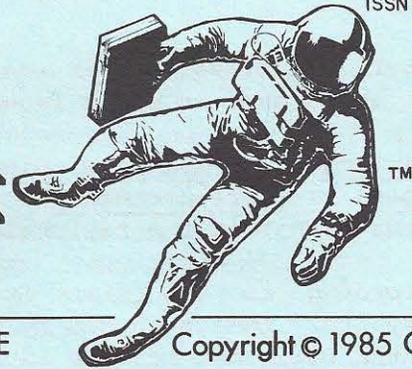


# THE COMMERCIAL SPACE REPORT

ISSN 0735-9314



A MONTHLY NEWSLETTER ON FREE ENTERPRISE IN SPACE

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Volume 9, No. 3

March, 1985

(Notice to Readers: Part Two of the article on the Apollo Asteroids scheduled for this issue has been postponed until a later issue to make room for more pressing developments.)

## DOT Issues Proposed Policy Statement On Space Launch License Procedures

The Department of Transportation (DOT) has issued a policy statement on procedures it proposes to follow in reviewing space launch licensing requests. Interested parties have until April 26 to comment on the proposed policy.

The DOT licensing process has two main elements: launch safety review and mission review. The launch safety review would address the vehicle and range safety resources of the applicant. The safety review requirements (as outlined in the policy statement) seem to address specific, objective safety aspects, and do not appear as if they would be too difficult for private launch firms to live with.

The mission review process is where the trouble lies. The mission review demands that every payload be judged acceptable to the United States Government before a launch license can be issued. This review is not primarily for safety reasons (as will be made clear). It's an open-ended rule whose major purpose seems to be to allow agencies within the Federal Government to control and/or suppress private launch activities. As is typical of such regulations, the terminology is rather vague, dealing with the payload in terms of "international obligations...national security and foreign policy implications... impact of the launch or payload on existing uses of space" and, of course, the ever-popular, all-encompassing "vital national interests" (items in quotes from Policy Statement).

Who will be doing the payload review? In the case of communications satellites and earth resources satellites, the review would be accomplished by the Federal Communications Commission (FCC) and the Department of Commerce, respectively. All others will be "reviewed by DOT in consultation with the Departments of State and Defense, and, as appropriate, the National Aeronautics and Space Administration [NASA] and other agencies to ensure that the payload mission does not conflict with national interests." So, unless they are flying a communications or earth resources satellite, private launch companies are probably going to find their payload funneled through NASA, which will judge whether or not it conflicts with "national interests."

Frankly, this stinks. NASA's Space Shuttle is presently engaged in a battle for its very life against all other launch systems (more on this later). Given the opportunity to rule on a launch license for a major private competitor based on concepts as vague as "national interest" and "impact on existing uses of space," what do you think NASA would do?

Effective exploitation of the space environment will not occur until space transportation operates on an airline-style basis, with low costs, frequent flights,

and short lead times. This would be impossible under the proposed mission review process, which assumes space launches that are infrequent, expensive, and difficult.

Existing laws and regulations deal quite satisfactorily with the huge variety of cargos that are presently transported by air without any such payload review procedures. What is the rationale for doing this with space transportation?

According to the Policy Statement: "Under the Convention on International Liability for Damage Caused by Space Objects...to which the U.S. is also a State Party, the U.S., not private launch entities, agreed to assume liability for damage caused by U.S. space objects in a wide variety of circumstances....This direct liability forms the basis for a broad Federal interest in proposed private space launch activities, one which extends beyond safety issues [my emphasis] to include both the purpose of the launch and the nature of the payload. This unique interest in the launch mission distinguishes regulation of commercial space launch activities from regulation of other modes of transportation."

A suggestion: if such onerous regulations are demanded by the Liability Convention, then this ridiculous agreement (among others) should be scrapped. Such liability arrangements would be inane applied to airlines, and they are just as inane applied to space vehicles. Take the regulation of air transportation by the Federal Aviation Administration as an example. These regulations (appropriate or not) obviously allow a profitable commerce in air transport. If space transportation must be regulated, the DOT could do worse than using its own regulations as a guideline.

Concerned readers should send the DOT their own opinions on this Policy Statement. The Statement has been published in the Federal Register for February 25, 1985 (available in many libraries). Comments should be sent to: Documentary Services Division, Attn: Docket Section, Room 4107, OST Docket Number 84, U.S. Department of Transportation, C-55, 400 7th Street SW, Washington, DC 20590. Remember, comments must be received at the DOT by April 26.

#### Air Force Selects Titan Over Shuttle-Derived Booster

Martin Marietta scored a victory over NASA when the Air Force picked the company's Titan 34D 7/C expendable launch vehicle (ELV) over NASA's proposed Shuttle-derived booster (SRB-X) to fill the role of a "Complementary ELV," or "CELV." The \$2.1 billion contract for ten vehicles was awarded February 28. The contract includes the price of ten Centaur G-prime upper stages to be purchased from General Dynamics.

Adding insult to NASA's injury at the loss of the CELV contract, Air Force Under Secretary Edward Aldridge has stated that the CELV, although not designed for it, could find a use as a commercial launcher...oh, to compete with the Ariane launch vehicle, of course.

As if this weren't enough, the Air Force has also been trying to sell off some of its old Titan II intercontinental ballistic missiles as commercial launch vehicles, in direct competition to the Shuttle. The missiles, obsolete as ICBMs, are due to be scrapped but can be refurbished to carry payloads into orbit.

The National Oceanic and Atmospheric Administration (NOAA) has decided to use some of these Titans to launch some of its new polar-orbit weather satellites (NOAA will continue to use the Shuttle to launch its new geosynchronous weather satellites). NASA had been hoping for the whole ball of wax, despite the fact that the Shuttle will not be able to do polar launches until the Vandenberg launch site is ready.

NASA was not the only one irked by this outcome. Private launch companies such as Space Services, Inc., General Dynamics, and Transpace Carriers, Inc. had all been trying for NOAA as a customer. All they needed was another government competitor.

To NASA, all this abuse from the military may seem to have been a particularly low blow, considering that many of the specifications which were instrumental in making the Shuttle design large and expensive were, after all, military requirements.

The White House finally intervened to throw some cold water on this NASA-Air Force catfight. National Security Decision Directive 164 directs the Air Force to ensure that at least one third (on the average) of all Shuttle flights carry military payloads. In return, the Air Force will be permitted to buy the ten CELVs that it wants (but no more without Executive permission). In addition, the Air Force will get some cost breaks if it uses the Shuttle more often. The NOAA issue is left open. Finally, NSDD 164 instructs NASA and the Air Force to begin long-term examination of future U.S. launch vehicle requirements. Mentioned as possibilities in the document are a new Saturn-V class launcher (300,000 lbs. into low earth orbit) intended for Strategic Defense Initiative applications, a transatmospheric vehicle (also for military use), and a second-generation Space Shuttle.

#### The Launch Vehicle Price Wars

NASA is fighting a knock-down, drag-out battle with Arianespace, considered by the space agency to be the Shuttle's only serious competitor. NASA and Arianespace, between them, are carving up the profitable communications satellite market. NASA has set a goal of 75% of the world market, while Arianespace's goal is 33%. Since this adds up to 108%, one can see that these two organizations have a problem already, to say nothing of any other competitors.

NASA Administrator James Beggs is pressing to keep post-1988 Shuttle prices lower in order to successfully compete with Ariane. In recent testimony before the House Science and Technology subcommittee, Beggs pointed out that with two launch pads operating, Arianespace could perform up to 18 Ariane launches per year. Beggs estimated that the satellite payload market would be under 20 payloads per year, giving Arianespace, with two satellites on each launch, the potential to walk off with the entire market if it wanted to (the Shuttle could absorb the entire market with five flights per year).

Arianespace representatives have scoffed at NASA's fears. First (according to Arianespace) they will be decommissioning their first launch pad as soon as the new one is ready, so they will only have one in operation at any given time. Second, Arianespace plans on conducting only seven or eight launches a year, with only some dual payloads, resulting in less than 12 satellites being orbited annually--less than the total market. Arianespace also said that the turnaround time on their launch pad and the Ariane launch vehicle production rate would limit launches to less than twelve a year in any case.

Both launch organizations are subsidized by their respective governments, although Arianespace not only states that it receives no government subsidies at all, but even claims to have made a small profit in 1984--statements which should probably be taken with a grain of salt.

Payload customers are, of course, in favor of Shuttle prices that are as low as possible. Companies in favor of continued price breaks include Orbital Sciences Corp. (developing a Shuttle-launched orbital transfer stage), McDonnell Douglas (working on its pharmaceutical space processing system), Fairchild (builder of the Leasecraft), and satellite builders and users such as Hughes Aircraft and Satellite Business Systems.

On the other hand, companies attempting to privatize existing U.S. ELVs (Delta, Atlas and Titan) favor higher Shuttle prices which would more closely reflect actual Shuttle costs and make the ELVs more competitive. At present, these companies' operating costs (unsubsidized by the government) are too high to allow them to easily underbid either NASA or Arianespace. Therefore, these companies are having a serious problem competing for customers, and some of them see the subsidies provided to NASA and Arianespace as a major cause of this problem.

- Transpace Carriers, Inc., marketing the Delta launch vehicle, has begun to criticize NASA's Shuttle prices. Formerly, TCI concentrated its fire primarily on Arianespace, accusing it of predatory pricing policies. TCI is not considered a serious threat by NASA. The company has been hanging fire for some time waiting for a customer--any customer--and the deadline on TCI's Delta privatization agreement with NASA has expired and been extended three times. In the meantime, McDonnell Douglas' Delta production lines have been closed, and TCI is going to have to pay to have them opened again. Other ELV companies are also having customer problems:

- General Dynamics Convair, which builds and plans on marketing the Atlas/Centaur, had located its first (and apparently only) commercial Atlas customer--Rainbow Satellite, Inc. (C.S.R., Aug. 1984, p. 6).

Unfortunately, the FCC denied Rainbow Satellite a permit to build and launch its satellites. The FCC cited lack of financing as its reason. It is uncertain where this leaves General Dynamics, which has declined comment on the matter.

- Martin Marietta, builder of the Titan, will do well with the previously-mentioned CELV contract from the Air Force. However, General Dynamics has not done as well selling its own Titan 34D to commercial customers.

The government itself is split on the issue. The DOT is leaning in favor of higher prices to help out the commercial ELVs, while other agencies, including the Air Force (whose problems with NASA are related primarily to schedule problems rather than prices) want the price kept as low as possible. The difficulty is only increased by the fact that defining actual Shuttle costs is like trying to nail Jello to a tree. Final pricing decisions will be left up to President Reagan, who will come up with an answer sometime in March or April. The price finally decided upon will probably be a compromise between the two positions.

In point of fact, the government and the DOT are beating on a dead horse. The battle to save commercial expendable launch vehicles is not with the Space Shuttle.

If anything ends up killing off the commercial market for the Delta, Atlas and Titan it will be Ariane, not the Shuttle. To quote Arianespace itself, they offer "the best technical advantages, the best reliability in launch dates, and the best financial arrangement." Ariane's subsidies will probably have little to do with it, and there isn't much that U.S. companies can really do about them anyway.

Under these conditions, what is the commercial space transportation field going to look like in the next decade or so?

#### Commercial Space Transportation: The Long Term

Arianespace will continue successfully marketing its Ariane series of vehicles. By the middle of the 1990s, the Ariane 5 will be in operation. Ariane 5 (C.S.R., Aug. 1984, pp. 3-4) will deliver a 15-foot-diameter, 33,000 lb. payload into low earth orbit, and Arianespace will use this vehicle to put a big dent in the Shuttle's market. This dent will become larger when France's manned Hermes mini-shuttle becomes available for launch atop the Ariane 5 by about 1997.

NASA (or a consortium of private companies) will continue to sell the Shuttle at prices subsidized by the U.S. government. The Shuttle fleet will probably consist of no more than four orbiters. If a fifth orbiter is ever built, it will most likely be dedicated to military uses, as will those U.S. ELVs that remain in operation and the new launch vehicles described in the aforementioned NSDD. The latter vehicles, in any case, would probably not enter service until the early 21st century. One exception might be the "second generation" Space Shuttle. Look for NASA to begin pushing hard for an earlier start on this project, and to target it towards commercial as well as military uses (more on this later).

Meanwhile, other countries will enter the picture. Japan plans on marketing its H-2 ELV (C.S.R., Aug. 1984 pp. 4-5), and even the Soviet Union and the People's Republic of China have plans to sell flights on their launch systems. In fact, any country that can slap four solid rocket boosters together is likely to try to get into the act eventually.

What about those private companies working on developing new low-cost, reusable launch systems, such as Third Millennium's Space Van or Pacific American's Phoenix? Will they have any impact?

These companies and others are presently struggling to convince investors that there is a market for accessible, inexpensive space transportation. Apparently, for the most part, the response has been the same as you would have received if you had gone to the computer industry fifteen years ago and declared that 64K computers with color displays and 200K disk drives would one day be available in toy stores. However, this is part of the free market process, and, despite setbacks, no one has given up yet.

The worst danger to such efforts is from government action, such as the oppressive regulations proposed by the DOT, and the anticompetitive pressures applied by NASA that have been discussed in detail in past issues of the C.S.R. (this is aside from pricing--most new launch vehicle concepts have launch costs far below even the subsidized prices of Shuttle or Ariane).

There is a remote, yet serious danger that NASA could do something in this latter category that could kill private space transportation entirely: the agency could make a firm announcement that it intends to build the Second Generation Shuttle mentioned earlier. If this happens, then the private investment community is likely to ignore any other ideas while waiting for NASA's new Technical Miracle.

One can envision NASA announcing that the New, Improved Shuttle will be everything the first Shuttle was not: it will have no expendable parts and fly payloads for about \$150 a pound. It will require no aviation training to ride it and permit the use of standard, commercial, off-the-shelf scientific instrumentation instead of specialized equipment. If this all sounds familiar, it should. These were only some of the features promised for the present Space Shuttle back in 1970. There is no reason to assume that scientists and businessmen won't fall for the same line again, and count on the government one more time while private industry solutions languish on the drawing board. This is in spite of the fact that Shuttle Mark 2 would not be in operation until nearly the turn of the century...just the announcement would be enough (for the best estimate on when any new Shuttle work would begin, calculate when the Space Station contracts will start drying up).

If private space transportation is suppressed by any form of government interference, then the exploitation of space as a whole will be seriously hampered. In the long run, it might not make any difference: neither the Shuttle nor Ariane will lack for customers. The military will be there, and there will be plenty of large companies with the multiple millions required to place their payloads into space. And, there are always the Getaway Specials to throw as bones to the rest.

Slowly but surely, as billions upon billions of dollars are thrown into the effort, humanity may yet move outward into space. How slowly? A letter appearing in the June, 1983 issue of Spaceflight contained a chart from the NASA Office of Space Flight. This chart showed NASA's estimate of manned progress in space. Each goal listed in the chart is followed by two numbers: the first number gives the date the goal would be achieved under an "accelerated" program and the second number (in parentheses) is the date for a "medium-pace" program. The chart appears below:

Permanent Space Station	1990 (1991)	Permanent Lunar Orbit Station	2008 (2010)
First Geosynchronous Mission	1995 (1998)	Mars Landing	2010 (2015)
Permanent Geo. Station	2000 (2001)	Permanent Lunar Base	2016 (2020)
Return To Lunar Orbit	2007 (2009)	Permanent Mars Base	2050 (2060)
Return To Moon's Surface	2010 (2012)	Flight to Jupiter	2100 (2120)
		Flight to Saturn	2120 (2140)

This chart is profoundly depressing to those of us who had once hoped that men would be orbiting Jupiter in the year 2001. It is even more depressing to realize that the very first NASA goal on the chart, the Permanent Space Station, will actually be completed in 1994 or later, instead of 1991.

All this should not escape the notice of those who are pushing for more and more government expenditures in space in the mistaken belief that it is the best way to accomplish these goals. NASA's achievements, impressive though they have been, have generally turned out to be "flashes in the pan," dwindling and dying after the basic goal had been accomplished (the Apollo program and Skylab, for example). This is not (as most seem to think) due simply to a shortage of taxpayer funds. Rather, it is due to a lack of the long range, responsible, market-oriented approach which is essential for successful private endeavors and rarely found in any government activity (at the bottom line, the only real goal that the NASA bureaucracy has is its own perpetuation). This approach has led to bitter frustration for those individuals (many of them within NASA's own ranks) who had hoped that each such achievement would be a decisive forward step in a constant progressive movement of humanity toward the stars.

There may be little that most individuals can do to assist the efforts of private space entrepreneurs as far as investment is concerned--the resources needed are not easy to come by. However, there is no excuse for standing by and allowing government to hamstring the endeavors of free enterprise. Concerned individuals can lobby to modify or obliterate regulations such as the DOT's "mission review policy," and those international agreement on which they depend. In addition, the government should be made to institute a policy that turns commercial space transportation permanently over to the private sector, leaving NASA as the research agency it was intended to be. These and other actions will be required to stop those in the United States and in other nations who see space as the property of the State.

Until next time,

*Tom Brosz*

The *Commercial Space Report* (C.S.R.) is published monthly, and endeavors to report and analyze developments in the field of private initiatives in space transportation and exploitation.

Subscription rates are: U.S., Mexico, Canada: 1 year--\$15.00, 2 years--\$28.00, 3 years--\$39.00. Foreign Air Mail: 1 year--\$20.00, 2 years--\$38.00, 3 years--\$54.00. Back issues are available at \$1.50 each from September, 1977. Xerographic copies may be substituted as stocks are depleted.

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