ORAL HISTORY TRANSCRIPT

ROBERT C. SEAMANS, JR.
INTERVIEWED BY MICHELLE KELLY
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The following interview of Dr. Robert C. Seamans, Jr. was conducted by Michelle Kelly at his home in Beverly Farms, Massachusetts on September 30, 1998.

KELLY: Thank you very much, Dr. Seamans, for talking with us today.

SEAMANS: I'm happy to chat with you and discuss the very interesting program that I happened to get involved in, more by chance than by plan, mainly the Apollo Program. Leading up to it were a series of educational experiences and then professional experiences.

In brief summary, I went to a private school, Lenox school, and I found there that I had relative ease in my math courses and science courses, and some difficulty with my English and history and things like Latin. But I managed to survive. In college, I went to Harvard [University], and I really had no idea what I wanted to do when I went to college. I took just regular courses my first year, everything from English to math and physics. I found that there was a summer course I could take in surveying. It was tied into what was called the engineering school, engineering science.

I had no idea what that was, but I didn't have anything to do that summer, so I went to Squam Lake and took the course. We got out [in the fields and woods] with transits and level lines and all that, and learned how. Almost invariably, a transit, when you set it up, it's on top of an ant hill or something like that and where you have to clear brush to see through to the next marker. But I really enjoyed it. I got to know the head of one of the departments in engineering.

So when I went back sophomore year, I took more courses in engineering. Finally, as it turned out with the summer course I'd taken and few other things, I was able to finish Harvard in three years, specializing in the engineering sciences, which included aeronautical engineering and mechanical and civil and mechanical drawing, and took my share of chemistry and a little bit of biology and math.

Again, I wasn't sure exactly what I wanted to do next. It just happened at that time that I'd had a series of incidents when I'd been bicycling, for example, in England, and went to the doctor. Just about the time most of my class were going back senior year, I was put in bed. I had to stay in bed for three months. I had rheumatic fever. In those days, you didn't have penicillin and stuff like that to wipe it out. But I was very lucky. By the end of what would have been my senior year, I was hail and hearty again. I could go to my graduation.

But I still didn't know what I wanted to do. Because I had been subjected to quite a few doctors and so on, I thought maybe I wanted to go into medicine. So I spent that summer taking some pre-med courses. By the time fall rolled around, I was convinced that I wasn't cut out to be a doctor, but I did believe that I had skills in engineering and I wanted to go back.

So at the end of the summer, I enrolled back at Harvard and I'd been taking courses there for two days when a friend of mine said, "You know, I'm not sure we're in the right place." He said, "I'm going over to MIT [Massachusetts Institute of Technology] this afternoon. Want to come along with me?"

So I said, well, I didn't have anything else to do, so why not. I went over to MIT with him and met the dean of admissions….[We] presented to him orally our experiences at Harvard. He said, "Well, you boys have done awful[ly] well, and I think you can start off here as sophomores." At that point, we both stood up to leave, and he said, "Well, maybe I'm misjudging you. Here are some forms you can fill out and you can go around to the various MIT departments and maybe they'll give you more credit than I'm giving you."

My friend was absolutely disgusted, and he just left there in a rage. I can't tell you why, but I filled out the form. So I found it great fun. I went around and negotiated the various departments, like English and government. I really had more than the equivalent of some of the courses at MIT. I was starting to build up credits. I finally ended up in aeronautical engineering.

The head of the department said, "Well, with all your background and Harvard degree, why do you want to come over here as an undergraduate?"

I said, "Well, I wouldn't consider it."

He said, "Well, would you want to come here as a graduate student?"

I said, "That's exactly what I'd like to do." I almost made the decision on the spot when he asked me that question.

He said, "Well, that sounds fine to me."

I said, "Well, your dean of admissions doesn't seem very enthusiastic about it."

So he called him on the phone right in front of me and they argued back and forth, and he finally said, "Well, it's all set. You can come here. Start next Monday."

It just happened the two colleges had different time scales. I said, "Well, how long will it take to get a master's degree?"

He said, "Well, you do have quite a few deficiencies. It may take you as much as three years."

I said, "Three years?"

He said, "Well, there are some specialties here, including instrumentation, and maybe it wouldn't take as much time."

I said, "Well, what is instrumentation?"

He said, "Well, I'm a little vague on that myself. Why don't you go see Dr. Draper."

And that's exactly what happened. It was just all as innocent as that. It was no great master plan that I had, it just worked out that way.

So that fall, I went into Doc Draper's class and I was absolutely enchanted with the intellectual content of what was going on, as well as the professionalism of it, as well as the closeness to the actual workplace. I found that really exciting.

…I finished all the course work I had to do in two semesters. That summer, I guess along about the middle of June, the courses stopped the end of May, I thought, I'm going to drop around and see Doc Draper and see what I might do for my master's thesis. He outlined a possibility which sounded pretty interesting. He said, "You'll get paid. You'll be a research assistant."

I thought, "Gee, getting paid!" Nobody ever paid me a nickel before, [except for] a little tutoring job I had once. I said, "Well, that would be just fine."

So I started the following week. It was fascinating, because I had a boss, whose name happened to be Oldfield, so he was called "Barney," because there used to be a racetrack driver called Barney Oldfield. Barney wasn't there very much. Lo and behold, a few weeks later I was informed by Doc Draper that Barney Oldfield was going to be called up into the Army. This is still before Pearl Harbor, but Pearl Harbor was going to happen in December. This was still June, July by then.

On the strength of that, I was made an instructor. Doc asked me if I'd be an instructor and help him give his course and so on. You know, things were happening pretty fast. But I said I'd be happy to do that, and so I did.

All of a sudden we were at war. I got my degree just about the time the war started. I also got engaged at that time and got married soon afterwards. So things were really piling on. All during the war, I was at MIT. I helped Doc Draper with his course and other graduate courses. At the same time I gave a course in aircraft instruments for the Navy. MIT gave it for the Navy. I had fifty students come in on a Monday and six weeks later they'd leave and then the next group would come on a Monday and six weeks later they'd leave.

This happened thirteen times and the war was over. So I got to know that material pretty well.

At the same time we were doing work both for the Navy and the Air Force, then the Air Corps, on the technologies, new technologies, that could be used to shoot down enemy airplanes. The Navy wanted to shoot them down from their ships, kamikazes coming in. The Air Force wanted it for air-to-air combat.

So when the war was over, I had quite a bit of experience on the deck of carriers, for example, in the middle of winter trying to install equipment in the Atlantic, and going down to Florida for work with the Air Force. Having the fun of working with a colonel who became a senior general officer, named Lee Davis, where we'd go down in a C-45, I guess it was, and he had work to do, so he'd say, "Look, you fly the plane and I'll sit in the back. I've got some work to do." One time when there were a lot of clouds and I thought it would be a lot of fun just to kind of zoom around the clouds, and he called out, "You know, you don't need to be quite so strenuous with the controls." Another time we were going along, and all of a sudden all the bells and whistles went off and I hadn't observed the fact that the tank was running dry. He had to come tearing [forward, the] propel[ler] [had stopped,] and get things all cranked up and get the plane going again.

But they were extremely busy times and very exciting times. This was followed by post-war. There were a couple of years after the end of the war before Dr. [Jerome] Hunsaker came to me and said, "You always thought you might want a doctor's degree." By then I was a professor. He said, "Time's running out when you can go after a degree. You're not supposed to go after a degree when you're forty-five and so on." By then I was getting pretty old; I was in my late twenties.

So my wife, Gene, and I, had to agonize over that one, because it was obvious it was going to be about two or three years' worth of effort. I felt that if I was going to do it, I didn't want to stop working. I was going to keep working at the same time. We had three young

children by then and the question of time with the children and so on. Gene agreed that it was worth doing, and I think we both, before the three years were up, wondered if we'd made a big mistake, but we got through it and our marriage was still intact. So I got the degree.

During that same period of time, I had a project where we were automatically flying a pursuit airplane while it was tracking a target, like air-to-combat, only completely automatic. This involved a lot of special tests of all the equipment you have on the plane, as well as the plane itself. I've tried to emphasize that to some extent in the book I wrote, because it was so similar to what we ended up with in the lunar orbit rendezvous with Apollo.

Some people were very concerned as to—we an discuss this later, because the White House itself had a big concern about the lunar orbit rendezvous, whether it was going to be safe to have people go down in the capsule and land on the moon and be able to come back. Before they could come back, they had to successfully dock…with another vehicle that was going around the moon. If they didn't dock successfully, they'd had it. But I felt, because I'd been so immersed in this particular kind of maneuver, that that was the least of our worries.

Anyway, not long after that, in the early fifties, there was a project that MIT had taken on right after the war to develop equipment for guided missiles. The Navy came to a number of places in the United States—Johns Hopkins [University], MIT, and other places—to make use of what the Germans had done—they were obviously ahead of us with their V-1 and the V-2—but to take it beyond what the Germans had done and incorporate it in our educational program.

This started off as, I don't know, maybe as many as ten or eleven different individual projects at MIT—a new wind tunnel, for example, and a new kind of simulator and various things, but it had not been integrated into a common goal. The Navy, in effect, came up and said, "Where's the missile?" There wasn't any missile. I was in put in charge of finding a missile.

This was a very fortunate thing for me. It was very frustrating, because working with Doc Draper in his lab, his management style was very simple. You put a bunch of people in charge, you designate who the people are, who's in charge, and they go and they do the project. And when it's all over, you disband it. And that's fine, as long as you have a lot of students coming on that join in these projects and so on.

But that's not the way the so-called Meteor Project was set up. Taking charge was not an easy matter. [I was] dealing with three different schools, [and] with, I think, seven different departments, with a lot of faculty members. Anybody who thinks they can step in and say they're in charge of professor[s] in different departments [is] crazy. I mean, very difficult management problems. I didn't always handle it very well. I'm afraid I was too trusting [at times and], too demanding [at other times], and I got myself at cross-purposes with some of the people involved.

But it was very valuable eventually when I got to NASA, because there you have all these different centers. How do you get something done that involves five or six different centers? How do you get them all to work together?

Anyway, at the end of about a third year, we had made some progress and we actually had something you could look at and say, that's the missile and it did work. But the Navy had other programs, as well, and so they canceled the project.

Just at that same time, I was getting some feelers from RCA [Radio Corporation of America] to see if I'd like to come and work with them. I went down to Camden, New Jersey, where they were located, and it didn't take me long to figure out that's not where I wanted to work. But there was a highly industrialized, old-fashioned industrial-type operation there. All the engineers were unionized and it was tough. So, I said no.

Then they came around and said, well, would I be interested in starting a new laboratory for RCA on [Route] 128 [outside of Boston], or near there. So I did that. That was highly educational to work in a big corporate structure where you have lots of levels and

staff at each level and people coming around with suggestions. Things went well enough that RCA decided they were going to put up a permanent building for the work we were doing. By then we had a thousand people working.

They wanted me to suggest how the building should be designed. First, we had to find the land and I helped on that. We were working in the Waltham Watch Building then, which they did a very nice job of renovating. But that's still a long way from—we were living right here, in Beverly Farms. It was sort of a long commute. I thought if we could find a place that was nearer Beverly, it would be very nice, and we did. It was on Route 3 and 128, in an area where, at that time, there was nothing industrial going on. You ought to see it today around there. It's wall-to-wall small companies and so on.

Anyway, my idea for the right kind of building was an H-shaped building, three-story, and that way you could keep everything more or less close together and you got lots of windows. When headquarters RCA came around, said, "Here's the design," I took a look at it and it was a square. I said, "Well, you know, I wanted to have an H-shaped building and I wanted three stories. This is one story."

They said, "Well, they decided in New York that we're not sure that it's going to be permanent operation, and whatever building we put up, it's got to be readily convertible for a storage warehouse." They said, "You know, it really is an H-shaped building, because you can take the square and take what would be the tips of the H and we just folded them in on themselves and that makes a square." Anyway, there were those kind of battles to be fought. The building was constructed and it was an H-shaped building, although it was only one story.

…I was driving home from Waltham one day [in 1957] when I heard on the radio about Sputnik. I was upset because I felt there was no reason that we couldn't have done it ourselves first. And I was sort of upset, I guess, because I wasn't involved, and it was the kind of thing that was exciting and I'd liked to have been involved in. I should say that I'd

been working for the NACA [National Advisory Committee for Aeronautics] for quite a few years on some of their committees.

NASA was formed, in part, out of the old NACA, National Advisory Committee on Aeronautics. I observed that the committees I'd been on were abolished. So I didn't even have that connection with what was going on.

[So I was working there in my office one day, when I got a call from [Dr. T.] Keith Glennan, who is the administrator of NASA. This is now 1960.] …I guess it was a June morning in 1960. I guess you could say that the adrenaline kind of went up a little bit and he said, "We don't know each other, but you know my deputy, Dr. [Hugh L.] Dryden," whom I did know at the NACA. He said, "We were just wondering if you were going to be down here in Washington in the next few days."

I said, "Well, I wasn't planning to." I was about to say, "But if you want me, I'll be there," when he said, "Well, could you have dinner with me tonight at the Statler in Boston?" It's no longer the Statler. I forget what it is called.

But anyway, we met and chatted, and after about forty-five minutes of conversation, he hauled a chart out of his pocket, put it down between us, and said, "Okay, here's the organization of NASA." He said, "Well, what we hope you're interesting in doing is to take over the general manager's job." You know, it's one of [those charts] with a lot of boxes and lines. He said, "I want you to take that job right there," and he put his thumb down on the place. He said, "We don't have jobs like manager. In the government you'd be called…the associate administrator. It would just be myself as administrator and Dr. Dryden as deputy, as your superior."

Well, it didn't take me very long. I've always had a rule when things like this come along, that I want to take at least a deep breath, and I do that by saying, "I'm not going to make a change like this without chatting with my wife." I really mean that, too, because she's got to think it's going to be good for the family, and good for her, and good for me.

So in a few days I called back and said, "That would be fine." I said, "But I really do have some work to clear up and I'd like to take a vacation before I come down." So I actually started on the 1st of September 1960.

Then it was a merry ride from there, until [President John F.] Kennedy went before the Congress, in a special State of the Union message in May of '61, and announced that, "Now is the time to take greater strides. Now is time for this nation," and so on, "to take a leading role in space and we should go to the moon within the decade and safely return."

But what happened during that relatively short period of time, was what I guess I'd have to say probably the most exciting time of my life, because just to be working for the government was a new experience. I got down there the 1st of September, I was very fortunate to have Keith Glennan as my boss. He had decided ahead of time that I should take about a month, the month of September, to go to all the different centers and take time at each center and see what they're actually doing.

He provided somebody named Dick [Richard E.] Horner, who had been my predecessor. He had had the job for a year. Keith told me that he felt they just had to have a general manager for the whole operation. They had gone to Dick Horner, who was then the assistant secretary of the Air Force for research and development, and he agreed to take the job on for only a year.

After I took the job on, they had a consulting arrangement with Dick, so he was available to chat with me about turning over the various stones and what we would find in these organizations, in terms of the caliber of the people and the work going on and the state of the laboratories. So that first month was educational.

Then pretty soon we were getting into some of the issues for the budget. The election wasn't until November, actually, but right after the election, the budgets were being put together for the following year, even though it was known by then there was going to be a change in administration, that [Richard M.] Nixon was not elected, Kennedy was.

So there were two or three very interesting meetings with [President Dwight D.] Eisenhower and Glennan and myself and a fellow named Andy Goodpastor, who was the president's special assistant. There was also one extremely interesting meeting of the Eisenhower Cabinet.

KELLY: What happened?

SEAMANS: At that meeting, I was there with Keith so that he could present the NASA budget, which he did, and he took about five minutes, I suppose. He kept it in pretty simple terms. The dollar value came out to be just a tad over a billion dollars. That was followed by the President's science advisor, named [George B.] Kistiakowsky, who was from Harvard, where he was…a professor in chemistry, I [believe]. He presented a study that the President's Science Advisor[y] [Committee], the PSA[C], had carried a study on the desirability and the cost and the feasibility of a man landing on the moon. He presented it in what I would say was a non-enthusiastic, rather cynical way. He said, "You know, if we were to take on something like this—he didn't quite say "as silly as this"—we couldn't do it until the seventies, at least a decade from then." He said, "You know, we can't tell you exactly what it would cost, but it might cost 20 to 40 billion dollars."

There was sort of sigh…around the table in the Cabinet. Then somebody said, "If we give those scientists that kind of money to go to the moon, the next thing you know, they're going to want to have that much amount of money, or more, to go to the planets."

Eisenhower cut in and he said, "I just wish somebody could tell me what is the best program for the United States that will cost no more than a billion dollars a year." And there was discussion of that. Of course, that was very germane to what happened right after Kennedy became President, because when you have a change in administration, you kind of shift everything immediately. There are many, many issues. The President has something

like, I don't know how many departments, but I know they grow all the time. I don't know, ten or twelve departments. [There were also] a very large number of independent agencies, of which NASA was one of the largest. You have all kinds of commissions and so on, and there are probably 150 people working directly for the President, and decisions on money don't get made without his approval. So you've got, within the Bureau of the Budget, now the Office of Management and Budget, to help him. Over the years it's been a remarkably effective part of bureaucracy. The taxpayers don't realize it, but that office is all the time doing its best to cut the budget. That's their game.

So once Jim [James E.] Webb came in, taking Keith Glennan's place, we were asked by Dave [E.] Bell, who was the head of the bureau, to come over and discuss those changes that we felt that the new administration would want to make immediately, recognizing that it would take probably a year before the president could make or want to make any major change in our budget.

So we had originally requested of the Eisenhower administration $1.4 billion. So the easiest thing for us to do was to look over the list of those things that the Eisenhower administration had not included. I don't think we included all of them, but a good number of them we went over and discussed with Dave Bell. His reaction was, "Well, these are all very interesting." He knew Jim Webb. "These are very interesting, Jim, but, you know, the president's got an awful lot on his plate right now. He doesn't have the time to get into all of this. He's going to want to get into it. This is really important, Jim, but these are things we'll take up next fall in connection with the budget for the following year."

Then the game is, when you reach that point, if you're the administrator or the secretary of a department, you can say, "Well, we understand that, but it's really important that a couple of these issues be resolved soon. These are really pressing policy issues and we very much want to meet with the President and discuss them."

The head of the Bureau has to say, "Well, I'll set up the meeting."

Then when you have the meeting in the Cabinet room over at the White House, you obviously get there early and you're sort of standing there, and the director of the budget is there. In our case, I think, Jerry [Jerome B.] Wiesner was there, the science advisor, and [George] McBundy was there, of the [National] Security Council. Since Lyndon [B.] Johnson had been so involved in the space effort, and was about to be made the chairman of the Space Council, he was there. Then there'll be—woosh—and the President comes in and shakes hands around and is introduced. He was introduced to me. We had been classmates, but…he'd met an awful lot of people since he graduated from college, and he did not immediately recognize me.

He sat down and we went through our discussion of why we thought certain things ought to be included, ought to be put in as changes, immediately. I had a fair number of meetings with Kennedy in the course of the three years he was President. He loved to just sort of sit there and debate them and turn to somebody and ask them a question. He often had a pencil, he tended to tap his teeth occasionally when they were talking.

Glenn Seaborg was chairman of the AEC [Atomic Energy Commission]. I had forgotten that. They wanted to get some money…immediately for a nuclear rocket, for example. Things were sort of being discussed, but they weren't in context, I didn't think. I said, "If I may, Mr. President, let me just summarize how I think these things fit together. This item here could affect what we might do in space by the year '65," and such and such might be [done at a later] date.

He said, "That's fine, Doctor. I'd like that in a memorandum in my office tomorrow morning." So I don't know that I put that particular memo in the book or not.

But anyway, these were all pretty modest increases and they did not include, which we had requested of Eisenhower, and which we requested of Kennedy, in asking for the supplemental funds, anything more for Apollo, or anything more for manned flight beyond the Mercury Program that was then going on. That's an important part of it all. It was for, I

don't know, something like, it seems like a lot of money now, when I think about it, but it was only for something like 120 million dollars or something like that.

KELLY: That was just to supplement the Apollo Program?

SEAMANS: That would be a supplemental, which went in and it was approved [but none of the funds were for Apollo].

I forgot to say that when we were still arguing, Keith Glennan was still arguing, in the Eisenhower administration, for increases in the Eisenhower budget, we were dealing with somebody called Maurice [H.] Stans, who was head of the Bureau of the Budget. There were two things that we wanted to put in, sort of in desperation at the end. One was 10 million dollars for communication satellites. We finally got the Eisenhower administration to put it in the budget, but we also had to show a reimbursable item for 10 million. The idea was that we, as an agency, would help put such a satellite in orbit, but it would be completely financed and paid for by a private outfit. It turned out, later on, that AT&T did just that. But we wanted to have some money in there so that we could develop such satellites ourselves.

We also wanted to have—Keith wanted to have 50 million dollars that the administrator could use with some degree of flexibility. Well, Stans just laughed at that, and he finally agreed to the 10 million. Keith said, "Well, I don't really understand how you're making these decisions."

Maurice Stans said, "It's very simple. I want a bargain basement program for space." Which, of course, [was in line]…with Eisenhower's view.

The way the things started with the Kennedy administration were really in that [same] mode. It didn't appear that there was going to be any very major change in our [manned space] activity, at least for a year's time.

Then in March, when [Yuri] Gagarin went into orbit, all hell broke loose. I mean, [the Soviets] got tremendous world publicity. Sputnik got a lot of world publicity. Whether the Soviets had planned it or not, to this day nobody really quite knows, but when they found out the impact this had, then they played on it. Then they [took] another step [by] putting a dog in space, [and] they went around the moon and took a picture of the back side of the moon. Then when they finally put a man up there, that blew everybody's mind.

And here we were, supposedly the most advanced scientific and technical country in the world, and…the Russians had been looked at as something backward, although obviously accomplished in mathematics. All of a sudden…they were pulling off these missions. The Soviets showed that the world was changing, and the great Communist countries were now ahead and were advancing much more rapidly, and that we in the United States were…dead in the water when it came to "progress."

KELLY: Was there intelligence on the American side that you were aware of, or was the CIA [Central Intelligence Agency] aware?

SEAMANS: That's a very good question. I think the answer is that the intelligence we had that early—that is, '60, '61—was very meager.

KELLY: I know the Bay of Pigs [Crisis] happened.

SEAMANS: We had the U-2 flying. By then, of course, Gary Powers had been shot down. The U-2 was able to overfly Russia before it was shot down. We were picking up information from around the perimeter of the Soviet Union, from aircraft that were flying with electronic snoopers aboard. Also we had ability to track some of their missile firings on the eastern part of the Soviet Union. There's a great peninsula there called Kamchatka. They

were launching from there and we [had] ships…at sea and [recorded] what they were doing. But as to what their intentions were, and what they were going to do in space, it was, at that time, very meager.

Before I left NASA, we were starting to get really good overhead photography of their launch facilities. We could see that they were building a new great big booster. They clearly had, we believed, a lunar program. Although it wasn't until the year 1992, I guess, that we finally got the information on what they were planning, the specifics of what they were planning to do.

So it was never terribly satisfactory. …What we believed, [was] oftentimes…based on information that was very highly classified. We couldn't use that data. There were several reasons for wanting to keep it very, very secret. If we gave too much away, it would make them realize what we knew and how we were getting it and make it more difficult for us to get it in the future. That was one thing.

Also, we knew they were gathering information on us, because we started to, as time went on, track their satellites and realize when they were taking pictures of us. But it was more advantageous, really, to us than it was to them. All they had to do was have the Russian ambassador of the United States buy *Aviation Week* and so on, and mail that over, and they'd find out quite a bit about what was going on. So we didn't want this game to stop, but we were getting a lot. If we were too public about it, we could embarrass the Soviet, we felt. It was better just to keep it…clandestine.

Anyway, after Gagarin landed safely, and was idolized in the Soviet Union, came to the Kremlin and given the Order of Lenin, and you name it, the first thing that happened was the Congress wanted to have a special hearing the following day, I think, or two days later. They took over the main caucus room of the house. They had Dr. Dryden…and Jim Webb. I was in the background. Just the two of them, you know, beating them over the head. "Why

are we behind?" "Why don't we do more?" "Why aren't we working twenty-four hours a day?" Of course, the answer was, or parts of it, Congress hadn't given us the money to do it.

Soon thereafter, I think it was about two days later, I was testifying with George [M.] Low, on Apollo, and [the question arose] why weren't we doing more on Apollo. I [attempted] to defend the Kennedy decisions and [noted] that Kennedy had provided funds for the big booster, which [was] need[ed], but that they had not put more money into Apollo because they were interested in getting more information on Mercury and our success there. George Low was doing the detailed testifying.

Then Congressman King, from Utah—I guess he was from Salt Lake City—quoted from the Bible. It's a quote, and I've looked it up and it really is there. But I forget now, it's somewhere in the Old Testament. It's about a couple of kings who are at war with each other. One of them goes out to do battle and he's got 5,000 men, but he hasn't done a very good job of reconnaissance. He doesn't realize that he's about to go out in a field against 10,000 men, and he's going to get clobbered. He said, "Isn't that the situation we're here in space? We don't seem to know exactly what the Russians are going to do."

"We keep going down and we do battle and we keep losing and losing." He said, "Isn't it true that the Russians are going to go to the moon in 1967, which will be the fiftieth anniversary of the Red Revolution?"

I said, "Well, I'm not privy to their planning, so I can't answer that question."

He said, "There you are. There you are, you people. You're going into battle and you don't know what your enemy is doing." Then he said, "Could we go to the moon in '67?"

Well, right after the election, we didn't know what the Kennedy administration would want to do, but we started carrying out some detailed studies of what would really be involved, detailed studies. We put the pieces together. Every one of the things that needed to be done seemed to be doable. We'd come up with an estimate of what it would take in dollars. I think it was around twelve or 13 billion dollars. So I knew that.

At the same time I knew that it was highly controversial…You don't want to…get out ahead of the President when you're [testifying]. He's got to make his mind up what he wants to do, and then you go up and present what the President's program is and defend it. So I tried very hard not to be too specific about it. But he finally got me to say that, yes, I thought that it certainly is going to be doable to land on the moon. Then the question of, "Well, could you do it in '67?"

I kept saying, "Well, you know, this depends on the level of effort, which means dollars. This is something that it seems to me that has to be decided by basically the people in this country. Do they want to really make this kind of an effort or not? Obviously, the decision-makers on this are you here in the Congress and the President, and he's reviewing these possibilities."

"But do you think it's possible to go to the moon in '67?" He also said, "How much would it cost?"

So I finally ended up saying that I thought that it was conceivable that with sufficient effort, we might be able to go to the moon in '67. To my surprise, when the hearing was over, I went outside and [found a substantial number of] TV cameras and microphones…[I was asked to] repeat the statement that I made inside.

I went tearing back—I'm just a country boy from New England, and all of a sudden this is pretty spectacular stuff. I went to Jim Webb's office and said, "You know, I may have made a big mistake. Here's what I did."

Not long after that, he got a memorandum from Kenny [Kenneth] O'Donnell, who worked directly with Kennedy, saying that they questioned some of my testimony and whether I was being loyal to the President and so on.

KELLY: I wanted to ask you, people for centuries have been thinking about man going to the moon, but where did the actual idea come up that we might be able to do that in our space

program, that you actually went to undertake studies of how to get there and how much it would cost and what the deadlines could be, or the schedule would be? How did that all come about?

SEAMANS: Well, it came about before I got there, first of all. Keith Glennan carried out a planning exercise, that Jim Webb didn't carry out afterwards. But Keith felt that there should be some kind of an agenda. When you put down all the things that you could do, remember this is the beginning of NASA. By the time NASA came along, I mean, [Sputnik] had already gone into orbit. So then the question is, well, what more do you want to put in orbit? The question is, you're going to get bigger and bigger rockets to put them up there. It's pretty obvious that at some point you could put a man up there.

Then, okay, once you get him up going around in orbit, where do you want to go next? You go higher altitudes, see more of the Earth. The moon isn't really very far away—250,000 miles. So you say, well, you could probably go up and take a look at the moon, or you could even go around the moon. Then it's not too far from that to extrapolate and say, well, maybe while we're up there, we could land.

This had all been on the planning agenda that the Eisenhower administration had put together, and it just said that landing on the moon was post-1970. It didn't say it would be 1970, just sometime after. You know, Jules Verne talked about it, and several of our comic strips were about going to the moon. Somebody once tried to write a paper on the whole subject, as to what extent science fiction influenced our planning.

KELLY: It must have been interesting.

SEAMANS: I don't know, I sort of forget what the answer was. It probably helped prepare people's minds for the possibility. I remember going up—to this day I can describe it. [My

wife and] I used to like to walk in the evening around Georgetown and get some exercise. That's where we lived…Eight blocks, up a hill [from] where we lived…[was] Montrose Park, and, believe it or not, it was a full moon [the] night [after I testified]. I walked up there with my wife. All of a sudden I looked up at the moon and thought, you know, are you crazy or not, saying that we're going to put people right there? The thing is, you might be able to [go there]...When you took it step by step, every step seemed to be [feasible].

KELLY: Who started with those studies? Do you know who the various people were and what they actually studied?

SEAMANS: That'd be a good thing to track down. I had several assistants. One of them was a guy named Don [Donald H. Heaton]—he was a colonel, and I had him chair one of the studies. Another one was a guy named Bill [William A.] Fleming, who was also an assistant, and I had him carry out [another].

I know that the people at the Marshall [Space Flight] Center under Wernher von Braun did some studies. Some studies were carried out by what became the Johnson [Space] Center, but at that time was still part of Langley down in Virginia. There were a thousand people working on the Mercury Program. It was called the Space Task Group, headed by Bob [Robert R.] Gilruth. They did some of these studies.

When I went down to Langley, that's when I first met John [C.] Houbolt. In the month of September, when I was looking around, John had a sort of a typical NACA kind of a discussion where you get a number of thirty-by-forty charts and somebody with a grease pencil would put stuff on, draw some circles and made some models of airplanes or spaceships or whatever, and describes it. That's when he first described to me this lunar orbit rendezvous idea. So that by the time Gagarin flew, there was already quite a bit of

discussion going on within NASA about the possibility of landing on the moon. It was not suddenly a new thought that came out at that time.

KELLY: Were discussions then undertaken with the President? Do you know it was even brought to the President's attention?

SEAMANS: Sure. It's a good question. I think it's important to say that when you ask me a question like that, I know either what people told me that was going on or what I observed myself. But there's always a lot of things going on that I, even today, may not be aware of. [Prior to Gagarin's missions, Mr. Webb, Dr. Dryden and I had had a brief discussion with the President about the cost and timing of a lunar landing.] I hear stories about the President inviting a newspaper columnist into his office, and right after the Gagarin flight [his saying], "Well, I guess we're going to the moon."

But as far as I knew, the first thing that happened was, Kennedy wrote a memorandum to the Vice President, as head of the Space Council [that] said, "I want you to advise me on what steps we ought to take as a result of the Gagarin flight." It implied, or maybe it said directly, "The country is sick of having the Russians keep doing things ahead of us. How can we at least get even with them?" "Get even" in the sense of pull up even. "Do we need to be building bigger rockets? Should we consider a space station? Should we consider going to the moon?"

Then the first thing Johnson did was to pick some people who were well known, like Wernher von Braun and Benny [Bernard] Schriever, General Schriever, head of the ICBM [Intercontinental Ballistic Missile] Program, and Jim Webb. He'd get them altogether and sit around a table and say, "Okay. Let's just chat about this thing." But he soon found he wasn't going to get anywhere by just that approach. So he finally wrote a letter to [Robert S.] McNamara, Secretary of Defense, and Jim Webb, and he said, "Look, whatever we decide to

do, between the two of you it's going to be done. I want your ideas on what we ought to do. I want them on a certain date." The date was the 8th of May, which was the day he was going to leave on his first trip to Southeast Asia.

Well, a meeting was set up that was going to be Jim Webb, Hugh Dryden, myself, and a guy named Abe [Abraham] Hyatt, who was in charge of planning for NASA. We were going to go to McNamara's office, he being the senior person, and it was going to be him and Roz Gilpatrick [phonetic], who was his deputy, and, I think, Harold Brown and John Rubel, who were in the engineering side of the Department of Defense. That was going to be on a Saturday morning.

Well, by almost sheer coincidence, on Friday, the day before, Alan [B.] Shepard [Jr.] went into semi-orbital flight. That really changed things around. It immediately showed the new administration that NASA did have [operational] capability. It immediately showed that even [a mission] a lot simpler than Gagarin[’s] had tremendous import, because it was reflected around the world. Almost immediately everybody was excited, pleased. [Everybody included,]…the Europeans and [Asians as well as Americans].

By Monday, of course, Alan became an instant hero and he came to the White House…[where he received an award from the President]. He went up and he spoke to a special message to the Congress. The Vice President [Lyndon B. Johnson] had a chance to sit in the back of a car with his arm around Alan and ride up the hill. It was big.

So with that going on in the public arena, [we] had the meeting at the Pentagon. Hugh Dryden went down for the launching and was still down there, so there was just three of us…from NASA. McNamara said, typical McNamara, he said, "Jim, the thing to do is, we both lay our cards down and see what we think ought to be done. And you go first."

Jim had to expose [our ideas] before they exposed [theirs]…Jim gave a little discourse on…a number of…[important possibilities] but [he said] the most important was to

decide what we wanted to do about manned flight. We, NASA, recommended that the President go to Congress and say that there should be a manned lunar landing program.

McNamara said, "Well, I don't know, Jim. The Russians are clearly moving along very rapidly with their space program. Are you sure if we do that, that before we even get started, they're going to go and land on the moon? Shouldn't we, as an objective, have a man landing on a planet?"

Well, at that, I mean, I couldn't believe a sensible person would say something like that. I said, "But we're not even close to being able to consider going to a planet. I mean, that [mission takes] a year and a half out, [and] a year and a half back. We don't have the knowledge." I also said I did not believe that the Russians, the Soviets then, could go immediately and land on the moon. We said we thought they could go fly around the moon, but not land on the moon.

Well, he sort of bought that and then we got into a lot of detail on it. Then McNamara said, "Well, we have written the response to Johnson's letter to us in a report form. Why don't Bob Seamans and John Rubel take a look at it together. John Rubel wrote the report. Jim, you and I can sign it after they've gone over it, and we'll submit it on Monday."

So I stayed [in the Pentagon] and Jim Webb [returned to NASA]. I read this report and I thought it was terrible, for a lot of reasons we don't need to go into here. I guess, out of deference to John Rubel and so on, I'd just as soon not have it say it was terrible; I think it had some deficiencies in it.

So I stayed over there, I spent time at the Pentagon with John Rubel, rewriting. We actually worked off and on, at least, until Jim Webb could join us on Sunday at around ten o'clock in the evening. I'd talked to him on the phone. He was busy planning the reception for the Shepard family and all the things that go into something as elaborate as welcoming a

hero. I told him, first when I called him, I said, "This is terrible. We've got to start from scratch."

He said, "I agreed with McNamara, we're going to go with that report, subject to any changes you can talk him into."

So he came over at ten o'clock and I'd talked to him a few times up to that [time]. He said, "Well, John, I understand you got this report and it's in pretty good shape now. Why don't we just sort of go over it again."

So he went and he was masterful in getting some changes inserted that I hadn't been able to get in. We finally finished at two in the morning, and it had to be typed. I went over at eight o'clock and picked it up and got McNamara's signature and Webb's signature, and we submitted it to the Vice President. That's really the basic document for going to the moon.

There was a special luncheon given at the State Department by Johnson for Alan Shepard and his family. He had the envelope in his hand that was the same envelope that I knew I'd delivered [earlier in the day]. When the [luncheon] was over, he said, "Well, I'm going to be going over to see the President on a few matters and then I'm going to be taking a trip for a while."

So that was still on the 8th, and the President went up to the Congress—I can't remember the exact date, the 23rd, was it? Or somewhere in there. And [space] wasn't the only [issue] that Kennedy was going to discuss.

But we received, maybe a week [earlier], the draft that had been put together by [Ted] Sorensen for the speech that Kennedy was going to make. There were some wonderful words in there, I think poetic. But it did say that he recommended that we go to the moon by the year 1967. Even though our planning…indicated that that [date] might be possible, we felt it was very unwise to stick the neck of the United States out that far.

So I was there when Jim Webb called Sorensen, and Sorensen said, "Okay. What do you recommend? I'm not sure what changes. What do you recommend?"

Jim said, "Well, within the decade."

So the President did agree to make that change. But he…wanted to keep it '67, because he'd still be, hopefully, President…The supposition was he [w]ould [be]…reelected.

KELLY: How is the Department of Defense involved in the decision to go to the moon? You mentioned you had been working with John Rubel and you had come up and drafted this policy memoranda.

SEAMANS: They were involved in the way I've just described. A great deal depended on the Department of Defense. First of all, they had the operation going down at Cape Canaveral. We weren't sure we were going to launch from there, but it appeared that we wanted to make use of those assets and all the down-range tracking stations…

Already on the Mercury Program we were making use of the Atlas missile, converting that to a launch vehicle. We already were using the Redstone Army missile. That was used in Alan Shepard's flight. As time went on, we used even more of their assets. For example, the so-called long-haul and intent on going to the moon was on acquiring the additional land that we'd need and of doing a great deal of construction at the Cape [Canaveral, Florida]. At the Cape, the government ended up buying 85,000 acres of land, for example—Merritt Island—and building the vertical assembly building and all that.

…We first had to decide whether we were going to keep the Space Task Group at Langley Field, or whether we were going to move it. We finally decided, yes, we're going to move it, and we moved it to Houston. [We] had to acquire the land there and [we] had to build the center. [We had] to test all this stuff. We eventually decided to test it in Mississippi. But a tremendous amount of construction work. We didn't have the capability in NASA to build [one of] the largest building in the world, the vertical assembly building. Of course, it wasn't the largest, but the next largest. But a big building. We felt that the only

organization that could possibly do it was the [U.S. Army] Corps of Engineers. So again, part of the Department of Defense managed the construction program. Did a tremendous job.

I forgot to say that all the recovery of the astronauts from the ocean. That's a good question. As time went on, McNamara became more restive about this and felt that they weren't getting enough back, and that we should pay them for it. [Our spending] was said to be enormous…it got up to, the maximum year, I guess, it was 5.9 billion. But here's the Department of Defense with, I don't know, let's see, when I joined the Department of Defense in '69, I think it was 75 to 80 billion dollars. I mean, they had a lot greater resources. So our trying to get the money to reimburse them was going to be a horror story, and we didn't actually end up doing it.

So what were they getting? Well, the same technology they used in space was used for ICBMs. In the beginning, the space program benefited from the military, but as time went on, it was expected that there would be advances in the space program that would have some major implication to national defense. That really did happen. I mean, the Department of Defense couldn't operate today without satellites. Some they developed themselves, but a lot of the developments have come from the NASA program. That's a good question, though.

KELLY: Can you tell me a little bit about the work between the Department of Defense and NASA, and how it was working with the Department of Defense?

SEAMANS: The relations between NASA and the Department of Defense, of course, they were very complex. You have to…start with the way it was before NASA was formed. The NACA, National Advisory Committee on Aeronautics, was a very unique organization. It was started in 1915 and…it was…[a] laboratory run by the government to help any arm of government that needed help, as well as all commercial ventures of whatever type, be [they]

airlines, or aircraft companies, or whatever. It was to be done not on a pay basis. It was going to be done by the NACA doing what they felt to be appropriate on the basis of the needs, as they saw them, for the industry and for the Department of Defense.

So they built up wind tunnels and so on. It turned out to be an ideal way to operate, because you had really good people working for the NACA, who worked there not for the dollars, obviously, but because they had the equipment, the wind tunnels, and so on, that weren't available anywhere else. So [they] had the [satisfaction] of doing really advanced research work.

So that was part of our heritage, and that still continued, to some extent, in the NASA era. You had other relationships where there had to be dollars involved. For example, when it came time to put up a communication satellites, for example, from, say, Cape Canaveral for a private company, how is that going to be paid for? The Department of Defense—and I suppose this is, in part, McNamara, with his business background—felt the government ought to be paid back on a total cost basis. How much did it cost the build the facility? Wanted to pay for amortizing the facility over time and so on.

We at NASA felt that what we were doing was for the future of the country, that as long as we, the government, broke even on it, that that was the way to go. So we said that anybody who came in, be it NASA or be it a company, ought to pay for all of the readily identifiable incremental costs. Now, we didn't want to make it an accountant's nightmare, but obviously it takes people and there were supplies that were needed and fuel and so on, and whoever was using the Air Force facility ought to pay for that. This kept getting pushed back and forth and back and forth. But anyway, that was another one of the relationships, you might say, with the Department of Defense.

Then, of course…when suddenly NASA, instead of using a few facilities at Cape Canaveral, was buying right next door, across the river, I guess it's the Indian River, from Cape Canaveral, Merritt Island, 85,000 acres of land. How are we, NASA, going to tie in

with the Department of Defense? Were we both going to have photographic laboratories, for example? That's a simple example. Were we going to operate tracking stations down range that our satellites and launch vehicles are going over separate from the Department of Defense or are we going to do it together?

We had a large number of studies that were carried out. I never did get a hold of all the studies that were carried out, but the first one was, where should NASA[’s] launch…[facilities be located for the lunar mission]? Should we stick with that area? This was before we decided to go to Merritt Island. We carried out a joint study with the Department of Defense.

By then Lee Davis, who was the guy that I used to fly down to Florida with, was a three-star general in charge of the Atlantic missile range, so we set up a study with the NASA people and with him and his people. We looked at taking over Cumberland Island, Georgia. We looked at operating from Christmas Island in the Pacific. We looked at Hawaii. We looked at seven different places from which we might carry out the lunar landing.

The decision was made that there was enough—I don't like the word—infrastructure there at Cape Canaveral, we ought to make use of it and grow it, but we needed more land.

Then we got into discussion of something like range safety. Every time you have [a vehicle] that takes off, it can go wild. It can go in the wrong direction. It could come down in Miami, for example. So somebody has to sit there and decide when you blow it up. Was that going to be NASA, NASA flights, and the Department of Defense or Department of Defense? We decided when it came to the safety of the operation from that standpoint, that would be the Defense Department's responsibility. Now, they had to obviously recognize that you don't get arbitrary when you've got men aboard, astronauts aboard.

So [we] had all kinds of protocols to work out as to what the safety officer would have—what information he'd have before he pressed the button to blow something up. There were a fair number of times whe[n] this happened, by the way—not with men aboard, I'm

glad to say. But that's pretty important. So there were many agreements that were signed, and a very large number of them were signed by John Rubel and myself during this period.

By the time I got there, of course, the arrangements had already been worked out with the Department of Defense for recovery of the astronauts. It was decided that the landings would all be in the water. People have always wondered about that, because the Russians landed on land. Well, it was a simple matter. From where the Russians took off, they had to go 5,000 miles before they got to the ocean. If they had to abort a flight, they couldn't wait to go 5,000 miles, so they had to have a capability of coming down on land.

On the other hand, when [the U.S. vehicles] took off, we immediately were going to go above water, so we had to have water recovery, at least. In those early days, there was insufficient capability on both sides to have the capability to do both. So we went with water recovery and they went with land recovery.

Then [we] got not only into the willingness of the Department of Defense to assign astronauts, but how about the issue of assigning key people to come and help run the program? In other words, to give somebody a tour of duty, who was in the military, to work for NASA, and how would that be done? It was decided that, again, this was in the first administration, that, yes, that would be done. When they came over, they would wear civilian clothes, for example. That's an issue: should they wear civilian clothes or not? They came over, in effect, as civilians, even though they might be—we didn't have any four-star. We had a couple of three-star generals, and admirals, and so on. Colonels and majors and so on.

Now, this became more acute when George [E.] Mueller came in. He immediately saw things that were needed. One of them was more competent managers. We had tried to recruit, but it turned out to be very difficult to recruit civilians to come and work on this program at a senior level. So we had to use a number of subterfuges. One was to get AT&T to set up something called Bell Com, non-profit. That's a story in itself.

Then George, when he came in, he not only saw the need, but I remember he came to me and he had the names of, I think, as many as possibly twenty-five officers that he wanted to have transferred. These were really top officers, including Sam Phillips, who was a general officer then and became a four-star general.

Well, I should also say that was the Department of Defense, it is not a homogeneous entity. Some of the things that would be worked out would be with, say, the Air Force. In the case I just mentioned, fortuitously the vice chief of staff of the Air Force…the guy whose nickname was "Bozo," his [last] name was McKee…he was a good friend of Jim Webb. If it weren't for him, we wouldn't have gotten, I believe, all twenty-five of those officers, but we got them all. [It was] very important to have that number of really competent managers.

Let's see, I've already mentioned earlier the whole relationship with the Corps of Engineers, absolutely essential that we had that. More recently, say, in connection with the Space Station, I chaired one committee about eight years ago. I was on the more recent committee on what ought to be done about the Space Station. One of the issues is management. I [knew NASA needed]…individuals from the Corps of Engineers to help. You can't do it now because the law is set up that they cannot…provide people who will be paid by NASA, to work on a NASA project, [and] at the same time…keep the billet open to bring in somebody else, in their organization, to do what these people had been doing. The way the rules have evolved over time, that's not possible. So it means that the Corps of Engineers couldn't, in effect, afford today to do what they did for us back in those days.

Then there were joint studies that were carried out. For example, there was what was called a Large Launch Vehicle Study, a big study to make sure that the large vehicles that were developing, the Saturns and so on, would be compatible with what the Department of Defense might want to do in the future, and to…see what might be done to make it compatible, if it wasn't.

One of the things that came out of that was the whole Titan Project. The Titan…that we used for Gemini, came out of that study. …When we went ahead with the Gemini Project with Titan, the Titan was still being developed. It was being developed as a launch vehicle, and to make sure that what was being done was compatible with the NASA needs, a special [group] was set up, called the Gemini Launch Vehicle [Committee]. …Brock [Brockway] McMillan, who was the Under Secretary of the Air Force, and I, were co-chairmen of it, and in the course of that development got into some real technical problems that had to be resolved.

There were a myriad of other things that were going on—the special studies in aerodynamics and in materials and electronics. What was it called? The AACB, the Aeronautics and Astronautics Coordinating Board, I think it was, there was a board, and then there were a whole bunch of panels in all these technical areas. I ended up as the co-chairman… This [committee reviewed] the myriad of things that were going on.

So when you ask about the relationship, maybe I've named 60 or 70 percent of it. But it just had to be just an awful lot of joint activity and support.

KELLY: Do you think this was intentionally done by President Eisenhower?

SEAMANS: Well, it's good once in a while to look at the legislation that was passed by the Senate. You had Lyndon Johnson and you had John McCormick in the House. It's a wonderful piece of legislation, really. It states quite clearly that [there are] going to [be] two programs: you're going to have one for the peaceful uses of space and one for national security. Once you make the decision that you're going to have this civilian open program, then…the two programs have to be very closely coordinated.

KELLY: Is that how the lunar landing mission was undertaken as well?

SEAMANS: Every project practically that NASA had, including the lunar landing—maybe that's a little strong. But I was going to say, had to involve, to some extent, an interaction between the two organizations.

KELLY: Do you think that it was widely discussed to join the military and NASA activities?

SEAMANS: Yes. It was wide[ly discussed], because it had to be. I don't see how it could have been done any other way. It would have been foolhardy to try to have a program that would [have been completely separate]—although some people were bothered by the fact that some of the astronauts were military. Some people felt that they should resign their commissions. Something as stupid as that. [Laughter]

KELLY: I want to go back a little bit when you were talking about President Kennedy's decision to actually go to the moon and you received part of his speech to Congress. What happened to NASA after that? Was there a buzz within NASA? How did people within the organization feel once they realized, "Oh, wow, we're going to go to the moon"? From what I understand, there was a mixed reaction of shock and surprise, but it seemed as if, at least, within NASA headquarters, it was pretty widely known that this was going to happen.

SEAMANS: Yes.

KELLY: Can you talk a little bit about that?

SEAMANS: Yes, I'm just trying to think a little bit. Somewhat strangely, Eisenhower did approve our going ahead with what was called the Saturn 1. So, the Marshall Center, which

managed it, went for contracts. It was during the period when we didn't have an administrator that they came in, Marshall came into headquarters to say they wanted to pick the Chrysler Company to go ahead and manage it.

I remember the difficulty of trying to work without having an administrator at that point. Jim Webb hadn't arrived. He didn't arrive for about six weeks. They had a hard time finding anybody to take the job, because it was a real question of whether the new administration would want to continue with the Eisenhower legacy or not. I remember discussing this, was it possibly going to absorb NASA in[to] the Department of Defense. Jerry Weisner, who became president later of MIT, but was a prominent person at MIT, was made the President's science advisor. He was put in charge of carrying out a study of how far we were behind in ballistic missiles, for example, which Kennedy had…run on, and how badly [NASA was] managing [the] space program, which Kennedy had…[been told].

It was sort of a devastating report and very uncomplimentary to Hugh Dryden, for example, talking about the need to bring new blood in and kind of get on with these older people running things the way they have in the past. So that was [an] upsetting…time.

Then we had trouble getting—see, we didn't really have to get the White House approval, but we certainly did have to let them know about it. I remember going over there on a snowy day and trying to get in to see somebody to explain what was going on.

So where were we? We were talking about the transition, and Kennedy really getting involved.

I think the truth of the matter is that except for the report and everything that Jerry Weisner put together, on the part of Kennedy himself and Dave Bell and McBundy, I think they always wished that some of this would go away. They had a lot on their plate right at the start, Bay of Pigs being one of them… They didn't want to be bothered by it all. Then all of a sudden, world events sweep them up in it and they were forced to make some decisions.

The decisions came a lot easier from a political standpoint when they saw how immensely—we had some new heroes. We had John [H.] Glenn [Jr.], we had Shepard. I would hate to say that politicians would use people, but it didn't hurt having a photograph taken of yourself and John Glenn. All the congressmen were trying to find ways to get astronauts to go to watermelon festivals in South Carolina, for example. Jim Webb had to fight this. I mean, you couldn't have our astronauts going all over the landscape. Their jobs were not just sitting in the cockpit and flying once. They had to help prepare [the] cockpit ahead of time. They had major assignments. They set up something called "A week in a barrel," or maybe it was a couple of weeks, whe[n] an astronaut would come to Washington and be available for whatever the Congress wanted to do. They hated it. [Laughter]

KELLY: Can you think of any particularly funny stories?

SEAMANS: There must be an awful lot of them. They loved to be seen with their arm around John Glenn, a picture they'd send to their constituents. Everybody was excited about it.

Things changed in the White House. People like Jerry Weisner and McBundy weren't terribly enthusiastic about it. They were…non-political. Jerry Weisner kept saying there's a tendency for the politicians to confuse, first of all, engineering and science. I always got introduced as a scientist from NASA, and for a while I'd try to disabuse people, "I'm not a scientist, I'm an engineer." But it was a waste of time to try to worry about it. The political forces would tend to say, "Well, we're going to go to the moon for scientific purposes." Jerry would just go bananas at that. He said, "If we want to do science, we could get a lot more out of our science if we spent the money here on Earth," on, I don't know, you name it, but for scientific purposes, bigger accelerators and things like that. So he [made] Kennedy realize that the decisions were really…geopolitical in nature… But as it turned out there was

a lot of science, too, good science, that came out of going to the moon. Have you seen the series—what's the name of the guy that was in "Apollo 13"?

KELLY: Tom Hanks' "From [the Earth] to the Moon."

SEAMANS: Tom Hanks. It's a great series. I never heard of [Andrew] Chaikin before. He lives in Cambridge. So I looked him up and I've had a good time being with him. I think he wrote a great book. But it really is telling about the space program, really from what the astronauts did. It doesn't get into what we're discussing here.

I didn't answer your question. So I guess the atmosphere somewhat mirrored what I've described. I mean, I think some of the people, NACA types, they were very concerned that what was going on would overwhelm the work that we were doing over in aero[nautics] that everybody would be so focused on going to the moon, that everything else would suffer. Jim Webb himself was concerned about this. He said, "This has got to fit in with everything we're doing. I don't want people to go around NASA who have ['Apollo'] written on their foreheads... We're all involved, but it's going to be done in such a way that everything else is attended to as well."

There was a famous meeting we had with the President whe[n] [D.] Brainerd Holmes had said that if he could get 400 million more in a supplemental, that we could go to the moon in '66 rather than '67. When he brought this to me, I said, "That's absurd. I mean, our budget's already gone from…Eisenhower['s one billion]…up to 3.7 and it's going to go up to five-something next year. …We can't use [another 400 million] properly."

But it got out in *Time* magazine that Brainerd Holmes was being held back in the space program. So the White House called a meeting where this was discussed. The first part of [the meeting established] that it was politically unwise to…try to get a supplemental.

Well, Kennedy said, "Okay, if that's the case, you've got other monies, Jim. Why don't you transfer 400 million from your other programs?"

Jim said, "Well, if you do that, you're going to hurt this and…this and…this."

Kennedy said, "Well, why are we going into space anyway, Jim? I'm not sure I see eye to eye with you on this."

Jim said—what are the exact words he used? He said, "We're looking for preeminence in space across the board. We're not just going to the moon."

Kennedy said, "Well, Jim, I'm just not sure I understand what you're saying. I want a letter tomorrow morning that gives me your views on this."

So that's the kind of thing that people were so afraid of at NASA. But not everybody. I mean, the Von Braun types, Werner would say, "This is what I've been talking about all along, all my articles in *Popular Science* and *Collier's Magazine*. This a wedding with a future. We're going to go for it now. This is wonderful."

The Bob Gilruths and so on said, "My God, here we are, we haven't even gone in orbit yet. We've got our hands so full now, how can we possibly do anything as stupid as this?" Not as stupid. "How can we take on this tremendous job when we're so overloaded today?" That was another reaction to that.

KELLY: How did you personally feel about it?

SEAMANS: Well, I thought it was great. [Laughter] I guess I thought it was great, in part because I felt we'd been struggling ever since I…got to NASA, about what our goals really were. We certainly weren't really in tune with Eisenhower's views, and all of a sudden it was clear and simple. There couldn't be a simpler objective to subscribe than going and landing on the moon. I certainly understood the other issues, but I felt this was going to be exciting. I was delighted to be part of it.

KELLY: Absolutely. Well, why don't we maybe wrap up here.

SEAMANS: All right.

[End of Interview]