

Interview with
Col Donald Scheller
by
Orville R. Butler
at
KSC Archives
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Dr. Butler: Good morning, Mr. Sheller.

Col. Scheller: Oh, Hi!

Dr. Butler: This is Dr. Butler, at Kennedy Space Center.

Col. Scheller: OK

Dr. Butler: And uh

Col. Scheller: Did you get the fax, do you know?

Dr. Butler: We did get the fax.

Col. Scheller: Oh good. Ok. That will save you a lot of time I think.

Dr. Butler: Very good. Uh, We're wanting to you talk this morning about your role in site activation at the Kennedy Space Center and we'd like to thank you for agreeing to talk us and allow us to record this so that so we can have some of this information for posterity.

Col. Scheller: Oh, my pleasure.

Dr. Butler: I'd like you to begin uh with telling us uh very briefly uh some of the information you provided on on your your biographical sketch

Col. Scheller: Ok.

Dr. Butler: You know, about where you grew up, and your pre-NASA experiences and then how you came to to NASA

Col. Scheller: Ok.

Dr. Butler: and came to Kennedy.

Col. Scheller: Ok. Well, I was born here in Baltimore in 1922. And uh got my lower, low education in the public school system here and then I attended uh Johns Hopkins Engineering School, but I was interrupted in that by World War II. I always wanted

to be a pilot and was able to get my pilots license before before I went down the service. So I was fortunate to have a leg up on flying. But I work for in the summers. One summer I worked for Bendix Radio as a drafts, as a junior draftsman and then I worked a year at what was then going on Martin Company as a engineering draftsmen. Worked mainly on the Martin B26 and the Mars flying boats and the PBMs doing master lines work and a variety of engineering design tasks. And uh then finally had an opportunity to enlist in the Air Force. Well it wasn't the Air Force in those days. It was the US Army Air Corps. And did my pilot training mainly in the South East of the US and then was be able get into my first level was the B17s as a pilot. And uh flew a combat tour in out of England and over Germany in World War II as aircraft commander of B17. Had about 36 missions, combat missions and then came back to the States and became a test pilot and then chief of flight test at an air depot. Its now Fairchild Air Force base. In those days it was an air material command base, Spokane Washington. And uh, lets see after the war. In those days most of the military officers were not regular officers. Congress created a thing called the Army of the United States which had no permanent designation of any kind, just to allow for the increased (unintelligible) count of World War II and I happened to be in that category but I had put in for regular commission. And they had a big economy cut in December 1946 and I was mustered out of the service and came back to work for Martin Company. I was back here for about three months and my regular commission offer came through. So I went back in and stayed, from then on I stayed in as a regular Air Force officer.

Dr. Butler: Uh Huh.

Col. Scheller: And, uh lets see, and then I was, when I was. And Fortunately I got into the R&D business early on because I had been a engineering draftsman in the in

civilian life. When I got back into the service they needed a R&D people who had some kind of experience with combat effective, with combat damage and how much damage an airplane could take, for example, in Aberdeen Proving Ground. The Army Ordnance Corps in Aberdeen Maryland was running a program called the Optimum Caliber Program where they needed experienced combat pilots to. What they were doing was shooting up World War II surplus airplanes to try to develop a Optimum Caliber anti-aircraft weapon and the Air Force had an opposite interest of finding out how to harden airplanes from that kind of damage. So I was assigned to Wright Air Development Center and stationed at Aberdeen Proving Ground to assist the Army in assessing damage to airplanes after these test shots. And that got me kinda into the ordinance business and from then on I was always in the R&D business. I was always in associated with air ordinance of some kind. I was rocket project engineer at Wright Air Development Center and the (unintelligible) lab for a while. And spent five years, I guess, out in the Mohave Desert with the Navy at their secret rocket development center at China Lake as a R&D Liaison Officer sent to the Navy where I provided them with up to date technical information on programs in the Air Force and particularly in the missile field and ordinance field and or I monitored their programs, one of which was sidewinder, which I spent a lot of time trying to get the Air Force interested in sidewinder, which was kind of an up hill battle in the beginning. And then finally the realization took hold that it was an ideal weapon for day fighters—non weather type fighters. And as you as you see every airplane flying today, combat airplane has sidewinders.

Dr. Butler: Hm Hm.

Col. Scheller: And that was a big goal of mine when I was stationed with the Navy there. And then after going to command and staff school for a year I went out to

Vandenberg Air Force Base and was in charge of the Atlas ICBM Inter Continental Ballistic Missile program—test program out there. And as a result of that got the either launched as test director or test operator about twenty-two Atlas missiles flying out to uh ?(place). Some of which were in support of the Army for the throw the Army's Anti-Ballistic Missile program which was stationed at Quajone (sp?) And uh I, I might lead into something here. One of your questions I noticed was How did you get into the NASA program.

Dr. Butler: Yeah.

Col. Scheller: When I was at Wright Field the ? lab chief of operations was a Lt. Col. Sam Phillips

Dr. Butler: Ah ha

Col. Scheller: Whom I got to know very well there and we became kinda life long friends and he knew what kind of things I was doing in the Air Force and of course he was head of the Minuteman Program. And when he found out I was finishing up a tour at Vandenberg Air Force base he got me involved in uh. He offered me a job, actually at Huntsville.

Dr. Butler: Uh huh.

Col. Scheller: I wasn't too crazy about going to Huntsville, but I did want to get into the Atlas, into the Apollo program and I asked him what the chances were of going down to Kennedy Space Center 'cause I've always liked dealing operational launches and testing of missiles, rockets and that sort of thing. And he did. And that's how I got down there.

Dr. Butler: And you came down as the site activation director?

Col. Scheller: Yeah. He realized, you know NASA at the time was, I mean not NASA but Kennedy Space Center was kind of a, kind of a transitory launch program base for the programs that were being developed at Huntsville. They put together the missile burn and a lot of people would come down TDY. In fact a lot of people like Andy Pickett and those folks, were, I think were actually enlisted men in the Army up at Huntsville in the early days there.

Dr. Butler: Hm. Hm.

Col. Scheller: And come down to these launches. And then they, of course, they decided in the Apollo Program to establish the Kennedy Space Center as the launch site for the Apollo Program and that's when they started to grow, but there wasn't any depth at least in to my knowledge in the army at the time for building large missile complexes. And they, of course they got started and did their 34 and 37 complexes but, uh, They (coughs) excuse me. They were looking for somebody who had some large missile launch site development experience and I happened to fit the bill, I guess, as close as anybody that they knew of. And so they put me into doing that job at Kennedy Space Center which I wanted. That about gets me down to where I guess you want to ask me some questions.

Dr. Butler: Yeah, why don't you, uh, tell us uh with whom did you work?

Col. Scheller: With whom did I work?

Dr. Butler: Yeah, when you when you came to KSC?

Col. Scheller: Well, when I first came down there I worked for Bill Clearman who was in the Apollo Program Office. And I spent a lot of time getting my feet on the ground trying to figure out exactly what these guys were doing that was so different from what we had been doing at the, in the Air Force and getting up to speed on what the

various parts, elements of the program were. And of course Clearman as, uh, as the rest of the Apollo program people, all worked for Rocco Petrone.

Dr. Butler: OK

Col. Scheller: So I ended up pretty much answering, essentially to Rocco. Which was really a great experience. He's an outstanding manager. By the way, do you have any idea what he's doing these days?

Dr. Butler: I don't have that information with me. I believe that my associate has interviewed him.

Col. Scheller: Oh really?

Dr. Butler: Uh but that, No I'm I'm sorry I think that was Walt Kapryan who replaced him.

Col. Scheller: Oh. Ok. Ok. But anyhow I mean he was an outstanding guy who I really learned a lot from working for him. Uh Didn't broke with any nonsense and yet he was very supportive.

Dr. Butler: Uh huh.

Col. Scheller: Thoroughly enjoyed the that relationship. And of course I worked with the directors, all the various directors and their designees to the sight activation board.

Dr. Butler: Hm Hm.

Col. Scheller: And to all the major contractors. We had. At our peak we had uh oh I guess. You probably seen that room. And I'm not even sure that room still exists. The management control center there in in

Dr. Butler: Well firing room four

Col. Scheller: Firing room one. Is that still. Whats

Dr. Butler: I thought it was firing room four

Col. Scheller: Oh. Say again.

Dr. Butler: I thought it was firing room four

Col. Scheller: No it was one, it was the first one.

Dr. Butler: Oh, OK

Col. Scheller: The first one we modified as a control center uh for the management fields control center. Anyhow, uh.

Dr. Butler: Yeah the room does still exist but I don't think its set up as a

Col. Scheller: Yeah probably isn't

Dr. Butler: a control center.

Col. Scheller: Yeah

Dr. Butler: Its set up as a reserve firing room now [not accurate]

Col. Scheller: Oh is that what it is.

Dr. Butler: Yeah.

Col. Scheller: uh huh. You see I've never been down there since the Apollo Program folded and so I don't know what the Shuttle program configuration looks like.

Dr. Butler: Uh Huh.

Col. Scheller: But anyhow, I worked with the, well at our peak we had about oh I guess about a hundred people would attend sight activation board meetings and they represented all the various contractors, stage contractors, the construction contractors and the various elements of Kennedy Space Center and occasionally the guests from Huntsville or depending on where we were working on at the time, or from Houston.

Dr. Butler: Ok, and you came to Kennedy when?

Col. Scheller: When did I come there. Uh Lets see. Let me check. See if I can figure out when I came there. It was 1964 I think.

Dr. Butler: Yeah. I think the best information I have says it was around August of 64.

Col. Scheller: Let me check and see if I can figure that out from. Hmm. Trying to figure out where to look on this thing. (14:11) Oh I see. Hm. (clicks) I uh don't just. I think that was about it. But I don't know why I'm having trouble finding it on this on this area. Either I have left out, uh, the work at Kennedy Space Center or I don't know how to find it in my own

Dr. Butler: Well that's

Col. Scheller: biographical sketch. But anyhow thats about, thats about the right time I think. Its as close as I can remember anyhow.

Dr. Butler: OK and you you arrived down here and placed in charge of of the Site Activation Board

Col. Scheller: Hm. Hm.

Dr. Butler: Uh and you spent what looks to be like just about a year before the Site Activation Board took off. Can you talk a little bit about uh what was going on during that time period.

Col. Scheller: Well mainly construction, like the VAB, for example, and the and the early construction of the launch control, the mobile launchers and the was primarily the brick and mortar and and the pads of course and the crawlerway. Uh, it was, it was mainly stuff that the Kennedy Space Center had gotten started. But of course none of the

none of the plans had really been put together in fine detail so that the interfaces, the technical were going to be met by both sides of an interface, you know. So I was mainly trying to get up to speed on whose who, whose doing what, what the overall uh How the overall plan ought to hook together. So I spent about a year doing that. But it was mainly during that construction phase.

Dr. Butler: OK May Maybe I should back up here a little bit and have you explain exactly what is meant by site activation.

Col. Scheller: Site Activation to me is. Well in my previous assignments in the Atlas Program, they included the construction of the the basic site whether it was a gantry site or a coffin site or a silo site for example. It included the construction, the outfitting, the integration of the of all the testing and the final proof testing to show that it was ready to turn over to a launch in this case to the launch operations organization and would meet their requirements. There was, at Kennedy Space Center the construction work had already been, the major construction work had already been contracted through uh largely through the Corps of Engineers. And so the Corps of Engineers became a very important part of our site activation effort. But the basic contracts, the basic construction, I should say, was well under way when I got there. Like the pilings were up for the, the pilings and some of the superstructure were up for the VAB and, I've forgotten, the mobile launchers were skeletal form I guess in their construction area. And the and likewise the crawler transporters. And the pads. The pads were well into construction phase when I got there. But I spent a lot of time just getting familiar with the people involved and the and the basic facility itself.

Dr. Butler: Uh, huh. You mentioned earlier that one of the things you were were trying to figure out is exactly how Launch Complex 39 and NASA was, in the

launching of the Saturn rocket was different from your traditional Air Force operation and and the launching of the Atlas. What differences did you find?

Col. Scheller: Oh, well the big configuration differences were the (clear throat) the mobility idea that was introduced at Kennedy Space Center for the Apollo Program and bringing in the various components into the barge basin for example or flying them, flying in the stages, bringing them into the assembly area and having, at least in theory, four missiles, four rockets I should say, four rockets in the various stages of um of uh, assembly and check-out and then the ability to mobile, mobile, the mobility aspect of taking them out to a pad, putting them on the pad and launching them and refurbishing the pad and bringing another one out. That that didn't exist in the in the Atlas Program for example. These were all combat, what we were doing in the Atlas program was, was proof testing the Atlas missiles and building various, it was a it was a succession of launch complex designs which went more and more hard with each, more and more hardened with each design. That started out the first three that we had on emergency war operation order and then there were three on gantries. I mean totally vulnerable, sitting above ground and and fixed in location. And then from that we went to a coffin design which, in our case, was built above ground, but which was actually designed to be below ground with a sliding roof on it, in the, out in a field. And then finally we went to a, uh, coffin, I mean silo type configuration where you tanked in the silo and and within eleven minutes of the time you get your order to launch you were launching. So all those were fixed locations, hardened fixed locations, whereas the Apollo Program was totally different.

Dr. Butler: Hm Hm. Lets go back to to the site activation process and talk about what what are the major management components. You know tell us a little bit about

PERT and the Equipment Records System. Earlier earlier studies have have placed quite a bit of of emphasis on those. What role did you see them as playing?

Col. Scheller: Vital. I mean that was the key to meeting our schedule on time. Uh the, well first of all, before I tell you about the systems, I need to talk about the guys who invented or helped invent and and manage it and that was John Pótate.

Dr. Butler: Uh, huh.

Col. Scheller: Who was the first gent in charge of the the scheduling operation there. Well he did the scheduling, he was the scheduler when I got there.

Dr. Butler: Uh huh.

Col. Scheller: But John was instrumental in bringing in, bringing the PERT up to the the posture that it ended up in and his, I guess it was his deputy, was Bill Tramel, who took over as, later on in the program took over as my interface, scheduling interface with the Kennedy Space Center. The two of them were outstanding schedulers. The

Dr. Butler: Uh huh.

Col. Scheller: John invented, John Potate invented the numbering system, the bubble system and the numbering system that was key to making PERT really operate. Picking the key interfaces that were important between contractors and identifying whose, what task each contractor was to do. At an upper level. We put the contractors out there with us in the control center and uh, required, one of the things we required them all to do was to show at every interface where they interfaced with either the site or or with another contractor or with Kennedy Space Center where they had an interface that they had to provide some capability for, uh, we required them to have the detailed PERT network lower level PERT networks on display at all times. And we had all those contractors out there in

the control center. Hm, in the management control center along with their schedule up so any contractor and I'm, I shouldn't just pull on contractors because a lot of those people also were government employees too. They had interfaces also and so each one of them had a desk, each organization out there had a desk and a display board and anybody could go to anybody else's schedule and see what was going on. There was no secrecy involved whatsoever. That that was one of the big plusses in the way that system worked. And then we ran, we being John Potate and later on Bill Tramel and I. It was our job to see that the key level B files PERT were properly oriented with the overall program schedule. And of course, then we ran, John had Boeing as a subcontractor to do the management control exercises and keep those magnetic boards posted and updated and do the computer runs so that we got three or four critical paths—primary, secondary and so on—critical paths runs, which we then published and showed up on the magnetic, updated magnetic boards to uh, show the world. And it was from that that we would put the pressure on whoever needed the pressure on and in getting things corrected. For example one of the first things we, first things that we did with PERT--one of the first runs, I should say--was extremely successful in that it identified right off the bat that we were gonna miss our launch goal by, I've forgotten, it was like fifty, fifty two or fifty-four weeks.

Dr. Butler: Hm hm.

Col. Scheller: Because and that would have put us past the President's goal by that much. Just that one task alone. And it was because in the, in the early stages of developing the mobile launchers and the and the associated plumbing on them, uh the ball was dropped as far as doing the LOX cleaning of the LOX lines. Of cleaning of all the LOX lines properly with to LOX level criteria and a lot of those lines were already in place. And

PERT network immediately showed, Ok, if you keep on going uh the way your going your going to be either fifty-two or fifty-four weeks, I've forgotten what it was now, behind schedule, which allowed us to do some work arounds real quick, and one of which was to bring Wylie labs on site and set up an on site cleaning process instead of having LOX lines shipped to us LOX cleaned and certified. A lot of the plumbing had to be cleaned right there. So Wylie labs set up their laboratory trailers right there in on the site. And that was one of the biggest gains that we got from the PERT network and the one that really made a difference programwise.

Dr. Butler: I see. You you mentioned that as one of the major successes. Uh. Was there ever a time when you weren't sure that you were going to make schedule.

Col. Scheller: Yeah. (laughter) Four or five times. One of them was, well one of them was, uh when we had a—Excuse me just a second let me get one thing, oh yeah, here we go—uh, one of them was when we first pulled the crawl, the crawler transporters, took them off their blocks, they were assembled out in the field, you know.

Dr. Butler: Uh huh.

Col. Scheller: And uh they were too big to do any transporting. So they were built this way on site. And dusty site, sandy and the like And the original crawler transporter was built with um, and I can't remember the number, now, of bearings, but a considerable number of roller bearings, Timkin roller bearings that carried both the vertical loads and the thrust loads and when we first took the first crawler off of its—oh, and also in the original design of the crawler transporter was to have a McAdam surface, and it did have a McAdam surface. It, I've forgotten whether we had it all the way out to the pad or not, but anyhow, in the construction area the McAdam surface was already down. When we took crawler

transporter off the blocks to take it out for its first mobility test which of course is an extremely slow speed. We had had guys walking along every all the tracks and watching for any kinds of problems. Well it turns out that the coefficient of friction had been miscalculated grossly and the treads started picking up McAdam. The machine was getting colder as we moved and of course we were destroying the McAdam surface also. But the big problem was we heard tremendous cracking sounds which turned out to be bearings breaking and we went back into in the construction area and they pulled some of the bearings and they were just disintegrated. It was it the steering, not only that but the steering pressures in the hydraulic system were way over what they should be in the steering system because of the friction when they tried to make any kind of a turn the friction was just tremendous and, which brings me to another outstanding guy in the Kennedy Space Center and that was Don Buchanan, the chief of facilities.

Dr. Butler: Hm hm.

Col. Scheller: I'm sorry that was not his title. I guess, Don Bagnulo was probably the chief of facilities. Let me see, what was Buchanan's? Buchanan's title? You probably know what it is. I've forgotten. He was essentially a facilities engineer and a super down to earth kind of an engineer.

Dr. Butler: Uh huh.

Col. Scheller: And uh, always reminded me of, was it Archimedes who said, give me a place to stand and I can move the world—that was his approach. And he and of course the panic was no way are we going to be able to meet the schedule.

Dr. Butler: Uh huh

Col. Scheller: If we got bearings that won't hold up. But he wasn't that defeatist and on his own sat down and figured out that and found a contractor up, I think it was, up in the Huntsville area who had equipment to test multiple kips loading. What do you call it, phosphour Bronze bearings—sleeve bearings

Dr. Butler: Uh huh

Col. Scheller: with solid sleeve, uh, solid disk end caps. And uh we had, understand they had, engineering had, facilities engineering had a contractor who was supposed to be number one in the United States to do a—or consultant, I should say—to do a study and his ideas were just impossible to meet. Uh, and uh, Buchanan didn't accept them anyhow. Went ahead with his tests and found out that by golly phosphour bronze bearings were ok. So that's what we put in and temperatures were you could walk along side the crawler and hold your hand on the anything, the end bearings, or the outside of the end bearing and I think we had, I think we had two or three that we had to change. One of which was a almost a interference fit. Because when we put those things in, of course we'd chill with alcohol and, I've forgot, it was dry ice I guess. We'd chill the bearing and reduce its diameter and warm the housing and then slide it in and let nature seal it.

Dr. Butler: Hm hm.

Col. Scheller: And even, one of them apparently got some sand in it, a little bit of sand, but it was just enough to cause some friction, additional friction and I think that bearing temperature went up to about four hundred degrees. But there was only about two or three of them that even, you could even feel any heat. The as you put your hand on one of those while it was running. Anyway, he solved that problem, like several other problems that

he solved very, in a very down to earth way and very effectively. I have nothing but respect of Don Buchanan.

Dr. Butler: Uh huh. I can imagine.

Col. Scheller: And also he, you ask me what were the times we thought we couldn't make it. Another time had some real concern was when we were doing first tankings with 500-F. The, you probably know that at the LOX pad, I think it was a nine hundred thousand gallon liquid oxygen pad in those days. I don't know what they've got now—probably the same. Uh, the, there was about fourteen hundred feet from the LOX pad over to the launcher, or to the pad itself. There's a—in those days at least—there was a fourteen inch aluminum line that carried the liquid oxygen under tremendous pressure, in fact they had two twenty-five hundred horse power electric pumps. One, well you had one on line and one as a redundant back up. Twenty-five hundred horsepower electric pumps and we were pumping about ten thousand gallons a minute, liquid oxygen, over a sun heated aluminum oxygen line that was fourteen hundred feet long. Anyhow, people had a lot of concern in the early days as to whether the program should build a separate LOX test facility which would run into the multiple millions of dollars, uh, to prove out some of these concepts because nobody had ever, up to that point nobody had ever pumped liquid oxygen up to four hundred or so feet, you know, on a tower and not have boiling within the system, within the LOX system. And nobody had ever pumped ten thousand gallons a minute to my knowledge. I think they did a, well, I better not get into that cause I'm thinking I'm not sure I have the correct figures there. But anyhow, there was a real question about which way to go and a decision was made to “no we won't put that money into a separate stand alone facility. What we'll do is we'll build the site with as best engineering know how that we

have and which is what we did, and if it doesn't work we'll try to fix it on site. And one of the things that didn't work was the delivery line that comes out of the liquid oxygen tank was an eighteen inch vertical line

Dr. Butler: hm hm.

Col. Scheller: end pipe. And it comes down into a immediately into a T and on each side of the T which gives it the capability of going either say to the left or to the right, its got two redundant loops you know. Immediately after the T was a big manual belay valve and that you operated by hand. And then beyond that was an automated valve which you controlled from the blockhouse. And that allowed you to first arm, manually arm one leg or the other of the redundant loop and then from then on you cleared the LOX pad of people and then the block house operated the valving from there on and ran the motors from there on. Well, it turns out that every time we'd do what we called a chill down test first, which was to try to cool that fourteen hundred foot line, aluminum line, with gaseous, cold gaseous oxygen

Dr. Butler: Huh huh.

Col. Scheller: And some just crack the manual belay valve and let that flow, just chill down the system before we opened it up. And every time we did that there'd be a tremendous bang and then the plumbing would jump and it was two schools of thought. One of which was, "Well thats what you expect." And the other school was "Naw, that ain't what you expect." But nobody knew for sure. And we're getting ready for our first test—first testing to the bird—into 500-F—and I happened to be up in the blockhouse at the time and the—or the launch control center—and the, the guy who was, who armed the belay valve, opened the belay valve to arm the one side, cracked it and it shook so badly and just jumped

a tremendous jump from that cold impact, that cold liquid oxygen on the warm system that it broke the eighteen inch delivery line. And

Dr. Butler: Oh my.

Col. Scheller: we had the world's biggest popsicle out there for a while. It just poured out. Fortunately we were extremely fortunate in that the direction of the flow was between two of the legs of the, uh support legs of the of the tank. Uh, if it had impinged on one of the legs it would have probably fractured it and I don't know what would happen there. But the result was eighteen inches of a eighteen inch drain line gravity draining like that with a head that thing had on it, was so strong that it created such a suction inside the tank and that tank is a dual wall tank, external wall and then, I've forgotten what the spacing is, but an internal wall and then between the two walls—a stainless steel internal wall. And between the two walls was pearlite and uh powdered pearlite as the insulator. Well the uh, you know, oh pressure release valve on top of the tank wasn't designed to handle that kind of a suction. It couldn't keep up with the suction and so this inner tank lining sucked in for about a sixteen foot diameter dimple. Uh. And of course everybody again wrang hands completely convinced that we have to scrap that one and buy a new tank and that -- all you have to do is take a quick look at how long it took to put the first tank in and you knew we would never make the launch schedule. And Buchanan came to the fore again and took a look at and puts some. Well first of all we had to clean out the tank and purge it with nitrogen first and then air and shovel out all that pearlite because it settled down cause of the dimple it settled non-uniformly and they had to shovel all that stuff out. And, took, he took a look inside the tank and decided look that first he would do uh dipenitrin (phonetic) checks around the, all the way around the edges of the dimple to see if there were any cracks.

Dr. Butler: Hm hm.

Col. Scheller: Turned out there weren't. And he said well, I think we can turn that thing around and fill that tank with water and let hydraulic pressure from the water pop it, pop the bubble, pop the dimple back, which is what he did. And to my knowledge they still use that tank today. But that saved us a tremendous amount. We probably worked twenty-four hours, I mean twenty-four hours a day for several weeks out there on that pad to get things turned around but that was another one that could have been a program killer. Except for a guy like Don Buchanan.

And let see what else. Oh yeah, two other things. One of them was the crawler trans, the crawler way. I went out one morning driving the along the crawler way and of course come back to that crawler problem and picking up the asphalt. Buchanan, again, common sense said, well what we need is, in fact I remember when he said it and people didn't know what he was talking about. He said, what we need is--let me see, what did he call it?—solid lubricant, no, yeah, I think he called it solid lubricant. Turned out what he was talking about is those round river run gravel that you see on the crawler way. I don't know how many trainloads of gravel that he got from, I think it came from Alabama, hauled that in and put it on top of the crawler way and it reduced the friction tremendously. Steering pressures went down in the hydraulic system tremendously and we weren't picking up any any of the roadway again, anymore, and that solved that problem.

I was driving out along the crawler way one morning and noticed there was a big standing puddle. A big one. Kind of a small lake there. Uh, just a couple of inches deep in the center that straddled both the crawlerway, both the tracks. Uh

Dr. Butler: Hm hm.

Col. Scheller: And uh I got the soil engineers to come out and take a look at it. Well it turned out that the original core borings that the Corps of Engineers had done for laying out that track, that crawler way, had only been done, my understanding was down to ten feet. And it went right through a swamp. Went, one section out there on out near the mobile service structure parking area as I recall went right through a swamp.

Dr. Butler: Hm hm.

Col. Scheller: And it turned out it was quick sand out there. Well, this, we called in the Corps of Engineers and they immediately got some soil mechanics people in to do deeper core borings and I think they went down to twenty-five feet if I'm able to remember right. And they were able to isolate in the area that puddle, they were able to isolate a lenticular shaped clay deposit underneath the crawler way that actually as we ran across it with the mobile uh mobile launcher, the crawler transporter and and the mobile launcher on top of it. That weight would actually squeeze that that lens shaped clay and it would move. And it had moved out over to one side and thats where the depression came then that allowed the water to collect. And the Corps of Engineers did a study of that very carefully and one solution of course was to tear up the crawler way and dig all the way down, I forgot how deep this thing was, probably eighteen, twenty feet, I guess. Uh, dig up the whole crawler way and dig all that clay out and then fill it with and compress it with regular compacted pile rock (?). And the other solution that they came up with was "no, why don't we just contain it with sheet pile, sheet pilings" That's what they did. They drove sheet pilings around it and to my knowledge its still there and its locked in. It can't go anyplace so it just stays ok now.

Dr. Butler: Hm hhm.

Col. Scheller: Uh, that was another case where the Corps of Engineers essentially solved that one, I don't know how much Don had to do with that. Then the other big one that I can think with was we had a continual problem with Huntsville in their GSE [Ground Support Equipment], ESE [Electrical Support Equipment] area. Uh, the, their deliveries. Well for one thing you have to realize that these guys were, a lot of them were German scientists and they weren't familiar with configuration management as we know it in the missile business and at least as I knew it then, I don't know how it is now. Uh, in fact an Air Force guy that came on board about the same time I did, came from the same organization, I was assigned to SAMSO, the space missile systems organization, and we had a very strong configuration management philosophy. And I've forgotten the Air Force reg. I think it was 80-4 if I remember right, um, documented the way figuration management in in in much much detail the way it should be run in the missile program, Air Force missile program. And, I can't remember the guys name [Major Andrew Reis] Hm. Anyhow, you probably have a record there. He was an Air Force, he was either a captain or a major. Uh, he and I introduced a couple of documents, rewrote, essentially we did 80-4 and wherever it said US Air Force we made it NASA.

Dr. Butler: Uh huh.

Col. Scheller: And put together some documents. I don't know where they stand now days. I don't know whether they still use them or not. But that became the, and one of the problems we found out then early on in that first year that you were talking about. One of the things we discovered was that there was no configuration management as such there at Kennedy Space Center. You could, I think we identified something like twelve different drawing release systems down there. None of which really guaranteed that if you

had established a configuration of an item and then did some kind of changes where you could go back and trace what the real configuration was anymore. And we we had that same problem in the Air Force. I had a, After I left NASA I was in the space business and built a site in Denver and one of the problems we found there was the same kind of problem. You could have a drawing number, a part uh with a particular drawing number and you could find a drawing that told you what that part looked like and then somebody would decide to make a change and instead of having a dash number they'd make a change and you had the same part number. You really didn't know what your configuration was. So anyhow that was one of the things we got into in that first year of working was to try and establish a better configuration management, some kind of a firm configuration management system down there.

Uh, how did that get me. Oh that got me on to the swing arm delivery problem. Uh, the other big problem that we had. Like I said we were having trouble with the. Everybody was getting their equipment pretty well in on time on our schedules and following our PERT needs but Huntsville. And Huntsville had one heck of a problem. They had a contractor, GE, up in uh, hm. Is that in Florida someplace, Daytona Beach, I guess it was. Um, who was building their ESE and GSE for them. And we'd get a delivery, we'd tell them we'd need this list of equipment on such and such a date and then we'd need this list on such and such a date to meet our activation schedules. And you know you'd get promises "yeah, it'll be there no matter what." And we'd have to do some rescheduling and work arounds. It got to be really serious and and particularly so with the swing arms. And you have to realize that the Germans were not use to a configuration management system. I mean their configuration management was "Well, OK, we're going to change this rocket nose and you

tell those guys, those slave laborers out there to get it done by tomorrow. They didn't have a concept of configuration management and its impact on schedules and its impact on performance and impact on costs. I mean any of those. So anyhow, the swing arms were being constantly redesigned and a lot of the ESE and GSE was being redesigned, not redesigned but uh, well

Dr. Butler: Modified.

Col. Scheller: Yeah, modified. Yeah. And finally got to the point where we told, we had to tell headquarters that "We're not going to make that schedule unless we get, we freeze the designs of these pieces of Huntsville equipment. And even if they're wrong, we have to have them cabled up and then they can come down here and make mods to their hearts content, but if, but we can't sit here with an empty firing room just because they keep thinking of better ways of doing things. They, General Phillips called a meeting with Von Braun and Dr. Rudolph and Kennedy Space Center's Rocco, I was there, Rocco and I've forgotten who all, but it was, oh and then GE. I can't think of the name of the Dr. that ran the GE program up there but he was really sharp and uh we started the meeting and I explained what our problem was, why we needed configuration or equipment deliveries on schedule and how far behind we were in those deliveries and Dr. Rudolph asked his people to get up and say what was wrong and never did get a real clear answer from them. And then they asked GE. GE, the GE guy rolled out a chart that looked like a nine by twelve roadway that he put up on the wall and these great big blocks all in serial that was. And he essentially said, "Here's the original design that they gave us and that's what we contracted against, costed against and scheduled against. And then here is the visit by Mr. so and so who changed that in this way and there was just change after change after change after change and uh they

couldn't get anything out the door. So anyhow, uh, Dr., I mean General Phillips said "Can you guys set down after this meeting and red line one set of drawings and give em to GE and let them carry them out of this building and deliver that design right or wrong on Kennedy's schedule. And Rudolph reluctantly agreed and they did it. From then on we started getting equipment down here and never, we never had any major changes that caused us any problems from then on. But the swing arms were a special case because they were so big and so complex and so such precise. People don't realize when they look at those things. They look just like bridges, you know. But they

Dr. Butler: Hm hm.

Col. Scheller: Several of them have to be remotely disconnected or had to be remotely disconnected and reconnected in case of an abort, from three and a half miles away. And they had to mate 10,000 PSI lines and and uh hydraulic lines and electrical lines, plugs that had to had to be remotely connected. So they are really precision instruments. And I think some of those hinges weighed sixty five thousand pounds.

Dr. Butler: Wow!

Col. Scheller: But anyhow the the and of course they were being designed by, their designs were being controlled by some of the German scientists under Dr. Von Braun. And also be people we had at Kennedy Space Center. Dr. Theo Poppel was one of these German scientists and we had to resort to. Those things got so far out of wack that we had to resort to just freezing the designs again on our own and make arrangements with the, ohhhhhh, the guppy and the superguppy airplanes to fly them down one at a time. Well, some of them were trucked but some of the critical ones were flown down, which was a tremendously expensive operation, but uh it saved our schedule.

Those are the main things. The LOX cleaning which PERT saved us on. The crawler bearings which Buchanan saved us on, the LOX tank failure and the repair of that which was again a Buchanan save; the crawler way sinking which was primarily a Corp of Engineers handled that fix and the swing arm deliveries which, well we had a guy. In fact the swing arms got so far out of wack that Rocco established one of his engineers up in the program office, Willard Holcomb, Holcomb H-o-l-c-o-m-b, Holcomb uh to essentially live at Huntsville and see that those arms were not; to see that configuration management was in fact being attended to and that delivery schedules and PERT networks were set up that which they did up there, and to for the building and outfitting of the arms and delivery of them and Willard spent most of his time in Huntsville just just working the swing arm problem.

Dr. Butler: Oh

Col. Scheller: That's about. Those are the main potential killers that I can think of.

Dr. Butler: Uh huh. You talked a little bit about the German Scientists

Col. Scheller: Hm hm.

Dr. Butler: And it sounds like like uh uh they played a a very important role. Was there anything that. Were, were the German scientists a group unto themselves

Col. Scheller: I

Dr. Butler: or were they just mixed in with everybody.

Col. Scheller: I think they were just mixed in. I didn't. I really didn't know. The only ones that I was really closely associated with—one of them, of course was Dr. Debus. He was outstanding. Uh, Debus was about as supporting as you could possibly be for me. And uh I I was really impressed with him. And the one that we had the most

problems with, I guess, was Dr. Rudolph, who was one of, I don't know what role he played with Dr. Von Braun's organization over in Penmuende, but he was apparently, if I remember right, its been a long time ago now, but if I remember right he was in charge of the GSE, ESE development at Huntsville and he didn't have, as far as I could tell, he didn't really have the the discipline built into him with respect to configuration management that that program just required. You couldn't turn a bunch of engineers loose and say, "OK, build me something" and keep it, you know, and keep changing it and make it better every day. You couldn't do that.

Dr. Butler: Uh huh.

Col. Scheller: And that was the way his organization operated. But uh Von Braun, on the other hand Von Braun, he just didn't know where some of these problems existed until we had that meeting. And that, I think it came as a surprise to him. In fact I know it came as a surprise to him where the problem was. And it was all being. The thing that was bad about it was there was. The finger was always pointed at GE down at Daytona Beach, because they were the ones that were supposed to roll things out the door and ship them to us and nothing was coming out the door. Well why it wasn't coming out the door was not clear to anybody, to some of the people at Huntsville.

Dr. Butler: Uh Hm. So so, GAE, GE was sort of getting a bad rap?

Col. Scheller: Well they sure were. I can't, I wish I could remember the name of the doctor. It'll probably come to me after this call. But they were very competent manager at in Huntsville.

Dr. Butler: Uh huh.

Col. Scheller: And uh. I mean not in Huntsville, but in Daytona Beach, excuse me. But he just did his. He couldn't get anything out the door. He'd be all set to ship something and somebody would come in "Oh I got a better idea. I'd like to change this."

Dr. Butler: That's a nice story

Col. Scheller: That piece, you know and "OK, you say so and your paying for it." And they'd do it. But uh the program schedule wasn't being met.

Dr. Butler: I'd like to go back a little bit to the beginning.

Col. Scheller: OK

Dr. Butler: Uh when you were first assigned to to KSC

Col. Scheller: Hm hm.

Dr. Butler: In the previous history of the Space Center written in '78, Benson and Faherty said that when you were assigned, Rocco Petrone and Debus had given you and awful lot of authority

Col. Scheller: They sure did.

Dr. Butler: That many of the operations directors were concerned were going to impinge on their authority.

Col. Scheller: It sure didn't. Yeah I'm sure that was the case. In fact I know that was the case. They were concerned but nobody ever... I mean I never had any problem as a result of that.

Dr. Butler: Oh, very good.

Col. Scheller: I mean each one of them assigned a lead person in their organization to work with me.

Dr. Butler: Hm hm.

Col. Scheller: And we never had any serious problems. Particularly so with facilities engineering. We had a guy by the name of Steve Harris who was, I made life miserable for him I'm sure. Because all the facilities problems I'd dump on him and

Dr. Butler: Uh huh.

Col. Scheller: he was very competent but the and he had the ear of the of Don Buchanan and Karl [Al] Bagnulo and so he got things done. But, you know, I had no problems. I'm sure that these folks had some concerns about some Air Force Weanie showing up on the site and starting to tell some of his people that they were had to do something differently now.

Dr. Butler: uh huh.

Col. Scheller: Anybody

Dr. Butler: Sure

Col. Scheller: would have become concerned about that.

Dr. Butler: Sure.

Col. Scheller: But I never had any problems and that I can think of. And you mentioned Hans Gruene.

Dr. Butler: Hm hm

Col. Scheller: Dr. Gruene and I never had a really had close, not I should say a close relationship. We didn't have a need for a close relationship.

Dr. Butler: Uh huh.

Col. Scheller: He had some very competent people doing who represented him. And I can't remember the name of the chap who was in charge of the computer system

there but uh he was he was very supportive. Andy Pickett and Neil Rainwater were two of the designees from the launch operations, or the vehicle operations group, who were outstanding. Andy Pickett in particular because he knew the propellant loading system inside and out.

Dr. Butler: Hm hm.

Col. Scheller: In fact we had a fire on one of our first, I forgot whether it was the first test or one of the first tests on the 500-F, tank test. On one of the skids, I don't remember which stage it was involved with, but one of the skids had a hydrogen leak. And a hydrogen leak is particularly, and it was night time. A hydrogen leak is a particularly nasty thing because normally you can't see it and uh, its under high pressure. It can do you damage physically. But it's a insidious thing from a fire point of view because you can't see it and uh. But Andy had in his design of rhw, in his portion of the design of the mobile launchers had. I guess it was Pickett's idea, I'm not real sure who came up with it. But anyway they had video cameras and also uh hydrogen leak detectors. I'm trying to think. Oh. Infrared detectors, I guess it was.

Dr. Butler: uh huh.

Col. Scheller: To pick up the fires, any fire from a hydrogen source. And they were focused on the skid that at the various levels where tanking occurred, you know on the mobile launcher. And we, I think we were in a detanking process. Maybe we weren't in detanking then. Anyway we were somewhere along in the tanking detanking process on 500-F when an audible alarm sounded triggered by the infrared system and it just so happened that there was a camera on in and the camera caught the flame as a dark spot. And it didn't show up like fire like you expect. And there was real panic because that bird was loaded

with all of its hydrogen, liquid hydrogen, liquid oxygen, you know. And of course the liquid oxygen system is a closed system. It doesn't vent to air.

Dr. Butler: Right

Col. Scheller: It vents back out at the burn pod. And Andy knew tht system so well that just very calmly he suggested opening certain valves and closing certain valves and redirecting the hydrogen into a detanking route that it normally didn't take. Got the , got the hydrogen out of the system and the fire went out. But that was the kind of performance that you could always expect out of Andy. He really knew the system.

Dr. Butler: Very interesting. OK, one of the things you mentioned earlier was that they had already built or were in the process, I think that when you arrived there, they were in the process of activating launch complexes 34 and 37

Col. Scheller: Hm hm.

Dr. Butler: Which each had been the largest and most complex launch site of their day. To what extent did you draw on the experience of completing those complexes and to what extent was launch complex 39 uh more complex.

Dr. Scheller: Its difficult for me to answer those. To answer your first question, I drew very little on that. Uh, uh, I drew mostly on my own experience with cableing and and ESE and GSE hook up and functioning and automatic program checkouts and that kind of stuff, from my own experience in the in the Air Force. I wasn't really exposed that much to 34, 37 and in some ways I was kinda glad because I understand when they when they tour, when they reconfigured one of them and started pulling out cabling, they found cabling that was hooked on one end and not on the other. (laughter) and all kind of strange things. And I knew from my experience that one of the important things was to

get the cabling right. All that underfloor cabling and uh so that played a, and I didn't have any experience at 34, 37. Nor did I have the great opportunity to get any in. I didn't feel like it lends itself to our program anyhow.

Dr. Butler: Hm hm.

Col. Scheller: So I didn't really draw on much. One of the things that did come out of it, I guess, though that translated somewhat over into the Saturn V program was the labor relations aspect. Um.

Dr. Butler: I was just going to ask you about that.

Col. Scheller: Ok. Labor relations for the most part, was not bad. But one of the reasons why it was not bad was because a couple of guys in the program office had worked 34, 37. And I wish I could tell you their names and I'm not sure exactly who it was now. But uh these guys and this first year you talked about, these guys spent a lot of time working with the labor the labor unions at and also with the stage contractors to work out interfaces where. The labor unions, of course, if you wanted if you turned them loose, they wanted to do all the cabling and the stage contractors if you turned them loose didn't want anybody to touch any cabling that had anything to do with them. And you can understand both sides of that argument.

Dr. Butler: Hm hm.

Col. Scheller: There had to be a compromise. And so from the experience with the Missile Sites Labor Relations Board, I think it was, that the Air Force. Air Force had a lot of problems before I got down there on their site with labor relations. And the and I guess Kennedy Space Center also with 34 and 37 and they developed what they, I think they called it the Missile Sites Labor Relations Board, or something like that. And so a lot of

work had been done, good work had been done in laying ground rules and the guys in the program office, the Apollo Program Office under Petrone, had participated in those things and and so one of the things they did actually before I got there. They started a an effort to define with. They took a drawing to the mobile launcher for example

Dr. Butler: Hm hm.

Col. Scheller: And they set down with trade unions people and also with stage contractors. This was, ok. “Here’s a facility that your both going to have to work on and your both going to have responsibilities and the way we, I don’t know exactly how they approached it, but what came out of it was. The way everybody agreed to was power cabling uh and grounding cabling and that sort of stuff would be trade union cabling and that was drawn out on every level of the mobile launcher, for example, as to which cables were trade unions and to which ones were for a stage contractor or mostly for stage contractors. Alright, so that kind of a road map already existed when I got there and that was very helpful. But what happened was, and I’ve forgotten how far along we were. I was keeping track of head count on the site uh, you know, contractor head count in the construction phase and then the outfitting phase as well as with our space contractors. And it was kind a fortunate that I was keeping that because there was a guy, I think he was an ex navy chief. I’m not sure, somebody told me who came to, got into the union business somehow. And organized. He had a great idea said ‘Gee we got an IBEW and this union and that union and their all working separately and HBEC union and what we need to do is make a union of unions and have a much stronger voice against the government, or with the government. And he organized, I think it was called the Brevard Building Trade Council and that became a very powerful organization because they could call a strike on almost anything and and they

started they started really flexing their muscles. And we had a stage, I mean we had a construction contractor, heating ventilating and air conditioning, gosh I can't think of what the company's name was, who was doing a lot of work on the site. And, I think their main job was running the HVAC plumbing up the mobile launchers was one of their main jobs. And they caused. Oh, they were operating non-union in our area, which was ok. Except theres some kind of NLRB rule of some kind, I think, that says that if a contractor of some kind operates in an area as union, he can't also operate in that area non union. And it turns out that this Brevard County Building Trades council found out that this HPAC contractor over on the west coast of Florida was operating union. And he was operating non union over here on the Kennedy Space Center. And they said, "That's the same area." And they they wanted him to. They wanted to force him to become a union shop.

Dr. Butler: Huh huh.

Col. Scheller: And he refused. And so they put. They said ok we're going to picket. And they did, they put pickets on all the gates. Well, I had this head count going and the head count showed suddenly we dropped from, I don't know, 1300 people to 50 people or something like that, you know. It showed impact and every day that, oh every day that they were out it was going to be that kind of impact. So we took them to court. We had called in the NLRB and we went to court over in Orlando and fortunately had a very favorable judge for one thing, but we got two rulings against them. One was uh for, oh I can't think of what, I can't think of what that term is now, but its um, huh. Anyway we got them on two different

Dr. Butler: We can dig that out

Mr. Scheller: Yeah, I can't think of what they were now. We got them on two counts and it caused the. We lifted, we offered to let them have a picket on one gate, but

not on the other gate, and they refused. They wanted to picket all the gates and that's what brought it to a head. And so anyhow the judge ruled in our favor and Brevard County Building Trades Council kind of collapsed because these unions didn't want to be paying dues to an outfit that was losing in court. And from then on we didn't have any problems. That was the only significant problem while I was there at least.

Dr. Butler: Hm hm. You You've talked about uh uh

Mr. Scheller: About an hour. (laughter)

Dr. Butler: Yeah, about about an hour. I I do have a few more questions if we can if we can run through them if you don't mind.

Mr. Scheller: Oh, no that's ok.

Dr. Butler: Uh

Mr. Scheller: I didn't mean to be so long winded.

Dr. Butler: That's ok, you've been telling some great stories. Uh there's some events that happened at KSC while you were here that were really peripheral to your work but had potential impact.

Mr. Scheller: Hm hm.

Dr. Butler: One of the questions I'd like to ask is about problems with the construction of the Saturn vehicle and the Apollo command module. Uh that lagged extensively behind schedule and that for a long time it wasn't sure whether whether any delays in the race to the moon were going to come from site activation or they were going to come from uh from uh problems from the vehicle and delays in getting the vehicle ready. Uh, to what extent did delays in Saturn production and and vehicle readiness affect your work.

Mr. Scheller: As far as I was concerned and for one thing I can't recall those being delays. So obviously they were not significant for me.

Dr. Butler: Uh huh.

Mr. Scheller: But uh, I don't think. Our problems were with building and outfitting the launch equipment. And to my knowledge none of that had any real bearing on uh, on that aspect of the job, which is what my job was. I don't recall them ever causing us any problem. Our our biggest problem like I already told you was the delivery of the, and also we never had a problem that I can recall from late deliveries of ESE or GSE from Houston. Houston, of course had, just like Huntsville, had its own GSE and ESE. I, You know what GSE and ESE are I'm sure.

Dr. Butler: Hm hm.

Mr. Scheller: OK

Dr. Butler: But you might want to describe it for us

Mr. Scheller: OK

Dr. Butler: Because not everyone who is going to listen to this is going to know.

Col. Scheller: Oh, ok. ESE is electrical support equipment and GSE is ground support equipment. And these are things that you have to have to control the vehicle on the or the various components of a vehicle during a countdown or preparations for a countdown. In other words the console that hooks to the computer that talks to the the guidance system, for example, that's ESE. Or a piece of propellant loading equipment, valving or something like that, that hooks to the bird which is GSE, ground support equipment.

Dr. Butler: Hm hm.

Col. Scheller: Uh, those kind of things. The things that I had to have. I had had to get those in the right order with the right configuration to be able to integrate them all properly and get em, get the whole site integrated. Turned out.

Dr. Butler: And as I understand it, Houston was primarily in charge of command module.

Col. Scheller: Well command and lunar module.

Dr. Butler: OK

Col. Scheller: and service module

Dr. Butler: And Huntsville was in in charge of the launch vehicle.

Col. Scheller: Thats right. Right. The, And I never had any. I can't recall that I ever having any delivery impacts from, for ESE and GSE from Houston.

Dr. Butler: OK

Col. Scheller: We had a lot from

Dr. Butler: from Huntsville. Very good.

Col. Scheller: And some from our our own equipment too.

Dr. Butler: Uh, huh.

Col. Scheller: But we had a little better handle on controlling that.

Dr. Butler: You sort of answered my next question more broadly. How was the relationship between Kennedy Space Center and the other centers. What about NASA headquarters?

Col. Scheller: I never had any problems. We had good relations with the people. Now I wasn't. My job wasn't really to interface directly with with the headquarters

guys on a regular basis. That was that was mainly Petrone and and the Center Director, I mean, yeah center director, Dr. Debus and the other directors. But, I mean I did, I did a lot. Uh and my relationship with Dr. Von Braun was good. Excellent, an easy guy to get along with. But uh and with the headquarters folks, of course the one person with headquarters that I was most familiar with was Sam Phillips, General Sam Phillips. And I've always had excellent relationships with him.

Dr. Butler: Sure. Sure. Uh, a lot of people have talked about uh the whole moon operation in terms of a race with the Soviets.

Col. Scheller: Hm hm.

Dr. Butler: Was that something that was always in the back of your mind?

Col. Scheller: Well, I was aware of it, yeah, but that was as far as I was concerned, you know, I was a Republican and Kennedy was a Democrat.

Dr. Butler: Uh huh.

Col. Scheller: He was our President and he had set a goal for the country to be on the moon by the end of the decade. That was what I was on my mind was meeting that Presidential national goal.

Dr. Butler: So your concern was fulfilling fulfilling the Presidents mission, not necessarily beating the Russians.

Col. Scheller: Right, I figured that was his mission.

Dr. Butler: Ok. Uh. What about. While while you were there in in 67 about well a little bit towards towards the latter part of of your stay at the Kennedy Space Center.

Col. Scheller: Right.

Dr. Butler: You had the Apollo 1 fire over on on launch complex 34.

Col. Scheller: Right.

Dr. Butler: Uh

Col. Scheller: That was a real shocking catastrophe.

Dr. Butler: Do you you remember what you were doing when that happened?

Col. Scheller: You know, I was probably at work, but I don't remember what I was doing?

Dr. Butler: And and did did it affect your site activation at all?

Col. Scheller: Not, if it did, I can't recall any specific impact. There may have been some design changes that we responded to. In the, You know I'm sure there were design changes that with respect to using oxygen in a ground test environment, you know, in the capsule, but I don't recall any of those things being directly translated to impact desires.

Dr. Butler: Hm hm.

Col. Scheller: uh. Uh. I just can't put my finger on any of those.

Dr. Butler: Thats quite alright.

Col. Scheller: The impact was more everybody was just you know shocked saddened and and uh hoping no more were I guess.

Dr. Butler: Now at the, towards the end of of 1968, well actually, I guess Benson and Faherty say that the primary job of site activation was finished with with the 500-F test. Uh but

Col. Scheller: As far as I was concerned the that all the new most of the new ground was broken at at that point. We showed how you could get there, and, you know, that

PERT worked and it would and B and pad B and activation of Pad B, uh and and the readiness for flight operations were pretty much proven on Pad A and Pad B ought to follow on the same general general route. So, I guess that I felt with the end of 500-F uh on Pad A we'd pretty much proven the system and it was just a repeat on Pad B and other firing rooms and other other parts of the facility would just follow along the same route.

Dr. Butler: So things. So site activation became a lot more routine after after 500-F.

Col. Scheller: As far as I was concerned, yeah.

Dr. Butler: Ok And then towards the end of 1968, you are reassigned you received the Order of Merit for your work at KSC.

Col. Scheller: It was called the Legion of Merit

Dr. Butler: Legion of Merit, Ok.

Col. Scheller: Yeah, uh huh.

Dr. Butler: And you returned to the Air Force. How did you feel about leaving KSC?

Col. Scheller: It was kind of like watching your mother-in-law drive your brand new Cadillac over a cliff, you know. (laughter) Mixed emotions.

Dr. Butler: Uh huh.

Col. Scheller: I love that kind of work. I love being in a launch control environment. Building things, a site like that. In fact I went on to do that with another site after I left there. I built a satellite tracking station and a control tracking station in Colorado for ESP program

Dr. Butler: Uh huh.

Col. Scheller: And then operated that Satellite for a while. Uh, I mean that's the kind of job I've always liked, so I hated to leave that. Hated to leave them Hated to leave a lot of good people and good systems down there. But I also looked forward to resuming my flying career and combat and got to fly one of the best airplanes in the Air Force inventory. I was squadron commander of a C-130 Hercules outfit in Vietnam.

Dr. Butler: Uh huh.

Col. Scheller: So, like I say, I had mixed emotions.

Dr. Butler: That's, that's quite a change going going from from building a huge launch complex to to being a part of a war effort.

Col. Scheller: Well that kind of the story of my life. I it was World War II I was flying combat. Right after world war II I was in the R&D missile and space rather missile and rocket business. Then Korea came along and I'm back in combat in Korea and after Korea I'm back in the space and missile business and (laughter) that's just that's been the story of my life.

Dr. Butler: Uh huh. Your two great loves.

Col. Scheller: Yeah. Yeah. The hard part was retiring.

Dr. Butler: Uh, any other recollections. People that uh you think might be worth while to interview. People that you keep in touch with.

Col. Scheller: No I don't keep in touch with anybody. There's so many, so many people over the years that I worked closely with that I'd like to be in touch with. The only people that I've have a background with are my World War II combat crew. We have a meeting every few years—reunion every few years. But outside of them I haven't been back to Kennedy Space, well I came back once. They invited me back uh, I forgot which launch it

was now, after my Vietnam tour. And uh, but outside of that I haven't been back down there and uh I, no the only people that I knew worked for me who were outstanding as far as I was concerned were Bill Smith who ran the equipment records system and um which tracked about was 4, I think it was about 37,000 pieces of equipment all tied to a schedule. And hes the guy who was able to flag delivery needs that were that were being threatened, you know, and was able then to put the pressure on who ever it was that that could rectify that. But Bill Smith was one and of course Bill Tramel. I don't know where these folks are anymore. Bill Tramel took John Potates place and I. Have you talked to John Potate?

Dr. Butler: Uh, No we haven't

Col. Scheller: Do you know where he is? I mean do you have any

Dr. Butler: Actually actually I don't. I'm I'm

Col. Scheller: I'd like to know what he's doing. Cause he is really a super scheduler.

Dr. Butler: Uh huh.

Col. Scheller: And a tremendously broad outlook on things. And he's the guy who. He's the guy who really put the level A schedule together. The level A schedule of course came from was the program schedule that Dr. um. Who was the Manned Space Flight?

Dr. Butler: Mueller?

Col. Scheller: Mueller, yeah. Dr. Mueller. Uh Dr. Mueller and Sam Phillips and those folks put essentially put together the level A schedule for the first at least for the first operation, first flight or the series of flights. What I'm saying is that John really came up with the flow idea, which I thought was the way to go

Dr. Butler: Uh huh.

Col. Scheller; at Kennedy Space Center instead of. You know it was kind of like elephant breeding down there at, nothing happened very fast and when it happened it was really big. And uh, to take a look at that whole task of two pads and three mobile launchers and two crawler transporters and a mobile service structure and and four check out bays in the mobile in the VAB. That was a tremendous hunk of stuff to put together. And the way John, I'm pretty sure John was probably the lead, if not the designer of that flow system. Uh if it hadn't been for him, I'm sure if anybody tried to tackle all of those things at one time, we'd still be trying to get through there. He, he was smart enough to say we don't need two pads at once and we don't need two firing rooms and we don't need two of this and two crawler transporters or whatever. And I'm not sure who came up with the idea of the 500-F, that was in existence before I got there. But that was a great idea to flow 500-F through one set of facilities; get em ready to go and then let launch operations start its thing and meet the President's goal and then uh bring the other ones with other flows of 500-f bring in the other pad and the other mobile launchers that were needed and the other check out bays. That was the key, I think the main key to coming up with a manageable schedule.

Dr. Butler: Hm hm. Very interesting. Well I think you so much for your time. You've given us some great pieces of information.

Col. Scheller: Well your quite welcome. Any time you want to call just, if there's anything else that you need.

Dr. Butler: OK. We we appreciate greatly the time that you've spent with us and if we have further questions we will give you another call.

Col. Scheller: Great. Appreciate it

Dr. Butler: Ok

Col. Scheller: OK

Dr. Butler: Thanks so much

Col. Scheller: You bet. Good bye.

Dr. Butler: Good bye