Oral Memoirs

of

Henry "Hank" Carl Okraski

An Interview Conducted by

Kendra Hazen

March 7, 2014

Community Veterans History Project

Lone Sailor Memorial Project

University of Central Florida RICHES of Central Florida

Interview Histories

Interviewers: Kendra Hazen

The recordings and transcripts of the interview were processed in the offices of the RICHES of Central Florida Department, University of Central Florida, Orlando, Florida.

Project Detail

The Community Veterans History Project, a RICHES of Central Florida Project at the University of Central Florida, includes interviews with Central Florida veterans from all branches of the United States military. Beginning in 2010, the UCF Community Veterans History Project is collecting, preserving, and making accessible to the public the experiences of Central Florida's veterans so that future generations will better understand the realities of conflict. It is a collaborative endeavor supported by multiple departments and offices at UCF. The histories, which are collected by students and faculty, are archived and made digitally available through the UCF library. The UCF Community Veterans History Project will also contribute selected veterans' histories to the Veterans History Project at the Library of Congress.

Legal Status

Scholarly use of the recording and transcript of the interview with Henry "Hank" Carl Okraski is unrestricted. The interview agreement was signed on March 7, 2014.

Abstract

Oral history of Henry Carl Okraski, former Deputy Director of the Naval Air Warfare Training Systems (NAWCTSD) in Orlando, Florida. The interview was conducted by Kendra Hazen at Research Park in Orlando, Florida. This oral history was produced as part of the Community Veterans History Project (CVHP) and the Lone Sailor Memorial Committee for the purpose conducting background research for a memorial honoring the former Naval Training Center (NTC) Orlando.

NTC Orlando was in operation from 1968 to 1998 and was one of three recruit training centers used by the U.S. Navy. It resided in the area that is now the community of Baldwin Park. NTC Orlando was the one time home for the Naval Training Device Center, which operated as the Navy's simulation and research command from 1968 to 1988. The command name was changed to the Naval Air Warfare Center Training Systems Division (NAWCTSD) in 1988. It is now the U.S. Navy's sole active duty command in Orlando and is responsible for developing simulation training across multiple branches of the United State Armed Forces.

Okraski was involved with the defense simulation industry from 1962-1994, which included stints as the director of Research and Engineering and the Deputy Technical Director for

NAWCTSD. He obtained a Master's Degree in Engineering from the University of Florida.

Henry "Hank" Carl Okraski

Oral History Memoir

Interview Number 1

Interviewed by Kendra Hazen

March 7, 2014

Orlando, Florida

0:00:00 **Introduction**

Hazen Today is March 7th, 2014. I am interviewing Mr. Henry ""Hank" [Carl] Okraski, who spent 32 years in government service, 10 of which were working in the Senior Executive Service. He was the Director of Research and Engineering and the Deputy Technical Director for Naval Air Warfare Training Systems Division, or NAWCTSD.

My name is Kendra Hazen and with me is Amanda Hill. We are interviewing Mr. Okraski as a part of the [UCF Community] Veterans History Project, and as research for the Lone Sailor Memorial Project. We are recording the interview at the National Center for Simulation Offices, located in the Partnership III building, um, in UCF's [University of Central Florida] Research Parkway in Orlando, Florida.

0:01:13 **Biographical information**

Hazen Mr. Okraski, will you start us off by telling us when and where you were born?

Okraski Yes. First off, Kendra, thank you very much for the opportunity to speak to you today. You're really representing a worthwhile cause, and I appreciate the opportunity. I was born in Utica, New York, in 1936—January 22nd, actually.

Hazen Thank you. Can you tell us a little bit about what your parents did while you were growing up?

Okraski Yes. Uh, they both worked actually. I was a latchkey child. I think one of the first. And they worked in a florist—a wholesale florist enterprise. My mother cut flowers. My father hauled coal and, uh, manure and all sorts of things like that to keep the, uh, flowers growing.

So I was pretty much on my own. I had, um, the run of the neighborhood, if you will. Actually, I wasn't born on the "other" side of the tracks. I was born on the tracks, because the railroad cars went right down the street where I lived, right next to my bedroom.

Hazen I'll bet that was a little loud.

Okraski It was. At like two in the morning, they would be bumping the cars back and forth and, uh—and it was, uh—I got used to it after a while.

Hazen Did you grow up with brothers and sisters?

Okraski No. I was the only child.

Hazen Can you tell us a little about your early education?

Okraski Yes. I was, uh, trained by nuns. I attended the St. Patrick's Grammar School for eight years, um, where I learned the value of discipline and, uh, how to pay attention in class. And I really experienced the nuns, um, caring for us. They wanted us to get ahead. I was really appreciative for that. So I went to St. Patrick's School for eight years, and then I went to Utica Free Academy, which is the local high school in Utica, for four years. Graduated from there in 1953. I worked a year thereafter and then when on to Clarkson University which is in Upstate New York—in Potsdam, New York.

Hazen Um, and during that time, did you have any members of your family who were in any of the [U.S.] Armed Services?

Okraski I had uncles. Several of my uncles were in, uh, in the service. Um, one of my uncles, uh, John—he was at Guadalcanal[, Solomon Islands]. He was in the 1st Marine Corps Division. earned three Purple Hearts while he was there. He's still alive. I communicate with him just about every week.

And I had other uncles that were there in the South Pacific and in Europe. Um, some—one was in Normandy[, France]—[the] Normandy invasion. So yes. I've come from a family—now, my father was not in the Armed Services. He was working on a farm under the agriculture deferment in those days.

Hazen Um, what branches were they in? or were they all in the same branch?

Okraski No. I had one in the [U.S.] Army, one in the [U.S.] Navy and one in the [U.S.] Marine Corps. And I also had another one in the Navy too, who was a deep sea diver. Yeah. with the original bubble heads where they wore the large thing. And, uh, he would repair ships, uh, in Newfoundland[, Canada]. Rather cold, you might say.

Hazen Um, whatever you were going through Clarkson University, what was your specialty? What was your area of specialty?

Okraski I majored in Electrical Engineering and I graduated with a Bachelor's [Degree] in Electrical Engineering.

0:04:13 **LINK Aviation**

Hazen And then from there, what was your first professional experience?

Okraski Yes. Uh, I was recruited from college to LINK Aviation [Devices, Inc.]. LINK Aviation was located in Binghamton, New York, and they were manufacturers of simulators—primarily flight simulators, at the time. and I always had somewhat of an interest in flight simulators. I might relate to you the first simulator that I ever had?

Hazen Mmhmm.

Okraski Okay. Um, I was 11 years old and I would spend summers on a farm. and all we had was radio for entertainment. There was no television, or we didn't have any movies or anything close by. So radio was the big thing. Every day, I would listen to *Jack Armstrong, the All-American Boy*. And they had one offering there that if you send, uh—I think it was 15 cents and a box top from Wheaties—they would send you a simulator. So I got the money. I got the Wheaties and I put it together and send it off. And I waited and waited. Every time the rural post delivery man would come by he'd say, "No, sonny. not today." And nuts. I'd go back. Every day I'd wait for him. Finally, it came and I opened it up and it was a cardboard instrument panel that replicated an aircraft cockpit. It had a control stick. It had a throttle and it had two rudder pedals simulating the aircraft.

So what we did—all of us youngsters, you know, part of the, uh, Jack Armstrong squadron—we would sit on our chairs and set up our cockpits and then listen to the radio. And he would say, "Today we're going to be flying over the jungles of South America. Look down. You can see the river." I would look down and I could see that river. You know, because in those days, we said radio was the theatre of the mind. And it really was. We used our imaginations and we could visualize things that weren't even there. So that was my first simulator. That wetted my appetite. So, then when LINK Aviation recruited me, I was very happy, because I would be working with simulators again.

Hazen What exactly were your responsibilities when you were at LINK Aviator?

Okraski Yes. Uh, with LINK, they started us out in, uh, Field Service Organization. So I attended a short course learning how to maintain and operate one of their flight simulators. They called it a "C11" or "Device 2F-2"3 in those days. And it was a basic one seater flight instrument trainer that was used in primary, uh, flight training for the Air Force in my case. And where pilots would learn how to fly instruments. how to do instrument landing. Uh, also how to react to various failures that might occur in the aircraft. So I would help the pilots learn how to go through emergency procedures to save themselves and to save the aircraft. So that was my first job. It entailed traveling throughout the, uh, Southwest, and that was in Oklahoma and Texas—uh, in that area where there are several Air

Force bases. And I had an opportunity to visit and work with the various pilots or wannabe pilots in those days. So, that was my first job, Kendra.

Hazen How long were you there? How long were you with LINK Aviation?

Okraski Well, I was with LINK Aviation for about four and a half years. Um, what happened was I did a short stint in the Army. I had to go through basic training, um, but I essentially went back to the inactive reserves.[1]

And then LINK transferred me to a number of places, but the most memorable one, I guess, was to Thule [Air Base], Greenland where I spent six months one night. It was dark for the entire period and I was working then on the F-102 aircraft simulator. And so I would help train a pilot, set up all the simulations and train the pilots, um, to do air to air combat maneuvering and air to air intercepts. And it was very, very important, because it was co-located with the ballistic missile early warning site located there at Thule, Greenland, whose antenna was essentially affixed at the Soviet Union at that time, 'cause we were under, you know, Cold War conditions. So having our pilots trained was very important in the event that anything should happen and they had to scramble. They were in a position to, uh, perform as they were trained.

Hazen Do you remember what year that was, when you..?

Okraski Around 1960.

0:08:55 **Naval Training Device Center in Long Island, New York**

Hazen Um, and then after your four and a half years with LINK, where did you go next?

Okraski Yeah. I—I traveled a little bit more with LINK, and I took a job with the Naval Training Device Center, which was located in Port Washington, Long Island[, New York]. And that's where I took a position as, um, a GS-11 electrical engineer working in the field support of Naval Aviation simulators. It was in a facility that was called a [Gould-]Guggenheim Estate at one time. It was a castle. Actually, it was a castle that was created that was by the Guggenheims and the Gould family years before. So it was quite a thrill to come to work and go into the castle. And, um, it was on an estate that overlooked Long Island Sound and several, several acres. It was beautiful. And our next door neighbor, who—Kendra, you may not recall—was somebody called Perry Como, the singer. So he lived next door—very casual individual and, uh, we would wave as we went on to work in our castle.

Hazen A castle. Um, what kinds of things were the projects that were being worked on? In addition to what you did, what are some of the different projects that were being worked on there?

[1] Individual Ready Reserve (IRR).

Okraski It was an interesting time, because originally the Naval Training Device Center, which began as the Special Devices Task by Admiral [Luiz] de Florez in 1941, um, expanded its mission to include more than just aviation training. In the beginning, he focused on flight simulators—in the LINK trainer actually grew out of some of the initiatives that were going on there and, uh, Luiz de Florez took the LINK trainer and, uh, modified it for gunnery training. Uh, and other applications that went beyond aviation. They began to get into surface Navy, land warfare, undersea warfare, simulators for all those kinds of things. But the primary thrust was in aviation. So aircrafts such as the P2V [Physical-to Virtual] —oh gosh—the F-3, the A-7, the A-3 intruder. Um, all those aircraft had simulators that were built and being delivered and used by the pilots' aircrew, uh, to train out in the field.

Hazen How long were you there in Long Island with them?

0:12:15 Migrating to Central Florida

Okraski Yeah. I was there until 1965. 1965. Well, let me back up about six months from there. Earlier, I had bought a house. My wife and I had bought a house out in North Port[, New York], and it was a really, really nice house. It was about all we could afford too. But it was near the water. It was a beautiful place.

Six months later the commanding officer gets on the loud speaker and said, "Ladies and gentlemen, you're next home will be in Orlando, Florida." I said, "What? Next home? I already have a home." But nevertheless, uh, we did move to Orlando, Florida. It was probably the best thing that ever happened to us at the time. We were—it was the beginning of a tremendous growth of simulation and a wonderful career opportunity for me and my friends and co-workers that moved here. And also a wonderful environment for my family to live and grow.

Hazen Did you know anything about the area before you got down here?

Okraski No, but they allowed us two visits and at that time in 1965. In 1965, uh, Orlando was a sleepy little town in the orange groves. Uh, we had Gatorland, I think, and, uh, Cypress Gardens.

There was no [Walt] Disney [World]. There was no SeaWorld, Universal [Orlando Resort], etc., etc. It was a sleepy little town. And it was very enjoyable to go out on Sundays and look at homes for sale and, um, take in some of the natural beauties. Some of the—like the Wekiva Springs, uh, which was—was open—open to the public. And there were other springs. Silver Springs [State Park], etc., etc. And the beaches were so close, so it was very, very nice. Very, uh, unspoiled you might say.

0:13:35 How Naval Training Device Center came to Orlando

Hazen And when you moved down, um, was it called? It was called the National Center for Simulation yet?

Okraski No. That's a whole other outgrowth. Yeah. The Naval Training Device Center changed its name about two or three times.

Hazen Mmhmm.

Okraski To where it is today—Naval Air Warfare System—Naval Air Warfare Systems Training System Division. Uh, so we went through an evolution.

Hazen So when you moved down, what was it?

Okraski It was still the Naval Training Device Center.

Hazen Okay.

Okraski At that time.

Hazen And what resources was here for them?

Okraski Nothing.

Hazen Nothing?

Okraski Well, the only thing that was here—and this is kind of amusing. You wonder how these things happen. These relocations cause we're always faced with things like BRAC [Base Realignment and Closure] and justifying movements and what have you. But the truth to be known, a lot of these decisions are totally politically based and what happened was an Air Force activity moved out of the Air Force base here in Orlando. Not McCoy [Air Force Base], but where Baldwin Park is today. Okay. there was an Air Force Reconnaissance Squadron located there. They were relocated and I think part of it was even disestablished. So there was a need to fill the vacuum.

Well, the powers to be—the political powers to be—got together and decided that this little activity up in Port Washington, Long Island, would feel much better if they were located in Florida. So they moved us to Orlando beginning in, uh, 1965. The, uh—many of the buildings were old barracks. Um, they were not air-conditioned. Um, we lived in that kind of a situation where—this was before computers, where you did your own memos and that. So we would draft memos in pen and ink and your sweat would drip on the paper and run as you're trying to write the memos to, ah, your—your—for business purposes. So it was rather a primitive existence. Although once the Navy got there, they began to refurbish the buildings and we got air conditioning, which worked most of the time. So that made us a lot more comfortable.

But an interesting thing about Orlando too, uh, from a historical stand point, um, when the, um, Normandy invasion was being planned, General [Dwight D.] Eisenhower came to Orlando and actually mocked up the Normandy Beach in one of the orange groves. In other words, he created an—an, uh—an emulation,

if you will, of the Normandy Beach head, and he would position ships and whatever on this false floor that essentially was cement looking like the Normandy Beach head. and he would, with his generals, plan their attack moving objects around and developing strategies that they would follow. So that was in Orlando long before the Navy or anybody else got down here to talk about simulation. Can I give you one more historical event?

Hazen Certainly, yeah.

0:16:06 **Admiral Luiz De Florez**

Okraski I think it was—the year was 1935 or so. I'd have to verify that, but Luiz De Florez, for whom the building is named out here—the Navy building is the De Florez complex—the Luiz De Florez building. Okay. And as I mentioned earlier, he got simulation off the ground particularly for the Navy beginning in Washington, D.C., but before that, uh, he was involved in the in oil—in oil production. the crack and process and all that. Well, he was honored for his accomplishments—he was a civilian though at that time—uh, by a number of people. one of which was Rollins College here in Winter Park. So he was given an honorary Doctorate degree from Rollins College the same year that Marjorie Kinnan Rawlings, who as you well know, is the author of *The Yearling*, and *Cross Creek*, and a few other wonderful novels. So that brought simulation down here again back in the [19]30s. If you believe in pre-destiny or something, you begin to wonder if there isn't some connection. So, those are a couple other historical points relating to the Orlando area having to do with simulation.

Hazen And kind of the birth of the idea of it being here.

Okraski Yes. Yeah.

0:17:50 **Maintenance Engineering Division**

Hazen Um, you talked a little bit about what was here when you got here, and the buildings. Can you tell us a little bit about those early days? What were kind of your primary responsibilities when you first got down here? What were some of the main projects that were being worked on?

Okraski Sure. Um, I, uh—when I came down, I was assigned to the Maintenance Engineering Division. It doesn't have to do with changing light bulbs or anything like that. What we actually had to do was plan for the logistic support of the simulators, because it was very critical to keep the simulators operating when they're being used by our pilots, aircrew, and other ships crew, etc. So we had to make sure that they were reliable, maintainable, and we provided an adequate logistic support package to go with each and every simulator that went out the door. And our industry was pretty much, uh, on board when they came to designing in reliability, maintainability, and providing a good logistic support package.

So one of my jobs was to develop the criteria for logistic support and I wrote a document called "Bulletin 40-1," which identified all the logistic support requirements for simulators that stayed in use for probably 20 years or so that people may even use parts of it today. It was important to do that.

Now, in the process of moving down here, a number of people didn't want to leave Long Island. They were particularly—they were really happy just to stay there. And I, in turn—I was offered a job at the Space program at the time too. But I elected to come to Florida and stay with our parent organization anyway. So when a number of people didn't come, it left some room at the top. So that gave me some nice promotion opportunities that I took advantage of and so going, you know, then from a division head to a department head to associate director, etc. I think the move down here kind of enabled that progression quite nicely.

So what I did is—I had a division and we worked very closely with the engineers in designing our systems such that they were maintainable and supportable. And we—the program began to grow quite a bit. Word got around that, "Hey, this simulation stuff must be pretty good. It must be saving a lot of lives and it's not costing as much as putting airplanes in the air or ships at sea or submarines under the sea." So the Army—well, they had joined us earlier with what was called the "Army Participation Group," and, uh, the simulation caught on with them and they began to grow very large. Then the Marine Corps—they came on board. Then the Air Force came on board. So what was just a single entity down here in the Navy became pretty much a joint operation. Joint with a small "j" not a large "J," 'cause we're not really a "joint" organization. We're, uh—we operate jointly though. And it was amazing of the synergy that was achieved by working together. You know, an engineer working on a tank simulator working alongside an engineer working on an air craft simulator could share technology and experiences and know-how, such that the customers were getting more for their money essentially than if an individual service were doing a procurement of a simulator. And that continues today. Maybe even more so today, because of the large number, the large acquisition program we have here, um, at the, uh, what we call now "Team Orlando."

Hazen After it was called the Naval Training Device Center here? What was then the next step?

Okraski Well, it was renamed Naval Training Systems Center, Naval Training Materials Center, uh, and Naval Training Systems Center, and then it went to, um, Naval Air Warfare Center. The reason for that is that, uh, we changed responsibilities on—we changed, uh, the organization that we reported to over the years. In the beginning, you know, it was like the Bureau of Aeronautics, and then it was Chief [of] Naval Research, and then it went to Chief [of] Naval Materials ,and then to the Naval Air Systems Command—so away and back again. So every time it moved, people felt, "Well, we gotta change the name of that." So that happened, you know, over several years. so the stationary was taking a hitting.

You know, in changing our names and who we reported to over the years, but it appears now that we have a very stable organization under the Naval Air Systems Command and our organization continues to grow down here and they're doing wonderful things. Saving time, lives, and money every day. See, that's the beauty of really working with an organization like this, because when you go home at night you realize that you touched the lives of every solider, sailor, Marine, and Coast Guard. You know, and through the efforts of what you're doing here. You can't beat that for job satisfaction.

Hazen Can you give us some specific examples of simulations that happen? Like what does it look like? How does that work? What kinds of things do you have to do on the front end to make it possible?

Okraski Uh, yes. Um, you know [*laughs*], I'm not gonna do this. You know, it's all in here. That was commercial.

Hazen [*laughs*]

Okraski No. I actually—kidding aside—it all begins with the requirements. It all begins with the requirements from the, um, the parent system. Like if it's an aircraft that you want to build a simulator for, uh, you examine the aircraft. you examine the tasks that have to be conducted by the air crew. And given those tasks, then you can select the media—what media is best to teach. Train those particular tasks. There are some that deal with, like, decision making. Others are procedural and each and every media kinda has their own strength, you know, with which each of the tasks that have been identified.

So normally it goes through some form of task analysis of the operational system and then from there you come up with the media. Uh, you identify the behavioral objectives, come up with the media, and then go about writing the specifications and statements of work for the training system that you intend to have procured or built. So our engineers spend a lot of time writing specification statements of work delineating exactly what the simulator has to look like.

Let's take for example: what would a flight simulator consist of? Okay. First of all, you've got the—the enclosure where the pilot would sit. So you've got to make sure all the instruments—all the nobs, and controls, whatever—operate just like the real airplane. So you have to make some decisions how you gonna design that and becomes a systems engineering process to do that. So you design that enclosure with the proper configurations. Then you decide, *Well, am I gonna have a visual display?* So that the pilot can look out the windscreen and see the real world. If so, there are several choices you have as to what kind of visual system you would put on this. So let's say you narrow it down to the visual system—maybe it's a widescreen. The pilot looks out, can look 180 degrees perhaps, and see even through the periphery what's happening in the real world. And this—the intent is to have it move and behave just like it would if you were flying the aircraft.

Okay. what else do we need? Well, we need some computers to make this thing work. So you get a computing system. You go through that whole exercise again. What's the proper size, speed, etc. for the computer? Then you say, "Well, should we have motion or not? Should we tilt and move this pilot?" We go through that same process to come up with the motion system. Then you have things we call like "control loading," and then like when the pilot moves the control stick. Does it feel right? Does it feel like the airplane? Is it, uh, hydraulic, or is it force-fed or whatever—make these kinds of decisions depending on what your requirements are.

So what you do is you take all these components and you integrate them together and you come up with a training system that replicates the function, um—the functions and usually the configuration of the system that you're trying to simulate. I mean, a true testimony to how well we've done our job is when a pilot comes out of a simulator and he or she is draped with sweat and they say, "That was god-awful." And then you know you've achieved some realness, because what we're looking for here. And, uh, I think the amusement people say it very nicely—is we're suspending disbelief for a little while. Because you know you're in a simulator, but if you get all engrossed in the task at hand. You can forget that it's a simulator—you begin to think that it's real. And that's what we want, because then you can train people effectively. You can make decisions under stress even though you've created the stress artificially. So that's kinda how you put it—that's what a flight simulator would look like. Then you have all sorts of other simulators, uh, besides just aviation, submarines, you might want to teach people how to control a submarine. You know, the driving aspects of it or the weapons system piece, fire control, etc., all those have to be integrated into the overall system. There are full-up systems, there are part-task trainers, entire families of training devices. I'm giving you a crash course here in a very short period of time.

Hazen That's perfect.

Okraski Okay.

0:27:45 **Naval Air Warfare Center Training Systems Division (NAWCTSD)**

Hazen That's exactly what I was hoping for. Um, I think you touched a little bit on this next question just through some of those examples that you said but what is the mission—the mission statement of NAWCTSD?

Okraski Well, see, I've been out of there now for a while, because I retired in 1994. Um, but the mission is—and I can just sort of paraphrase—I believe it is to be the principle agent for the acquisition research and logistic support of—of training simulators for the, uh—the Navy and the other services as a side. Something to that effect. But it is—they are the principle activity within the Navy for procuring simulators.

Hazen And, um, can you tell me a little bit about your time at NAWCTSD? What were some of, uh, your major projects?

Okraski Sure.

Hazen And what happened on your watch when you were here?

Okraski Yeah., I'd love to, 'cause we, uh, you know—we have a road of accomplishment, I think, over those years while I was here that I'm quite proud of the people that were able to make some real breakthroughs in technology and satisfy the war fighter and the warrior in a way, in a manner, that hadn't been done before.

I'll give ya one example: Um, the MILES system, which is the Multiple Integrated Laser Engagement System, was essentially developed in our laboratory at NAWCTSD by a team. The team was headed by a gentleman by the name of Al Marshall. Al Marshall had a better idea on how to teach weapon—team—weapons team engagement and that was the use of lasers. Um, eye safe and totally safe lasers, as opposed to using live ammunition out in the field. So he came up with the whole concept of outfitting soldiers with the laser detectors and this was really the first laser tag, if you will, but it was for the military. He was a Navy engineer doing some work for the Army and the Marine Corps went and bought the MILES system also. So it was a tri-service initiative kicked off by one little team, if you will, working in the, uh, in our laboratory under the Office of Naval Research, uh, task.

Some other things that we did, uh, other than the just the technology growth and the improvement in the fidelity of simulation. You know, visual systems have gotten to be really, really good when it comes to realism, uh, as is motion for that matter. Now, while I was there too, we toyed with the idea of developing deployable trainers. You know, we felt, "Gee, why do we always have to bring people into the school house, put them in a simulator, and then they get deployed out to sea?" And by the time they come back, some of the skills have already perished. I mean, they're perishable skills to some degree. Why not put the trainers out there where they are?

So along came the whole idea of deployable simulators and mission rehearsal simulators that could be deployed, put on board aircraft carriers and other installations that are closer to the squadrons and the people that actually use them. So, uh, the deployable simulators, I thought, was a really neat technology that was like the next—next energy level above what we had been doing in the past. And—and the same is true in so many other areas too, where a level of realism has increased, uh, tremendously too.

For example—his happened after my watch—so the, um, battle stations 21—the simulator up at Great Lakes where they brought together the entertainment world along with the simulation—military simulation world—and they built a training device for recruits—Navy recruits— that essentially forms the part of

their graduation. Their last day. It's sort of like a hell week, but only compressed into one day, where they're able to simulate fires on board ship, casualties, injured people, leaks in the bulkhead—all simulated—but like with real water and what looks to be like flames. Again, borrowing on the Disney magic and any other theme parks that are here. And it became so—it's so realistic, in fact, that it's hard to replicate what they've done up there.

Another, uh, thing that we did, way back when—or "back in the day," as they say today—was pier-side training along the same notion of, you know, why bring people in to a classroom, or why go to sea and train all the time, uh, because that that can be expensive. We came up with the pier-side trainers which essentially are, um—well, they're trailer-based simulations. More like stimulators than simulators. But anyway, we take these trailers, and we plug them into a ship that's tied up pier-side, and through cables and running alongside and into the ship. we're able to generate signals, put them into the ship, so that the people that are at their operating stations see everything as though they're out at sea. We can create targets in that trailer. You know, create targets and threats and then the people in their battle station. or in their normal working stations, they can look at their radars, their sonars, their fire control, and they see targets like they're at sea and they give commands and they run through the exercise as though they are out at sea. So that was a family of pier-side trainers that started to be quite successful.

And then the next step was imbedded training where we were able to imbed some training features into the actual parent system, whether it be an aircraft or a ship. I know one particular radar, for example, that when they go out at sea they can generate targets and practice radar movements simulating those targets that are out there. There are no targets in the water, but they—the ship's crew—think that there is, because we can generate those and they look at their scopes, the water, and they see actual targets that aren't real. So, you know, tech, and…

This this happened outside of my experience at NAWCTSD, but it began at NAWCTSD, and that's the whole notion of using virtual reality for training. Um, one of the things that Dr. Hayes—Dr. Bob Hayes—had a project with his team called "V Sub," to where they simulated the gentlemen in the submarine at the conning tower that was steering a submarine through a canal or channel, say. And they did that through virtual reality. They would put the head-mounted display on the individual and that individual would see the banks of the canal, would see other ships, beacons, markers. and then through a headset communicate with what would've been the people steering the submarine when in actuality it was a voice recognition system that was taking action based on the commands being given by the individual. So—and that was a very, very neat, neat program.

0:35:59 **Teaching deaf and hearing-impaired children**

Okraski And later on, after I retired and I—I worked, uh, with a company General Dynamics—actually Veridian, at the time. Um, I was like a support contractor to them—came up with this notion of maybe we can do something for deaf and hearing-impaired kids using that same technology. At that time Congressman [Ira William "Bill"] McCollum[, Jr.] was very active and interested in what we're doing, and he was able to get some support money for us to build a virtual reality system for Lake Sybelia Elementary School up in Maitland. There they have a high percentage of deaf and hearing-impaired children, and what initiated this was the principal coming to one of our NCS [National Center for Simulation] meetings.

At the time, I believe I was chairman of the board at NCS and we got all through with our meeting and it was an open meeting. He said, "Yes, sir. I'm, um, a principal of Lake Sybelia Elementary School. What can you do to help us?" "What's your problem, sir?" He says, "Here's my problem. We have a large group of deaf and hearing-impaired kids and our teachers spend most of their time with living skills—teaching them how to do very simple things. They don't have time to get into reading and arithmetic and things they're supposed to be learning. What can you do to help us?"

So we moved out and we got all the support we could. We put together a team. We got some money and we did build a virtual reality system. and the kids loved it, because they would get immersed in the system. And we simulated, for example, the question of how to cross the street safely. So we would simulate trucks going by, so they could see them and we even had the odor of diesel so they knew it was a truck and a little bit of rumble, because we fixed the seat so it would vibrate. And, uh, so they learned to go to the cross-walk and go through the green light and whatever. We had stranger danger, danger stranger with an intruder coming in the classroom—in the classroom—on the school grounds. and, uh, we taught them what to do if they saw a stranger that didn't look good. We taught them how to, uh, go to and order in a fast food restaurant.

Many times these kids—they're not looking for recognition. They're not looking for attention. so if they order the wrong thing usually they'll just take it and eat it—whatever it is—or if they get the wrong change back, they're not gonna make a thing out of it. They just by and large don't want to be recognized like that. So we taught them how to go to a fast food restaurant and order. We gave them the menu. We told them how to order. They made change and we gave it back to them and whatever. We did that. We did fire in the home. How to get out of the building if it's on fire, etc. So we taught them all those things using that technology of virtual reality and, to me, that one probably one of the most rewarding projects that I ever got involved with.

Hazen That's really cool.

Okraski Yeah. Yeah. Fun too. Like I tell people, I never worked a day in my life. And that's true. if you enjoy what you're doing, you never will work a day in your life.

0:39:27 **Challenges faced by simulation projects**

Hazen One of my questions is about challenges. In creating the different simulations for—I guess it's kind of a broad question—what are some kind of reoccurring challenges that you come into when you go to put together one of these simulations?

Okraski Well, of course, it's—we always think in terms of cost and schedule and performance, and cost is always an issue. Particularly, if you're dealing in an area where you cannot define precisely, exactly what you want, and so there's opportunities there for some, some, uh, you know, movement within that—you know, feasible window of opportunity. So many times cost-growth is an issue—trying to keep the cost within the budget.

And the same is true with time. Technology changes so rapidly, and usually you want the most current technology in your system. So there might be some delays attributed to that and then when you get to new technology, then there's a learning curve or whatever. So time can be a problem.

And performance, uh, can be an issue too, because you really have to understand what the user wants. And it can be sometimes vaguely stated and our engineers and others—our education specialists and psychologists—will write a specification and it may not be exactly what the, uh, expectations of the eventual user. And then you have turn over personnel. you know, the user has different people coming on board, because of rotation. The new person might say, "That's nice, but here's what I really want." So that can drive cost and schedule a little wacko too.

So those are some challenges and, and the technology itself. You do want to have everything that's as current as can be, because you've got that whole issue of user acceptance to deal with.

Kids today have the latest bells and whistles, and it's true in the service too. I mean, all the younger people coming in the service usually are familiar with and have used the latest technology. So, if you come along and give them something that's lesser than that, they're not going to be happy and chances are they may not even use it. So you've got to be very accommodating to the, uh, you know—the generations as they're coming along to what you deliver.

Um, I can give you a good example of that. Today, gaming—you know, we're using gaming technology in some of the simulator developments, like in decision making and some of those, uh, training devices. They're actually using off-the-shelf games, um, or it can be just the gaming engines that are being used in the simulations. S, we have a whole new generation now that are familiar with

gaming, but we have others that are not familiar with gaming. So we've got to bring the new people in as quickly as we can to make sure that we're satisfying the generational needs of our—our service people. So keeping up with the technology and incorporating that in our latest devices is going to be a challenge. So, um, there are a few challenges. There are other challenges—I'm sure—but, uh, those are a few.

0:42:47 **Future of the simulation industry in Central Florida**

Hazen Thank you. Um, and even in that you talked a little bit about this next question—can you tell me about what you think the future looks like for simulation? Specifically here at NAWCTSD. what's the future look like with what kinds of things they might get into? [00:42:47.25]

Okraski Yeah. these are exciting times, because every time I think that we're here now—it just goes off onto another curve. I—I liken this to, um, a growth curves that I—I—I've been developed for other things, like tennis rackets. Tennis rackets, you know, started out as wood rackets, and then they went to aluminum rackets. Then they went to composite rackets. And every time they go from one technology to another, you get off a growth curve that looks like it's saturated onto a new growth curve that begins to get saturated and you continue to do that. And that's where we are right now in simulation and training.

With—as I mentioned, gaming, for example—it's opening up a whole new area for us to investigate. An area too that I think is gonna get some attention and that is the fidelity of simulation is determined by brain activity. To be able to measure brain activity in an individual while varying fidelity might give us some indication as to how well we are conveying information to the trainee based on their mental arousal or other, uh, symptoms that would be evident through brain wave measurement. For example, we might take a look at a low fidelity simulator—as opposed to a high fidelity simulator, as opposed to an aircraft and do the same measurement on individuals—and just take a look at what kind of distraction or what kind of concentration takes place in each of those situations.

So I think there's, you're gonna see more activity in the brain—brain measurement area. I'm not up to the point yet where they're gonna put probes into the head and with one throw of the switch you've got it. That—that's maybe for my son or somebody else to pick up on that, but, um, yeah. I think that's a very, very good area to and people are doing that now to some degree. Not full-scale yet, but they are looking at it.

Um, other areas—I mentioned gaming. Again, I think being able to tell a story better. Being able to tell a story of how a simulator is included in the overall scenario or experience that you're trying to create. The attractions do that really well. They prepare you for it, you know, on The [Twilight Zone] Tower of Terror. you're terrorized before anything happens for that matter. Or if you go to the Cape [Canaveral], over here where they have the new [NASA Space Shuttle]

Atlantis [Exhibit] and you go through the space mission. they get you all prepped for the mission that you're going to be involved with. They know how to tell a story, and I think we need to do that too with our training for our military personnel. To be able to integrate what we're doing more into the overall scenario that we're trying to establish. Yeah.

Hazen Thank you.

Okraski Okay.

0:46:25 **How NAWCTSD has changed Orlando**

Hazen And one of my last questions is about the changes that have happened in Orlando because of NAWCTSD's presence. You kind of described for us what it was a little bit like when simulation kind of got started here. Can you tell us a little bit about how it's changed? How Orlando has changed because of NAWCTSD's presence here?

Okraski Yeah. I—I think we need to look at it from a little larger picture first. And that is, when we first came down here, there were no companies that—except for Lockheed Martin—that had anything to do with simulation. But then, as simulation began to grow, all these other companies began to come down and wanted to be close to the acquisition agencies—the Army, Navy, Air Force, Marine Corps, and Coast Guard, to some degree too. They want to be close to it, so they begin to orbit essentially the Team Orlando organization that we've been talking about to where Team Orlando now accounts for billions of dollars of acquisition of simulators and this accounts for some 27,000 direct employees working with the [U.S.] Defense Department in modeling and simulation.

Now it's spread. We're no longer just defense. We're into entertainment, homeland security, transportation, medical—all using simulation. And we don't know how large that piece is, but if the other piece is 27,000, it's equal to or greater than probably. So what went from a handful of people moving down here in 1965—yeah. We might have 50,000 people now involved in simulation, one way or another.

Tremendous impact on the tax base in Central Florida., the average salary is about 70,000 dollars a year. people working in the simulation industry and the educational system has been totally responsive. The University of Central Florida, what were our community colleges now are four year colleges that have been set up. We can get a Master's or Doctorate degree in simulation through UCF. Our high schools now—we have a curriculum in modeling and simulation that NCS put together. It's on our website. It just seems to be no end to this and that's good. You know where the long pole in the tent is to all this? Teachers. We don't have teachers than can teach at the K[indergarten] through 12 level modeling and simulation and let the kids know about the careers that are available and why they need to study STEM [Science, Technology, Engineering,

Mathematics]. you know, cause that's the basis for our business in modeling and simulation is STEM. But it has—it has grown almost exponentially, and I expect it to continue to grow too. In spite of cut backs or other barriers we might see, we're in a growth, uh—we're in a growth community right now.

0:49:09 **Closing remarks**

Hazen Thank you. Um, do you have any other thoughts? Kind of wrapping up our interview. Any final thoughts about simulation and, um, its benefits? How it benefits us?

Okraski Well, we know about the military. We also know that it's being infused now into the medical world. Our Lake Nona [Medical City] complex down here—Medical City—has a number of simulations for like endoscopic, other forms of surgery, the Da Vinci simulations, and all. Um, the VA hospital. They all have some form of simulation. so, um, the spectrum has opened up as to the application of simulations. It provides for a wonderful career for individuals that want to get in to a well-paying, yet very, very satisfying career. and we need to really get that information out—get that out to the youngsters so they do they do begin to think of it as a viable career and they can stay in Florida and enjoy what we have here in doing so.

Hazen Thank you.

Okraski My pleasure, Kendra. Thank you for taking the time.

Hazen Thanks.

End of Interview