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What's Wrong With the Commercial Space Launch Act: A Launch Base Perspective

By Lt Col Wayne Eleazer

Background

The Commercial Space Launch Act, known by the abbreviation CSLA, was passed by the U.S. Congress and signed into law by President Reagan in 1984. The CSLA was later amended in 1988 and was recodified into Public Law 103-272 of the U.S. Code in 1994, the most recent act accomplished without making any real changes in the law.

The CSLA and its amendments deal with a variety of issues, including government agency responsibilities, licensing of commercial space launch activities, requirements for liability insurance, and charging policies for private acquisition of government property and services. Most importantly, the legislation clearly indicates that the U.S. Government has the responsibility to support and encourage the commercial space launch market. U.S. Government agencies must allow commercial launches to occur and allow commercial launch firms access to U.S. launch ranges, facilities, and excess launch property except under a very limited set of circumstances.

The CSLA was the enabling legislation for the development of the U.S. commercial space launch industry. By requiring that commercial firms have access to government owned launch infrastructure and by limiting the costs charged by the government for the use of the infrastructure, commercial space launch operations became technically and financially viable. The first truly commercial operations began in 1987 with the launch of the commercial Delta Palapa B mission. The Delta program's success was followed by the launch of various commercial Atlas and Titan III missions, and in 1993 the first commercial Pegasus flew from the Eastern Range.

Evolution of the Industry

Commercial launches significantly increased in number over the following years. This was also accompanied by a decrease in the number of government launches as the Department of Defense's satellite constellations became operational. In 1997, commercial launches at Cape Canaveral amounted to 47% of the total, and at Vandenberg AFB they accounted for a remarkable 63% of space launches. In the future, commercial launches are expected to account for upwards of 70% of future launches from U.S. launch ranges.

Initially, commercial launches were merely a small subset of government launch activities, both in number and in nature. The type of launch vehicles employed, the operations methods used, the infrastructure utilized, and the organizational and management relationships for both commercial and government missions were essentially identical. An Atlas or Delta launched to place a commercial satellite in orbit differed was essentially indistinguishable from one launching a government payload, but by the mid-90's a new trend was evident. Unique commercial vehicles were being developed and new privately funded infrastructure brought on line to support them.

The commercial environment altered in other ways as well. There were new, and distinctly different players. State agencies sought to enhance their local markets. Companies appeared which did, or desired to, provide services to the industry outside of or in addition to services provided by government. Other companies sought to or actually adopted business practices intended to ensure their dominance in the marketplace.

Since the beginning of commercial launches, the main day to day supporter of the commercial launch industry, the U.S. Air Force, has gained considerable experience with the industry's preferences, requirements, and capabilities. As a result, the Air Force has placed additional emphasis on achieving reduced range turn around times, higher launch rates, and lower costs. Most recently, the Air Force made a radical change in its future procurement and launch operations plans and now will utilize an almost completely commercial approach to place its payloads into orbit.

Thus, as compared to the environment in which the CSLA and its amendments were developed and enacted into law, there has been considerable evolution of the industry. It is considerably more robust, much more of a factor at the launch ranges, more diverse in nature, and more purely commercial in its business practices and overall outlook.

The Excess Capacity Dilemma

A basic concept in the CSLA is the concept of what has been termed "Excess Capacity." Under this concept, commercial firms are allowed to use "Government launch property which is excess or is otherwise not needed for public use and launch services that are not needed by the Government." In other words, the Federal Government is not allowed to subsidize commercial space launch activities, but also cannot charge commercial firms more than the "additive" cost associated with direct support of the specific commercial activity.

Excess Capacity is probably the most important single principle contained within the CSLA. Before the Act, Federal agencies would have been required to charge commercial operations not only for the actual, direct cost of operations, but also for military manpower used, and even for a portion of the associated investment costs. By both prohibiting subsidies and preventing charges that were not truly a result of the commercial activity, U.S. commercial launches were essentially placed on equal footing with the government launches conducted by the same companies. This approach was modified somewhat by the first amendment to the CSLA, the Commercial Space Launch Act Amendments of 1988, Public Law 100-657, which further specified that "direct" charges should be those which were "additive" in nature. The amendment did not have an immediate impact on the Air Force's charging practices for commercial customers, since it took some time for the Service to define a commercial charging policy, this not being accomplished fully until 1995.

The wisdom of the Excess Capacity commercial charging and access approach specified in the CSLA cannot be disputed. It supported free market principles, kept commercial costs to a reasonable level, enabled commercial firms to estimate their costs with much better accuracy, and allowed the government launch ranges to utilize a virtually identical charging practice for all launches. Excess Capacity also reflected the actual situation at the government launch bases, since commercial missions initially were in the minority.

However, as the commercial industry grew and evolved, problems with the original excess capacity concept increasingly became evident. First, it became obvious that as commercial missions began to dominate activity at the Air Force launch ranges, a "right-sized" DoD launch capability would be totally inadequate to meet commercial needs. This situation was first recognized in the late 1980's, when General Dynamics took the nearly unprecedented step of upgrading a deactivated government launch complex SLC-36B, at the company's own expense, solely to meet commercial launch requirements and leasing land for the construction of support facilities, also at company expense. While the SLC-36B situation was within the original concept of excess capability, other issues arose which pointed out flaws in the concept. The support infrastructure used by all missions, both commercial and government, suffered from aging facilities and utility systems. While they were vital to commercial missions, and in fact came to be utilized by them more frequently than for government missions, there was no way to ensure that commercial users contributed to their upkeep, improvement, and replacement. A roof or utility system does not wear out more frequently due to increased use by the program which depends upon it; these costs were not "additive." Despite this fact, with decreasing government launch rates, the Air Force has found it difficult to justify the increases in funding. In fact, in 1993 the Office of Secretary of Defense (OSD) Comptroller cut Operations and Maintenance (O&M) funding for the Air Force launch ranges solely based upon the assertion that since the Service's procurement of launch vehicles had decreased, the O&M costs associated with supporting the launches of them must decrease as well. For all practical purposes, this funding cut erased O&M increases the same office had approved two years before. This constituted an official OSD position that commercial launch requirements could not be factored into Air Force O&M budgets.

In one sense, the Excess Capacity concept was never really implemented. Theoretically, the Air Force would have been required to meet all DoD requirements for both space launches and test activities and then allow commercial activities to utilize what was "left over." In reality, the scheduling of space launches is a process that typically must be accomplished years in advance, so it was hardly feasible to wait until DoD missions were complete to determine if excess capacity existed. As the backlog of DoD payloads required to be launched was worked off, more and more capacity became available for commercial use, but even early-on the Air Force recognized the need to make available a number of launch slots for commercial use. Furthermore, once scheduled and agreed to, commercial and DoD launches were treated with equal priority at the launch bases. The ultimate abandonment of Excess Capacity in scheduling launches occurred in 1997, when the catastrophic failure of a Delta II mission while launching an Air Force Global Positioning System (GPS) satellite caused a major back-up in Delta II launch schedules. The Air Force agreed to allow commercial missions to go first, and deferred the launch of a replacement GPS satellite for months so that a number of commercial missions could be launched first.

As commercial launches increased in number, other problems with the excess capacity concept became apparent. Commercial launch firms found that they had to commit to strict schedules, with penalties for late delivery of the payload to orbit. This placed an added emphasis on schedules. Since the Air Force launch ranges could only support one launch at a time, and reconfiguration of the ranges between different launches (range turnaround time) typically required approximately 48 hours, conflicts became common, if relatively short in duration. This situation was exacerbated when the inevitable schedule slips and launch scrubs occurred due to weather problems and equipment failures. On the average, it typically has required from about 1.25 to 1.5 launch attempts for each successful liftoff. Commercial launch firms occasion-

ally found themselves waiting weeks for their next available launch date when confluences of bad luck and full schedules occurred. Despite the mandated Excess Capacity approach, no government missions actually “bumped” commercial launches. However, delays in one mission, combined with weather problems and last-minute hardware failures, tended to have cumulative scheduling effects on all missions, in part due to the range’s inability to shift quickly from one mission to the other.

The answer to range turnaround time was very simple; add additional personnel so as to allow a second shift. This by itself would cut turnaround time approximately in half, but once again the Excess Capacity limitation would not allow the solution to be implemented. The Air Force could not provide a “free” second shift; that would be considered subsidization. The Air Force also could not pass along the entire cost of the second shift to the commercial customers, since the firms could only be charged for the portion which they actually used, when they used it. This would require the Air Force to fund an additional several million dollars a year to provide a capability with a very limited military utility. Not only was this unpopular within a cash-strapped Air Force, it would not, and did not, escape the sharp-eyed accountants in the OSD Comptroller’s office. The Air Force’s answer to this dilemma was to refocus range upgrade efforts on the improvement of range turn-around time through technical improvements in the range instrumentation and communication systems. Unfortunately, this approach is not only costly, but requires years to implement. In any case, the problem remains, although a solution is now in sight.

One of the more unusual problems with the Excess Capacity approach only became apparent when the commercial firms began to require additional infrastructure for new programs and expanded operations. The firms began to require additional communications links to existing facilities and new links to new facilities constructed at their own cost. They have been quite willing to pay for this type of infrastructure, but problems occurred because only the Air Force can provide the engineering and installation required for such capabilities; configuration control demands this be so. This in turn created two problems. First, the Air Force typically did not have the manpower to meet the schedules the commercial firms demanded. Second and more seriously, legal review determined that the phrase in the CSLA “launch services that are not needed by the Government” did not include installations which the Air Force did not require to conduct its activities. In short, the firms were willing to pay the cost of meeting their requirements, but the Air Force could not allow them to employ an outside contractor and still maintain satisfactory configuration control of communications systems. Neither could Air Force agencies perform the work, since it was “outside the scope” of the CSLA. Finally, there was the old problem of capacity to handle the workload. This remains an unsolved problem.

As the implications of the CSLA were examined by the Air Force, there was noted also a rather curious exception in the law to the excess capacity concept. Raw, or unimproved land was not to be considered as launch property, and since it was not, the CSLA virtually did not apply. Therefore, if firms wanted to rent land on the Air Force launch bases for the construction of new commercial facilities, it had to be on a rental basis. Even though the construction of the commercial facilities cost the Air Force nothing, frequently enhanced Air Force capabilities (by improving launch capabilities for both the government and commercial customers), sometimes even lowered government costs (by replacing or freeing up government owned buildings), and was essentially making use of one form of Excess Capacity (undeveloped land at the launch bases), commercial firms were required to pay rent for the land. The basis of the rent, the “fair market value” of the land, makes little sense. Much of the land on the Air Force launch bases is

of no value on the open real estate market; it's location and safety restrictions make it unsuitable for the construction of housing, most agriculture, or ordinary industrial uses. On the other hand, due to the proximity of the operational launch facilities, range support capabilities, specialized base support functions, and absence of zoning restrictions, the land's value for space launch activities is incalculable. Given this, charging for land use appears to violate the essence of the CSLA, and the "fair market value" approach appears to be unrealistic at best.

Dealing With New Players

The CSLA envisioned four elements interacting in the commercial space launch industry; the individual private commercial firms, the Department of Transportation, the Department of Defense, and the National Aeronautics and Space Administration. Since that time, new players have entered the field in ways not envisioned in the original CSLA.

The first new players to show up were the state agencies. These included the Spaceport Florida Authority (SFA), the Western Commercial Space Center, the California Spaceport Authority, the Alaskan Aerospace Development Corporation, the New Mexico Spaceport Commission and the Virginia Maryland Spaceport Development Group. These organizations interest in promoting their state's involvement in commercial space developments were followed by local county or area (e.g. multi-county) organizations which focused on promoting specific areas. Identifying even the nature of these organizations proved to be a problem almost immediately, since they varied greatly, from Florida's official state agency to some of the other states' combined public-private approaches.

These organizations were similar in some respects to commercial space launch companies, since they required some of very same support, services, and access to government property as did the commercial firms. In other respects, they resembled local governments, in that they had no product as such to sell, and no profit motive. Depending on the organization, the location, and the issue, to the Air Force these organizations appeared to be either state agencies, regulatory authorities, real estate magnates, sources of technical expertise for customers, political lobbyists, commercial companies, or cheering sections.

Most unusual of all were those that wished only to assist in making the launch base more attractive to industry, such as the Economic Development Commission of Florida's Space Coast and similar organizations in California. Such organizations presented special problems for the Federal Government. Since they were specific to the local area, and therefore by their nature prejudicial relative to other geographic locations, the Federal Government had to remain somewhat at arm's length, even when their activities were compatible and complementary.

Although the state and local agencies were not addressed in the CSLA, the Air Force quickly decided to treat them in more or less the same manner as private commercial space launch firms in terms of meeting their support requirements. In terms of other areas, the agencies activities have been treated in a manner appropriate to the situation. In the area of excess property, the Air Force concluded that normal procedures for the disposal of property relative to state government did not apply, and that state agencies should not receive preferential treatment when competing with private firms for the use of excess property. The single exception to this rule is associated with the "brokering" of property for use by multiple customers; state agencies can be allowed to broker property, but private firms cannot.

An area closely associated with relationships with state agencies is that of launch site operators. Launch site operators are state agencies or private companies which do not conduct launch operations but construct and rent out launch facilities solely for use by private firms conducting launch operations. The efforts of the Spaceport Florida Authority at Cape Canaveral Air Station's SLC-46 and SLC-20, Spaceport Systems International at their Vandenberg AFB launch pad are examples of these. Because the CSLA does not explicitly address this situation, DoD, DOT, and NASA recently cooperated in the development of an official policy for such situations.

Extensive work by the Air Force, DOT, and NASA along with the state agencies themselves has for the present answered the most pressing issues in this area, but not always to all parties' satisfaction. The state agencies continue to insist that they are not merely the equivalent of private firms, and desire a special relationship with the federal government. The Air Force has also reluctantly concluded that it legally cannot work very closely with local industry advocacy organizations, even when such efforts are in the best interests of the Service and the U.S. taxpayer.

Competition Concerns

The Commercial Space Launch Act Amendments of 1988, Public Law 100-657, added new direction from Congress on the both government support and control of U.S. commercial space launch industry. From the launch base perspective the most significant aspect involved new restrictions on private acquisition of government property and services, as described in Section 4 of the law.

The previous requirements and restrictions on provision of government property and services were added to by the requirements that the government "...consider the commercial availability, on reasonable terms and conditions, of substantially equivalent launch property or launch services from a domestic source."

The legislative history of LP 100-657 explains that the above provision was added in recognition of the fact that commercial sources were becoming available for some of the services provided by the government, and that it was the opinion of the Congress that such commercial activities should be encouraged and not have to suffer from the competition of government-provided services.

It is fairly easy to ascertain the intent of Congress in this provision, but the Air Force has had some significant difficulty in determining meaning of the term "substantially equivalent." The House report on the bill explains that "substantially equivalent" is meant to refer to "price, quality, and schedule." This would infer that commercial users of government property and services should not have to pay higher prices, accept lower quality products or services, or suffer adverse schedule impacts as a result of utilizing commercially available property or services instead of those provided by the government.

In fact analysis of numerous discussions and formal legal decisions indicates that there are virtually no circumstances in which the "substantially equivalent" concept can be applied. Air Force lawyers have concluded that government provided property and services will always

be lower in price than commercial sources. Therefore, the "price" element of substantial equivalency has no real applicability, even when there may be a 1000% difference between the commercial source and the government's price. This conclusion is particularly significant because the "price" element is the only one which can be evaluated clearly and objectively; the others are subject to opinion. The "quality" element is particularly difficult to assess, since it is primarily a case of one firm's opinion versus another's. The "schedule" element is hardly more useful, since schedules are themselves variables affected by the quality of the product and the amount of manpower employed, which, in turn, relates back to price.

As a result, it appears that the only cases in which competition with commercial sources does not constitute a virtual prohibition on the government's provision of property and services occur when there simply are no competing private sources or when the private firms which do exist agree that they have no objection to the use of the government property or service.

The full impact of this provision has not been felt largely because it has not been implemented except in a few specific instances. To fully implement it would require that each daily request for government support from a commercial space launch firm be analyzed and checked against at least local private firm capabilities; this would constitute a scheduling nightmare at best. Currently the provision has been directed at only a few cases, primarily involving commercial payload processing. In recognition of the difficulties in applying the provision, special direction expanding and explaining the provisions in the law have been included in the 22 May 96 "Air Force Policy on Commercial Use of Air Force Property and Services." Among the restrictions adopted is a flat prohibition on cost sharing between the Air Force and private firms when there exists privately-funded competition.

Some private firms have even argued that the provision would allow a single firm, such as the first one to establish a capability, to prevent other firms from establishing a similar capability even when they would do so entirely at their own expense. For example, if a private firm built a launch facility on leased land, this might prevent another firm from obtaining the use of an abandoned government launch facility, since this might constitute competition from government sources. While this issue has not been completely resolved, it has been a concern and in some instances has prevented the government from providing excess launch property to requesting firms.

The provision is of increasing interest and concern due to the new relationships which the DoD is developing with the commercial spacelift and space communications industries. In recognition of the expanding commercial industries in these two areas, DoD is in the process of adopting a more commercial-like approach to procurement activity. Already, commercial space communications is a vital part of military communications, and has assumed a role which was once reserved for military systems. The Air Force has come to view the spacelift mission as a primarily commercial one as well, and has radically changed its approach to operation of the Evolved Expendable Launch Vehicle system to reflect a commercial-style approach. Restrictive interpretations of the "substantially equivalent" concept will limit innovative cost sharing approaches which could offer the ability to meet both commercial and government requirements at reduced costs.

Conclusion

Despite continuing resource limitations, the Air Force is the “backbone” of the U.S. commercial space launch industry and the Service’s support has enabled the industry to grow and evolve. The recent Air Force decision to procure and support the Evolved Expendable Launch Vehicle in a primarily commercial manner is an example of the trust and confidence the Air Force has in the industry. Innovations aimed at improving and streamlining Air Force support of commercial launches, such as increased access to Air Force property and fixed price charging practices are another example of Air Force commitment to commercial space launch operations.

The Air Force has expended considerable effort into analyzing the will of the Congress and in developing suitable procedures and policies for supporting commercial space launch activities. Although there is not complete unanimity within the Air Force on all aspects of commercial support, it is apparent that the Service has gone about as far as it can without risking violations of the law; additional direction from the Congress is required to resolve the remaining issues. The Congress is now considering possible changes to the CSLA. The Air Force experience in supporting the industry must be taken into account, together with the demonstrated changes in the industry and its anticipated future directions.