Apr 29th, 8:00 AM

Paper Session II-A - Launch Services Infrastructure: Commercial Needs Outstrip Availability

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Launch Services Infrastructure:  
Commercial Needs Outstrip Availability  
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The Space Launch Industry is currently experiencing a radical change in direction and complex-
ion. After over 40 years of cold war spending by the Department of Defense, combined with  
NASA’s aggressive pursuit of scientific knowledge, the United States has produced a capability  
evied and copied throughout the world. But the imperatives of the coming century are vastly  
different than those which have governed our operations in the past. With the virtual elimination  
of our cold war enemies combined with a political establishment preoccupied with budget cuts, a  
door has been opened allowing commercial interests to move to the forefront. Today’s Space  
Launch Industry is transforming into yet another extension of our growing global economy.

Recent years have seen an explosion in the development of commercially sponsored space  
applications ranging from remote sensing to the exponential growth in the telecommunications  
sector. This growth in commercial applications is producing a noticeable evolution in our indus-
try. In response to the increasing need for commercially sponsored satellites on orbit, we have  
seen the emergence of several companies focused on providing services and capabilities to  
meet these requirements. The past decade has seen the formation of companies dedicated to  
the creation of everything from launch vehicles and satellites, to commercially operated launch  
facilities, or spaceports. Additionally, with the emergence of this new market we have seen the  
traditional, large government and NASA prime contractors, reshape their operations in order to  
capture a share of this growing market. In fact, it is the race between the emerging companies  
and the reshaping of traditional prime contractors, which will define the future of this industry.

The pressure to commercialize space, combined with the rapid reduction in government spend-
ing, is forcing the industry to operate under significantly different parameters. The ability to  
compete globally, as we have seen in so many markets, will force vehicle, satellite, and facility  
providers to approach their business from a new perspective. Commercial competition fosters  
imagination, pushes for increasingly lower prices and improved efficiencies. The leaders of  
these companies must guide their businesses with a much broader perspective and with an eye  
on an increasingly competitive global market place.

This pressure from the commercial industry is real. Recent projections indicate that the teleco-
munications sector alone, could require the placement of over 275 satellites into geo-stationary  
orbit (GEO) by the year 2006, and the requirements for low earth orbit (LEO) communications  
constellations could be twice that of GEO. Some projections estimate that by the year 2005,  
over $100 Billion per year will be spent worldwide in activities associated with commercial space  
and the industries it benefits. When factored in with the continuing needs of NASA and the  
government, the launch requirements from Cape Canaveral in Florida and Vandenberg Air  
Force Base in California, will outstrip current capacity by 2003.

Today there are several companies working to address this expected lack of capacity. Seen as a  
provider of "off the shelf" capability, Russian boosters are being aggressively pursued as a quick  
avenue to a wide variety of proven launch vehicles. In addition to bringing Russian boosters to  
satisfy the commercial requirements, new vehicles are currently under development. The US Air
Force is sponsoring the development of two new boosters currently being designed by Lockheed Martin and Boeing as part of the Evolved Expendable Launch Vehicle (EELV) program. When completed, EELV will provide low cost, flexible vehicles able to support small, medium and heavy payload requirements. NASA is also supporting the development of new launch vehicles through programs such as Bantam. The Bantam Program will develop a small launch vehicle able to place a 150KG payload into sun synchronous orbit. In addition to these government sponsored programs, several companies are currently developing new vehicles entirely with private funding.

Taken in total there are a dozen new vehicles entering the market. Of course it isn’t reasonable to assume that all will survive and make it into operation, but certainly the available stable of vehicles will grow, especially when you consider that many of the vehicles in operation today such as Atlas, Delta, Proton and others, will continue to operate. This expansion in the vehicle stable can provide the necessary capacity and flexibility in one element of the launch support puzzle.

But vehicles alone can not satisfy the entire capacity issue. Once you have solved the problem of producing launchers at a rate equal to that at which satellites will be produced, a new problem emerges. Will there be enough payload processing facilities and launch sites available to meet the required launch rate? Clearly, by the year 2000, the primary limiting factor will be the availability of infrastructure at the launch site. Today, fully 70% of the new vehicles hoping to enter the market lack a presence on the primary launch ranges (Cape Canaveral and Vandenberg Air Force Base).

Commercially operated spaceports are an attempt to solve this problem. As has been demonstrated, launch facilities can be designed to support multiple vehicle configurations. Today’s spaceports are designed with the intent of supporting a variety of booster configurations. Therefore, a NASA Bantam, a Russian Start, or an Athena, three significantly different configurations, can all fly from the same launch site. Additionally, commercial operations have proven the ability to operate more efficiently and while reducing recurring costs to each user. Today, a few start-up spaceports are working to gain recognition and support for their new approach to launch infrastructure. And at this time, it appears the battle over infrastructure could ultimately have a more profound impact over the future of the commercial launch industry, than any other single factor.

In order to understand this statement, we must recall my opening comments. Launch operations in the United States has a proud tradition. It is that tradition which has established practices which govern our operations today. In order to further clarify this discussion there are some important points which must be considered:

Traditionally, launch facilities have been constructed as part of a focused program requirement. As an example, the government requires a capability which is provided by a particular launch vehicle (Atlas, Delta, Titan, etc). A contract is awarded to a prime contractor for the production and launch of this vehicle. With the contract also comes the government-supported requirement for a launch facility. This is ultimately how most launch facilities are allocated and constructed, under government or NASA direction.

An interesting by-product of this relationship of program requirement driving vehicle and facility development, is that the launch vehicle drives the configuration of the launch site. This is a totally logical relationship, and has supported the development of government programs very well. But, today this relationship is limiting the development of the commercial booster market. Simply put, contractors who operate, maintain and fly from the existing launch facilities have a
virtual lock on the market. Since there are a limited number of launch sites on both coasts and these limited sites are designed to support one vehicle only (theirs).

A third point, and perhaps the most difficult to address within this paper, is that those contractors who are currently operating launch sites are being paid by the government to maintain them. Once again, a very logical relationship developed over time. The government had a requirement, which led to the development of vehicle and associated facilities, and the facilities must be maintained. The contractors currently operating those facilities have no desire to see their government operations and maintenance (O&M) contracts end. The move toward commercial operations and commercially operated launch sites would allow the government to move out of the O&M business.

These three points are significant, and lie at the heart of our future ability to meet government and commercial launch rates. Taken together, what they produce are the following conditions. Today we are limited to a handful of facilities, each of these facilities is designed to support only one of an even smaller number of launch vehicles. These facilities and vehicles are manufactured and operated by yet an even smaller number of companies, who are naturally working to control their share of the market. This is a capacity-limiting scenario which runs counter to the needs of commercial customers.

If commercial spaceports are unsuccessful at providing infrastructure for the future, then new commercial launch vehicles will either have no place to fly, or be forced to perform unnecessary and expensive modifications to surplus launch facilities. This runs counter to the needs of the commercial market. Should this condition remain unchanged, the commercial customer will be faced with a limited number of choices at U.S launch sites. The customer will demand lower cost, highly flexible and efficient operations and receive in response two options, at best, within each weight class.

The solution to this problem will require a substantial break from tradition and perhaps the one best suited and most able to initiate the break, is the government. In the past the government had to pay for the development, manufacture, construction, and maintenance of their launch capability. But it is clear there is sufficient interest (read that revenue potential) in the commercial market, that those companies wishing to compete for this business will be willing to develop and maintain their own launch capabilities. The government will be afforded the luxury of purchasing their vehicles and services off the line at competitive and greatly reduced prices.

This change will open the door to commercially operated spaceports. With the government no longer paying for the operations and maintenance of the sites, booster companies will begin looking for cost-effective ways to reduce recurring costs. Spaceports are an effective means to reduce both recurring and non-recurring costs to individual users. They have accomplished this through designs intended to accommodate multiple users and launch configurations, thus providing flexibility, and allowing for a broader business base in which to spread the cost of operations. More users, more flexibility, more launches, lower cost to the user.

Additionally, the shift to commercially operated launch sites will open the door to vehicle providers looking for facilities to support their requirements. By opening the doors to more vehicle configurations, ultimately you open the doors to greater competition, and it is in competitive environments which commercial industries thrive.
By stepping out of the launch services and maintenance business, the government has the opportunity to initiate the reduction in facility costs while increasing the stable of available vehicles. These changes will ultimately provide an environment which will allow the commercial launch services industry to thrive and grow at a rate equal to that of the telecommunications industry driving it.

The Next Challenge
Solving the infrastructure issue is a critical first step toward improving commercial operations on both coasts. Having solved the infrastructure issue, other challenges emerge for commercial operators. Perhaps the most critical challenge will be the identification of the resources necessary to achieve a competitive advantage. The most important of these resources is technical and managerial expertise. On both coasts, there exists a select group of individuals who understand the requirements and realities of operating within a competitive commercial space launch industry. Specifically:

There is a select group of individuals who understand the needs and the goals of commercial customers. These individuals strive to improve the operating potential of their programs and organizations with the express intent of producing advantages for their customers.

Of this select group, even fewer have the technical expertise to solve unique problems or produce new ways to achieve competitive or technical advantage.

Even fewer of these individuals can produce cost effective approaches which will satisfy both the technical and the programmatic challenges consistent with commercial challenges.

To make things even more interesting, this select group of individuals is spread throughout different companies and organizations. They do not reside all in one place. Though this is a problem, the commercial environment provides the freedom, through flexible subcontracting schemes, to access this expertise.

The customers which identify these individuals and the companies which create the ability for their key players to be accessed, will shape the future successes of the Space Launch Industry.

Conclusion
Few participants would argue that todayís Space Launch Industry is experiencing radical change. The outcomes of todayís infrastructure battles will significantly effect the nature of the commercial (and government) launch capability well into the next century. The success of any commercial venture typically stems from competitive advantage and product quality, combined with the ability to deliver product at the point and time of market demand.

The creation of infrastructure options increases the capacity of the Space Launch Industry. The identification and utilization of key resources maximizes the commercial providers ability to deliver their product at the lowest possible cost at the optimal stage of market demand. The need for infrastructure, more payload processing and launch site capacity, and access to key personnel at both ranges, will continue to be central to the success of commercial space launch ventures in the United States.

The views expressed are those of Mr. Dominick Barry, not of Spaceport System International or its limited partner ITT FSC.