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PREVENTIVE LIABILITY FOR SPACE ACTIVITIES

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Abstract

Most discussions of liability concern issues of fault and causation with regard to some type of damage. The premise of such discussions is that damage has occurred already. In contrast, the concept of "preventive liability," like preventive medicine, concerns the avoidance of any damage in the first place. Consequently, the goal of preventive liability is to structure the design, construction and operation of space activities so that incentives to prevent damage are created.

This paper will begin with a general discussion of the concept of preventive liability. The body of the paper will examine how preventive liability principles may be considered in the context of current trends in space activities. The conclusion will raise some unresolved issues for further consideration by my distinguished colleagues.

Introduction

At first glance, the concept of "preventive liability" may seem redundant. The principles of liability in most legal systems are designed to clarify in advance who would be liable to remedy any damages. By providing a measure of certainty to state and private actors, liability principles indirectly create incentives to avoid any such damage. As a result, liability principles already contain aspects of prevention.

In practice, however, the preventive aspects of liability are often subsumed in calculations of the damages themselves. A good illustration of this phenomenon was the case of the Ford Pinto automobile. The fuel tank of the Pinto was in a position that could result in an explosion in the event

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of a rear end collision. In discovery during litigation alleging that the Pinto was a defective product, documents revealed that Ford executives had been aware of the danger, and of the potential liability. Nevertheless, they had not changed the design of the Pinto to prevent such liability, because they calculated that it would cost more to change the design than to pay for the damages. The focus was more on damage remedy than on damage prevention.

The Pinto case raises the point that, if the potential liability had been greater than the potential damages, the Ford executives' calculation may have resulted in a decision to change the design to prevent such damages. This is an important aspect of the concept of preventive liability. The potential liability must be greater than the potential damages. Incentives are thus created to take actions that will prevent damages.

The limitation of this approach is that it is difficult to make such calculations. Potential liability and damages can only be estimated. Mandatory minimum levels of liability and/or punitive damages may aid such calculations, however, they still would focus attention on damage remedies. Therefore, another important aspect of the concept of preventive liability is the need to shift the paradigm from focusing on damage remedy towards damage prevention.

Preventive Liability Applied to Space Activities

The idea of changing the liability paradigm to focus on damage prevention rather than damage remedy is not new in the field of space law. For example, the first paper I presented to these colloquia was entitled "Prevention of Orbital Debris."[1] Far more distinguished space writers have also pointed out the value of prevention in the design, construction and operation of space activities. In an edited version of a paper presented at last year's International Astronautical Congress in Graz, Austria, Dr. Lubos Perek listed the following items among those required for good management of space activities:

- preventing interference in space communications;
- preventing material interference among objects in space;
- preventing human error in manufacturing and operation of spacecraft; and
- preventing technical malfunction of spacecraft.[2]

The first item, preventing interference in space communications, is regulated by the International Telecommunications Union (ITU) and the national regulatory authorities, and is facilitated by technological advances. The second item, preventing material interference among objects in space, has been the subject of numerous papers in these colloquia concerning both operational spacecraft -- "rules of the road" -- and defunct spacecraft and other objects -- "orbital debris."

This paper focuses on the last two items listed by Dr. Perek -- preventing human error in manufacturing and operation of spacecraft, and preventing technical malfunction of spacecraft. As with the first two items, technological advances may facilitate efforts to prevent human error and technical malfunctions. However, such advances must themselves be conceived and realized without error as well.

As a result, the vast majority of preventable damage ultimately can be traced directly or indirectly to human behavior. The Ford Pinto case showed that, even if a technical solution is readily available, the damage remedy liability paradigm can drive the decision making process into accepting foreseeable and preventable damages.

This danger is equally applicable to space activities as long as the focus is on who is responsible and/or liable to remedy damages rather than how we can best prevent such damages from occurring.

Current Trends

Examining current trends is an important way to test the feasibility of applying preventive liability principles to space activities. The following four topics expand the perspective from specific cases and proposals to general trends: "whistle blowers," acquisition reform, insurance, and mergers.

Whistle blowers

One method of creating incentives to prevent potential damages is to reward individuals who step forward to report -- or "blow the whistle" on -- waste, fraud or abuse. "Whistle blowers" are often persecuted by their employers or colleagues because they put an end to a profitable arrangement or otherwise upset the status quo. Consequently, moral imperatives do not always provide sufficient incentive. Financial incentives may also be required.

In the United States, waste, fraud and abuse in the performance of government contracts can result in both civil and criminal penalties under federal law.[3] In certain cases, the "qui tam" provisions of the False Claims Act permit whistle blowers to receive up to 25% of funds recovered by the federal government in lawsuits against government contractors. A recent example is a lawsuit filed by a former employee of Martin Marietta alleging that the company double-billed the U.S. Navy up to $30 million on a missile program.[4]

Such laws that encourage whistle blowers to expose waste, fraud and abuse can be an effective form of preventive liability. The potential savings to taxpayers is only the most direct benefit. Other benefits include the prevention of substandard products and services that, in case of malfunction or failure, could cause serious damage to those who may operate or rely on them. Perhaps most important, whistle blower laws raise the potential liability to help offset the potential damages in the ex ante calculations of potential abusers. If both the risk and cost of getting caught are raised sufficiently, incentives to prevent damage are created, and the goals of preventive liability are served.

Acquisition Reform

Because so many of the whistle blower cases concern government contracts, the larger issue of acquisition reform must also be addressed. One trend worth watching is the experiments of the U.S. National Aeronautics and Space Administration ("NASA") under its "smallsat" program. To help internalize costs with its contractors, NASA plans to deduct cost overruns from award fees.[5] This policy serves the goals of preventive liability because it creates an incentive for the contractors to prevent excessive costs and delays that damage taxpayers and space capabilities.

Another proposal is for NASA to fund new smallsat technology development and then have the contractor buy back the finished satellite after a year in orbit.[6] This proposal would allow NASA to recoup some of its investment in new technologies. It also would give the contractor added incentive to ensure quality design and manufacturing since it will end up owning and operating the satellite in the long run. Any proposal that encourages higher quality products at lower cost to the taxpayer also serves the goals of preventive liability.

The buy-back proposal is also the reverse of other proposals for more mature technologies, such as communications satellites, in which the government purchases the satellites on orbit. The design, manufacturing, launching, and initial operational risks are thus shifted from the government to the contractor. The internalization of costs and liability creates incentives to prevent damages, again serving the goals of preventive liability.

Insurance

Contractors can internalize the risks of space technologies as long as they are able to spread those risks through insurance. Because NASA's smallsat program involves emerging technology, it is more difficult to shift the risks to the contractor. The buy-back proposal is an effort to deal with this lack of third-party insurance for new technologies. On the other hand, the proposals for on-orbit delivery of relatively mature communications satellites is possible because contractors are able to obtain third party insurance.

Both launch and initial on-orbit operations insurance are available now that the space insurance industry has had enough time and experience to assess the risks. In fact, underwriters are beginning to differentiate between launch vehicles based on their performance records.[7] This trend serves the goals of preventive liability because it creates incentives to prevent damage.

Nevertheless, it should be noted that the more sophisticated market forces noted above currently only function for relatively mature communications satellites orbited by relatively mature launch vehicles.

> As commercial space systems mature, the technology becomes better understood, more durable, and more reliable, and the costs of insurance and the costs of services are reduced. But there is very little in the space industry that is sufficiently developed to obtain low rates. Years, if not decades, of experience are still needed. Consequently, the necessary qualities of an early space entrepreneur are patience, persistence, and vision.[8]

Mergers

Another trend that is certain to have an impact on the design, manufacture and operation of space

activities is the consolidation of the U.S. space industry through mergers. This past spring, Northrup emerged as the victor over Martin Marietta in the bidding for Grumman.[9] By the autumn, Martin Marietta had found another partner when it reached an agreement to merge with Lockheed.[10] The mergers have raised many issues, including concerns about the potential impact on competition.

For the purposes of this paper, the concerns about competition do not focus on the applicability of antitrust laws. Rather, the potential impact on competition is relevant because it will have an impact on the design, manufacture and operation of space activities -- and thus also on the applicability of preventive liability principles.

It is quite possible that the merged companies, with their greater resources, will have more capacity to internalize costs and risks -- which would serve the goals of preventive liability. However, it is also quite possible that the incredibly complicated task of integrating and rationalizing the companies will distract both management and workers and compromise the quality of their products -- which would undermine the goals of preventive liability.

In any case, it is unlikely that the mergers themselves will help bring about the paradigm shift from damage remedy to damage prevention that is so greatly needed. Achieving that goal will require a reevaluation of the fundamental principles of liability.

Conclusion

In our relatively short experience operating in the space environment, we have learned that mistakes are not easily corrected and damages are not easily remedied. The liability regimes that have been developed on Earth have had a mixed record, and there is little evidence that the damage remedy paradigm will be any more effective in the space environment. Consequently, it is imperative that the fundamental principles of liability be reevaluated.

This paper was intended to help move this process forward by exploring the concept of preventive liability and its application to space activities. Several trends were examined to test the feasibility of applying preventive liability principles to space activities.

This exercise revealed some unresolved issues that require further consideration. For example, we must take great care in creating

incentives to prevent damage. Otherwise, we may inadvertently create incentives not to act at all -- positively or negatively. Other issues include the following: How should we reward desired behavior? What cultural issues must be addressed? How do we structure the changing relationship between state and private actors? What is the role of third-parties? How does the consolidation of the space industry affect the process?

These are difficult questions that do not have simple answers. The goal of this paper was to raise these issues in a framework that will encourage further reflection and consideration. I look forward to hearing your thoughts.

Notes

1. Reibel, "Prevention of Orbital Debris," Proc. 30th Colloq. L. Outer Space, at 147-54 (1987).

2. Perek, "Management of Outer Space," Space Policy, August 1994, 189-98 at 191.

3. See, e.g., False Claims Act and False Statements Act.

4. See "Justice Takes Charge in Civil Fraud Suit Against Martin," Aviation Week & Space Technology, May 23, 1994, at 60. See also "U.S. Joins Whistle-Blower Suit Against GE," Aviation Week & Space Technology, June 13, 1994, at 59.

5. See "Smallsat Pacts Key to NASA Reform," Aviation Week & Space Technology, June 13, 1994, at 56-57.

6. See id.

7. See "The space insurance industry: Does it have a future?" Aerospace America, January 1994, 26-30, at 26.

8. Doyle, "Legal Aspects of Space Commercialization," in Space Law: Development and Scope, Jasentuliyana, ed., at 133.

9. See Velocci, Jr., "Grumman, Northrup Stakes High," Aviation Week & Space Technology, April 11, 1994, at 62-63.

10. See Velocci, Jr., "Megamerger Points to Industry Future," Aviation Week & Space Technology, September 5, 1994, at 36-39.