

Creating Processes Associated with Providing Government Goods and Services under the Commercial Space Launch Act at Kennedy Space Center

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Kennedy Space Center (KSC) has decided to write its agreements under the Commercial Space Launch Act (CSLA) authority to cover a broad range of categories of support that KSC could provide to our commercial partner. Our strategy was to go through the onerous process of getting the agreement in place once and allow added specificity and final cost estimates to be documented on a separate Task Order Request (TOR). This paper is written from the implementing engineering team's perspective. It describes how we developed the processes associated with getting Government support to our emerging commercial partners, such as SpaceX and reports on our success to date.

In January 2010, I joined the Commercial Orbital Transportation Services (COTS) team at Kennedy Space Center (KSC). I joined from within the International Space Station and Spacecraft Processing Directorate Business Office, and was assigned the task of finalizing a reimbursable agreement between KSC and SpaceX that would make KSC services, equipment, and facilities available to SpaceX. We chose to write our agreement to cover a broad range of categories of support that KSC could provide to our commercial partner, and allow added specificity and final cost estimates to be documented on a separate Task Order Request (TOR). We started with a draft Umbrella Space Act Agreement (SAA) and had a list of general KSC capabilities in paragraphs of the first SAA Annex under the Umbrella agreement. When the abstract went to NASA Headquarters, the Office of the Chief Counsel recommended that we use the Commercial Space Launch Act (CSLA) as the authority of the agreement, rather than the Space Act.

I. Commercial Space Launch Act – 101

In order to write and implement an agreement under the authority of the CSLA, I wanted to understand what the act says and what it was intended to do. The CSLA was passed in 1984 during a time when United Space Alliance wanted to increase the number of commercial missions manifested on the Space Shuttle. The Act states, "The development of commercial launch vehicles, reentry vehicles, and associated services would enable the United States to retain its competitive position internationally, contributing to the national interest and economic well-being of the United States."² One of the main purposes of the CSLA is "to facilitate the strengthening and expansion of the United States space transportation infrastructure, including the enhancement of United States launch sites and launch-site support facilities, and development of reentry sites, with Government, State, and private sector involvement, to support the full range of United States space-related activities."³ To this end, the CSLA provides the following general requirements:

The Secretary of Transportation shall facilitate and encourage the acquisition by the private sector and State governments of

- (A) launch or reentry property of the United States Government that is excess or otherwise is not needed for public use;
- and
- (B) launch services and reentry services, including utilities of the Government otherwise not needed for public use.⁴

NASA has been entering into CSLA Agreements routinely in support of the Launch Services Program (LSP). The partners of the United Launch Alliance – the Boeing Company and Lockheed Martin – have had CSLA Agreements in place for years. When SpaceX began efforts to on-ramp as a launch service provider to LSP, they also entered into a CSLA Agreement with NASA. These Agreements are written for five years periods.

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Once an overarching CSLA Agreement is in place with NASA at the Agency level, any Center can enter into a CSLA Subagreement with that partner. In the summer of 2009, SpaceX had allowed the Agency level CSLA Agreement to lapse, so when we switched our approach from Umbrella SAA to CSLA Subagreement, we first needed to work with SpaceX and NASA Headquarters to get the overarching Agreement in place. SpaceX was already aware and had requested support for their approaching initial hot fire, so there was a sense of urgency to get all the agreements finalized in time to authorize KSC support activities. We were able to get both the Agreement and Subagreement in place for the first SpaceX COTS Demonstration flight, thanks to a quite concerted effort on the part of all parties and approving officials. The Task Order Request form was included as an attachment to the KSC CSLA Subagreement.

II. Task Order Request (TOR) Processing

The vision with our approach was to only do the hardest part – getting the agreement in place – once. Then implement lower level “agreements” for specific support requirements using the TOR, which could be processed relatively quickly. The TOR was fairly simple. There was a section at the top where the requestor can identify the mission that is being supported, the need date for the support, and a brief description of what is needed. When the TOR is received, we assign it a control number. Once the request is fully understood and KSC resources necessary to meet the request have been identified, we populate the bottom of the form with our project plan, which includes the statement of work describing how we will meet the request, the associated schedule, and the estimate of costs. The simple form is shown below in figure 1.

TASK ORDER REQUEST For support from the CSLA Subagreement between KSC and SpaceX		
Mission:	Need Date:	Control Number:
Description of Desired Support:		
Authorized Requester (print and sign):	Date:	
<i>To be completed by NASA</i>		
Task Statement of Work:		
Proposed Schedule:		
Estimated Cost:		
Funds Available (Yes/No)?		
NASA Approver (Print Name and Sign):	SpaceX Concurrence (Print Name and Sign):	

Figure 1. Initial Task Order Request form.

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Our team was very small – about six of us, all with significant other duties. Since we had already known there were pending requests before the agreements had even been signed, we received the first TORs as soon as we provided SpaceX with the form. We were developing the process as we were exercising it. As soon as the TOR was received, we would assign it a control number to act as a unique identifier. The TOR was then turned over to a knowledgeable technical point of contact, our Project Engineer (PE). Our team only has two full time project engineers, and they have very different skills. We had other PEs that were called upon for specialized TORs, like propellant support.

The PE would contact the requestor to get any additional details about the request necessary to determine how best to meet the need. He then identifies which team at KSC is best suited to answer the request. If it is one of our contractors, the

PE would complete the contractor support request with all the required data. If it is required some of our civil servant expertise, he would contact the implementing organization and arrange for the support.

The next challenge once the required support was well defined is to develop the cost estimate. I will discuss this topic in the next section, but to complete the TOR process discussion, once the cost estimate is developed, I sign the now fully populated TOR form and return it to the requestor. The requestor then has an opportunity to consider the estimate, and sign and return the TOR if they want the support. It is only after we receive the completed TOR with the authorizing signature from the requestor that we will authorize work to begin. Verify funding is available is another prerequisite to starting work.

III. Developing the Cost Estimate for TORs

When I first read the CSLA language, the most difficult question was immediately obvious. Under CSLA and as stated in the National Space Policy, NASA is supposed to make our excess capacity available to commercial launch and reentry service providers to encourage their maturation. With the retirement of the Space Shuttle, KSC has an abundance of excess capacity as we adjust our contractor workforce, determine long-term requirements for equipment, and define core capabilities. The CSLA also states that the Government shall be reimbursed for the

direct costs of the goods and services we provide to our partners. The question that leaped out at me was, "What does 'direct' costs mean?"

The CSLA did provide some definitions, but they really weren't necessarily helpful. The CSLA language defines direct costs this way: "Direct costs' means the actual costs that - (A) can be associated unambiguously with a commercial launch or reentry effort; and (B) the Government would not incur if there were no commercial launch or reentry effort."⁵ That sounds very clear, but practically speaking, what does that mean?

It turns out that the answer wasn't as easy as going to our Chief Financial Officer (CFO) and getting a definition from her team either. Our first attempts were almost trial and error. For example, our first requests were for support from one of our major contractors on KSC. It didn't take long to determine that their contract management and administration costs should fall into the "indirect" category. The Government will be paying their management team whether or not the request for special support to our commercial partner was provided. Each of our contracts had to be reviewed to determine what was direct vs. indirect costs.

Then a TOR came in that requested support in one of our labs that is staffed with civil servants. Remember, the two criteria established by the CSLA were unambiguously attributable to the request AND the Government would not otherwise incur the costs. Well, our civil servant workforce is relatively stable – we don't change our headcount easily. While the time to provide the service was definitely unambiguously attributable to the support request, would the civil servant time pass the "but for" test? Would the Government not incur those costs, but for the request? This was hotly debated. Sometimes it seemed like a personal affront to even ask the question, but we asked it anyway. In the final analysis, it was determined that civil servant labor should be reimbursed. If the request had not come in, the lab boys would have been maintaining their equipment or doing other lab maintenance. When the support request came in, those activities may have been assigned a lower priority, but they would still have to be accomplished.

The next bit of pricing fun came when we received a TOR for short-term storage of some GSE. Around the same time, we also received a request for use of a partial footprint in one of our main processing facilities. In both cases, all of the costs failed BOTH tests. The costs would be neither unambiguously attributed to the support nor would the Government not incur the costs but for the request. It took quite a bit of effort, but we worked each request to closure. For the short-term storage, operations and maintenance (O&M) costs for our warehouse space was fairly well known. We determined a proportionate cost for the space being requested and provided that estimate back to SpaceX. We did compare it with market-based prices, as a sanity check.

For the processing facility, we first looked at the total costs and made the determination of what costs behaved like direct vs. indirect costs. We determined that "brick and mortar" costs really acted like indirect costs. NASA would have a roof that doesn't leak with or without the request. We would ensure there was high voltage power to the facility. We would maintain the parking lots and grounds. We started to think in terms of what a landlord would be responsible for, as opposed to what a tenant would pay for. If a tenant would pay for the costs, such as utilities, O&M of lights and provision of access control monitors, NASA should be reimbursed for a share of those costs. Once we backed out the "brick and mortar" indirect costs, we calculated a cost per square foot of the rest of the facility. That was the amount we expected to be reimbursed for use.

The discussions were quite interesting. It took both our financial and legal communities considering the intent of the legislators when they wrote the CSLA to finalize the decisions. No one could believe that Congress intended NASA *give away* our assets – especially our prime processing facility space. All in all, I think it was a fair decision. NASA might realize some savings for sharing, and our commercial partners get a significant discount on the specialized support.

Another interesting scenario was when SpaceX requested long-term use of a telemetry facility KSC had slated for demolition. It took many months to determine the right authorizing mechanism to grant them access to the property. The property needed modifications, as well, so the extra discussion of whether SpaceX would be allowed to make the changes themselves or if they must use KSC contractors to execute the modifications took a bit of time. It also became a bit of a hot potato – which directorate on Center would retain NASA responsibility for the assets? Timing is everything and Murphy doesn't quit messing with us. KSC was in the throes of a Center-wide reorganization that made determination of these straight-forward questions anything but obvious.

As a result of these early requests coming into KSC and the significant discussion to determine the right amounts to request for reimbursement, the Agency kicked off a pricing policy review. The KSC Chief Financial Officer was charged with leading the effort and the result was a revision of our NASA Policy Requirements (NPR) governing reimbursable transactions – NPR 9090.1. The Interim Directive was released last December and the final NPR revision should be out before this December. It was a tremendous team that pulled lesson and examples from across the Agency and developed appropriate policy for reimbursable agreements under the authority of the CSLA.

One interesting aside that was included in the policy discussion was with respect to Program concurrence. Several representatives from the International Space Station Commercial Resupply Services Program and the Commercial Crew Program thought it was important for the Programs to know and approve in advance when a Center provided support to one of their commercial providers. I struggled with this for a while. I mean they didn't have that level of insight into their providers' other suppliers. And shouldn't their risk management strategy be robust enough to deal with whatever uncertainty there was in the provider's supply chain. Once I stepped back and considered the bigger picture, having insight into what support providers were getting from NASA might be important as the Programs design their next procurements. Perhaps a service should be Government furnished, for example. So, we simply added another step to our process to get Program concurrence for the support.

IV. Meeting Commercial Expectations for Response Time

Our team knew our toughest challenge would be to be able to get Government response time anywhere in the neighborhood of what a commercial entity would expect. We set an self-imposed, internal goal of two weeks from receipt of TOR to return to the requestor. Defining the tasks, calculating the appropriate amount to be reimbursed, and getting it all approved within two weeks would be no small task. Turning a Government team on, contractor or civil service, once the up front work was done would be relatively easy. To make our task more challenging, our commercial partner is also learning, defining, and refining their processes. They don't always anticipate their needs more than two weeks in advance.

We met with the SpaceX team to explain the process we would be going through on our side. We also explained that even if we could return an estimate to them within the two week goal, we would absolutely, ALWAYS have to have the funds on Center before we could authorize work or incur any costs. We did get bit one time when costs were incurred without prior authorization. We committed the near unforgivable civil servant sin of going costs over obs – our actual costs exceeded the amount we had obligated for a specific task. This happened because of a unique circumstance when our commercial partner could indirectly request services from our support contractor through the 45th Space Wing (SW). We worked with SpaceX and 45th SW to understand how this happened and to develop a strategy to prevent future costs from being incurred without NASA authorization.

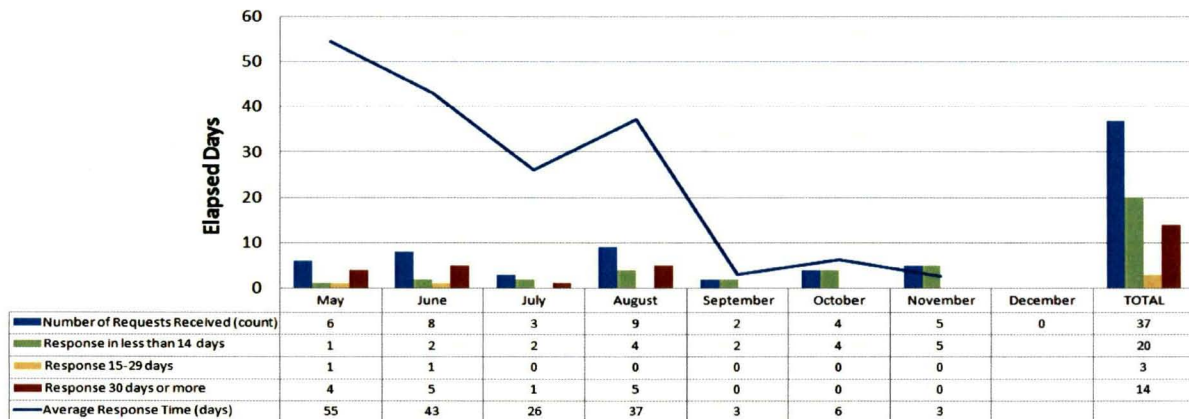


Figure 2. Task Order Request Process Performance as of December 2010

With understanding of the financial realities and with the clearly stated goal of two weeks from receipt to return of the TOR, I held my breath as I built my first metric chart. Remember, we had been executing as we were figuring out how to process requests. The first metric reporting is shown below in Figure 2.

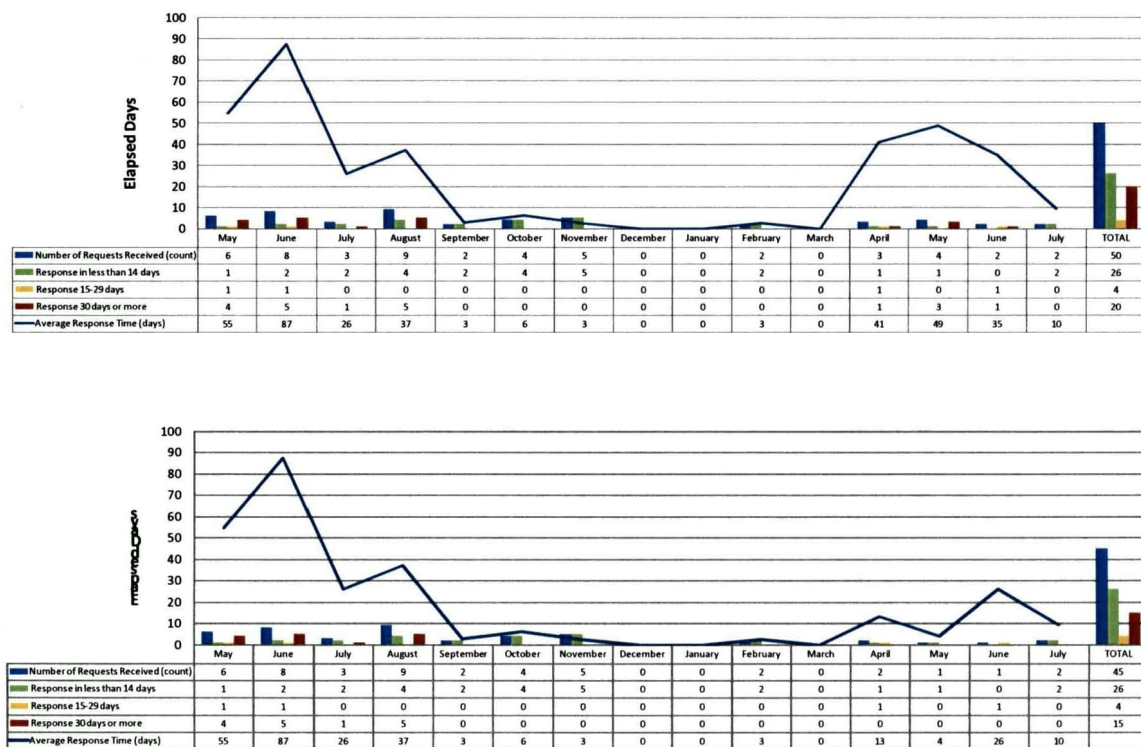
The Subagreement that allowed the first TOR to be submitted was signed in April 2010. This first report was occurring in November 2010. In that six month period, when we were breaking new ground with each request, defining direct vs. indirect costs, negotiating with senior managers, our Chief Financial Officer, and Legal Counsels, our response time dropped from two months to less than a week. These are elapsed days, not necessarily business days. For each of the peaks, we can point to a specific request for a new type or category of support that required pricing policy definition. The spike in August was due to a facility storage request and a request for launch support. It wasn't until December that the NASA Interim Directive for the revised pricing policy was released. Our experiences were defining policy.

While some individuals still believe this is a slow response time, in general, the commercial partners seem satisfied. As we identify areas where we can further streamline our processes, we are implementing those changes. For example, one of the more time-consuming steps in the process is to get an estimate from the contractor and approved by the CFO. For requests that we thought would be recurring, we developed a strategy that would allow us to get the estimate fully developed and approved one time for a specified period, such as through end of fiscal year. Then we could simply reference that “parent” request’s estimate when subsequent “child” requests came in.

We are also expecting our commercial partner’s processes and planning to become more mature. This should allow them to anticipate their needs more than two weeks in advance. If we are all working together, the two weeks response goal, while not nearly as fast as commercial response times, should be sufficient. It’s lightning fast in Government time. I’m proud of KSC for working as a community to meet or exceed our self-imposed goals.

V. Epilogue

We still get some pathfinder requests. Every day it seems like we have a new issue. But our small team of six



**Figure 3. Task Order Request Process Performance as of July 2011
With and Without Outlier Requests**

part-time and one dedicate civil servant worked each request, each action as it comes. The team has managed to sustain their performance for requests similar to ones we have seen already. Figure 3 shows our updated metric with and without outlier requests, such as our first long-term facility request in April or personal property loan in May. Our average performance for familiar requests over the last six months is 7 calendar days per request.

I have developed very solid friendships with several of the KSC Attorneys. I now consider the Deputy Chief Financial Officer, whom I didn’t even know in January 2010, a friend. Just about every senior manager at KSC has sat across from a table from me expressing their opinion with significant emotion. Often times, I would have to talk to the same individual on the same topic, and their opinion would change from meeting to meeting. It was important

to allow them all to get to the same understanding I did with respect to the intention of the CSLA and the current Space Policy direction. We have to come to the same place of sincere belief we are doing the right thing together.

Some of the KSC team is still a bit uncomfortable with this new way of doing business. The most significant pending question is how or whether we allow commercial partners to use NASA personal property. At the writing of this paper, we are still working on getting the right delegations and authorizing strategy in place. I'm not as concerned with a few individuals feeling slightly uncomfortable, as long as both the legal obligations and the intent of our NASA requirements are met. My experience tells me that with time and patience, we all arrive at the same conclusion. It is part of NASA's mission to encourage growth in the commercial launch and reentry industry. It is for the Agency's good and for the nation's good.

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References

²Commercial Space Launch Act, 49 U.S.C 70101(a)(5).

³Commercial Space Launch Act, 49 U.S.C 70101(b)(4).

⁴Commercial Space Launch Act, 49 U.S.C 70111(a)(1).

⁵Commercial Space Launch Act, 49 U.S.C 70111(b)(1).