

NASA ORAL HISTORY PROJECT

ORAL HISTORY TRANSCRIPT

COURTNEY A. STADD
INTERVIEWED BY REBECCA WRIGHT
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WRIGHT: Today is January 7, 2003. This oral history with Courtney Stadd is being conducted in Washington, D.C., for the NASA Headquarters History Office, Administrators Oral History Project. Interviewer is Rebecca Wright. Mr. Stadd is currently the NASA Chief of Staff and White House liaison. Today's session will focus on his involvement with the area of commercialization of space.

We thank you for taking time to visit with the project today.

STADD: It's my pleasure.

WRIGHT: You've been involved for the past twenty-five years in identifying, fostering, and developing market-driven opportunities in space. When in your career did you begin to work for an end to the "government's monopoly on launch services"?

STADD: I guess I first developed an interest in this area in the mid-seventies. In fact, when I was graduating from the Georgetown [University] School of Foreign Service, [Washington, D.C.] I was approached by a small group of people who were interested in looking at the economic frontier of space development, and that led to my working with a former associate dean of the graduate school at Georgetown, a gentleman called Steve [Stephen T.] Cheston, who,

unfortunately, died a few years ago. He was a former vice president at Motorola [Incorporated] involved in their former Iridium satellite project. We formed what we called an Institute for the Social Science Study of Space, which was the first such interdisciplinary scholarly effort in the country to look at the both technical and social economic aspects of space development.

In the midst of that project, we got a grant from NASA, in roughly 1977, to look at some of the economic, social, human factors associated with space exploration, and along the way I encountered the late Gerard K. O'Neill, who was a Princeton [University] physicist, who gained fame for, amongst other things, promoting the idea of space colonies. I found the prospect of space colonies to be interesting, but probably a bit fanciful in terms of it being feasible in the near term. I was fascinated, however, by the social and economic issues associated with it.

So that began to open up my eyes as to what the opportunities were, and along the way, I was contacted by a group in California that was forming a company—at that point we called it Arc Technologies [Incorporated]; was renamed Starstruck [Incorporated]—and that company was the first to privately finance and develop a rocket for commercial use.

So you could see in that period of time—and this is roughly between '76, '77, and 1981, '82—I got very much involved in this area. In fact, in the summer of '77, I was recruited by the National Space Institute, currently known as the National Space Society [NSS], to take over their monthly membership publication, and within about a year or so, I was asked to actually take over the organization. This was a group that was formed by Wernher von Braun. He had passed away that June of '77. Former NASA Administrator [Dr.] Jim [James C.] Fletcher was the Chairman of the Board of the National Space Institute.

And that also gave me further exposure to the interesting developments going on in the commercial world, although part of my charter was to also follow closely the civil part of the

agency, and in fact, in many ways the NSS became my graduate work, if you will, in terms of beginning to develop a knowledge of NASA, the space agency, and the potential of the commercial space market at the time.

So you had this interesting, I guess, at least for me, convergence of an academic pursuit at Georgetown that, by the way, culminated in the first scholarly journal—I was the managing editor of it—called *Space Humanization Review*, that brought together physicists, economists, sociologists to look at the various and sundry challenges and issues associated with space development. Then coincident with that, my involvement with the National Space Institute, and then—to put it in chronological order, after I left the Space Institute, I actually spent a year taking time out to think about my next steps. In that year, which was roughly '80-'81, I established what today is referred to as the World Affairs Council. There are two of them in Washington. I formed one at Meridian House International.

During that year, I found myself migrating more and more to space-related issues, and it was during my tenure there when I was approached by these entrepreneurs in California to help establish this new commercial launch company. By the way, one of the investors was Steve Wozniak, the co-founder of Apple Computer [Incorporated]. So this was formed very much in the wake of the euphoria over the new computer, semi-conductor industries that were forming at that time in Silicon Valley.

So that's my way of responding to the initial question of how I got interested and what brought me to ultimately spend a career pursuing this area.

WRIGHT: You originally started out in private industry, and then you made a move toward public service. Could you share with us how that transition occurred?

STADD: Sure. When I got involved with this company, Arc Technologies, subsequently called Starstruck, and it was called that because the first president of Apple Computer, Michael [M.] Scott, who put in the bulk of the investment, wanted a name that he thought could resonate with the younger generation, the so-called “*Star Trek* generation.” There were a number of us who weren’t exactly ecstatic over that name; we felt it was a bit too flaky, if you will. But he had the purse strings and ultimately prevailed. The company went through another incarnation, and ultimately became known as the American Rocket Company.

But the group of us who co-founded that effort philosophically believed that U.S. space industry was suffering from what we referred to as a lack of product differentiation. That is to say, there was little diversity in the products and services being offered. Our diagnosis was that this resulted from the domination of large aerospace companies and from the monopoly of the government in purchasing those services. Remember that many of the people I was associated with back in California were entrepreneurs who came from the emerging, as I mentioned, microprocessing, semiconductor computer world, who felt strongly that entrepreneurship was the ticket to accomplishing great things. So it was our feeling that if the government would only get out of the way and allow the entrepreneurial sector to put its genius to work, that we could do great things. So our whole presumption was in favor of looking for a regulatory regime that was minimal, a licensing regime that was minimally burdensome.

Because I had spent some time in Washington, both at Georgetown, at National Space Institute, the World Affairs Council, I was the only person associated with the company who, (a) had a business suit (remember this was Silicon Valley where informal attire was typical), and, (b), had knowledge of Washington. So it fell to me to go back to Washington and to carry the

water in developing a licensing and regulatory regime that would be philosophically along the lines that I mentioned earlier, being supportive of this type of entrepreneurial effort.

I also want to give major credit to a gentleman called Jim [James C.] Bennett, who was a colleague and one of the co-founders of this company, who had articulated a deregulatory philosophy regarding the launch industry, that put a big premium on performance-based regulation versus the classic certification approach that the Federal Aviation Administration historically had taken to aviation, where you get down to every single component and certify its safety, and so forth.

By the way, that was an understandable approach, given the fact that you're dealing with human life, given the amount of traffic you're talking about. But in the case of this fledgling rocket industry, the view was, you'd have very few events, the existing and proposed commercial rockets did not involve flying people, and that's why we promoted the idea. And I do give Jim Bennett credit for helping author that philosophy that it ought to be based on a performance-based regime. That is, the company in question, the company seeking license from the government to launch, the onus ought to be on the company to stand up to a general set of safety criteria, and as long as we demonstrate how we're going to avoid posing a threat to human populations, then we ought to be licensed and allowed to conduct our business.

Well, when I came back to Washington, it fell to me to help organize a coalition of companies. And it was an interesting time back in the early eighties. We had many more aerospace companies, I might add, than we have today. General Dynamics [Corporation] was very much in the aerospace launch business. Obviously, we had Martin Marietta [Corporation], you know. We had a bunch of companies. So, myself, along with other rocket company representatives, formed an ad hoc coalition of big companies and small companies. The larger

companies were interested in ensuring that the Space Shuttle, which at that point was just emerging as an operational entity, did not end up as a de facto monopoly in the space market and thereby wipe out opportunities for commercial satellite business for the big companies. That basically was the fundamental agreement, if you will, that brought the small fledgling companies together with the larger companies to work together in trying to get the government to put in place a regulatory regime that would be supportive of this new commercial rocket industry.

We hired Covington & Burling. The reason for that is that we were looking for a well-established law firm in Washington. I interviewed many of the top law firms in Washington, which was a pretty bold thing to do when you were a new-start company, and walking into these very fancy, well-furnished law firms, in many cases, old traditional Washington law firms. And the law firm that impressed us the most was Covington & Burling, in particular a young lawyer who's now, I understand, a partner, a full-fledged partner, but back then was an associate, a guy called Dr. Richard [A.] Meserve, who was both a physicist and a lawyer, and probably no one is aware of this, but Richard really was the prime draftsman of what ultimately became the 1984 Commercial Space Launch Act.

This is a case I'll have to come back later on and fill in the blanks, but there was a former Hawaiian congressman, Danny [Daniel Kahikina] Akaka, who was the original sponsor, and Diana [P.] Hoyt, who is currently working here at NASA Headquarters [Washington, D.C.], I first met Diana back in the early eighties, when she, on behalf of the congressman, was supporting legislation promoting commercial space. So, between Diana Hoyt's support and ultimately that of the House Science Committee, we ultimately got passed the 1984 Commercial Space Launch Act, which authorized the Department of Transportation to put in place this regulatory licensing regime based pretty much on this philosophy I talked to you about earlier,

this performance-based approach to regulation. I can spend a few moments, if you wish, talking about some of the debates that went on surrounding that.

There was great interest by industry in having the Department of Commerce be the lead agency. Again, it was our feeling that the FAA [Federal Aviation Administration] was exactly the opposite of what regulatory model that we wanted in place. The Commerce Department had historically housed a number of regulatory bodies—I might add, including the FAA at one point—that it had spun out over the decades. So we thought it was historically consistent to suggest that they stand up a small licensing regime for this new industry.

Secondly, frankly, because Commerce's charter is to promote and advocate U.S. industry, we felt that we would be in friendlier hands if it was hosted at the Department of Commerce. The former head of NOAA, the National Oceanic and Atmospheric Administration, Tony [Anthony J.] Calio, no stranger to NASA—he was formerly Associate Administrator [for Space and Terrestrial Applications] at NASA back in the very early eighties, had worked here in the seventies—was very supportive of our efforts, and I got to know Tony Calio, worked very closely with him, and he managed to make the case to then Secretary of Commerce Malcolm Baldrige, who was excited by the idea of Commerce being the lead for this new industry. Mr. Baldrige had a very close working relationship with President [Ronald] Reagan.

So we had legislation that called for Commerce to be the lead and we had managed to persuade the Commerce Department and key officials to support it. We—i.e., our colleagues from this ad hoc coalition—talked to people in the White House and felt we had support there as well.

But then the Department of Transportation began to press its case to be the lead agency for this emerging industry. For them, they appeared to be the only logical choice. After all, they

are in the transportation business. They have a multitude of modes, from maritime, railroad, highway, to aviation in which they license, and there were a number of people over there who felt that they were a better, more appropriate candidate than the Department of Commerce. Nonetheless, we strongly pushed for Commerce, again fearful that the FAA would get its clutches on it and thwart the emergence of this new industry.

Again, this is a little-told story, but roughly in the—I have to be reminded of the time frames, but I think we're in the maybe summer, spring, summer of '84, there was a meeting at the White House, chaired by the President. One of the topics was the issue of who should be the lead, and then Secretary of Transportation Elizabeth Dole told the President she thought this was a classic case of deregulation. She argued that she could oversee this industry with a small team of regulatory experts and that it was very appropriate and logical for DOT [Department of Transportation] to take on this job.

I understand that one of the President's aides passed a note to Secretary Baldrige asking whether he'd be open to dividing the authority with the Department of Transportation so that Commerce would have the promotional role and DOT would have the licensing and regulatory role. I was informed that the Secretary decided at that instant, no, that he felt a divided authority was a weakened authority, and that if, in their wisdom, the White House—the President—opted to have DOT take over licensing, he was not going to stand in its way. And that ultimately turned out to be the case.

We were disappointed in Commerce, but to the credit of Secretary Dole, she had her senior staff call myself and other members of this ad hoc coalition, and they went out of the way to assure us that this issue had the personal attention of the Secretary, that she would do

everything she could to assure that our industry did not fall victim to over-regulation, and that it would not fall into the clutches of the FAA, and so forth and so on.

Whether we liked it or not, the reality was that the President had spoken. We took some solace, although we continued to be anxious about how DOT would treat us. The Congress fell in line pretty quickly, and once the President had issued his executive order, the lead agency was changed in the legislation to be the Department of Transportation, and that was the reality.

I remember Congressman [Ed] Zschau, a former congressman from Silicon Valley, was also another key advocate for this legislation, and Congressman [Manuel] Lujan [Jr.], on the Republican side—both were on the Republican side—were great advocates and very effective at pushing this legislation. And I recall that the day the President held a White House event to announce this new executive order, the White House called those of us in industry and asked us to bring models of our different rockets, so we could array them around the President's dais. That was a big day for us, and I remember arranging to take Congressman Zschau up to the White House, and I remember renting a limousine. I remember him coming out and saying, "Gee, you know, I'm supposed to do that for my constituents; it doesn't work the other way around." But we were so excited.

I remember having our people in the company build a model, which is no trivial thing for a small company—big companies do it all the time—but particularly one that we knew was going to be in the White House. We took special care with it. So I remember being sent this model of our rocket, which was actually a hybrid propellant, and the way they cut the propellant, the rocket, the way it was sent to me, was sent to me very well packaged, but it was a bit unstable, so when I got to the White House, I remember looking for different ways to prop it up, because it didn't have a fancy base as some of the other ones did. I don't remember a single

thing the President said during the event; I just remember looking at this rocket, apprehensive that it was going to fall over at any point during the proceedings.

But that was a big deal for the commercial industry. It culminated two years of very hard work. It was a singular milestone in the history of commercial space in this industry, the first time the United States Government—the Congress, the White House—had formally acknowledged and formally put in place a licensing regime for this new industry.

Although our competitor at the time, Space Services Incorporated [SSI], chaired by David Hannah [Jr.], had successfully launched their own privately financed rocket, from Texas—it also was a demonstration—we actually also ultimately launched our own. I think it was in the late summer of '84 after several failures. In our case, we launched our vehicle directly out of the water.

What made ours markedly different was, unlike the Space Services people, from whom I take away nothing—Deke [Donald K.] Slayton was head of the effort; as typical, Deke Slayton did a marvelous job—but in our case, everything was privately built and financed. In contrast, SSI used a Minuteman stage that was creatively—legally, but creatively—arranged by former NASA General Counsel [S.] Neil Hosenball. In a sense, what Neil arranged was a permanent lease of this first-stage Minuteman to this private company. This was very creative thinking.

As I mentioned earlier, we, on the other hand, actually built everything, the propellants, the casings, the fairings, the nose cones, everything was done in an industrial plant in Redwood, [California], and what made that possible was using this benign hybrid propellant. In fact, the Navy had done a lot of work with it, as well as United Technologies [Corporation]. We were trying to improve the state of the art with that hybrid propellant at that time.

I was called by Tony Calio on behalf of the Office of the Secretary, after the executive order was signed and as the legislation was making its way through, and I was asked if I might be interested in coming to join the Department of Commerce as the first person dedicated to space commercialization. It coincided with a reality that was beginning to quickly descend on Starstruck, which was that unlike the computer industry, unlike the experiences that a number of the former computer executives associated with the company were accustomed to, reducing theory to practice in the rocket business is formidable.

This is not to say the computer industry is not complex in its own right. It is to say that building rockets, flying them successfully is, in its own right, very, very complicated. I think that when the management began to recognize how large and sustained the nonrecurring capital investment threatened to be, after they'd put in a fairly significant investment just to get to the demonstration point, to the testing point, let alone to the point where we could declare it operational, that's when they got cold feet. That's when they decided that perhaps they needed to pull up stakes.

So the company was going through some churning, and as I looked at that churning, looked at where my expertise was beginning clearly to develop here in Washington, my feeling was that I could better serve this embryonic, fledgling industry here in Washington than elsewhere. So, after some deliberation, I called back Commerce. I accepted the opportunity, and sometime early '85, as I recall, late '84, '85, I took the job. I showed up at the Department of Commerce as Special Assistant in the Office of the Secretary for Space Commercialization.

They housed me in the Office of General Counsel, which sounds unusual, but it bespeaks the interesting approach that Secretary Baldrige had concerning the use of his general counsel. He really looked to his legal shop to do a lot of his policy analysis and advocacy, so the general

counsel shop that I entered at that point was really a hotbed of activism on behalf of the Secretary. And this was a Secretary, as you might expect of a Reagan appointee at the time, who put a big premium on deregulation, a big premium on market-driven initiatives, and, therefore, the type of philosophy that I enunciated earlier, that we had generated when I was with this rocket company, very much—I found a very fertile and congenial environment when I came to work at Commerce.

So I feel really fortunate that I was able to operationalize that experience in industry and had the opportunity to go into government and work at a senior level, my first job, to help translate theory into policy. In that position, I worked closely with a Robert [H.] Brumley, who was at that point a special assistant to the general counsel. He ultimately became general counsel. Robert Brumley was a very interesting person -- what I would refer to as an entrepreneurial bureaucrat, pretty innovative.

The biggest issue, we felt, in the '84, '85, '86 time frame, was the prospect of NASA dominating the space launch industry, through the Space Shuttle, which at that point had been declared operational, and by that point, the agency had declared a policy of encouraging as much commercial business on the Space Shuttle as possible, in addition to the civil and some military missions that they were supporting. It was clear that in response to this perceived major subsidy by the government, that the Europeans were greatly motivated to likewise subsidize their entry into the foreign market, the Ariane rocket family.

So those of us either associated with the rocket industry directly or, at that point, in my case, at the Department of Commerce, felt that unless we put some policy breaks on what was happening in the U.S., we would end up devastating the established expendable launch industry

with players such as Martin Marietta and General Dynamics, as well as clearly resulting in the stillbirth of the emerging entrepreneurial rocket industry.

So that theme occupied much of our time and effort at the Department of Commerce, and there were innumerable interagency meetings involving, obviously, NASA, Department of Transportation, those of us at Commerce, the Office of Science and Technology Policy, Office of Management and Budget, Defense personnel, grappling with the appropriate policies that would allow for a viable space shuttle, while at the same time encouraging the emergence of a viable U.S. industry that could take on not only the European entry, Ariane, but take on any other foreign launch competition that at that point looked like they might be coming into being. Certainly we knew that Japan, China and the Soviet Union, at the time, were certainly potential threats, although we, at that point in the mid-eighties, did not have a handle yet on the nature and scope of those threats.

So a great deal of time was invested in the interagency world in pushing the agency to develop a full-cost methodology for determining pricing on the Space Shuttle. We went through innumerable variations on additive costs, average costs. There were innumerable studies that were put out, both by the government, Congress as well as private-sector think tanks, regarding this whole effort. We at the Commerce Department, along with our then, at that point, allies at the Department of Transportation, were very adamant if the agency was going to continue to launch commercial payloads, that they had to do it at the full cost.

And if you'll allow me to provide a sidebar observation, in roughly around that time period, maybe '83, '84, another individual no longer with us, I regret to tell you, Phil Salin, who died of liver cancer a few years back, he was a senior executive with Arc Technologies, was a Stanford [University] graduate, and I arranged for him, working with the Republican minority at

the time—and a bit of what I have to admit was a bit of rear-guard guerrilla action—managed to get for the first time on the public record an analysis of what launching on the Space Shuttle really costs. When the majority on the committee—at that point it was called the Committee on Space; now I think it's called Space and Aeronautics Committee—when they got wind of this testimony, I'll never forget, when I showed up at the hearing, there were maybe, I think, one or two members. Now, normally these hearings on space, there weren't a lot of members that would show up at a normal—but this was extraordinary in how few there were, and I recall in the audience that there were an inordinate number of not only NASA personnel, but Shuttle contractor personnel sitting in the audience. People were both, I think, unhappy with the message, but I think, to a large extent, viewed Phil Salin as representing a fly-by-night entrepreneurial venture—these are my words, but I'd be surprised if that wasn't what the perception was among the people in the audience, and certainly among the majority staff on the committee at the time.

But there was no walking away from the fact that Phil was absolutely brilliant. He was a brilliant economist. He had spent a great deal of time in research in systematically analyzing what the costs were. He systematically, which was typical of Phil, went through all the available public information regarding the infrastructure costs associated with the Space Shuttle. So I believe that any history that looks at the dynamic or the debates between the role of the Shuttle and its impact on the commercial launch industry, by rights, needs to start with Phil Salin's statement, which I think has held up pretty well in history. When you correct it for inflation and so forth, he got it pretty right in terms of the huge costs associated with launching these payloads.

And, of course, the agency had no interest in charging full cost, because if they did that, it would act as an immediate, you know—discourage the interest of the commercial satellite industry immediately, so they had no interest in acceding that point about how much it really cost.

And we got into very, very intense debates. Now I'll shift you back to the mid-eighties, these interagency debates, where we at Commerce Department and Transportation were pushing hard for full cost. Frankly, it wasn't until the horrible tragedy of the *Challenger* accident in January 1986, when things dramatically changed. In fact, in the months leading up to the *Challenger*, there was every sign that the U.S. launch industry was beginning to pack it in, that they saw little prospect for NASA, for the government, rethinking its policy toward launching commercial satellites, and with the prospect of competing against subsidized foreign competition, few of them saw any real opportunity.

Unfortunately, it took the trauma of the *Challenger* loss to regitalize the interagency world to go back and look at what the appropriate role of the Shuttle ought to be. So I got heavily involved in that whole effort in the months following the *Challenger*, when we developed a new space policy, actually, a national space policy that included a commercial section. And although we got into heated debates, again, the agency obviously was in much less of a position to argue that perhaps it was inappropriate for the Shuttle to be putting astronaut lives at risk in supporting “vanilla variety” commercial satellites, as we used to put it. Obviously, there's nothing “vanilla variety” about launching anything, but as compared to those research-related efforts on the Shuttle that did require intimate astronaut involvement, we made the argument, among other arguments, that there's really no real justification to put an astronaut at risk in launching satellites that could be as effectively launched by other means.

Other arguments included that we did have an industry on the verge of collapse, and that overnight we could create a market base for this industry, and that the agency, which at that point it wasn't clear when the Shuttle was going to be back in business—of course, we know, in retrospect, it took almost two years, over two years, to come back to business, and that during that time, we anticipated that there'd be quite a backlog of missions for the agency to work off of, and that during that interim period, rather than handing it on a silver platter to the foreign competition, let's give our U.S. industry a chance to go after that industry.

But to show you the nature of the recalcitrance that we were facing even up until the eve of the President announcing a new policy, the agency was still fighting this and, in fact, there was even the prospect of some of our allies in the interagency world accepting the NASA compromise, which was that NASA would phase itself out of launching this industry, over time.

We at Commerce, led by Secretary Baldrige, refused to surrender our adamant position. Our feeling was that the agency at that point, at least in the eyes of the Secretary, had lost its credibility. He had fought too many battles, or we had fought too many battles on his behalf, before and after the *Challenger* accident, for him to believe that the agency, once it was back on its feet, once the Shuttle was back successfully operating, that it would indeed give up this lucrative satellite market.

So he was adamant that the President should support taking NASA immediately out of launching the commercial satellite, unless the President deemed it on a case-by-case basis to be appropriate, and there were some other exceptions, but by and large, our view was that they should be totally out of that business.

I still have, somewhere in my own personal archives, a copy of the options paper that was delivered to President Reagan by then Chief of Staff Don [Donald T.] Regan, and, actually, it's

an interesting piece of paper, because the President initially checked off an option that was one that we opposed. It was one that supported the phasing-in. What I have is a copy of where the Chief of Staff brought it back to him, and the President crossed out and put his “RR” next to the option that ultimately became incorporated into the national space policy, that ultimately became legislated sometime later, and that was the prohibition on NASA launching commercial satellites, subject to some very strict exceptions.

There’s another individual who deserves her day in the sun, and that is a lady by the name of Madeline Johnson. Madeline Johnson at that point was Director of the Office of Commercial Space Transportation. She had the boldness to insist on being on the White House dais when the President’s press secretary announced that the President had just decided that the Shuttle would not be launching commercial satellites, and she did those of us who advocated that position and others who were in the industry at the time a huge service, because she grabbed the microphone and declared in no uncertain terms that NASA would no longer be in the business of launching satellites, and that sound bite is what went out on the wires and, in fact, really preempted any reinterpretation that the advocates for a different policy approach might have spun, if it hadn’t been for her taking the initiative.

I’ve always believed that Ms. Johnson, who soon thereafter left the space community, to pursue other professional interests is yet another person to whom we owe a bit of tribute. To those of us who believed in sending a very clear signal to the marketplace, she did a very important deed at that point. I have no doubt that those at NASA at the time, and the contractors, who were very much opposed to this new policy, would have done everything they could to support a different interpretation.

By the way, not out of malice aforethought, but because they were very, very well-intentioned people, who really felt, in their heart of hearts, that the Space Shuttle was the most appropriate vehicle, and that the expendable launch vehicles were yesterday's technology, and that the more business we could get for the Space Shuttle, that meant more launch events, and that meant, over time, that the economics would drive toward lower cost.

I was a member of the school of thought who believed that the capital investment in the Space Shuttle and its supporting infrastructure was so huge, and that particularly in the wake of the *Challenger* accident, the care and feeding that it took to maintain the Shuttle, the costs associated with that, were so large that it was very unlikely that we would ever achieve the traffic model that would result in the lower costs that some of the proponents suggested at the time. And again, I also felt strongly that when it came to launching commercial satellites, it was best to have our industry do that.

Now I loop back to a point I made earlier, which was this focus on product differentiation. There were those of us who felt that the Shuttle had a very important mission. It is impossible to imagine today the great achievements we've made in space in the past twenty-some-odd years, in the absence of the semi-reusable launch vehicle. Certainly the engineering achievement of the Space Station would have been impossible, or, at least, would have been far, far more difficult, formidable, in its absence.

But with that said, we're still a country that today, as I speak to you in the year 2003, we're in a marketplace that is very much suffering from the lack of diversity of launch vehicles in various weight classes, and a number of us foresaw that prospect, and although we do not have the innovation diversity that we had hoped for, the past twenty-some-odd years has only

convinced me more that if the Shuttle advocates had prevailed, or continued their monopoly, that it would have dealt a devastating blow to the launch industry.

So as much as today's industry is suffering, at least we have an industry to suffer. I would suggest that we probably would have entered the nineties with very few suppliers left, the exception being the Department of Defense, that would have sought various artificial means to ensure an expendable launch vehicle system. And, of course, the evolved expendable launch vehicle, EELV, is the Department of Defense's answer to filling that void. But there's no question that we would have been, I think, in even worse straits if we had followed that path.

WRIGHT: Let's talk some about the Office of Commercial Space Transportation. You mentioned Madeline Johnson was the director. You took that position as well.

STADD: Yes.

WRIGHT: Tell us about your expectations of the job and what you were hoping to accomplish with that directorate.

STADD: Sure. I should add that while I was still at Commerce, and in the wake of the President's decision to take the Shuttle out of the launching of the commercial satellite business, the Secretary had supported establishing an Office of Space Commercialization. Bob Brumley and myself were the co-architects of that office. It was our feeling that there needed to be an office solely dedicated to promoting and supporting this fledgling industry, and by that I mean not only launch industry, but also the Earth-observation industry, which at that point was also

embryonic. There were also some very interesting entrepreneurial communications initiatives. There was also at that point the very much fledgling global positioning system industry. So there were a number of industry sectors where we felt having a policy advocate at the Department of Commerce made a lot of sense.

So we took a rib out of the International Trade Administration, ITA, which is the international expert arm of the Department of Commerce, and established this office, much to the chagrin, I might add, of the people who were at ITA, who were managing a long-established aerospace office. But our feeling was that that office was doing its job of care and feeding for the established aerospace industry, but that there really needed to be a voice for the entrepreneur. And, by the way, by entrepreneur, I mean not only the new-start companies, but I mean the intrapreneurs within the established aerospace companies who were seeking new product lines in the commercial space industry as well. We thought by establishing such a small office within the Office of the Secretary, we would give it a cabinet voice. And even though Commerce is very small, when you have a secretary with as close a relationship as the late Secretary Baldrige had with the President, there's a lot that you can gain from that type of agility and that type of access.

So I was offered the job to run that office, and I would have done that except that I got a call from the Office of the Secretary of Transportation, and they offered me to take over this Office of Space Transportation. So Madeline Johnson, for a number of different reasons, had decided to leave the department, and I was approached to take that job. I remember I went over and met both with Jim [James H.] Burnley, the Deputy Secretary of Transportation, who ultimately became the Secretary of Transportation when Secretary Dole left a year and a half later to help support her husband's run for the presidency at the time. So it was lucky, because I

was able to develop a relationship with him early on, but I met the Secretary, we bonded, we very much shared the same vision for this industry.

I found myself, by 1986, now the head of an office that was a product of an executive order and legislation that I was originally sent to help put in place. Of course, it was a different agency than I originally had in mind, but it says something, perhaps, about the small world of Washington. But the irony was not lost on me or anyone else who knows of my role in this industry.

I found myself in a fairly unique situation. There are people in the academic world who study space policy. There are people in the industry world who advocate policy change. But there are probably, for better or for worse, few people who are able to view it from all three standpoints, and between the mid-seventies and the mid-eighties, I had that unique opportunity. I also benefited because commercial space was so new, and there was such a dearth of people crazy enough, like myself, to try to make a living at it, that I never kid myself to think that I had any special talent or intelligence or skill; it's just that, as in things like that in life, I was in the right place, right time.

So when I took the job both at Commerce and then specifically at the Department of Transportation, I recognized the unique opportunity and the responsibility that I had, because I realized everything I was doing would set a precedent. No one had ever licensed a private rocket before. Today, you tell somebody that in the year 2003, and they accept it as reality, but a short seventeen years ago, when you would mention that to your colleagues in the Department of Transportation, in the other modes, FAA, Coast Guard and company, they did look at you sort of funny. "You're telling me that the government is going to countenance private people to go off

and engage in something that is potentially dangerous?" After all, what is a rocket but it's a controlled explosive.

But through the bipartisan support that we had on Capitol Hill—and I give credit to a number of the members on the Hill who had the vision to support the industry, President Reagan, that White House, and to Secretary Baldrige and Secretary Dole who, again, had the boldness, the vision—we set about to do just that. And she kept her promise, her deputy, Jim Burnley, kept to the promise as well, when he became Secretary, which was to not allow this office to become captive to the traditional certification approach to regulation.

So we took the executive order, we took the law, and I had some very talented members of the team, Gerald [C.] Musarra, who's now a Vice President at Lockheed Martin, at that point was sort of a junior civil servant at the time, I recognized early on that he is a very talented lawyer, and he ultimately became my de facto chief counsel. I give Gerald a lot of credit for being the architect and helping to translate the law, the policy, into the regulations.

Another gentleman, Norm Bowles, was a gentleman who helped, managed operationalizing the licensing in our office.

By the way, to show you what a small world it is, not only is Gerald now Vice President of Lockheed, but about a month ago, I had the privilege of being in the audience when the President [George W. Bush] hosted the President's Quality Management Award ceremony at the Ronald Reagan Building, which is the highest management award you can be given by the President, and lo and behold, after not having seen him for many, many years, Norm Bowles stands up to accept an award from the President for his management of the FAA Oakland facility. We had some good people, is my point, who've gone on to other things in life.

But we spent that first year, '86, part of '87, really putting in place the machinery to license, and if memory serves, I believe I issued the first license for Space Services, which, unlike Starstruck, had gone from its test to actually signing up a payload and had put in an application to be the first licensed company. That was a proud day, to do that.

And we issued the regulations, the first set of regulations ever, for a private rocket industry, and we tried to hold to our promise that they would be based on what I referred to as performance-based philosophy, where we try to establish a minimally burdensome set of safety criteria.

I might add that our efforts were controversial, so I think it's worth taking a moment to remind people of the context. NASA was still unhappy about the policy, but one thing about this agency, it was true then, and I can guarantee you it's true today, once the policy decision is made, they do salute the flag and implement. You know, there were people in NASA that were really making their best efforts to try to work with us, but it was clear that it was hard for them to take seriously this small band of people at DOT that were daring to get involved with an area that was theirs and the Department of Defense's exclusive concern. And this whole regulatory business was really alien territory for an agency dominated by engineers used to working on the cutting edge of, in this case, launch technology.

The agency is certainly not a regulatory body and, in fact, at one point in the interagency debates and, in fact, even at some point when the Congress was debating this '84 Commercial Launch Act, there was some thought given to whether NASA ought to be the lead. In my judgment, saner heads prevailed and said NASA is a research agency; it is not a regulatory agency. Fortunately, that was the dominant thinking.

But the Department of Defense, Air Force, also had its concerns about this new office. The Air Force, rightly, felt that they were the resident experts on national range safety, and, again, they were asking, what were these upstarts doing in this civil agency, what value-added did they have to offer. And, frankly, when I first took the office over, it was an uphill effort to persuade both NASA and, in many ways more importantly, the Air Force, because we were, more than NASA, rubbing up against prerogatives that were long associated with the Air Force in the area of range safety.

Now, the approach I took was to, first of all, very much concede the expertise to the Air Force in this area, and to develop a partnership with them. I arranged for detailees from the Air Force to come work in our office. I tried to foster as effective a collaboration as possible. Then-Secretary of the Air Force Pete [Edward C.] Aldridge was a great help in trying to foster that environment. But I would be less than forthright if I didn't say that there was a lot of time and effort and a lot of time—many, many, many, many months—devoted to building bridges with the Air Force, as well as with NASA. But, again, because of the safety, the idea of DOT putting together a regulatory governance model at the ranges, it meant we had to work very closely with the Air Force.

On the Hill, I encountered some hostility from the oversight committee. There were members on the Hill, mostly Democrat, who felt that the Department of Transportation was a trespasser into an area of expertise that had been long the sole preserve of NASA, and they felt that we were driven more by mindless ideology than by practical concern. So a lot of my time and effort was spent trying to educate and trying to reach out, and I did that in a number of ways. I took the advisory committee that had already been created before I got to Transportation, and then I, working with the Secretary, populated it with as many respected people as I could recruit

in industry, and those industry people were very helpful in helping advance our credibility in the community, particularly with Capitol Hill.

I don't know what else you want me to add.

WRIGHT: One of the things that you were talking about was the range safety, which brings up the issue of insurance. How did you cover that issue? What were the debates? What was the discussion evolving with that?

STADD: Realize that this was a steep learning curve for the government, i.e., regulating the private launch industry. We at the Department of Transportation—now, this is where we earned our spurs. This is where we began to demonstrate why we were, if not uniquely qualified, why we brought such value-added to the table, and that is, that as an agency that since 1967 has been in the regulatory business, we recognize that anytime you mix government oversight, safety oversight, in industry, and whatever it may be, in the maritime or aviation or highway business, where you're putting the public at some level of risk, you have to do a risk management analysis, which brings you into the liability exposure world.

So we knew fairly early on that at some point we were going to dealing with the issues of indemnification, liability, risk management. It was brought to the fore by the leading underwriter at the time, INTEC [International Underwriters Inc.], which has subsequently been taken over by a European company. Rick [Frederick H.] Hauck, who was the first commander of *Discovery* after the *Challenger* accident, now heads up that U.S. subsidiary. The former chairman of INTEC, Jim [James] Barrett, along with Norm [Norman R.] Augustine, who was the President at that time of Martin Marietta, met with me and talked about how they were going to

find it untenable to finance satellites, particularly the very expensive satellites, without some level of government indemnification. That is, they needed something that they could take to the marketplace and tell their insurers that the government was standing behind them in the event of a catastrophe. Otherwise, if they had to go to the marketplace with an open-ended exposure they did not believe that their own board of directors, who had critical fiduciary obligations, would stand for it, for that form of exposure, nor did they believe that they could afford the premiums even if they could get insurance to cover that level of exposure. Nor, should I add, did they feel that their boards would support the level of self-insurance that would be required to cover that level of exposure.

At this point, let me give credit to Gerald Musarra. He and I drew our sleeves up, and from our deliberations and discussions with experts in the field, we ultimately proposed this concept of tiering the indemnification, so that the industry would carry a significant share of exposure, but at a certain point—and I can't recall if it was a half a billion or a billion at this point, maybe a little more than that—the government would accept indemnification beyond a certain point.

So we took that tiering concept. I want to give credit to the Office of Management and Budget, which felt that we made a good case. The White House did support us. And we then took that to Capitol Hill, and Marty Kress, who ultimately came to work at NASA, now retired, at that point was working on the Senate Commerce Committee, and I'll never forget, Marty and I took a walk somewhere in early '88, as I recall. We actually walked around Capitol Hill, around the Senate buildings, and he was on the majority, he was a Democrat, I was obviously a Republican for Reagan, and we walked around and we discussed this proposal. He talked to me about the different issues that he'd have to deal with, with his members. But ultimately from that

walk that afternoon, came an agreement, and Marty was a very effective advocate for this amendment. And through our efforts on the executive branch side, his on the legislative side, we ultimately were able to get support for this amendment that resulted in this tiering, which had a sunset clause attached to it, and it has been renewed, I gather, subsequently, a number of times since.

That clearly was critical to allowing the industry to move forward and to get the financing, the investment required to continue to launch. The industry had many other competitive challenges, but we mitigated the risk management as much as we could. It took, as in all these cases, it took give and take. Obviously, the industry would have loved the government to pick up as much of the indemnification as possible, and obviously, the government's side wanted to be careful to what extent we were artificially supporting the industry. And I feel that history has confirmed that I think we came up with a good compromise, which has served all parties since.

WRIGHT: Before we close today, could you give us an example of some of the industry's competitive challenges that they were going through at the same time you were going through all your challenges?

STADD: Yes. Part of it was cultural. These companies had been long accustomed to being primary vendors to the U.S. Government. None of them had any commercial experience. So for them, it was really a huge, almost trauma to the system to get out and do commercial marketing, do the type of loss leader marketing and so forth, and the type of business development with new commercial actors that they hadn't dealt with before. They were very accustomed to dealing

with government. One could argue that these large aerospace companies were, in many ways, extensions of the government by culture and mindset. After all, that was, in fact, their customer base. So if I had to pinpoint the biggest challenge, it was pretty much a culture challenge for these people.

The other big challenge was dealing with foreign competition, the prospect of dealing with subsidized competition. And the other big role that we tried to play at DOT was to help advocate on behalf of the industry to ensure that our United States trade representative recognized the importance of this industry to the extent of putting it on that person's radar in negotiations with Europe and other countries. So I would say those probably were the biggest challenges.

The other big challenge was convincing the government that, again, formerly had been the owner of these launch systems, to stand back and view them as launch services. I think another challenge they had was, indeed, to retrain the government to be a true customer. Although we've made huge strides since then, back then, that was a steep hill to climb.

I would like to say a couple points about the office. What's interesting about regulatory offices is that oft times they find themselves walking a thin line between bringing the level of clinical independence to regulation that is fundamental on behalf of the American public, while at the same time providing an appropriate level of advocacy and promotion. By the way, the Federal Aviation Administration has encountered this dilemma for decades, and, I would submit, most other agencies, as well.

So, in addition to my dealing with the credibility issue of this new office, and building the regulation and licensing regimes, I also had to walk that line vis-à-vis appropriate and effective promotion. Frankly, at that time there was no voice other than the fledgling efforts of the

Department of Commerce, and, of course, I had left Commerce, so there was at that point really—you know, there was a bit of a vacuum. I don't want to make this sound egocentric, and I'm proud to say that we made efforts to fill that vacuum at Commerce over time.

But, really, it fell to the Department of Transportation, it fell to my office to fill that void and be the advocate, so I spent a great deal of my time between '86-'88 talking to as many of the aerospace fora as I could get to, to educate to them as to our charter, the scope and nature of our activities, as much time as I could educating the Department of Defense, NASA, Commerce, and the White House personnel, including the United States Trade Representative Office as to our issues. The Commercial Space Transportation Advisory Committee, COMSTAC, as I mentioned earlier, was invaluable in terms of surfacing the issues that they felt required support by our office, by the government.

And again, I constantly had to view all that through the lens of "Is that an appropriate role for us as an advocate?" And it was a challenge. It was a fascinating time, and, again, I realized that I had a really unique opportunity to help shape, form an office almost from its birth, although I do want to give credit to Jenna Dorn, who had been a director for a short period of time and Madeline Johnson. But the bulk of that effort fell on our watch really—Jenna went on to serve Secretary Dole very ably and is currently head of the Federal Transit at the Department of Transportation.

But by the time I came on board, there was a host of challenges we had to face at that point, and at some point in the interview I could give you my observations about where I think that office has gone, both positive and negative.

WRIGHT: We'll do that. With the time today, it's probably a good time to close, and we can start back up tomorrow.

STADD: Great. Good. I'll look forward to it.

[End of interview]