

**NASA JOHNSON SPACE CENTER ORAL HISTORY PROJECT
COMMERCIAL CREW & CARGO PROGRAM OFFICE
ORAL HISTORY TRANSCRIPT**

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INTERVIEWED BY REBECCA HACKLER
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[This oral history with Jonathan A. Arena was conducted via telephone from Houston, Texas to Cleveland, Ohio.]

HACKLER: Today is April 22, 2013. This telephone interview for the NASA Commercial Crew & Cargo Program Office History Project is being conducted with Jon Arena, who is at the [NASA] Glenn Research Center in Cleveland, Ohio. The interviewer is Rebecca Hackler, assisted by Rebecca Wright, who are in Houston, Texas at the Johnson Space Center History Office.

Mr. Arena is a senior counsel for NASA, and assisted in the establishment of the Commercial Orbital Transportation Services [COTS] program for the space agency. Thank you for taking the time to talk with us this afternoon. We'd like to begin by asking you to briefly share with us your background as a NASA attorney.

ARENA: I started working for NASA when I was still in law school at [College of] William and Mary in Williamsburg, Virginia. I first worked as a summer clerk at the Langley Research Center [Hampton, Virginia] in the summer of 1999. At the completion of that summer, the Chief Counsel at that facility asked if I would consider working part-time while I was still in my last two years at William and Mary. I did, so when I graduated from law school I had a number of

job offers, including one from NASA Langley, and I accepted that job offer. I worked at NASA Langley for four to five years.

When an opportunity to transfer to the Johnson Space Center [JSC] came up, that was just about the time that the Constellation Program was transferring from [NASA] Headquarters [Washington, DC] to Johnson. I transferred down to Houston, Texas, and worked on a number of interesting projects there, including COTS and Constellation. I was at the Johnson Space Center for about four years when an opportunity came to move closer to home, where I'm originally from and my wife is originally from, in Ohio at the Glenn Research Center [Cleveland]. We took that opportunity to move up to Glenn, and we've been here since.

HACKLER: Before you worked on the COTS program, did you have any experience with government procurement and Space Act Agreements?

ARENA: Yes, my entire time working for NASA has been what I call a government business practice. That means I spend the vast majority of my time working on government procurements and advising in government contracting matters, as well as working on Space Act Agreements. Here at Glenn now I do some work on CRADAs [Cooperative Research and Development Agreements] and other kinds of partner agreements, like cooperative agreements, joint research agreements, technology licensing, and things of that nature. That's the bulk of what I do for the Agency.

HACKLER: What were your thoughts when you first heard about this program to use funded Space Act Agreements to partner with commercial companies to provide transportation services to ISS?

ARENA: I thought it was a really interesting and unique approach. Within the legal community, there had always been a few of us who had thought about using the Space Act [Other Transaction] Authority to provide funding in different circumstances. The Agency historically had not done that. Not really because there was a strict legal requirement not to do it, but the Agency had been somewhat conservative throughout the first 40 or 50 years in the way that it interpreted its Other Transaction Authority, and so had historically not done that sort of thing.

An interesting thing I got to do very early on when I was a junior attorney at Langley—the Langley Research Center did one of the first CRADAs, and I got to second chair that, and saw that as a little bit of a pathfinder to do a nontraditional partnership where the Agency provided some funding. I thought COTS was a much grander scale and a much grander vision of doing something like that, so it was very exciting.

HACKLER: What was your role in COTS getting it started? Can you overview your responsibilities?

ARENA: Let's talk through this. Originally, Bernie [Bernard J.] Roan, who's the Chief Counsel at JSC, had approached me and indicated that I should contact Alan [J.] Lindenmoyer, who I didn't know at the time. I was relatively new at JSC still, maybe in my first year or so. Bernie asked both Amy [V. Xenofos] and I to give Alan a call, because there was going to be a new

project handed down from Headquarters. He characterized it as an out-of-the-box kind of project, and he wanted us to look into it and see what we could do as far as providing some legal advice.

It was very early on, in the first couple of sets of meetings, and getting to meet Alan Lindenmoyer and Valin [B. Thorn] and the initial team, which at that point was only four or five folks. Alan kicked off this idea that had been handed down. I remember a lot of the talk was from the [NASA] Administrator [Michael D. Griffin] himself, who had thought about this and was trying to get it going, and sent it down to JSC to get some legs.

We initially worked through a broad outline of what it would be, what are the right legal authorities. A lot of my initial contributions were thinking through, “Is it a government contract? Is it a Space Act Agreement? Is it a CRADA? Is it a cooperative agreement?” What are the right legal instruments to think through to meet some of those initial requirements and milestones?

HACKLER: How did you communicate and cooperate with the NASA legal team at NASA Headquarters during that effort?

ARENA: As it firmed up a little bit, it looked more and more like a funded Space Act Agreement was the way we wanted to go to meet some intellectual property needs that we had, and some indemnity needs that we were going to have in going to [International] Space Station. Then we started to reach out to Headquarters, the Office of General Counsel, more and more. I can't remember exactly how we got started, but I started working quite closely with a senior attorney

at Headquarters, Bill [William J.] Bierbower. I don't know if his name has come up in your other interviews.

HACKLER: Yes, we have heard of him.

ARENA: He's no longer with the Agency. He was working in a role that they call a legal DLC, Director of Legal Counsel, for ESMD [Exploration Systems Mission Directorate]. Pretty quickly, we started building a relationship where we really had to touch on almost all the legal disciplines up at Headquarters. There were intellectual property issues, there were international law issues, indemnification issues, and all sorts of things like that.

Bill and I built a pretty good relationship very quickly, where he would reach out to the various areas of expertise and bring them into the conversation. We would talk very regularly, several times a week. I think we had a standing conference call every week with just the lawyers. Amy and I at JSC, and Bill would be hosting at Headquarters. Depending on what legal issues we were going to talk through that particular day, there would be patent attorneys, or government contracts attorneys, or fiscal law attorneys.

We would work through a number of issues and start to iterate on, "If these are the requirements that we want to get done as an Agency, how does that translate into actual contractual language?" How does that translate into a framework for building a competition, how we would go about putting what we were trying to accomplish out into the public space, how would we ask for companies to come back to us with proposals and offers, how they would like to do the work, and how we would go about an evaluation process?

There were simultaneous things working at the same time from the lawyers' perspective. One was what would that document shape up to be, and the second was what did we feel like some sort of competition needed to look like. What were the hallmarks of a good, transparent due diligence methodology to pick some companies to partner with.

HACKLER: Can you talk about the important principles for you in the competition?

ARENA: From a competition standpoint, we wanted to get a couple of things done very quickly. We used them as our guiding principles. The first was, although we understood internally among the lawyers that this was not something that needed to be competed from a legal standpoint, from a transparency standpoint and from a fairness and equity standpoint we really felt like we needed to, at some level, have a competition to show that the Agency was giving a fair opportunity to companies at all levels. There was a lot of talk initially about whether such a competition would be open to the traditional, large, conglomerate aerospace corporations, or just the new startups, the mom-and-pops.

The phrase at the time was NewSpace, which kind of stood for a bunch of relatively small, young, entrepreneurial space companies. We knew that we wanted to have something very large where everyone could compete. We weren't going to limit it in any way to a certain sector or size of company or anything of that nature. We knew that we wanted it to be transparent so that all along the various steps to picking companies to partner with, everyone on the other side of the process understood what we were doing and how we were going to pick companies, and understood why the government was doing what it was doing.

As lawyers, we wanted it to be defensible. We knew what we were doing was very unique, and so we were likely to get criticized. We weren't sure from whom—maybe companies competing, maybe from the public, maybe from Congress. We wanted to make sure that the process was robust enough to withstand criticism. In that vein, we borrowed very liberally from a government contract framework where we were going to issue a set of things that we thought were important to being successful. We didn't necessarily call them requirements. We were going to evaluate companies on their approaches to meeting all of those criteria, then there would be a down select process until we got to some eventual winners of the competition.

HACKLER: We understand that, in the process of selecting those winners, you were involved in the due diligence process of visiting companies and meeting with them face to face. Can you talk about your role in that aspect?

ARENA: Sure. That was kind of a learning process, I think, for a lot of the folks on the NASA side. At the Agency, there is a lot of experience with working with well-understood, large, multinational corporations. At the time, there was relatively less experience working with very small, entrepreneurial groups. One of the things that Alan Lindenmoyer did fairly early on was he brought in a venture capitalist to help advise the COTS group on that sort of thing. Maybe you know his name?

HACKLER: Alan Marty?

ARENA: Yes. He was a very interesting and great guy. He was part of that due diligence as well. The strategy of it was we were entertaining offers from companies—everybody from a company that we all know, to just a guy with a crazy idea, to go to the absurd. We had a couple of those actually. We quickly realized we needed some way to figure out who really had a legitimate shot from a business standpoint, as well as a technical standpoint.

We would do research on the company in general so that we could better understand the financials, the business strategy, the backing, the approach to not only meeting the technical goals of the program but also to—we used the phrase a lot that we were trying to “incubate” a whole industry. We needed companies that understood how to do the engineering, but also understood how to build businesses so that they would be in business to actually provide these services down the road.

HACKLER: Can you talk about some of the specific qualities you were looking for in their business plans to make sure they were viable?

ARENA: There were a few. We looked for a sound business team. Very early on, we came to the conclusion that a company’s history maybe was not as important as the people who were actually running the company. Because again, to compare it to traditional government procurement where the government is trying to buy a good or a service—the government relies very heavily, not just on what a company wants to charge us, but also have you ever done this before? “You want to paint the buildings for us. Tell us about all the other buildings you’ve ever painted and how you’ve done there.”

We didn't have that kind of experience base in the companies that we were working with, so we spent a lot of time trying to understand the company's management team, as well as the technical team. We were looking for folks who had brought together a management team that had been successful in the past. Maybe not successful in exactly this endeavor because it was so new, but folks who had shown some business acumen and some ability to go from an idea to an actual, ongoing business in other realms perhaps.

That was a key aspect for us, to understand the strengths and weaknesses of the business team. Another one was to really understand the financials of the company, because it's an expensive business to try to build your own spacecraft and provide that service. We really spent a lot of time understanding the different ways in which companies were proposing to finance their ventures, and the different kind of advantages and disadvantages of their financing approaches, and how they added or maybe dealt with certain business risks. That helped us to understand whether a company was going to be viable a few years down the road even if it met its technical milestones.

HACKLER: Can you possibly think of any examples of some of these due diligence sessions where companies made a strong impression on you, or some of the things that stood out in your memory of this time of selecting the COTS partners?

ARENA: This may make some intuitive sense—one bright line of demarcation that filters through, is there is a certain level of company where you understand from a financial standpoint that they've done very little work in having strong financial backing. In other words, even if they have a fairly reasonable technical case, you look at it and say, "Okay, that looks like that's

an \$800 million dollar process. How much of that have you got guaranteed, or have you just had initial conversations?”

There was a fairly easy sifting out from those companies that had a well-thought-out approach to financing what they wanted to do, and those companies who were almost exclusively focused on the technical challenges and had very little money, either in the bank or lined up, and didn't really seem to have access to the avenues of capital to turn those technical hurdles into successes.

HACKLER: As we know in retrospect, one of the initial COTS partners that NASA selected, Rocketplane Kistler [RpK], was unable to meet their financial milestones, and their Space Act Agreement was terminated in October of 2007. Were you involved in that process in your role as an attorney?

ARENA: Yes, I was heavily involved in that process on all sides of the deal, both working and advising all of the senior NASA people as they were deliberating through, step-by-step, what was the next correct thing to do, and also representing back to Rocketplane Kistler. They had an attorney, my counterpart, and he and I were regularly on the phone right up until the very end as a matter of fact. We had a 3-hour phone call late at night just before we actually terminated their agreement.

HACKLER: Can you talk about what sort of efforts NASA undertook to try to help them meet their milestones? We understand that it was not an easy decision to make, and NASA really tried to help the company to be able to succeed in their proposal.

ARENA: There were competing strategies. We had always said early on in COTS that if partners were going to fail, the idea was to fail early. And we meant that, both from a technical and business standpoint. That's why, when you look at those original agreements and the milestones, you're seeing both technical milestones and business and financial milestones as well. The original thought was if they can't make it on their own, then we're just not going to spend a lot of time on them. In practice, I think what RpK showed us was an organization who had a good business approach, who had a sound technical approach, who just had problems coming up with the money at the right times.

We knew that—not just for RpK, for everyone involved—that was going to be one of the real hurdles was folks getting financed. I don't know if helping RpK is the right way to phrase it, but trying to be a good partner, because they were making progress in some other areas. I remember negotiating restructuring some of their technical milestones and some of their milestones in general. You'll see some changes made to those initial milestones, giving them some additional time and helping to define what we would consider success in some of those initial milestones, particularly their milestones to meet some financial obligations to raise certain amounts of money.

Initially when they were drafted, as with a lot of things, there was probably some ambiguity in understanding what some of those milestones meant. We all looked at the sentence, but then it's like, "How do I know if that's been completed or not?" I think we tried to be very helpful and a good partner in interpreting the language in the milestones, and also helping to renegotiate a few of those milestones to give them a little more wiggle room as well.

HACKLER: We heard from Bruce [A.] Manners [COTS Project Executive for RpK] that you travelled to New York [City, New York] to have some meetings with potential investors on Wall Street [financial district]. Is there any aspect of that you can talk about?

ARENA: Sure, there were a lot of high points to the whole program for me as an attorney. I think our trip to New York—it might have been a couple of trips to New York—was certainly a high point for me. One of the interesting aspects of RpK's approach, from a financial and business standpoint, was that it was going out to raise capital. It had hired the investment bank Jefferies [Quarterdeck LLC]. Basically it was trading equity in the company for investors. Investors were providing capital, and tranche is the way that you do this in certain kinds of financing in exchange for equity positions in RpK. RpK was taking that capital to help meet milestones—technical milestones, business milestones, financial milestones. Early on in our discussions with RpK and then with their bankers at Jefferies, it was pretty clear that to attract the level of sophisticated investors that they were looking for they would need NASA to explain NASA's part in it.

This was a very interesting set of discussions by me and Alan and the whole COTS senior crew and then folks at Headquarters, Headquarters legal especially, because what we were trying to do was make sure that we weren't getting on the wrong side of any of our rules and regulations about NASA endorsing private entities, and that was very important. We didn't want to give the impression that we were endorsing particular companies, but it was clear to us that if this was really going to be a successful enterprise and we were going to be able to incubate some of these companies, NASA needed to talk to Wall Street, and provide the context for what we were doing—why it was important for the Agency to have a private market that does these sorts

of things, that if there were companies that could provide these kinds of services, the Agency would take advantage of those, and that was the real value proposition of winning one of these COTS agreements. Now that you're partners with NASA, how does that help you to be better than the company right next door to you that didn't win one of the agreements? What are the real benefits that you get out of partnering with NASA?

We worked through those kinds of issues, and we accompanied RpK during some of their meetings, especially with their bankers at Jefferies before Jefferies took them to potential investors. We helped Jefferies to understand the posture of the COTS program. Why were we doing it, what were we offering, why is what we were offering a real competitive advantage, and why was a company who was going to be a COTS selectee really off to a good start and worthy of investments. Did I answer your question?

HACKLER: Yes, you did. It's a very thorough background to NASA's role in that whole process. Can you talk about what transpired in some of those meetings?

ARENA: It was so interesting because you had big New York investment bankers hanging out with NASA rocket scientists, and they were just from such different worlds. It was so interesting to be in some of those boardrooms and watch them talk to each other. This is an anecdote, but one very high up investment banker at Jefferies—at one point in our discussion, he just sort of came out and said, "I really didn't know that we even had a Space Station." "We have a Space Station? Did that just happen?" The NASA guys are aghast, "What do you mean, do we have a Space Station?!"

The bankers would speak the shorthand bankers speak, they would start talking about tranches and financing and leverage this and that, and all of the NASA rocket scientists would just kind of glaze over and look at me and look at each other. They had no clue what the bankers were talking about. It was really an interesting set of discussions.

I remember in particular giving a talk to everyone at one meeting. I remember seeing a lot of the Jefferies guys there. I hate to say that, but they were all guys as I remember it. I remember their eyes lighting up when they finally got it. What they got was what NASA was fundamentally offering was a chance to go to the Space Station, that no matter how much money any other organization ever had, they said the money you're providing NASA—which was about \$250 million in general. That's not a ton of money when we start to look at this, and it looks like you're going to need \$1 billion or \$2 billion to actually build a company. What they got at some point, I remember late one evening, was that's not just what NASA is offering.

We're offering a little bit of seed money, but we're offering you access to some of the smartest rocket scientists on the planet. We're offering you access to the folks who designed and build and run the only Space Station the planet has. That's really how you put a price tag on that level of interaction and expertise. I remember when we had that discussion, at some level that sunk in to the bankers in the room. They said, "Oh, boy! We can go raise money on this. This is something we can do now." I remember that being a particularly interesting discussion.

HACKLER: It sounds like you were the translator in between the two groups.

ARENA: I would say everybody had their formal roles, and one of my informal roles throughout that COTS process was being a translator, explaining some of the legal aspects to the engineers,

some of the business aspects to the engineers, and trying to be a go-between between folks who have vastly different backgrounds.

HACKLER: Do you have any insight as to why, at the end of the day, all those discussions weren't quite enough for RpK to raise the funding it needed? From your perspective in the legal role.

ARENA: From my perspective—NASA deals with some of this on a smaller scale all the time, frankly. When you think about going and trying to raise large amounts of private capital, you're pitching this idea and you don't need a million bucks, you need \$500 million. One of the things that maybe NASA doesn't quite get, and I think this is what happened to RpK, is you have to be better than every other investment opportunity out there.

Big investors, folks who have a lot of money, New York types, they have 6, 8, 10, 12 folks in and out of their office every day saying, "If you give me \$100 million, here's what I'm going to do with it. Here's your return on your investment." They're constantly cranking through these potential deals to see where they're going to put their bets, where they're going to put their money. There are a lot of things going for COTS, but I think at the stage it was in, there were just other investment opportunities that a lot of private capital found to be a little more firm, maybe a little better guaranteed return, and so you start to cut down on who's willing to make a bet on building spaceships. I think ultimately that's where it ran into some trouble.

HACKLER: Were you involved in the discussions with NASA making the final decision to terminate?

ARENA: Yes, I was part of all of that.

HACKLER: Can you talk about what sort of issues came up and how those discussions proceeded?

ARENA: I don't have a good recollection of specific dates or specific meetings, but I remember the tone of the discussions as they progressed. What we were thinking a lot about was whether RpK had a meaningful opportunity to raise this money. This isn't to disparage RpK or any of the folks who were associated with that company at the time, but of course they're telling you, "Sure, we have a get healthy plan." There was a lot of really intense discussion, back and forth near the end. The phrase we used was, "Show me your get-healthy plan. You haven't been able to raise this money this way, and you haven't been able to raise that money in another way, so tell me how you're going to do it in some reasonable amount of time." You're trying to stare at that get-healthy plan and say, "Does that really make sense?"

I remember the more we dug into it—the more we had them on the phone for conference calls, the more we thought through it internally and had our own internal advisors, guys like me—the less confident we felt that there was really any meaningful opportunity for them to turn it around, and to raise the money it was going to take. Once you get to that decision, once you feel like they're really not going to recover from this, then it's pretty quick to get to the decision. Why keep stringing them along? Why keep going?

We all had it in our heads that there was such a limited amount of money on the NASA side, and that the NASA branding of it was so important that we wanted to make sure we really

were partnering with folks who had the best opportunity. It's such a long shot to start with. Once you draw the conclusion that someone's just not going to make a go of it, then pretty quickly you need to move on.

HACKLER: What sort of work do you do as the legal team to conduct the termination? There is the article—I think it was 17B—on Termination for Failure to Perform, but since this was the first [funded Space Act] Agreement that NASA had entered into with commercial companies, was there a lot of work that you had to put in to make sure all the i's were dotted and t's were crossed?

ARENA: Yes, I remember a fair amount of coordination, especially with NASA Headquarters, all along the way as we were moving in that direction. Here is where everybody plays their respective roles. You have Alan as the program lead, and the folks working for Alan, and me as well, trying to work with RpK to see if they can get healthy, to see if there is a way for them to meet their goals and continue and be successful. At the same time, I'm also starting to work with the Headquarters attorneys and starting to craft a framework that if this doesn't go well, what do I need to do to document that we gave them opportunities to get healthy, that we're putting them on notice, that under the terms of the Space Act Agreement we don't think that they're meeting their milestones.

If you go back in the file, I think you're going to find some correspondence from NASA to RpK that looks somewhat formal. It looks like a lawyer wrote it. "We're putting you on notice that you haven't met this milestone, and we need you within a certain amount of time to

give us your new plan on how you will meet that milestone,” and things of that nature. That’s all what’s going on behind the scenes.

We’re lawyering the file to make sure that it’s clear that we gave them a fair shake and that we dealt with the terms and conditions because, as a lawyer, especially on a brand-new program like that, you’re always trying to do two things. One is you want to make sure that you have a very legally defensible position, so you’re abiding by the terms and conditions of the contract that you have signed. You’re interpreting the language correctly and you’re following that.

Especially when you work for NASA, for the government, for a public entity, you also want to make sure that it’s clear that you’re being fair, that you’re being equitable in everything that you’re doing, that you’re giving folks a chance to be successful and you’re not just pulling the rug out from underneath them. I remember going through a lot of steps to make sure that there was a record that we had done those sorts of things.

HACKLER: Were you also involved in putting together the next round of competition? The second round, when Orbital [Sciences Corporation] was eventually selected as the partner, was completed very quickly after RpK’s termination.

ARENA: That was an important point too, because, to your earlier point, we were making this up. This was the first time we had done these types of agreements and this type of competition. There were very quickly a bunch of discussions in Alan’s office about whether we need to do a full-up complete competition again, or can we do some abbreviated version with folks who

competed before, or some subset of just the companies who made the final round who we had gone and visited with and negotiated.

In the end, what we decided was the time between our initial COTS competition and when RpK was terminated was not that great. We decided that the most fair thing and the most expedient thing we could do was not to start over from scratch, that there wasn't a need to do that. All of the work and all of the competition was fresh enough that we could do an abbreviated version to quickly pick another partner and get moving out on it.

HACKLER: The last topic I'd like to ask you about today is if you were involved at all with the unfunded SAAs that NASA entered into with some of the partners that weren't selected for funded Space Act Agreements.

ARENA: Yes, I helped put all of those together as well. That was an interesting byproduct that we hadn't originally planned on doing. I don't think we had given a lot of thought and a lot of preparation to the concept that we would have a couple of funded, but then a number of unfunded partners. I think it came about more as we got more into the competition, and everyone got a better sense that there are some really great ideas out there. We may not have the money to fund all of these great ideas, but we can in some way help to encourage these companies, even if they don't merit being one of the couple of finalists.

I remember having discussions, with Alan especially, quite a bit as we were kicking around this idea, and we felt like having unfunded agreements did a couple of things. It would give a formal legal mechanism so some of these companies could get some expertise from

NASA, because relatively speaking their concepts and their understanding was maybe just a little bit less sophisticated than the companies that we funded.

The second big thing that Alan and I talked about was we wanted to in some way say to the community that although these companies aren't getting money, NASA finds what they're up to of merit because many of those companies obviously were not planning on completing their program just on NASA dollars. They would have it in their offers or their proposals, and then when we'd have discussions with them they'd say, "Well, here's our approach to getting funding. We're going to go find private equity." We wanted to send a signal out to the community that said although they may not be one of the top two, this is a company that's got something going for it, and it's something that NASA wants to stay engaged with.

HACKLER: Did you help negotiate those agreements?

ARENA: Yes.

HACKLER: Can you talk about that process a little bit and which companies you worked with? What are some of the key issues that stand out in your mind as sticking points?

ARENA: To all the companies, but I would say especially to the unfunded companies, they were always trying to push for more language in their agreements that I'll broadly characterize as endorsements from NASA. Even our funded partners—maybe SpaceX [Space Exploration Technologies Corp.] less than RpK—these companies were especially interested in getting the strongest language they could that would indicate NASA's commitment to them. A lot of that

was because they were looking to take these unfunded Space Act Agreements and hold them up as banners, saying, “You should come work for my company,” or, “You should help finance my company because we are one of the chosen few that’s working on this great, new, innovative program with NASA.”

Some of those companies were more or less sophisticated, so I remember talking with a few, and they got that there was a line that NASA couldn’t cross. We’re not going to write something that says we think you’re the greatest thing since sliced bread. Other companies maybe didn’t quite get that. They were less experienced with working with NASA or any government agency. I remember seeing some of the drafts of their language where it was basically a commercial for them, and they just wanted NASA to sign. I remember spending quite a bit of time making sure that their agreements sent the right message that we were trying to send from NASA.

The second issue that I remember coming up quite a bit was we tried hard to tailor each of their agreements to what they needed. We spent a fair amount of time—and this was maybe more on the technical side, and then I just translated their technical agreements into legal, contractual language. There was a real effort to figure out with each company, “Here’s where we think you’re lacking in some expertise or you’re not thinking a problem through, and we want to provide you with assistance or insight in that area.” We tried to spend a lot of time giving each company what we felt like it needed and what it wanted from us. We certainly weren’t pushing anything. We were hearing the companies talk to us about what they felt NASA could provide them.

HACKLER: Was there any limit to the number of unfunded Space Act Agreements that COTS could enter into with these companies?

ARENA: There wasn't. Since there wasn't a rule book, there was no, "You can do three of these and no more." I remember when we first started formulating this idea of doing the unfunded agreements, we had this sensibility that these agreements should be real agreements, and so we didn't want to do too many of them. That never translated into, "We're going to do four," but it translated into us needing to find a definite line below which—we used to talk about watering down the NASA name. We didn't want to partner with just anyone. I remember having some discussions on where do you draw that line. I remember different technical guys on Alan's team having different thoughts on who we should include and who we shouldn't include, and working through all of that to come to some consensus that this is the roster of companies that merit continuing to work with the space agency.

HACKLER: I think Rebecca Wright also has some questions she'd like to add to follow up.

WRIGHT: Thanks, Jon. If I could get you to go back to when all of this first came up, at the beginning of the discussions and how the legal team got involved—to sort out any kind of confusion, was this a JSC effort from the legal office and then Headquarters got involved, or was it more of a joint, cooperative effort from the very beginning?

ARENA: I would say it was more the former. When it first started, it was a JSC effort. Alan got this job to run this program, and so much of the first several weeks or maybe couple of months of

the effort, it was just JSC legal helping out. At first it was very rudimentary. “Here’s what a Space Act Agreement is, here’s what a government procurement contract is,” just kind of educating folks.

It was an interesting process in that the more it got legs—at first it was kind of a crazy idea, to be honest. I probably shouldn’t use that language, but I remember the first few meetings, this COTS idea was just this wild, crazy thing. Then as it got more and more backing, and it was clear that we were actually going to get the money for this, and it got more and more attention at an Agency level and a national level and Washington cared more about it, then it became much more interactive.

WRIGHT: Still that same time frame—once it took legs, it seemed to take off running. You were really working closely together as a team to move everything in place to get this going as quick as possible. Do you recall what was pushing that mandate?

ARENA: I remember we all had a strong sense—and this was just our sense, so don’t take this as fact as much as my opinion—that the [NASA] Administrator [Michael D. Griffin] was going out on a limb, and fenced this money off. We used to talk about the \$500 million, and he gave a couple of very public talks. We all had a very strong sense that we need to do something now. Some of that was because we felt like he had personally put his name behind it, and so we needed to honor that and get something done.

Some of that was because, if you guys put yourselves back in that timeframe, there were a whole lot of question marks. We knew that the Shuttle was going away, and we knew we’ve got this plan to have our own Orion [Crew Exploration Vehicle] to get to the Space Station, but

there were these gaps. Some of the momentum was trying to deal with that issue. I think we also, as a group, had a sense that if we went slowly, it would get cumbersome and it would get bogged down. It would turn into, for lack of a term, a government program, so there was a real sense of energy about it.

I'll tell you—from my standpoint, working with the group that I worked with on COTS, it was the best program I've ever worked on in my 13 years in NASA because of all of that energy, and because of that sense that you had to make the rules up as you went, and you could do it as best you could. It was a lot of fun, and I think that kept the energy level high.

WRIGHT: I like that term, “sense of energy.” This is kind of an “out there” question, and don't feel obligated to answer it, but since you've worked in procurement and contracts, do you have any idea about what monetary amount of value the legal office contributed to the COTS program?

ARENA: Rebecca, you can't put a number on that.

WRIGHT: Just to infinity and beyond?

ARENA: Yes. I guess I'll just answer it this way. We worked a lot of hours on COTS—not just me, but we were regularly working lots of nights. I can remember one particular meeting running into Alan [Lindenmoyer] at the mall, and he said, “Oh, I'm so glad that I ran into you.” While my wife shopped and his family shopped, we sat down for two hours in the food court,

and we mapped out some strategy to get something done. We threw ourselves into COTS pretty good.

WRIGHT: Did you get a vote in the selection process, or were the legal people just advising?

ARENA: No no, just advising. Just doing the same types of things that we would do in a procurement context, making sure that what they were considering they were documenting correctly, that they were following the process that we had laid out and said we were going to follow, and things of that nature.

WRIGHT: As you were walking through this process, did you have reservations on whether or not the legal process that you put in place was going to be able to be defensible, because didn't you have a couple of chances to answer some questions whether or not this was legal and the right thing to do?

ARENA: Yes, we got protested. One of the companies that didn't win an agreement actually filed a protest against us at GAO [Government Accountability Office]. One of the things I got to do was not just theoretically defend the process, I and some Headquarters attorneys wrote the legal brief representing NASA to the GAO. We said a couple of things. First, you don't have jurisdiction over this because it's not procurement, and second, what we did is fair and reasonable and transparent.

We won that case, which was a really seminal case for NASA, because for 50 years we had our Space Act authority—we didn't use it for procurements, we didn't use it for purchasing

goods or services, and we said the GAO did not have authority over it. We all felt that internally, but we had never actually litigated a case and had GAO give a decision saying, “Yes, you’re right. Your Space Act authority, as long as you use it appropriately, does not fall within our legal authority.” No, I really didn’t. I felt like it was very defensible. I felt like it was a very good framework that we had come up with.

WRIGHT: The last one real quick—when you were in New York, one of the comments that you made was that you were trying to help them understand why it was important to help support this new industry. What were some of the reasons that you gave to those potential investors and bankers to have them understand why this was important?

ARENA: To the investors and the bankers representing the company, there really is only one reason that’s important to them: they can make money. They generally don’t really care about Mom and apple pie and all that sort of thing. They’re thinking, “I have to place my money somewhere. I want the greatest return I can get, so you tell me why you will provide a return.” A lot of those conversations were that this can be a business.

Put yourself back before there was commercial flight, so before Mr. Boeing and Mr. Lockheed and Mr. Martin. There was a time when there were folks who probably wouldn’t have invested in—“Nobody’s ever going to fly on planes, trains are the wave of the future”—but if you got in, that’s a real industry. There were a lot of comparisons. They were always trying to think of the right analogy. “Does this really have a chance to be an industry with companies that make money and be the big hit of the 21st century?” A lot of what we were trying to do was provide that kind of context.

We used to talk about FedEx [Corporation, shipping service] quite a bit, “This could be our FedEx.” I used to say we need to get water and brownies and underwear up to the Space Station, and if there were a company we could hire to take all that stuff, that’s what we would do. The space agency wants to go to Mars. It wants go do big, giant things. We don’t want to carry food and underwear to the Space Station forever. If there are companies that can do that for us, we will pay them a lot of money to do that someday, but there have to be companies to do it.

WRIGHT: Thank you.

HACKLER: We don’t want to take up all of your afternoon, but we do want to give you the opportunity to share with us if there are any last thoughts or reflections you have about your work on the COTS program.

ARENA: Only what I’ve mentioned already. I really view COTS as a real highlight of my career, both because the legal work was really interesting and groundbreaking, but there was also a real sense of community and a sense that we’re doing something really new and really important. I just remember all the energy around that group of people who were working on it at that time; I remember it being just a really special project to work on. We spent a ton of time outside of work hours, too. We would have barbecues and go for cocktails, and just do things. We got to be a very close group. I remember all of that combined being just a really wonderful time.

HACKLER: I’m sure everyone appreciates all of the work that you did in laying a foundation for this program to be possible. Thank you for your time this afternoon.

ARENA: Thank you.

WRIGHT: Thank you. Bye-bye.

[End of interview]