 How.) 236, 245 (1845).

Recognition of congressional authority to confer and withhold jurisdiction to the inferior federal courts has continued to the present almost without exception. Palmore v. United States, 411 U.S. 389, 401 (1973); Lockerty v. Phillips, 319 U.S. 182, 187 (1943); Lauf v. E.G. Skinner & Co., 303 U.S. 323, 330 (1938); Kline v. Burke Constr. Co., 260 U.S. 226, 234 (1922). This is further exemplified by the fact that until 1875 the federal courts lacked any federal question jurisdiction whatsoever. Moreover, a plaintiff, in many cases, must still satisfy the jurisdictional amount requirement of 28 U.S.C. § 1331 (1970) imposed by Congress. C. WRIGHT, A. MILLER & E. COOPER, FEDERAL PRACTICE AND PROCEDURE § 3526, at 108 (1975). The only qualification on this principle which the courts have recently expressed concerns the restriction of federal court jurisdiction arising out of the Due Process Clause and the First Amendment. Fisch v. General Motors Corp., 169 F.2d 266, 273 (6th Cir. 1948), *cert. denied*, 335 U.S. 902 (1949); Faulkner v. Clifford, 289 F. Supp. 895, 900 (E.D.N.Y. 1968), *appeal dismissed*, 393 U.S. 1046 (1969).

Thus, Congress can provide that a particular court, and that court only, should hear certain questions. For example, the Emergency Price Control Act of 1942, ch. 26, § 204 (a), 56 Stat. 31 (terminated on June 30, 1947, under the provisions of Act of July 25, 1946, ch. 671, § 1, 60 Stat. 664), Congress declared that any appeals from the Administrator's decision must be filed with the Emergency Court of Appeals. In deciding a controversy arising under the Act, the Supreme Court in Lockerty v. Phillips, 319 U.S. 182, 188 (1943), stated, "[I]t is plain that Congress has power to provide that the equity jurisdiction to restrain enforcement of the Act, or of regulations promulgated under it, be restricted to the Emergency Court, and upon review of its decisions, to this Court."

41. This ability derives from the power of Congress to confer and withhold jurisdiction in regard to the federal courts. Thus, Congress can place restrictions and qualifications upon the questions that the lower courts may hear. *See generally* note 40 *supra*. As Judge Sirica pointed out in his opinion in Senate Select Committee on Presidential Campaign Activities v. Nixon, 366 F. Supp. 51, 55 (D.C. Cir. 1973):

> Simply stated, Congress may impart as much or as little of the judicial power as it deems appropriate and the Judiciary may not thereafter on its own motion recur to the Article III storehouse for additional jurisdiction. When it comes to jurisdiction of the federal courts, truly, to paraphrase the scripture, the Congress giveth, and the Congress taketh away.

The Emergency Price Control Act of 1942, ch. 26, § 204(a), 56 Stat. 31 (terminated on June 30, 1947, under the provisions of Act of July 25, 1946, ch. 671, § 1, 60 Stat. 664), established that no action could be taken in the courts until the Administrator had acted upon the petitioner's protest. In upholding the Act, the Supreme Court stated, "Nor can we doubt the authority of Congress to require that a plaintiff seeking such equitable relief resort to the Emergency Court only after pursuing the prescribed administrative procedure." Lockerty v. Phillips, 319 U.S. 182, 188 (1943).

IV. Conclusions

A. In order to allow industry to evaluate and economically tolerate the level of liability inherent in initial space industrialization, it is submitted that the administrator of the National Aeronautics and Space Administration should recommend to Congress, through the President, as provided by 42 U.S.C. section 2476(b),[42] that:

1) Legislation be enacted to establish a program of joint private insurance and governmental indemnification for third-party and international liability arising out of National Space Transportation System-related activity;

2) Legislation be enacted to establish a federally underwritten program of special space life and property insurance to provide no-fault excess property and life insurance for users of the National Space Transportation System until such time as the private insurance industry makes such coverage commercially available;

3) Legislation be enacted to establish special exclusive jurisdiction and venue in the United States Court of Appeals for the District of Columbia for claims arising out of National Space Transportation System-related activity. Such jurisdiction should require exhaustion of administrative remedies as a prerequisite to any action.

B. It is also submitted that the Administrator of the National Aeronautics and Space Administration should:

1) Establish an administrative tribunal to settle claims arising out of National Space Transportation System activity; and

2) Commission agents with the authority to quickly settle claims of third parties out of the funds provided by the joint private insurance and governmental indemnification scheme.

C. It is also proposed that the aerospace industry should internally fund studies to determine how much industry can afford to pay for insurance in an initial program of space industrialization.

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42. 42 U.S.C. § 2476(b) (Supp. I 1971), which provides that "[a]ny report made under this section shall contain such recommendations for additional legislation as the Administrator or the President may consider necessary or desirable for the attainment of the objectives described in section 2451(c) of this title."

THE IRRATIONAL TREND TOWARD MANDATORY MATERNITY COVERAGE*

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I. INTRODUCTION

During the past fifteen years, the interest of all branches of government in the economic status of women has become manifest. When Congress enacted the Equal Pay Act of 1963[1] and then followed it by the passage of the Civil Rights Act,[2] including Title VII, in the succeeding year, the basis was laid for a fundamental reconsideration of employment practices, including compensation, in relation to the sex of the individual. In 1967 an executive order of the President[3] added sex as a prohibited basis of discrimination to race, color, religion and national origin for all parties to federal contracts.

In March 1972, the proposed 27th amendment to the United States Constitution—the Equal Rights Amendment—was approved by Congress.[4] This amendment provides that "Equality of rights under the law shall not be denied or abridged by the United States or by any State on account of sex." The Equal Rights Amendment (ERA) hovers only a few states shy of the necessary 38 for ratification, but it is not clear whether that goal will be realized. Whether or not ratification is obtained, merely keeping the ERA in the forefront of national publicity has focused federal and state legislative, administrative and judicial attention upon a variety of related issues.

Sex-based differentiation is only one of several means used to classify risks

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** The closing date of this Article was July 28, 1977. The views expressed herein are those of the writers and do not necessarily represent those of the Health Insurance Association of America.

1. 29 U.S.C. § 206 (1963).
2. 42 U.S.C. § 2000e (Supp. II 1972).
3. Exec. Order No. 11246, 3 C.F.R. 169 (Sept. 28, 1965), amended by Exec. Order No. 11375 (Oct. 17, 1967).
4. H.R.J. Res. 208, 92nd Cong., 2d Sess. (1972).