Apr 26th, 3:00 PM

Paper Session II-B - The U.S. Commercial Launch Services Industry and International Competition

Dennis R. Dunbar  
*General Dynamics, Commercial Launch Services*

Lee R. Scherer  
*General Dynamics, Commercial Launch Services*

Follow this and additional works at: https://commons.erau.edu/space-congress-proceedings

Scholarly Commons Citation  
https://commons.erau.edu/space-congress-proceedings/proceedings-1989-26th/april-26-1989/15

This Event is brought to you for free and open access by the Conferences at Scholarly Commons. It has been accepted for inclusion in The Space Congress® Proceedings by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.
THE U.S. COMMERCIAL LAUNCH SERVICES INDUSTRY
AND INTERNATIONAL COMPETITION

Dennis R. Dunbar & Lee R. Scherer
General Dynamics
Commercial Launch Services

Abstract

This paper discusses the threat to our fledgling commercial ELV industry of current and anticipated foreign competition, which is generally subsidized by their governments. It considers actions that might be taken by U.S. industry members to improve their competitive position and steps that might be considered by the U.S. government to support this industry so important to the U.S. national strategic posture.

Introduction

From the birth of the space age until about 1980, the United States had a monopoly on space launches in the free world. The decision by the United States to cease purchasing expendable launch vehicles and place all of our launch needs on the Space Shuttle was at least one fundamental point in the decision of the European community to develop its own ELV - the Ariane. Although Ariane had the usual infant mortality problems, it was soon evident that this European vehicle would be a formidable competitor for the launching of commercial satellites. The negative effect on our balance of trade could be significant.

In 1983 the decision was made to allow privatization of the government - developed launch vehicles and the U.S. commercial launch services industry was born. The brief history of this industry has been one of continuing and difficult competition.

Throughout this paper, the commercial launch services industry is defined in a narrow sense as those larger launch vehicles originally developed under government contract. Launch services using improved versions of such vehicles are being marketed by General
Dynamics, McDonnell Douglas, and Martin Marietta to foreign and commercial customers, primarily for communication satellites. There is another segment of this industry which will not be covered in this paper. It consists primarily of entrepreneurs developing smaller vehicles, generally for low earth orbit missions. Members of this group include Space Services, E Prime, Conatec, American Rocket, Orbital Sciences, and most recently LTV. Their future depends on the need for smaller satellites by government and commercial customers. Recent increase in interest within the government for light satellites has brought more promise to this segment.

Industry Phases

Competition to our commercial ELV industry can be divided into rather distinct phases as follows:

Phase I 83-86 Space Shuttle  
Phase II 87-88 Ariane  
Phase III 89 Long March  
Phase IV 90+ TBD

Phase I - Space Shuttle

In order to attract the maximum number of commercial customers to the Shuttle, which would keep the launch rate high and the cost per flight down, a pricing formula was established which was very attractive to the satellite owners. The Ariane was being offered at similar prices with the backing of the European member nations. It was a price war in which the U.S. commercial industry could not participate since the cost for building one of our vehicles was much more than the price offered by either Shuttle or Ariane.

The U.S. commercial industry could not compete with its own government.

Phase II Ariane

The Challenger tragedy was followed some months later by a Presidential directive that the Shuttle would no longer carry commercial payloads, with a small number of exceptions. The price of Ariane increased, due in part to a weakened dollar, and our industry (Figure 1) could compete on a more or less equal footing.
This phase has brought modest success and each of the companies have been able to obtain some firm contracts. In early 1989 the total number of commercial contracts (non-DoD) is 21, and of these 11 are non-U.S. which represents a significant positive balance of trade. This degree of success has been due in part to the fact that many of the Shuttle customers moved quickly to Ariane after the Presidential decision. This coupled with the two Ariane failures in 1986 and the resulting hiatus left the Ariane manifest very full.

Ariane is a tough competitor. The launch rate over the past twelve months is enviable. Ten launches have been scheduled in 1989. Recently a buy of 50 Ariane IV vehicles was announced.

This phase can be characterized as a wide-open free enterprise competition. The playing field is somewhat tilted in that Arianespace enjoys more government support than do the U.S. companies. These are in such areas as government funded R&D, and other financial and insurance support. For example, the R&D to develop Ariane 4 and Ariane 5 were funded by the European Space Agency (ESA) and is not recovered in prices charged to commercial customers. The R&D to develop Atlas I, II, IIA, and IIAS were all paid for by General Dynamics and must be recovered through commercial sales. As another example, we must carry $500 Million third party liability insurance with the U.S. government covering the next $1.5 Billion. Arianespace is required to have about $70 Million insurance with the French government covering all above that. A very important difference in financial risk is in the area of launch failure. If Ariane fails due to operational problems, Arianespace is responsible. If the failure is due to a design problem, then ESA covers the failure analysis and corrective actions. With the third stage engine problems that occurred in 1986, media reports placed the costs at some $300 Million. If U.S. companies have a failure of a commercial vehicle, each company is responsible for all of the costs.

During this phase General Dynamics assessed the market and the competition and made the decision to proceed with the production of 18 Atlas I vehicles when we did not have a single order. We knew that we could compete with Arianespace only through a quantity buy. This is the kind of risk-taking measures that the commercial business requires if one is to be successful. Later we were awarded the MLV-2 contract by the Air Force and we further increased our exposure by committing to production of commercial variances of
this larger vehicle. There is no question that we are committed to full competition with Ariane and with our American peers.

Phase III - Long March

In mid-1988 Aussat held a competition for its next generation of satellites. The three U.S. spacecraft companies bid as well as a European team of British Aerospace and Matra. Hughes was selected as winner. The Australians asked Hughes to obtain export licenses to ship their two spacecraft to China for launch on Long March, since the launch costs were only about 1/3 as much as those of any U.S. launch provider or Ariane. At the same time a consortium called Asiasat, who owns the recovered Westar 6 spacecraft, asked Hughes to obtain an export license for that satellite.

Whether or not such licenses should be granted and, if so, under what conditions, then became a prime subject for debate within many departments of the Administration and on the Hill. Figure 2 shows that the Chinese are developing a family of launch vehicles that encompass a very broad spectrum of payloads.

The U.S. industry's argument against Long March can be summarized in four distinct categories:

1. Inconsistency of National Policy - The Administration and Congress had strongly urged the U.S. companies to enter the commercial arena. We have subsequently all made major capital investments. Now, before we have even made our first commercial launch, a different policy allowing China, a non-market economy, entry into this market can serve to kill the industry established by the earlier policy.

2. Negative effect on national security.

(a) A major argument for government support of the commercial ELV industry initially was that it constituted a "reserve fleet" in the event that one or more Defense vehicle programs are grounded. Long March entry will likely cause drop out of one or more of the U.S. companies decreasing or eliminating such a back-up.

(b) A concurrent commercial industry reduces the cost of launch services to the Air Force. For the MLV-2 competition, we
were able to show that our having embarked on a commercial program resulted in a substantial savings to the Air Force.

(c) The Long March vehicle required to launch Aussat must be of twice the performance of the existing vehicle. Providing the incentive for the growth of a potential weapon system by a factor of two is certainly not in the best interest of our national security.

3. Technology Transfer - The U.S. is far ahead of the Chinese in satellite technology. Integration of a satellite on a launch vehicle requires exchange of substantial technical information. Under the Aussat contract there are significant penalties for schedule delays. The U.S. satellite company will have a strong motivation to assist with problems that arise in development of this growth vehicle. This is not only with technical problems, but in management techniques and documentation requirements that we have learned over the past 30 years - often the hard way.

We know that satellites can remain essentially intact if a launch vehicle is destroyed early in the launch phase. Many here remember the OTS launch on Delta in 1977. The spacecraft was recovered and remained on display at ESTEC in Europe for some time. There have been similar occurrences with military payloads. Recovery by the Chinese of such a U.S. satellite would be a major technology gain for them.

4. Unfair Trade Practices - A capitalistic country cannot compete with a non-market economy whose prime interests are prestige, technology and obtaining of hard currency. A controlled economy can charge any price it chooses. If there are no restrictions PRC can capture as much of the market as their production capabilities allow.

Our arguments were accepted by many, but also opposed by many who believe in a free trade policy for this country and that market forces should prevail. Aussat threatened to reconsider its offer to Hughes if the licenses were not approved, so loss of the U.S. business had to be considered. There were foreign policy implications about which we can only guess but obviously the U.S. wishes to better its relations with the PRC and we know the Chinese placed a high priority on gaining approval for launching of these satellites.
The issue had to be elevated to the very top. In November 1988 the President approved the granting of export licenses for the three satellites subject to certain conditions. There had to be assurances that there would be no technology transfer; the PRC had to sign the liability treaties that other nations have signed; and there had to be an agreement to "prevent possible unfair Chinese pricing or trade practices." The first two points were concluded quickly. The last was much more difficult and the agreement was not signed until late January.

Some major conditions in the agreement are that the Chinese may be given export licenses for as many as nine launches over the six year period 1989 - 1994. Their price and terms and conditions must be "on a par" with those of western launchers. They cannot charge promotional prices except for the first successful launch of a new vehicle. Their commitments must be spread proportionally over the six-year period.

Monitoring of this agreement by our government will not be easy. Probably most difficult will be the determination on what pricing "on a par" means since this requires the gathering of proprietary data which companies may or may not be willing to share.

In any event, today the U.S. companies must not only compete with an aggressive and capable Arianespace; but also with PRC, a non-market economy, with whom an already thin market must be shared.

**Phase IV - TBD**

The danger with the Long March decision is the precedence that it sets. The U.S. has used the export licenses as an instrument of foreign policy. What happens if the same process is requested by the USSR for Proton launches? Today there is a strong edict against exporting of U.S. spacecraft into the Soviet Union. Suppose the Soviets launch from outside the Soviet Union, such as from Cape York? This certainly reduces the technology transfer issue. Or suppose Proton is sold to another organization in the free world to launch? What then would our policy on export of U.S. build satellites be?

The USSR has an awesome launch capability which could dominate the commercial market. The relationship between our two countries may or may not soon reach the state that they would be allowed to
launch U.S. spacecraft. But there are other competitors coming down the road, Japan followed possibly by others like Brazil, India, and Israel.

The Long March decision with a quantity standard was cartelization. We have started dividing up the pie. Each new entry will want its fair share.

Phase IV may determine whether there is a commercial ELV industry at all, or whether our commercial satellite industry will be completely dependent on foreign launch services.

Conclusion

Where is this all going to lead? The answer is unclear at this point in time. There are certain things that our industry must do to survive:

1. We must recognize that we are in a commercial business with aggressive foreign competition for whom there are elements of national assistance that can probably never be completely irradiated.

2. To compete we have to take risks which were unheard of with our comfortable government contracts of the past. If General Dynamics had not committed to produce 18 vehicles without a single order there is no telling what our status would be today.

3. We have to aggressively seek ways of reducing costs while still maintaining or improving our high reliability. Arianespace has just announced a 50 vehicle $3 Billion production order. That is a tremendous industrial base over which to spread costs.

4. We have to do a continuing and effective job of convincing Congress and the Administration of the importance of maintaining a viable commercial launch services industry and seek support where required.

But no actions that we can take may prove sufficient to keep us in the business without our own government's support. In discussions with various Departments before the Long March decision, we found a number of free trade advocates. One stated bluntly "If the Chinese price for Long March in only 1/3 as much as U.S. industry's price it
sounds like you folks could use a little competition." This attitude completely ignores the fact that Chinese workers are paid 20 to 50 dollars per month. Or that President Reagan has stated that a viable commercial ELV industry is vital to our national security. Or that if we lose the ELV industry the satellite industry will surely follow.

From our government:

1. We need a priority effort in the establishment of the legendary international "level playing field" for the industry. Discussions have been held for the last three years with Arianespace with little progress.

2. We need firm quick reactions against Chinese violations of the Long March Agreement, which calls for pricing on a par with western launchers and proportional distribution of the commitments over the six year period of the agreement. The export license process is controlled by the State Department. Monitoring of the agreement is done by the U.S. Trade Representative. The only real club we have against PRC violations is the denial or revoking of export licenses. We have one example in our industry of a claim of unfair trade practices by TCI against Arianespace. The procedure took 18 months. If export license approvals were to continue while deliberations over agreement violations are underway over such a period, we are liable to be out of business before a finding is ever reached.

3. We need an unwavering stance by our government against allowing entry of the USSR into the international market. There is no way any of us can compete against a non-market economy who is launching 90 vehicles a year.

Without our industry's own extensive effort and dedication and without the U.S. government's backing it is fair to say that the history of the U.S. commercial ELV industry will be very brief.
WESTERN COMPETITORS FOR LAUNCH SERVICES

- **ATLAS FAMILY**
  - Payload: 5000–8000 lb to GTO
  - Manufacturer: General Dynamics
  - Country: U.S.

- **DELTA II**
  - Payload: 4000 lb
  - Manufacturer: McDonnell Douglas
  - Country: U.S.

- **TITAN III**
  - Payload: 10,000 lb (dual)
  - Manufacturer: Martin Marietta
  - Country: U.S.

- **ARIANE 4**
  - Payload: 10,000+ lb (dual)
  - Manufacturer: Arianespace
  - Country: Europe

FIGURE 1
LONG MARCH FAMILY OF LAUNCH VEHICLES

- CZ-1D
- CZ-2C
- CZ-2E
- CZ-3
- CZ-3A
- CZ-4

AUSSAT
ASIASAT

FIGURE 2