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ORAL HISTORY TRANSCRIPT

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INTERVIEWED BY REBECCA HACKLER
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HACKLER: Today is December 7, 2012. This oral history interview is being conducted with Amy Xenofos at the NASA Johnson Space Center in Houston, Texas, for the Commercial Crew & Cargo Program Office History Project. Interviewer is Rebecca Hackler, assisted by Rebecca Wright.

First, can you share with us briefly a little about your background as a NASA attorney? What are your previous experiences working on contracts and SAAs [Space Act Agreements]? I understand you've been here and at [NASA] Headquarters [Washington, DC].

XENOFOS: I started here in the summer of 2000. I was hired directly out of law school, so this was actually my first and only job as an attorney out of law school. I went to law school in Florida and moved to Texas. I had never lived in Texas, or anywhere outside of Florida, before. I was here from 2000 until summer of 2006. We actually started a lot of the planning for the COTS [Commercial Orbital Transportation Services] project in 2005, so when I went to Headquarters in 2006 we timed it so it would coincide directly with the award of the first round of funded Space Act Agreements.

I went up to Headquarters the summer of 2006 as the lead counsel for the Exploration Systems Mission Directorate [ESMD], and stayed up there for about two and a half years. I was in ESMD until the summer of 2008, and then from fall 2008 until January 2009 I actually did a

rotation in the Office of Procurement for six months. Then I came back to JSC in February of 2009 and was named Assistant Chief Counsel for General Law and External Partnerships, and that's the job I have today.

So starting in 2000, at the time our office managed the Space Act Agreement process for the Center. We had never done funded Space Act Agreements before COTS; COTS was the first time we did it. Our office managed the Space Act Agreement process, and we gave that up probably around 2003. Now that I'm back, I am the lead attorney here for our Space Act Agreement policy and practice. So it followed me everywhere.

HACKLER: Can you briefly review for us what are the different types of SAAs that NASA uses to partner with industry? We know there are funded, reimbursable, nonreimbursable.

XENOFOS: Those are the only three types that we have. You have reimbursable, where money is coming in; funded, where money is going out; and then nonreimbursable, where no money changes hands. Each party brings their own resources and assets to the table and they're responsible for covering their own costs for doing the collaborative work. Nonreimbursable tend to be more collaborative, you're bringing stuff into it and you're getting tangible stuff out of it.

With the reimbursable agreements, we tend to do those a lot. Reimbursable and nonreimbursable are what we do probably 98 percent of the time at this Agency. The only time we've ever done funded agreements has been for commercial crew and cargo. All of those agreements, until very recently, have been done at the Johnson Space Center and Headquarters. We do the competition, Headquarters awards the agreement, and then the agreements get managed here.

For the Commercial Crew and Cargo Program [at JSC], that was the case for the entire scope of the program. Only now with the Commercial Crew Program at [NASA] Kennedy [Space Center, Florida] have we had another Center involved in actually managing funded Space Act Agreements. Otherwise all the funded agreement work has been done here, and I've been involved in every funded agreement we've done, including all the ones at Kennedy now.

The nonreimbursable agreements are done with all sorts of entities. We can do all these agreements under our Other Transaction Authority in the Space Act authority. In the National Aeronautics and Space Act [of 1958] it says, when it was written, that we have the authority to enter into contracts, grants, leases, and any other transactions that we may need to carry out our mission. So "other transactions" is written very broadly, and we've read it just as that. If there's no other authority that would allow us to do what we want to do, and we want to do something to carry out our mission, then we can do what we call a Space Act Agreement. It really is a catchall.

The Space Act also allows us to accept reimbursement from outside entities and keep it at the Agency, we don't have to give it away to the [Department of the] Treasury. It allows us to do agreements not just with domestic entities, but foreign entities, for-profit entities, nonprofits, academics, other federal and state and local government institutions, pretty much anything under the sun we could think of.

It's a fantastic authority. We've used it more and more as the years have gone on. I think especially as the amount of program activity has been reduced, the amount of Space Act Agreement activity has increased, because people are still here, they're still wanting to do research and advance ideas, and the Space Act Agreement is a tool that lets them do that in a nontraditional way.

HACKLER: Is there a specific requirement for when you have to use a Space Act as opposed to a contract?

XENOFOS: It's actually the other way around. We have this great book, the Grant and Cooperative Agreements Handbook. In that handbook, we have a definition of when you use a procurement, when you use a grant, when you use a cooperative agreement. Those are the authorities we go to first.

If you want to acquire a good or service for the direct benefit of the Agency, you have to use a procurement. You can't use a Space Act Agreement. If you have money and you want to be able to advance or stimulate a public purpose, you would use a grant or a cooperative agreement, depending on the level of involvement you want to have with the entity. When we give a grant to a university, normally we just throw money over the wall and say, "We know you're working on this area. It stimulates a public purpose for you to advance the research in this area, so we're going to grant you some money. Give us a report of your results from using this money when you're done."

With a cooperative agreement it's the same concept, except we don't want to just throw you money and have you give us a report; we want to actually be substantially involved with you while you are doing the work. Cooperative agreements and funded Space Act Agreements are very similar. When we were starting with COTS we had to do a lot of work to be able to distinguish why a cooperative agreement among other authorities would not get us where we wanted to go, and justify that we had to fall back on a funded Space Act Agreement. Any time we do a Space Act Agreement, it's because we can't do it any other way.

HACKLER: Thank you, that's a very thorough explanation. You were involved from the very beginning with this new form of funded Space Act Agreements. What were your thoughts when you first heard about this new program trying to do this nontraditional procurement? What sorts of legal challenges did you have to overcome to be able to make that happen?

XENOFOS: I thought it was very cool. First off, we had more help from the legal community than anybody could have ever wanted. I think we had a team of about a dozen lawyers from Johnson Space Center and Headquarters all getting together to figure out how we would structure such an instrument, because we had never used our Space Act authority to provide funding to anybody before. We were so nervous about having our use of the authority questioned, whether we were going out too far, whether we would be accused of circumventing the Federal Acquisition Regulation [FAR] and circumventing the Competition in Contracting Act by using our own in-house authority.

One thing—I spend a lot of time correcting people on this. COTS was in no way a procurement. It's not like it's a nontraditional procurement. It is a non-procurement, because we were not actually buying anything. In the strict legal sense, we were not acquiring a good or service for our direct benefit. In this case we had an interest in seeing a capability developed, we had an interest in seeing an industry flourish, and the Administrator [Michael D. Griffin] said, "You know what? These guys out there say they can do it if they only had the resources. So let's see if they can do it."

We were very clear in our analysis and very clear in our setting up that we could use a funded Space Act Agreement, that we were not doing this to get a service for ourselves. At the

time, all of the statements out in the public were saying that between the remaining Shuttle flights and with Constellation [Ares rocket and Orion Crew Exploration Vehicle] coming on board, and all of our International Partner commitments that we had, we had more than enough support to carry out our cargo and resupply needs for the [International] Space Station.

COTS was just a bonus. If somebody came up and was able to develop a capability, great. If everybody fell flat on their face and realized that it was just going to be too hard, and it turned out that nobody could demonstrate a capability by the time we got to the end of these agreements, that was fine too. It was always seen as a backup, which is different than what you hear with crew today.

That's why I think it's been a lot harder to justify using funded Space Act Agreements on the Crew Program than it ever was on the Crew and Cargo Program, because of that policy background.

HACKLER: What are some of the specific changes you made to the Space Act Agreement to make it commercial friendly, to allow these companies to develop their capabilities?

XENOFOS: One of the reasons that we said we had to use a Space Act Agreement, that a cooperative agreement would not work for us in this instance, had to do with intellectual property rights, which has always been a huge sticking point for industry. We wanted people to be able to develop a capability, but we also wanted people to be able to market that capability and develop their own private-sector interest in buying the capability.

I think it's easier to make an argument that there are other people, aside from the government, that may want to ship stuff to space. It's harder to make that argument for carrying

people, but I think when you're trying to just ship cargo, there are other people out there who would want to do that.

We wanted to make sure that any industry, any commercial partners that had capabilities developed, that we didn't have our fingers so much in their intellectual property rights, in their inventions and patents and their data rights, that it would inhibit them from being able to sell to commercial companies, to potential customers. In procurements and grants and cooperative agreements, we're required by law to take a certain amount of rights in any data that's generated or inventions created under agreements if they're performing work for us.

In this case, with the Space Act Agreements, we said because they are not performing work for the government, we either will not take or will not exercise government purpose rights in the data that you generate, or in the inventions that you create. So a lot of the language in the agreements we had to draft special for funded agreements, that's different from the standard language we have in reimbursable and nonreimbursable agreements.

We had to acknowledge there were certain march-in rights that we could take in intellectual property and inventions they might make, or in data they might generate under the agreement, but we agreed—mainly in the invention area—to refrain from exercising those rights for a certain amount of time, as long as they continued to make progress toward developing this capability for commercial purposes.

If they went bankrupt and went out of business, and they weren't pursuing anything anymore, we would have the right under the agreements to come in and take whatever we thought was valuable, and be able to bring that in for government purposes. Then if we wanted to hand it to somebody else so that they could develop a capability, then we could.

We've never had to do that. It never happened, but that was something that was unique to these agreements, that we could actually say, "We're not going to touch your intellectual property. You can use it. As long as you're making progress, we promise we're not going to exercise any rights we may have in your intellectual property."

The other thing that's unique to the Space Act Agreement is also something that we learned from and modified as we've done more agreements. In the very first agreement we had a personal property clause. Not intellectual property, but actual hardware, equipment, personal property. We said, "If we have to terminate this agreement because you're not making progress, we have the right to go in there and buy property from you that you may have bought under this agreement using our money," and we put in there a pre-calculated formula.

We had to be responsive to stakeholders outside of NASA like OMB [Office of Management and Budget] and Congress who were like, "This looks like you're just throwing money down a hole. Why would you even do this, because what is the likelihood that anybody's going to make it work?" So we had to put something in the agreement—which was unique to this agreement—that said, "If you guys fail, we can go in and buy back, for pennies on the dollar, property that you may have bought or acquired under this agreement," to show we could get something of value back to make our outside stakeholders happy. Those were all unique to the funded agreements.

But as we went on, we realized that that actual clause wasn't doing us a whole lot of good, and it was a real burden on the companies. So we modified that personal property aspect of it in later agreements. You really don't see it in the later agreements, but we had them early on in the first COTS agreements.

HACKLER: One thing that I'm curious about with the intellectual property rights—I read an article a few weeks ago that said that Elon Musk, the CEO [Chief Executive Officer and founder] of SpaceX [Space Exploration Technologies Corp.], doesn't like to patent his ideas and inventions. Do you have any legal perspective on that, or did that come up at all in the SAA negotiations?

XENOFOS: Not that I remember. A lot of that would have come up probably during implementation. Honestly, our office didn't get involved a whole lot in implementation from that perspective. We got involved in a lot of other issues.

I think it's interesting that he wouldn't want to seek patent protection on some of the stuff he's developing, because he's probably unique in that he's the one who's doing the most in-house. You'd think he'd want to protect some of that. But it doesn't change what we can do with our property, so maybe that's part of it. That's interesting.

HACKLER: I think he was quoted as saying that it would just be selling the ideas to other governments, and he prefers the trade secret route.

XENOFOS: That's true, because when you patent something, it's published. Once you patent it, anybody can pick up the patent from anywhere and read through the patent. It discloses all of the technical detail that goes in that patent. So I can see—because he is a pretty secretive person—where he would want to avoid something like that. That's actually a really good point, that's interesting.

HACKLER: The other thing that we understand from talking to Alan [J.] Lindenmoyer was that using the International Space Station [ISS] as a test bed for proving these capabilities to deliver cargo was something of a hiccup in legal discussions. Can you talk a little bit about that?

XENOFOS: Sure. It really comes down to the choice of instrument thing I talked about. If we said everybody had to go to the Space Station to do a demonstration, the concern was that it would look like we were trying to get a service for our direct benefit. If we're trying to say we're developing a capability that anybody could use, well, who else is going to want to go to Space Station but us?

Because of the orbit that it's in, and how you have to go to get there, it was just so unique to us that we said, "Requiring a demonstration flight to the ISS looks too much like we're trying to do R&D [research and development] to develop a service for us. That would kick us into the procurement route." So instead what we said was, "You have to demonstrate to low-Earth orbit [LEO]. If you want to go to Station, that is a LEO destination option. We'll make it available. You'll have to meet certain requirements to be able to come close to our Station that everybody has to meet. It's not going to be unique to you." Those are like safety requirements. But a company could demonstrate to another LEO location and still have a successful COTS demo.

That was a very important distinction that we said, "It's your choice to go to it." We didn't actually make it a requirement. That was the way we were able to get around, "Is this a service that we're trying to buy for ourselves?" Because there is a type of contracting called research and development contracting where you're trying to develop a service or good that isn't available today but that you eventually want to buy. You can do that through a contract, but we didn't want to do that here. A big part of it was because of the IP [intellectual property].

So we ended up having to say that it was a choice to go to Station. Everybody who seriously proposed pretty much proposed to go to Station. Actually I think at first somebody had actually proposed—maybe it was just an early demonstration that they had proposed to go to a different orbiting test bed. They were going to put a spent stage in orbit, and then they were going to go dock with that spent stage. I want to say somebody had talked about that.

But at the end of the day, everybody who was really serious about wanting to do a demo [demonstration] had all said, "We want to do a demo to Station." Because they knew that if they eventually wanted to provide us services—and I think a lot of people felt like we were the one sure customer out there if they could develop something—they were going to have to do all those interface requirements at some point, so why not try to get in that early. But that was an important distinction. It was their choice; it wasn't our requirement on that.

HACKLER: Were there a lot of discussions regarding how to work that in the Space Act Agreement?

XENOFOS: I think early on we all got comfortable with the idea of making Space Station a choice. I don't know from the technical side, from Alan's side and those folks, how important it was that we had to go to Station. I know from the legal side it always seemed a very obvious solution to the problem. Let's just not require them to go there. Let's tell them they have to go to low-Earth orbit. If they want to go there and you guys are comfortable with it, then okay. So it seemed obvious from the legal side, but from the technical side I don't know how controversial that might have been.

One thing that was really controversial though, was if a company doing a demonstration chose to go to Station said, "Hey, since I'm going up there, do you want me to carry anything for you?" That became a real issue, because then it looked like we were actually getting something for our direct benefit through the demonstration flight under the SAA.

From the technical side, well, this just seems practical. They're going anyway, they have got space. Why would we not give them like t-shirts and water and stuff that if we lose it we don't care, but if we could get it up there it'd be nice? From the legal side we were like, "Gasp, you're jeopardizing the whole rationale for using a funded Space Act Agreement if you do this! Please stop!" From that perspective, that one had a lot of time and energy spent on it. As it turned out, when [SpaceX] did their demo flight, they ended up carrying some of our stuff.

HACKLER: If you can share this type of information, what sort of changes to the original draft SAA that was in the [COTS] Announcement did companies propose when they submitted their proposals?

XENOFOS: Without sharing specifics—there were some things in the agreements that might have been only unilateral that the companies wanted to make bilateral. For example, we had a statement in the agreements about warranty. We said, "Anything that we would provide you, we're not providing with any sort of warranty for fitness or merchantability." It's a whole legalese paragraph. If we provide you something, it's as is, where is. If you can use it, awesome. So some of the companies wanted to make that a reciprocal warranty provision.

There was some negotiating with everybody on the intellectual property. That was all unique to the company and to their concept and how much technology they had coming in.

Some companies wanted to use more heritage hardware and material, some companies were going to be developing it more on their own. So the IP clauses that we wrote affected everybody a little bit differently.

We had some differences from them. Some companies were saying, "We'd like you to give us a longer amount of protection, a longer amount of time before you would potentially march in and take stuff to give us more time to develop whatever we're going to develop," that kind of thing. Those are probably the big things. The stuff that had the most negotiation was stuff that was supposed to be negotiated, like the milestones and the dollar values and the content of the milestones. That's really where all the real haggling was.

HACKLER: When you did the negotiations, was it a matter of just a few hours to get this done, or was it days of haggling?

XENOFOS: It was days. Especially for the first round of agreements, because everybody was new to it. Everybody was new to the instrument, and what we felt comfortable doing and not doing. Really what we tried to do with the negotiations was nail down specifics. So when someone said, "I met a milestone," what does that mean, what did they have to give us?

I think with the first round of agreements we weren't as smart about nailing down what it was exactly we needed to see in order to get the money, the success criteria for each milestone. We had much more of a general understanding between the parties. Both us and the other parties were like, "We'll work that stuff out, we'll get to it." It was very good natured. I think it was just because we hadn't had any experience in working with the legal instrument to know what we needed.

Since we've done the first round, our negotiations have gotten a lot more focused on the milestones about what do we need to see to know that a milestone's criteria has been successfully met. What content, what documents, what's going to make us feel comfortable before we actually give you the money, and to put that down in writing. The early negotiations, there was just so much we didn't know because we had never done it. I'd say the milestones for the first agreements were probably some of the most vague that we've had of all of the agreements.

The way the competitions worked, we had a sample agreement in the Announcement. For contracts you put out an RFP, or a Request for Proposals. For the Space Act Agreements, we wanted to use different terminology to avoid confusion. This was not a procurement, so we called that request an announcement. We put out the Announcement. We had all the conditions for proposals and what we wanted to see and what we were going to evaluate, and we had a model Space Act Agreement in the back with the terms and conditions we're going to come in the door with.

Then, for any company that made it past the initial evaluation period and we thought had potential, we met with them. It is similar in focus to what in procurements we call a competitive range. If we have 12 companies come in and bid, we're going to take these 6 to the next level. We said only these 6 are competitive, that's the competitive range we have left. Then the people below that, we're not going to look at anymore.

In the funded SAA competition, nobody was eliminated from the competition, but we did establish what we called a most favorable group. We didn't say it was a competitive range where we eliminated people, because we eliminated no one at the initial evaluation stage, unless they were just completely unacceptable and didn't meet the Announcement criteria.

Then after we said, "You guys are the most favorable," and we went to—in procurement they call it discussions. For funded Space Act Agreements we called it due diligence, because we were told in industry that's what you do before you make an investment decision. You do your due diligence, so that's what we called it.

Due diligence meetings with each company lasted two to three days. During those two to three days was when NASA evaluators got to go see proposers' facilities, and when we got to negotiate the Space Act Agreement. So we might have a whole day where we did nothing but negotiate the agreement. Then we might break up into teams, and the lawyers and the business guys would go off in one room, the technical guys would go off in the other, and we'd each hash out our own sections and then come back.

At the end of that meeting the companies would go back and address any strengths and weaknesses we gave them on their proposal. Then they would come back and give us a final proposal with a final Space Act Agreement, including a final set of milestones and dollar values for each. Hopefully it would encompass everything we had talked about during due diligence so that it was in a state that we could say, "Yes, these guys are good. We can award to these guys, their milestones are okay." We didn't have to do any more after that.

Since then we've had to do some, "Yes, I want to pick them, but I need you guys to go and refine these milestones a little bit more." We always allowed for that in the process, but we didn't have to use that for the COTS agreements. We've had to use it for the commercial crew agreements.

HACKLER: You talked about the agreements and negotiations getting more refined over time, as you had a better idea of what you knew you needed to look for. I was wondering, in legal

documents, what is the significance of certain words being capitalized? Like if they would capitalize milestone or invention, or different verbs such as will, must, shall.

XENOFOS: Normally we like to only capitalize the terms that were defined terms, that had a specific meaning for the purposes of that agreement. So Partner or Party, or like you said Milestone or Invention, or even Agreement. We would define those because they were a proper term for purposes of that agreement, you defined it somewhere.

I'm not a big fan of capitalizing the must and the will and the shall. A lot of attorneys do that for emphasis, but I don't think it adds any real legal value. It just makes it feel stronger. Typically when we would capitalize a statement, it was just because it was a defined term in the agreement. It actually meant something specific to that agreement, so you wouldn't defer to the Webster's definition of that term; you'd want to go look for that term as it's defined in the agreement somewhere to know how we're using it.

HACKLER: With the verbs, what is the difference between, for example, "someone *will* do" something versus "Party B *shall* do" something?

XENOFOS: It's stronger. We've always said *shall* is the strongest, I think *will* comes after that, then you've got *may*. It's really just how stringent the requirement is that we put on them in the agreement, or that they put on us, or that we put on each other. It's very subjective, I have to say. There's no real like legal book somewhere that says, "This is quantified at 90 percent you must do it, and this is 60 percent you must do it."

HACKLER: Did your legal counsel have any influence on which partners were selected?

XENOFOS: I'd like to say we had some influence when they did the final selection. It's funny, because for every one we learned a little bit more about what we needed to do for our final selection.

The selecting authority and signing official for all of these agreements was the ESMD Associate Administrator. It was always somebody at Headquarters, because we said only Headquarters has the authority to do funded agreements. For the first selection, we had never done it before. The selection authority for any activity will always have a group of advisers. The General Counsel is always one of the advisers.

But in these competitions, I think they relied a little more heavily on business advisers that they brought in. Both the evaluation team and the Selection Authority had their own business advisers that had been brought in from outside as consultants to talk about how industry does venture capital and investing. You probably heard about some of that from the program.

For most evaluations the selection authority relies upon the findings and what was developed by, in this case, the Participant Evaluation Panel, or the PEP. Normally for procurements we have a Source Evaluation Board. But for funded SAAs, we established a Participant Evaluation Panel. But normally you would just rely on what those guys came up with as far as findings and how they parse the data, then the selection authority can make his decision.

In this first one, the Selection Authority actually had the companies come in and do a pitch directly to him and his advisors. They were able to ask questions directly of the companies. At the time we had an Associate General Counsel for Commercial and IP Law at

Headquarters who was new to the Agency and had a lot of experience in private business and venture capital, so I think his advice was taken very well and was asked for quite a bit because of that background.

I think those of us who have been confined to the Agency for the most part, our advice came in really handy when it came to how do we structure a competition, how do we make it look fair and open, how do we ensure that what we're doing is transparent and aboveboard. But when it came to who got selected and who had the best portfolio, I don't think my advice really mattered a whole lot.

HACKLER: I'm sure it was very valuable in the negotiations and sorting out all the legalese.

XENOFOS: As we went forward, folks like me who were involved in every single one and were able to learn stuff from it—I think our advice became more and more valuable. Now I'm at the point where the Commercial Crew Program, even though they're at Kennedy, they call me for legal advice on the funded SAAs rather than talk to local counsel because of my experience. I think that's really where it all comes down to is whatever experience someone brings to the table, that's what folks are going to listen to. I think that's the right thing to do.

HACKLER: You did mention closer to the beginning that you didn't have as much to do with execution of the Space Act Agreements, but do you know of any issues that did come up once they were signed? What sort of things did you learn from that you applied to the later rounds?

XENOFOS: Well, one thing that came up during the COTS agreements was the use of government property. Under funded Space Act Agreements—and you may have heard about this a bit from Bruce [A. Manners, NASA COTS Project Executive], because this was a huge issue on the Orbital [Sciences Corp.] agreement—we have no authority to transfer property. The General Services Administration has a disposal and excess process for personal property, and everybody in the government has to use that.

Under a Space Act Agreement we can loan property, because there are certain bits of property that we had that companies couldn't get elsewhere. If they were going to go to Station for example, and they needed to have certain equipment in order to interface with Station, there's some of that that they couldn't get from the private sector.

So with a company like SpaceX, where for their demonstration they were planning on going up, berthing to the ISS, and then coming back, we could loan equipment to them under the agreement with the idea that if everything works, they're coming back and we can get it back from them. But with a company like Orbital, where their demonstration plan was to go up, berth, and then burn up on reentry, we can't loan them equipment.

It became a huge issue. There were certain types of property like the Common Berthing Mechanism—we had one, and they couldn't get one built anywhere near in time that they needed to for a demonstration. They wanted it from us because we had one sitting around. We wanted to give it to them, but we had no way to get it to them.

We had to go and develop this huge rationale. We had to go all the way up to Congress and let them know what we were going to do, just to get them this piece of equipment. We had no idea that this was going to come up when we negotiated the agreements, so there was nothing in the agreements. We had stuff in the agreements that said we would be willing to provide them

with property or services that were unique to us, but we never really thought through what that meant when we wrote it, we just put it in there.

So that was huge. In fact now we're actually pursuing authority from Congress to add to our Space Act that says we're allowed to, in certain circumstances, transfer property under a Space Act Agreement if it meets certain criteria and it's for certain goals to help commercial space. It's very unique to commercial space.

We learned that from the COTS agreement with Orbital that it's authority we didn't have. We hadn't thought about it, how do we get there? We eventually worked through it, but it took over a year to figure that out. That was one area the lawyers at JSC and HQ [Headquarters] got really involved in. How do we provide property to these guys under the agreements that they can't get from anybody else but us? How do we do that rationale and work all that out?

The thing I never got involved in was when the program did their quarterly reviews with the partners, when they went on milestone reviews and got to see tests and all that. I never got my invite to those. It was a bummer. Never got to go out to the SpaceX or Orbital facilities and see all that cool stuff. We only got involved in the really sticky stuff, not the fun stuff.

HACKLER: The facilitator role.

XENOFOS: Yes, exactly.

HACKLER: In addition to this being the first use of funded Space Act agreements, there was also the first termination of a funded Space Act agreement, with Rocketplane Kistler [RpK]. I was wondering if you had any role in that and how that was executed?

XENOFOS: I did. Like I said in the beginning, these were technically Headquarters agreements. They were signed by the AA [Associate Administrator] for ESMD. They were managed at the Center by the program, but when it came to something like termination it had to be a Headquarters call. It could only be terminated by the person who signed the agreement, which was the AA for ESMD.

At the time, I was lead counsel for ESMD at Headquarters. When we did the termination, Rick [Richard J.] Gilbrech was the AA at that point. When we awarded them it was Scott [J. "Doc"] Horowitz, then Rick Gilbrech came on, then Doug [Douglas R.] Cooke, who was Deputy AA for ESMD under both Horowitz and Gilbrech and was around for the entire life of the funded agreements to that point. Then they merged [ESMD and the Space Operations Mission Directorate], so now we just have HEO [Human Exploration and Operations].

The definition was very clear in the agreements that we could unilaterally terminate for failure to meet a milestone. There was a lot of discussion on what that meant and how to proceed in accordance with that SAA clause. With Rocketplane Kistler, one thing that we knew from the competition was that their business case was not as strong as some of the other competitors. They relied on a lot of outside financing to be able to do what they needed to do, unlike some of the other competitors who might have had some more in-house money available.

What we had done to try to mitigate that risk in the agreements was to negotiate early on in the milestones that they had to get big chunks of that money from their outside investors, so that we could see that they had the resources to make progress. That was what tripped them up. They were only around Milestone 4 or 5, but it was a financial milestone that tripped them up, not a technical one. So what did it mean to fail to meet a milestone? We had a whole paragraph

in the agreement that they had to have an opportunity to tell us why it didn't work and what their plan was to go forward. We had to be able to sign off on that saying, "We think that's a credible plan."

SpaceX ran into situations where they may have failed to meet a milestone. I think Orbital might have too, but all of theirs were technical in nature. It was more, "We've had a slip because of this thing, so it's impacted this milestone. We think we can get there in a couple of months." It was all very clear. You could see okay, they have a plan. They've figured out what it is and they're going to fix it down the line. Not an issue.

But with RpK it was, "We just can't get this deal nailed down." We spent a lot of time at Headquarters getting documentation, getting information from them, sitting down with Rocketplane Kistler and their business people to say, "What is your plan to structure this stuff? How does it work?" We had lots of meetings at Headquarters. This was a really hard decision for the AA to make, but I was up there with them when we were figuring out what information we needed. I drafted the letter that the AA signed that says, "We're going to terminate and here's how we're going to terminate."

I was actually part of the team in the Office of the General Counsel at Headquarters that had to set up the new competition and figure out what we were going to do, what the Announcement was going to look like, what changes we were going to make from the first competition to this one using what we had learned already. One thing that folks really learned was the importance of the business case. I think some people were a lot less willing to take on the business case risk than they were the first time around, because of what happened with RpK.

So yes, I was up there for all of that, which was awesome. If I would have been down here, I probably wouldn't have been nearly as in the middle of how that one got terminated and the other one got competed. It was great.

HACKLER: Were there a lot of issues with the termination? Did RpK try to contest it at all?

XENOFOS: Yes, oh yes. RpK were upset about the termination. When we did the first competition, we had a bunch of competitors. We went through the whole process, and we awarded two agreements, to SpaceX and RpK. After that award, we got a protest at the GAO, at the Government Accountability Office. Normally that's where you get protests for government procurements.

We got a protest from somebody that had lost, Exploration Partners [LLC], saying, "You guys can't do this as a funded Space Act Agreement. What you want to do should be an R&D contract. You're trying to circumvent the Competition in Contracting Act and the FAR by doing this." They lost the protest because the GAO said, "Exploration Partners wasn't timely in its protest. If Exploration Partners didn't think NASA was using the right legal instrument to do something, Exploration Partners should have protested at the time the Announcement came out, but now that NASA has gone all the way through to award it's too late to say they used the wrong instrument, so we're not even going to look at it."

RpK and SpaceX helped us defend that protest from behind the scenes. We were the actual defenders of it at the GAO, but if we needed information from them we could go to them. I think RpK might have even written an amicus brief in support of us. Anyway they learned.

We did Round 2 and we put out a new Announcement saying we're going to do another round of financing.

RpK protested at the GAO as soon as that Announcement was released, saying, "This should not be a funded Space Act Agreement. This should be an R&D contract. These guys are trying to circumvent the procurement rules. We ought to know, because we were one of the first guys." That protest was a landmark protest in the GAO. People cite it all over the place as the GAO's analysis of when you can use an Other Transaction Authority instrument versus a procurement.

It's been great to have that protest decision, because now we have in writing from the GAO what the criteria are you have to meet. You have to be able to defend your legal instrument selection in these ways to be able to successfully defend a challenge to the instrument. That's how pissed off RpK was. They not only were upset that we terminated their agreement and were arguing with us on that, but they tried to tank the second competition to keep us from bringing anybody else on.

RpK ultimately lost the protest and we won. It's because we had done so much homework early on, before we even decided to do a funded Space Act Agreement, on why we had to use a funded Space Act Agreement. If we hadn't done that, then chances are GAO might have had a different outcome. So that analysis was huge. I haven't really heard much about Rocketplane Kistler since their agreement went away.

HACKLER: I think the company dissolved in 2010.

XENOFOS: There you go.

HACKLER: You talked about that GAO case being such a landmark case for that type of agreement. Have you seen your work on this being translated into any other precedents, or setting the stage for other funded Space Act Agreements?

XENOFOS: We've had a lot more interest from people about using funded Space Act Agreements for whatever they want to do. I think the idea of developing commercial space industries has become much more in vogue, so we have lots more folks coming to us with an interest in using a funded Space Act Agreement to do this, that, and the other.

There's actually currently a rewrite of the NPD [NASA Policy Directive] 1000.5, which is the acquisition NPD for the Agency. I haven't read the whole thing, but it seems like a real driver for that rewrite is to be able to add funded Space Act Agreements into the acquisition analysis. We had never done that before, so that's something that's new. What is our criteria for using funded SAAs.

I don't know that our authority, that the way we've used it, has changed the way other agencies use it. Other agencies have Other Transaction Authority besides us. We were the first ones to have it, because we had ours in our original statute in 1958, but other agencies since have got it. DoD [Department of Defense] has got it, DARPA [Defense Advanced Research Projects Agency] has got it. I think Homeland Security has got it, the Department of Energy has got it. But all of theirs are a little bit different than ours.

DoD has done something that would have been considered funded, but because their authority is different it's not really comparable to what we do. Really the big change has been that people have tried to operate more at the edges of our Other Transaction Authority once they

saw that we did something like this and it was successful. They're like, "Wow, I wonder what I can do, I wonder what I can push those boundaries on."

Because we do so few and they've been so concentrated in one particular area of commercial spaceflight, it's neat because the only expertise in the Agency has been developed at Headquarters and at Johnson Space Center. That's really cool for me, but I don't see the Agency wanting to use it a whole lot in the future.

I think we've learned a lot from it, but I think we've also learned about the headaches that can come with it, just from an implementation and a management perspective. With procurements you have an entire procurement office structure at each of the Centers, and at the Agency level, with hundreds of contracting officers and analysts and people to manage those policies and all of those instruments and the money flowing in and out.

With funded Space Act Agreements, we had no infrastructure. We had nobody who understood how these worked and how they were managed, so a lot of that fell to the legal office to try to figure out how we manage these, what they look like, what's the process for getting somebody payment, what kind of information do we have to have, how do we amend these things, how do we close them.

I think that's an overhead, honestly, that neither the lawyers want nor the technical people want. We've had some pushback over the years that the programs feel like legal is using these instruments to try to run their program for them. It's because we worry so much that misuse of the instrument could somehow jeopardize future use of our authority, that we tend to rule on the conservative side. I think the programs are like, "Well, now I don't have the flexibility that I need to do what I want to do."

With procurement, I think they understand the rules a lot better going in, because you've got the entire Federal Acquisition Regulation, all 52 parts of it. You've got all sorts of case law spanning decades. So it's very clear what you can and can't do. With this authority, it's really not. Some people like that because they figure well, I'll just push the boundaries and see how far I get. But we've gotten some pushback that, "Why is legal trying to run my program?" I don't think we want that or the programs want that, so we're tending to shy away from them.

HACKLER: That's a really interesting perspective. Some of the people we've talked to in the COTS office have said they really prefer the Space Act Agreement *because* you have that freedom to make changes, that you don't have to go through a change board [Configuration Control Board] like you would have with a traditional contract, and go through the whole process every time.

XENOFOS: That's true. That's the way the Commercial Crew and Cargo Program operated, they didn't have these big control boards and infrastructure. The Commercial Crew Program has taken a totally different tack on it, and they've put all of that structure on it. I don't know why, because I think the Commercial Crew and Cargo Program did great without it.

I think the model that C3PO [Commercial Crew & Cargo Program Office] used for how they manage the funded SAAs was the right model, because they only had less than a dozen people and $500 million. More by the time it was done, because we had additional money from Congress that they appropriated afterward that we added to the agreements. But we had all this money and we had just a couple guys managing it.

It was because we weren't trying to control what the commercial partners did. The companies were free to develop their designs and do what they wanted. We were there to provide some limited technical assistance and make sure they were doing what they needed to do to get money. Maybe it's just a function of the Commercial Crew and Cargo Program growing up learning about these instruments as we were growing up learning about these instruments, so that the way we see them being managed and they see them being managed is similar.

But with what the [Commercial] Crew Program is trying to do—I know this isn't actually part of your scope, but this goes to what we've learned in using these instruments. The crew program is much more trying to force a traditional program structure on these commercial companies using these funded agreements. They're just not built that way. So we're having lots of struggles with the program because they do have control boards. They do have hundreds of people working with these companies on these agreements. To do what, because we're not in charge of anything.

I agree with the Commercial Crew and Cargo Program in the way they did it, that in an optimal world, when you're using these instruments, you shouldn't have a lot of oversight. There's no reason to. I think the more oversight and stuff you add, the more it begins to look like we're trying to drive requirements, the more in question you can call our use of the authority. I guess I've only learned that recently in working with the crew program, how much I appreciate Alan and his guys.

HACKLER: You mentioned the Congressional appropriation for augmenting the COTS budget [in fiscal year 2011]. Did you have a role in that at all?

XENOFOS: No, I was just here. When we knew that we were getting that authority, we had to come up with a rationale on how we could add the money. From a legal perspective, it didn't make sense to just give them more money for stuff that they were already doing, because we had already pre-negotiated these milestones for certain dollar values. To just haphazardly throw more money at certain milestones without any sort of rationale made no sense. I worked with the Office of the General Counsel to develop a policy and process for how we could add the money to the existing agreements and actually implement what Congress gave us.

Alan was totally on board with his guys. They had been living with them, and had seen what they were doing. We negotiated new milestones, stuff we knew that if they could do this one more test, or these couple more things, it would significantly reduce risk. Then we would tie adding the new money to them doing those things that would reduce risk, so it actually made legal sense.

Then we also had to say that anything that they added as far as milestones for risk reduction had to be within the original scope of the Announcement that was put out and the original scope of their proposal. What we didn't want to do was add things that were completely out of scope, to have someone be able to come in and say, "Well, you guys just changed the scope. If I'd known the scope was like that, I might have had a better shot of getting an agreement to begin with," and then challenge the whole underlying agreement.

I was heavily involved in how that policy and process was structured and how we got the money on the agreements. Every time we turned on a new milestone we did a rationale out of this office that said, "Yes, this milestone fits within the original scope of the Announcement, and fits within the original scope of their proposal." That was my role in it.

HACKLER: And at that point you had more experience with the Space Act Agreements.

XENOFOS: Absolutely, so I felt a lot more comfortable understanding why we were having to do it that way. With everything we do, at least at our Center, we have a long history of working very closely with the Office of the General Counsel. Not every Center does that. But I think because we do that—they were Headquarters agreements anyway. Any amendments, any new milestones we added, had to be signed off on by the Associate Administrator for ESMD or HEO, depending on when stuff happened.

We worked in lockstep with the Office of General Counsel, and kept them in the loop early, which allowed us a lot more flexibility here at the Center to do what we wanted to do, because Headquarters didn't feel like we were pulling anything on them. I think that helped make the agreement process run a lot smoother as well. But yes, it was fun to do that.

You're right, when we put down the criteria for what you've got to be able to show us in order to get the money, we were a lot smarter at that point on how to write that, and how to structure it so that we were a lot clearer about what would qualify and what would not, what we actually really wanted to see.

One other thing about these agreements I didn't talk about before—because we were not acquiring anything, any data that we got or any information that we got through these milestones we could only use for purposes of saying, "Yes, you met the milestone," or "No, you didn't meet the milestone." We couldn't take the data, retain it, and use it to make ourselves smarter or for other government purposes. We weren't allowed.

That was one thing that was unique about a Space Act Agreement that would have been different if we had a procurement. We could have actually taken data, had government purpose

rights in it, if it were a contract. We could have used it on other programs. We could have used it to get smarter about how we built MPCV [Orion Multi Purpose Crew Vehicle], we could have used it for other things.

But in this case it had to stay with the program. The program couldn't use it for anything else. We couldn't use it to evaluate other companies or anything like that. We could only use it to say whether they met that milestone or not. When the agreement is done, you have to go back to the company and say, "We have this data. What do you want us to do with it?"

HACKLER: How do you keep that data separate? Maybe that's more a question for an engineer, but it seems like if you know something it would be really easy to apply it, even unconsciously, to something else you were doing.

XENOFOS: You're right, it is. How they do that is a mystery to me. I think what folks do is stuff that they absorb, experiences and best practices and lessons learned, they carry with them. But I think they were supposed to have been well trained on any specifics about a company's ideas, any innovations that they're making. Those are not things that can be shared.

But with more competitions that come along, if someone had worked for years with SpaceX and then another competition comes along and SpaceX is involved, they can pull on that experience with their past performance to say whether they've had a good experience or a bad experience, without giving away any sort of specific proprietary technical information. But I don't know how the engineers do it, that's a fine line.

HACKLER: Do you know who was responsible for training them in how to keep that separate?

XENOFOS: I think it was just Alan and his guys on their own. They read it, they understood what we meant. I think they really tried to put in place a system that would allow them to meet the intent of what we were doing as best they could.

It was really an honor system. I didn't see it as my responsibility to go check on them. There was no procurement oversight to make sure they were doing stuff, there was no contracting officer empowered. It really was Bruce and Mike [Michael J. Horkachuck, NASA COTS Project Executive for SpaceX] that were empowered to manage those agreements. They really invented it all themselves.

HACKLER: One other thing I was curious about—we've spent a lot of time talking about the funded Space Act Agreements, but COTS also had a few unfunded Space Act Agreements where NASA provided some technical assistance. Do you have a role in that aspect?

XENOFOS: Yes. The first ones we got were from the first competition. We didn't know who was going to be viable and who wasn't, and what was going to come out of stuff, but we wanted to have as many people working in the industry as possible. We thought that was for the benefit of the industry and the benefit of the country. So there were some folks that didn't get any money but said, "We're still going to pursue this on our own." We thought well, that's great.

So anybody from the competition that wanted to enter into an agreement, we said, "Sure, we'll do this." It wasn't really a commitment of our resources so much, it was really just time to go look at milestones and see if they met them. If they met a milestone, all they really got was an, "Attaboy, good job," but it allowed these companies to go out and say they had a relationship

with NASA. A lot of these companies said that that alone would help them try to get private financing and try to continue on with their efforts for a cargo system.

At the time we had all of our cargo needs covered, so we didn't know that we would ever buy anything from any of these companies anyway, but we thought if we can help someone by just having an agreement with them and letting them call us up and answer questions, that was a good thing. Those agreements looked a lot like the funded agreements as far as data rights and responsibilities and how the milestones looked, because we felt like that would be the fair thing to do.

I don't believe we did this for CCiCap [Commercial Crew integrated Capability], but for COTS 1 and COTS 2 and CCDev [Commercial Crew Development] 1, which was also with the Commercial Crew and Cargo Program, any company who didn't get a funded agreement but made it through to due diligence we offered the opportunity to have an unfunded, or a nonreimbursable, Space Act Agreement.

I think they were good. From what I can tell, I know at least one company, Sierra Nevada [Corporation], had an unfunded COTS agreement, and now they're in the funded race for crew. I think the companies that wanted to really make it work found a way to make it work. I think they were good to have.

Then separately—it wasn't managed by the Commercial Crew and Cargo [Program] Office—all the centers had reimbursable agreements with these companies to provide support. We had to come up with policies on how they could provide that reimbursable support, and Alan would know about it so that Alan could keep track of how many resources we were providing to people, and hopefully do that in a way that when we gave somebody money to meet a milestone, it wasn't because we were getting from them the NASA answer to a problem.

If someone needed to have some testing done in a NASA facility, that's one thing. But what we didn't want—if we had a milestone for them to do a particular analysis of their vehicle or review of their vehicle for some area, what SpaceX wasn't delivering to us was the [NASA] Langley [Research Center, Hampton, Virginia] answer to that analysis. We might be able to give them raw data and information, but it really needed to be the companies that developed solutions on their own, worked it into something usable that they then gave us. Because if we wanted to just have the NASA answer, we wouldn't have had to do this whole program to begin with. So all three types of agreements came into play with COTS.

HACKLER: That's very interesting. At this point I'd like to ask Rebecca Wright if she has any questions.

WRIGHT: I've got a couple. Did you feel like the original purpose of the public-private partnerships that you were starting to help develop morphed or changed as you went through?

XENOFOS: I don't think with Commercial Crew and Cargo it did. I think we, for the most part, stayed true to what we said we were going to do. I think the thing that morphed was our need for the services. Early on we had said, "We don't need them, we're fine." Then the [Space] Shuttle went away. I think we always knew Shuttle was going to go away, but then when Constellation was going to go away too [cancelled in February 2010], we were like, "Oh, we need something."

That part of it morphed, because we had originally said, "We're not going to buy anything until a capability is developed. If a capability is developed, then we'll decide if we think it's in our best interest to buy." We ended up entering into [Commercial Resupply

Services] contracts with people a full three years before a capability was available from anybody. We said we'd never do that but we did it, because the company said that they needed the lead time in order to build vehicles and have systems ready when we might want them.

So I think that part of it changed. It didn't change the nature of the agreement so much, but it changed the way we interacted with the companies, and maybe how far involved we wanted to get with their designs, how much insight we wanted to have on what they were doing. Once we had a contract in place, the Commercial Resupply Services contract that got put in place in parallel with the funded Space Act Agreements, it really became this dance where Alan and his group were interacting with the companies at one level, and then you had the Space Station Program, who managed the contracts, interacting with them on a much more traditional contractor-government level.

That contract was supposed to be a commercial services contract, so it wasn't like this cost contract where we did all this oversight. It really was supposed to be like FedEx [Corporation, shipping service], like we're going to give you a bunch of cargo and you're just going to carry it. But even then we started getting a lot more involved with them under that contract. We were able to get a lot more data, and we were able to do a lot more of the interface requirements for Station under that contract than we could have done under the agreement.

So that changed. Once we had a contract in place at the same time, I think that changed the dynamic with the companies a little bit.

WRIGHT: Were you involved with putting the legal piece together for ISS?

XENOFOS: I was not, because I was at Headquarters. If I'd been here I might have been, but since the program was here, attorneys here handled that procurement. I was really on the fringes of that procurement. When they came up to Headquarters and did briefings I participated in those, but I wasn't involved in the day-to-day, how they structured the contract and what it looked like and how the competition went, like I was with COTS.

WRIGHT: Could you share with us who the lead attorney was on that?

XENOFOS: Yes, the lead attorney for that was Karen [M.] Reilley during the competition. Karen Reilley came down here for a rotation when I went to Headquarters for a rotation. She's a Headquarters attorney. Now she's the Headquarters attorney that I work with the most on commercial crew, she's my counterpart up there.

WRIGHT: Speaking of attorneys, you mentioned earlier the Associate General Counsel, the new guy that was there. Who was that?

XENOFOS: His name was Richard [W.] Sherman. He left, but the person who took his place is there now, her name is Courtney [B.] Graham. Courtney Graham worked for him at the time, and she was hired on after the first COTS competition. She didn't come on until after the SpaceX and RpK agreements were awarded, but she has been the lead policy maker on our Space Act Agreement policy ever since.

When the GAO came in and did an audit of our funded Space Act Agreement policy, she was their lead liaison for that. All of our policies we have on how we use funded agreements,

how we structured getting personal property to Orbital for their agreement, I worked directly with Courtney. She and I hammered that all out together. Besides me, Courtney is the other real resource at this Agency on funded Space Act Agreements.

WRIGHT: That's really good to know. Why did they choose to go with the second round selection, and not pick from runners-up in the first round?

XENOFOS: This is reaching back and speculating a little bit—I think we felt like enough time had passed that we wanted to reopen the competition and see what kind of progress had been made. A lot of these companies didn't have their own money, they were going to have to get their own resources from elsewhere. So we saw this as an opportunity to see what kind of progress had been made since the last competition, who was still involved, who was still serious.

It gave us another chance to get in and look at people's books and see what they were doing. We saw it as an opportunity not only because we wanted to see where people were, but we didn't want to be accused of acting behind the scenes in how we picked somebody new. We wanted to make sure that we could justify that our pick was a fair and open pick, that we had a transparent process.

That was really important to us because we were really concerned that we could get challenged—just like the first time. We could get challenged, and we did. I think if we had just gone and picked somebody else, we might have gotten a challenge from someone saying it had been too long since the first competition. You can't say that they're in the same place now that they were then.

WRIGHT: Did it also give you an opportunity to apply some of your lessons learned?

XENOFOS: Oh, it absolutely did, yes. When we did the Announcement for the second round, we actually put in, "Here are the things that we've changed since the first competition." We had a whole listing of all the things that we did differently from the first competition until now. We awarded the first agreements in August of '06, and for this competition we put the Announcement out in October of '07. So it had been a little over a year.

We put, "Several clarifications and changes from the first competition are made as part of this Announcement," and we gave a little list. We did some clarifications about the amount, the kind of business information we would want to be included. The structure of the proposal had been modified to reduce the page count, simplify what we wanted.

We said each company was limited to submitting one proposal. We weren't smart enough about doing that before, not that it really made a huge difference. Obviously the funding had changed, so we had to let folks know how much funding was left that they were competing for. We didn't take any money back from RpK that they had earned, but we got to pull all the rest of it back that we hadn't given them yet.

We changed the evaluation, screening, and due diligence process a little bit. We got a little bit smarter about how we did the evaluation process on this one. With procurements, we have a Section L and a Section M in the RFP. Section L says, "Here's what we want to see in a proposal." Section M says, "And here's how we're going to evaluate what you give us."

In these competitions we had the equivalent of a Section L. We said, "Here's what we want to see in a proposal." We didn't tell them a whole lot of information about how we were

going to evaluate. We gave a real top level, "We're going to have an initial evaluation, we're going to have a due diligence, then the Selection Authority is going to pick."

But how we evaluated them—what kind of criteria we used, how we weighted stuff, what levels of confidence we gave them—we didn't tell them that in the Announcement, because we didn't feel like we had to. In the original competition we weren't even sure what we were going to get, we weren't even sure how we were going to be able to compare them against each other.

So as we did more of these competitions—we've done five total, and by the last couple, we actually did say in the announcement, "Here's how we're going to evaluate. Here's what level of confidence is, here's some of the criteria we're going to use." But in the original announcements we never put any of that, which was very different from a procurement. It gave us the flexibility to be able to, once we saw the proposals, figure out what we were going to give them and how we were going to use the information. Because we weren't even sure how we were going to use the information we got.

WRIGHT: Based on how the agreements were written and the terms that were there, does NASA have the option to tell RpK, "We want some of the information, the data that you compiled and were going to use"? Or does that exclusively belong to RpK?

XENOFOS: Well, it's interesting, because in these agreements we give them money for milestone completion. The money that we give them is tied to they have to achieve XYZ that they described in the milestone, but the money is not to pay for that work done in the milestone. We don't ask them to track the money under these agreements. Like most contracts, they have cost accounting standards that say, "You have to track how you're spending our money so that we

can show that you're using it on the performance of this contract and you're not overcharging us."

The Space Act Agreements, we don't have any of that tracking. We give our money to them, they use it however they want. It might go toward stuff they're doing under these milestones, or it might go to other stuff and they're using money from other sources to do the milestone work. We just don't know.

The tricky thing about trying to get data from them after the fact—well, property in particular, but I think data a little bit too—if it was generated under the agreement, how to show that it was generated under the agreement and not generated separately, and that it was tied to their performance of the agreement. With RpK I don't recall if we ever tried to go get any of their data, because they were so early on, they had hardly done any technical work.

So my honest recollection is I don't think they really had much that we wanted or felt like we needed, because the milestone that we terminated them on was Milestone 4. It was just so early that they really hadn't done any true technical work that would generate anything that we felt like we would need or want to try to pass on to anybody else, so it really never became an issue.

Same with the property for them, it just never became an issue because they were so early on. We did that on purpose when we did the milestones with them. We wanted those financial milestones early so that we didn't sink a bunch of money in there, and then if they couldn't get their outside financing we would be left with nothing. We knew it was a possibility with everybody, but we wanted to mitigate that risk as best we could.

WRIGHT: As part of their process to try to succeed, they apparently had some meetings on Wall Street [financial district] in New York [City] trying to find some investors. I understand that NASA people were attending those meetings, as well as possibly legal people. Were you at any of those?

XENOFOS: No, I was not. I did not want to be part of any of that. I don't even know that I knew that NASA people went to those, honestly. If they did, I don't know what they did, except to say that, "Yes, we have an agreement with them." I thought we, for the most part, stayed out of their efforts to try to get private financing. So if we were in the middle of it, I really didn't hear about it.

WRIGHT: As a legal person who had worked at NASA for five years, can you go back and tell us your first impression when you heard that this was a possibility, that this is the type of process that we want to put in place? What you felt and how you worked through those challenges of putting this together?

XENOFOS: It's so funny, because I think everything still was so new to me. The first five years I was here, I worked on so many things that no one had ever worked on before. My first project when I came to NASA—we had this industrial plant out in Downey, California, that we used to support the Shuttle Program. We were at the point where we were in the process of getting rid of it. We didn't need it anymore, we were dispositioning the property. The property was all sorts of contaminated from decades and decades of use by not just us, but the military and contractors.

I had done a lot of environmental study in law school, so I came in saying I wanted to do environmental stuff. I said, "I want to work on this." It was a land transfer that was unprecedented at the Agency because we were trying to transfer land without having to clean it up first. We were going to transfer the cleanup at the same time we were transferring the land, and give someone a discount on the purchase price equivalent to what we thought it would take to clean up the property. To negotiate all of those agreements, no one at the Agency had any experience doing it. I just walked in, newbie lawyer, "All right, let's give it a try." So I did.

Then as soon as that was done, probably within a year, *Columbia* happened [STS-107 accident]. I was asked to go be the attorney on the recovery team out in the field for a month and a half, trying to set up how we do the recovery. How we work with all these different agencies, how do we share resources, how do we get all the debris back to the Centers and do the investigation? That was unprecedented, no one had ever done stuff like that before.

So by the time this came around, "All right, something new again. Cool." I was like, "We're going to do this. We'll figure it out, we always figure it out." I think maybe because I was so new, and that was my background, that it didn't faze me. If anything, it was like, "Well, this is how it's supposed to work. We always do something new because we're NASA, we're always doing something different."

That's how it's been ever since, that I expect to see strange things that no one had ever done walk through the office and have to try to figure it out. That was my background walking into it. If you had had somebody who been at the Agency for 20 years and had a different experience, they might have looked at this and went, "I don't know." Some of the Headquarters attorneys were like, "Oh, I don't know about this."

But it was good that we had a mix of people that were less experienced but really energetic and willing to throw themselves into it, like me, and people who were more experienced in procurement and IP who could bring those decades of experience with them to develop that policy. I think it was a good teaming, because like I said, early on we had a dozen lawyers from all different aspects of the problem trying to attack how do we develop a policy.

Our experience really did vary from people like me who'd only been with the Agency five years, to that Associate General Counsel who had been with the Agency a couple months and didn't know a Space Act Agreement from a hole in the wall, but he had all the business experience. When we're trying to put together what kind of information do we need on a business plan and financial information and what can you do with what you get, that was something that none of us had.

Then you had someone from Headquarters who had 20-plus years of procurement experience and really understood the evaluation process for procurements and why we did what we did in the procurement evaluation process. It fell to the lawyers to figure out how were we going to structure an evaluation process to decide who gets a funded Space Act Agreement, because there was nothing in writing anywhere to say how do we do this in a fair and open way. All we had to fall back on was the procurement, like the Source Evaluation Board process.

We had an attorney at Headquarters, [D.] Eve Lyon, who's still at Headquarters. She's fantastic. She had decades of policy experience that she could bring to bear that said, "I understand the evaluation process and why we do the steps we do, how each of these adds value." She was really great at being able to help us understand what elements of the process we could take out and not worry about because they really didn't apply, and what parts of the process we ought to keep because it inherently shows that you're being fair and open.

WRIGHT: So legal actually pulled this process together.

XENOFOS: We invented this process from soup to nuts, the lawyers did. Yes, it was amazing. We had outside help. Alan's folks were the ones who really came up with, from a technical perspective, what do we want to see. The lawyers can't do that, that's got to be the engineers and the folks in the field.

Then we had advisers like Alan Marty. His experience was in venture capital, and we had our new Associate General Counsel who had a lot of experience in private equity and venture capital. Those were the guys who could come in and give advice on when you ask for a business plan, here's the stuff you need in it.

But it was really those of us who had been with the Agency for a while that sat down and said, "All right. Once you guys decide what you want, what are we going to do with it? How are we going to look at it? How are we going to structure this to make sure we could best defend ourselves should we get questioned on how we did it?" The lawyers had to invent that whole thing, because there was no one else that could do it. Then we ended up being the process owners of it. Even to this day I'd say most people consider the lawyers to own the evaluation process for Space Act Agreements.

What we've learned on those competitions has translated a little bit to nonreimbursable and reimbursable agreements. Because we're using those instruments more, we're having more situations where we feel like we need to put out announcements of opportunity for people saying, "We have these unique capabilities that we may want to offer up to people in the field," or "We would like to collaborate with people in this area of research."

But we don't want to do it with just one person. We want to see who else is out there, so we'll put out a Request for Information or some sort of announcement and have people come in and tell us what they want to do. What we've learned from how to do competitions there I think has helped us in being fair and open about how we partner on reimbursable and nonreimbursable agreements.

WRIGHT: Through that whole process, with all of the attorneys and the technical people, what do you feel is probably the most challenging piece that you all had to work through?

XENOFOS: I thought the IP was extremely hard. The intellectual property provisions and how we would structure what data rights we got, and what we did with them, and how we would handle invention and patent rights. Maybe it's because it's an area that is so alien to me. We have lawyers here that do nothing but intellectual property. We had two of those guys on our team, one from here and one from Headquarters. Kurt [G.] Hammerle is still here. He was on the team, but his focus was on intellectual property.

Trying to figure out what we were allowed to do with stuff, and how much stuff we could actually say we're going to be hands off on, and how we structured that in a way that was helpful, to me just seemed so hard. I don't know how they did that. Still to this day, they've been having huge issues about is this work for the government or is it not, do we have government purpose rights or do we not. So if you ever really want to get into a really technical discussion about intellectual property, Kurt Hammerle. To me that was the hardest part.

That and how we would do the evaluation of proposals once that came in. That's where Eve Lyon came in, and she was a huge help with her tons of experience in the procurement

evaluation process. She really led the charge on how we were going to structure an evaluation process for these competitions, and we still use a lot of that today. She'd be a good person to talk to for that part of it.

WRIGHT: Based on all your experiences through these last six, almost seven years of working on this—do you feel like the attempt of what your team wanted to do at the beginning has now met your expectations? Do you feel like what you put into place is accomplishing—

XENOFOS: I think the Commercial Crew and Cargo Program has been immensely successful. It has been way more successful than I thought it would be. Maybe it was because I was a bit of a cynic about the commercial sector and what the commercial sector could achieve. Granted, everybody's come in years behind what they said they would do in their original proposals. I think one of the original proposals said that they were going to do a demonstration flight by 2009. It's taken them years longer than they said they would, but they did it.

To me that's just amazing what they were able to accomplish, and how well Alan's team worked with the companies, that they were able to take such a unique instrument and not get held up by how we normally do business. They figured out a way to work with these companies that would enable these companies to succeed without being the big government coming in on top of them.

I give Alan and Mike Horkachuck and Bruce Manners so much credit for being able to do that, because we structured these instruments really in a vacuum without knowing how they were going to work and what they were going to do. They were the ones who actually figured out

how to use them. I think this particular program has been way more successful than I thought it would be, and I give them like lots of credit.

WRIGHT: You mentioned Congress earlier. Have you had a lot of questions from Congress on whether or not this is okay to do? What questions have you had?

XENOFOS: We have, we've had lots of questions from Congress about what are we getting out of this. We've had lots of interest from Congress about how we spend this money, what the companies are doing, what we're seeing out of it. We've had to do a lot of educating Congress about what a funded Space Act Agreement is, how far we can operate within a funded Space Act Agreement, because a lot of people outside the Agency, even some folks in the Agency that don't understand them, see them as an alternative way to do procurement. It's just not.

You can't buy stuff with a funded Space Act Agreement, but people seem to think you can. We had to do a lot of educating of Congress and OMB about when we can use it and what we can do under it. They'll say, "Well, why are you so constrained?" Because we have these other authorities that enable us to do these other things. We can't do those things under this authority because then it looks like we're ignoring that authority.

Unless they're working with it, folks just don't think it through. We've gotten tons of questions about that. Then when the Crew Program comes along, and they've already been out there making statements like, "Well, we have to buy services from somebody else. We don't have the ability to get them ourselves, we have to buy them elsewhere," Congress is saying, "Oh. Well, you're using funded Space Act Agreements. How do you do that?" Trying to do that little tap dance on how you justify it has been really difficult.

Especially early on we didn't get as many questions, because we had always said this was going to be a backup plan, that we already had these other ways of doing it. But then when the contract came into play and it more and more became something that we really needed to see someone develop and do a demonstration, because we were really getting to the point where we were going to have to rely on some cargo services, then I think the questions ramped up a little bit about what is this instrument, how are you doing it, how do we know that we're getting value for the dollars.

HACKLER: Thank you so much for sharing your perspective on the COTS story. Clearly you were very instrumental; I was just noticing your award over there. Did you have any last thoughts you'd like to share about your involvement with the legal side of COTS before we close out for today?

WRIGHT: Or anything else that you might have thought about that we didn't even have any idea that you'd done?

XENOFOS: Well, only that I just feel so lucky to have been able to work on it. There were two of us here at the Center that worked on it when it first popped up. We weren't sure how much time it was going to take. That other attorney [Jonathan A. Arena] moved on to [NASA] Glenn [Research Center, Cleveland, Ohio[just after the second one was awarded, so he hasn't been involved in any of the others since. He's gone on a totally different path. I just feel so lucky to have been part of this, because funded Space Act Agreements have become such a high visibility

thing at the Agency. To be able to say that I'm an expert on them for the Agency is just really cool. I feel like I got in at the right place at the right time and was really lucky.

But I'll tell you, I feel like if I hadn't had the opportunity to work the agreements with Alan and his team, it would have been a whole different story. Because now that I've been working with the Commercial Crew Program, and working with those folks who weren't there when the instruments were created, and weren't part of the thought process behind how we were doing things, and why we had to do things a certain way—it's much harder to get folks to understand what you can and can't do with a funded Space Act Agreement and really appreciate the flexibilities. I think Alan and his team, like you guys were saying, really do appreciate the flexibility that comes with it. But you have to manage your program in a way that leverages it.

You have people now who are using them for commercial crew who are really trying to run a more traditional NASA program, and you can't do that with a funded Space Act Agreement. Alan and his guys got it. The new guys, they just don't. So I really feel lucky to have been part of this, but I also feel lucky to have been able to work with Alan and the guys from the very beginning on up, because I think that's made it easier.

WRIGHT: So it was more of a team effort?

XENOFOS: Yes, much more so. I think communication was easier, the communication we had was always good. I think for the most part Alan and his guys saw us as helpful. I know there were times that they did not see us as helpful, and I can't blame them. But I think for the most part we had a pretty good working relationship. I really enjoyed working on this project, it was probably one of the best projects I've gotten to work on.

WRIGHT: At the beginning when you were pulling that structure together, did you feel like there were a lot of suggestions and ideas and recommendations coming from their team and the people they had associated with to help you pull that flexibility part of it in? Or was it more this is what we can do, this is how far we can stretch those, and then you guys are going to have to fill in those blanks?

XENOFOS: I want to say that Alan and the technical guys, to a large extent, just relied on us to come in and tell them, "This is how far we think we can go." They really did their best to try to articulate to us what they wanted to do. I think they really relied on us to bring them, "Here's what we think we can do and here's why." Once they saw something, they weren't shy about pushing back and saying, "Well, I don't know that that's going to get us there. What about this, that and the other?"

We had a lot of that dialog. But I think they really relied on us as lawyers to say, "Here's what we think we can do, what we can't do and why." Because we were seen as the experts to insulate people from protest. I think that was a big risk everybody had, so they deferred to us a lot. But they weren't shy about saying, "Why can't we do it this way, or why can't we do it that way instead?" We'd have those conversations. Those were good.

WRIGHT: Well, thank you for this conversation. We appreciate it.

XENOFOS: Thanks, guys.

HACKLER: Thank you for your time.

[End of interview]