

UNDERSEA & HYPERBARIC MEDICAL SOCIETY

INTERVIEW OF COMMANDER WALT EAGER

PROCEEDINGS

INTERVIEWER: This is the interview with Commander Walt Eager.

CDR EAGER: Today's success of the Ocean Facilities Program would not have been possible without the dedicated effort of those who originated it and contributed to its early development. Two of these were Whitey Odden, my civilian assistant, and Don Potter, my design assistant. I can only tell you about the Program's first six years from my perspective. I was the Director, Ocean Engineering Program Office from its inception in 1968 until I retired from the Navy in 1974. It was clear from the outset that for this Program to succeed extraordinary effort would be required from all participants.

As background the Office of Naval Research (ONR) stimulated NAVFAC's interest in developing Ocean Engineering and Construction capability. I presumed that this occurred because there had been project-destroying failures by other Navy organizations to install deep ocean facilities for ONR. One example is Seaspider. This project was intended to provide a large, suspended, acoustic array for surveillance system experimentation. NAVFAC had waterfront facilities planning, design and construction capability. However, extending this capability to the deep ocean was not an easy task. The much more forceful and less predictable physical environment presented the primary challenge. We had to have facilities and installation plans that were extraordinary in detail as well as weather-compensating contingency plans to back them up. We had to have robust work platforms with unique features. I considered it essential to supervise every aspect of our first project, Tektite, and to provide through it the necessary training to extend NAVFAC's capability from waterfront design and construction capability to that which was required for the open ocean.

Fortunately, I had extensive experience designing and testing Marine Corps amphibious craft after

graduating in Engineering from Caltech. I then joined the Civil Engineer Corps that provided the best opportunity for engineering experience while dispensing with my military obligation. I was given assignments that I regarded as choice. They each contributed important technical and managerial experience and created in me an eagerness to take on important projects even though they were considered more risky in terms of military career. One of these was as start-up engineer, then project engineer and R&D officer in the military nuclear reactors branch of the Atomic Energy Commission. Another was as Professor of Nuclear Defense Engineering at the Civil Engineer Corps Officers' School where we taught civilian engineers to design protective structures, such as Titan missile silos. I subsequently obtained a Masters Degree in Physics by studying nuclear weapons effects at the Naval Postgraduate School. This curriculum was multi-disciplinary, ranging from structural design to to radiation physics and human physiology. The later course in particular prepared me for my assignment as head of the Man-in-the-Sea Branch of the Deep Submergence Systems Project (PM-11). This branch managed the development of deep, saturation diving systems. The project office was successor to PM-1 which managed development of the nuclear submarine. During this assignment I qualified as a Navy Diver and gained important experience that was useful in the development of NAVFAC's Ocean Engineering and Construction Program. These experiences enabled me to train and supervise our NAVFAC designers, our MCB-1 construction divers and our ACB-2 work platform fabricators and support personnel. They enabled me to make mid-course, on-site adjustments to our installation plans to compensate for any unexpected conditions. We were also fortunate to start with a very skilled waterfront facilities designer, Don Potter, who quickly became an excellent ocean engineer. I was fortunate to have a very capable civilian assistant in Whitey Odden, who continued to develop the organization while I was commanding the construction detachments from ACB-2 and MCB-1. We were also fortunate in starting with Master Chief Miller of MCB-1 who was our Master

Diver. He was a personable and skilled diving supervisor who maintained an excellent safety record throughout our initial projects. As the capabilities of individuals increased and as these individuals developed into a well-integrated team I was able to spend more time at NAVFAC developing the Ocean Engineering and Construction Program.

Our first underwater construction project was in support of Project Tektite I. This was a science project organized by ONR with ONR, the Department of Interior (DOI) and NASA as participants. The aquanauts consisted of a geologist and two biologists from DOI. Project Tektite I had several objectives. The first was to test the ability of divers to work in the ocean for an extended time period while living and operating from an underwater habitat. NASA's objective was to collect behavioral information on the effects of extended isolation in a threatening environment that might help it predict the behavior of post-Apollo astronauts. Extended isolation resulted from inert gas (helium) saturation of the divers blood. They could not come to the surface without extensive decompression. An additional threat was presented by sharks and poisonous eels. The General Electric Corporation manufactured the habitat and the life and work support systems.

A NAVFAC-directed team, consisting of an ACB-2 detachment and construction divers from MCB-1, procured and fabricated the underwater construction equipment installed all facilities in a National Park in and near Lameshure Bay during the winter of 1968/1969. This bay is at the remote, southwest end of St. Johns, Virgin Islands. The underwater construction project is briefly described in my report, "Navy Underwater Construction". The Program office has a copy. ONR published a report on the overall project. I will limit my description here to incidents that may be of substantial interest, if not of historical or educational value.

The Park Ranger position on St. Johns Island is a “stepping stone” to the position of National Park Service Director because it is frequently visited by members of Congress and the Executive Branch. Therefore, the Ranger is very sensitive to the possibility of adverse incidents. At that time there were black power advocates with Communist Party affiliation, moving from island to island and trying to sow the seeds of revolution. Grenada was one of their successes until a U.S. Navy Seal Team brought the problem there under control. During my first trip to the island the Ranger requested that I keep my men from interacting with the locals. He was concerned that interaction might lead to conflict that could be exploited by black power advocates. His concern stimulated my own. Our Program did not need such problems. However the island is inhabited by blacks and whites who are very proud and protective of their close personal relationships. Ten days after we arrived to install the waterfront and underwater facilities an article appeared in the newspaper, citing complaints by the locals that there has been no interaction with my men. The article suggested that this was the result of racial discrimination. A visibly shaken Ranger arrived at our base camp from the other end of the island in record time and retracted his previous direction. I assured him that we had been on a very tight work schedule and that I had granted no liberty since we arrived. He provided this fact to the newspaper. We invited the locals to our base camp and continued to interact with them socially. Thanks to our men there were no adverse incidents.

In addition to a challenging physical environment there was a threatening political environment that had to be dealt with simultaneously. One of the Navy organizations that was involved in previous facilities installation attempts was not about to relinquish its position voluntarily. This problem manifested itself during the construction phase of our very first project. ONR invited NAVFAC to

perform the terrestrial, waterfront and underwater construction for Project Tektite and the Supervisor of Salvage to run this saturation diving experiment after construction was completed. I was authorized to command the facilities construction phase. A limited duty, salvage officer of my same rank was to command during the operations phase. This salvage diving officer attempted to assume command of my Seabee detachment when we hit the beach at Lameshure Bay, St. Johns, Virgin Island. Of course I did not allow this to occur, but it put me on notice that any substantial problem that developed during our construction project would be used against the developing NAVFAC Program. The first incident was not long in coming. The ACB-2 coxswain, who ran our personnel boat to St. Thomas Island for mail and supplies, damage his boat on an uncharted coral reef . The night of the boat incident this officer got drunk in the bar of our base camp and ridiculed my coxswain. The next morning I had this officer ordered off St. John Island. He was reassigned to the public relations office that ONR set up on St. Thomas Island.

There was another interesting incident that occ

I decided that the work that I was doing there was pretty much complete, so I requested a transfer, and it just happened to be that there was a billet opening at the Deep Submergence Systems Project. This was, of course, the group that followed PM-1, which did the nuclear submarines, and its interest was in deep submergence. John Craven was the chief scientist there, and Captain Bond was the medical person there. I was head of the Man in the Sea branch. The purpose of that branch was to basically develop equipment for doing deep saturation diving.

At the same time, a coincident group, setting along side of mine, was the group that developed

the DSRV, the Deep Submergence Rescue Vehicle. Of course, those of you who know of that program understand what was involved there. I served two years there, and then the Office of Naval Research decided to involve NAVFACs in the Tectite project. The Tectite project was, of course, an underwater research project created principally to do scientific work using saturation diving. This was shallow saturation diving.

It involved General Electric, who built the habitat, and the Department of Interior, who had two geologists and a biologist there, as aquanauts. The function of the ---- engineering command was to basically provide the facilities for that operation. I should backtrack a little bit and say that in my role as Man in the Sea branch head at Deep Submergence Systems Project, PM-11, I became a diver and trained in the ---- Navy Yard. In fact, I swam the Anacostia River with my radium-dialed, or luminous-dialed compass glued to my faceplate, and I was only eight inches under the surface of the water.

Anyway, I was detailed to the NAVFACs as the PC-2. I have forgotten exactly what PC-1 was in NAVFACs. Anyway, that program office, of course, was where we started putting together the underwater construction teams and so forth. Tectite was done in the Virgin Islands, and I don't know with how much of this detail you're familiar. I guess I'll err on the side of detail. Basically, the project was a two-story habitat. This Navy underwater construction pre-print that I'm leaving with you shows some of the details. But there was this two story underwater habitat placed in Lampshire Bay in the Virgin Islands, St. John, and General Electric Corporation constructed the habitat. The National Aeronautics and Space Administration (NASA) was involved because one of the purposes of the project was to find out what happened to people under isolated conditions.

They couldn't come to the surface under some sort of threat environment because they were looking at post-*Apollo* flights. Therefore, NASA was involved. The Department of the Interior was

involved with the geologic survey, and there was one other Department of Interior organization also involved.

We essentially installed the habitat and put down, throughout Lampshire Bay, all of the facilities that communicated to both the habitat and shore-based station, including underwater refuges. We put all of the life support systems on an ante-pontoon and jacked that up out of the water in-shore. We used guardways for the landing, the transport between the offshore platform [and...]. St. John is a piroclastic-formed island. It's very steep-sided. We were out in the bay, so there was a need to transport back and forth to our shore base, which the Seabees built, the amphibious battalion. Amphibious Construction Battalion Two (ACB-2) was what I used. I went there as the commanding officer of that organization and had an ACB-2 officer under me, Jerry Pachillo .

Anyway, we went ---- went down and built the base camp, which was basically a base camp that provided personnel support. Then, at a distance from the base camp, at the bay, were these pontoon causeways. We then used those as a [pier?] to transport. Then, offshore, over on the side of the island was this ante-pontoon that we jacked up out of the water on hard rock. It had the helium source there. This was a helium auction diving operation with, I think, one percent helium being in the mix.

We then, of course, had the habitat to place. The habitat being a two-story structure, we had to get it down somehow. It had to go on a landing ship dock, and the landing ship dock, of course, couldn't bow us down far enough to get it on, so we mounted it in the Philadelphia Navy Ship Yard on an ante-pontoon. We transported the ante-pontoon on this landing ship dock down to Lampshire Bay, floated it off, and then drove piles through the spudwells and into the sea floor, which was sediment. Then, we attached winches to the top of these pilings, and the ante-pontoons were repaired by cutting holes in the bottom and putting a manifold on top so that we could sink it. But the winches were used

to stabilize it so that it wouldn't roll over when we started flooding it. We had various compartments. We had this thing compartmentalized so that we could flood various compartments to maximize stability. Still, you had to have some means of stabilizing it. The interesting part of that process was that we did the test down in Little Creek. Is that what you still call that area, Little Creek?

INTERVIEWER: Yes.

CDR EAGER: That was in Norfolk. There, we had some wave action. In Lampshire Bay, being on the lee side of the island, there wasn't much wave action. The tests were not performed in realistic conditions. We got down to Lampshire Bay, and drove the piles into the ground through a template. We got ready to put it down. There was a tendency, even with the winches, for the pontoon to jam up on the piles. The interesting part of this program, which became nationally publicized, was that it attracted *Life* magazine, the whole works, and it attracted all kinds of people.

Lawrence Rockefeller, who was the owner of the resort on the other side of the island, and quite a bit of St. John, was there. *National Geographic* was there, covering it. All kinds of newspapers were there, including the Associated Press stringers. As we were trying to do it, these people were circling around the launch platform, watching this going up, and we didn't make it.

I should also say that Phillippe Cousteau and his wife were there. In fact, I escorted them around the site, underwater, and so forth. I think he was the one who was killed in a shark attack. Anyway, it came out in the St. Thomas newspaper's headlines the next morning, "The Unsinkable Molly Brown." You can understand the pressure that was on me, with all this publicity, and the potential problems for our program if we didn't get it done.

I spent a rather sleepless night figuring out what was wrong, and went back the next day and took very small increments of control. I had one Seabee in a crow's nest on each of the piles with his winch, and by commanding this thing in very, very tight increments, and very carefully controlling the

manifolding, we got it down. Once the habitat was down, it was a floater, and we had to add lots and lots of ballast to the base of the pontoon to get it down. We actually moved it on over to the site.

We did a number of different things. Once the facilities were all installed, it was then a matter of a salvage officer, and I don't know how much of the politics you want me to discuss. Anyway, I guess you should know that there was a major political problem in getting this program started.

The director of salvage, who was a very strong-minded person, had decided that he wanted control of this program. I was equally determined. Since it was a new program, no NAVFACS, there wasn't a lot of understanding of the program in the command structure. The whole matter of doing things rested with me. I, as a commander, was dealing with this captain at the supervisor of salvage [office], and it took a lot of very, very strong will to keep that program from absorbing this program.

However, there was a compromise that had to be made that the Office of Naval Research sort of negotiated. In fact, let me just tell you the whole story. When we arrived on St. John, a supervisor of salvage officer, a limited duty officer, was there to greet them and immediately tried to take charge of the Seabee unit.

Of course, I didn't let that happen. Anyway, he ended up staying on the island and caused a lot of problems with the enlisted men. We had line Navy boat drivers, coxswains, to run our mail back to St. Thomas and supply and that sort of thing, and they were line. Of course, he tried to take charge of them.

One of my coxswains got into trouble going into St. Thomas. There was a lot of shoal area there, and he ended up puncturing one of the boats. I heard about this, and I knew it was going to create problems. I jumped on the other boat, and went on in and tried to figure out how we could salvage this thing and get it out before this guy started causing problems. He finally found out about it.

Unfortunately, in order to sort of appease him, I agreed to let a bar be built there in the base camp, and

this fellow had an alcohol problem. I should mention that this concerned me with regard to the development of our program. The salvage divers were pretty heavy drinkers. I could see that as a problem for us because we had to deal with things that were much more precise and controlled. We didn't need somebody coming in the next morning with a hangover.

Anyway, this guy got hold of my coxswain in the bar one night while he was under the effects of alcohol, and chewed him up one side and down the other. I wasn't there, of course, but the coxswain came to me and said, "Commander Eager, I just can't drive anymore. My confidence is completely ruined." Of course, we were depending upon these coxswains to drive our boats.

Well, I got on the shoreline. We did have some telephones there, very poor telephones, but I got on the radio and radioed SEABEEPAC. I told him to get this guy off the island. No, I should say SEABEELANT. I called COMSEABEELANT's office, and told them to get this guy off the island. He was sent back to St. Thomas, and he set himself up in the public relations office there, so that solved that problem. Well, anyway, we got the habitat in place, and we had to have a ballast, which we brought ashore. We had causeway sections in which we had our equipment mounted, in addition to ante-pontoon on which the habitat was, and the ante-pontoon on which the support system for the habitat was. We had causeway sections loaded with our trucks and various other mike boats. We had mike boats and various things like that. I have to go back in my memory, and this is the first time I've really reviewed this in a while, so some of the things that come out shouldn't be for publication. Anyway, I'm following my nose here.

Incidentally, I brought the engineers from NAVFACS down with us. Don Potter was a very fine engineer, and we used him. Of course, all of the design and everything was done under my direction, using the engineers at NAVFACS. They came, and I trained them. I had the design background. I also had all of this life support background from having gone through the course at the

naval post-graduate school, the nuclear engineering course, because it had all the life science involved, so I could completely understand that.

Then, having worked with Dr. Bond and the others in the Deep Submergence Systems Project, I had full understanding of that program, and could direct and supervise all of it. There was nothing that I didn't have control of. Therefore, I could deal with the challenges from the supervisor of salvage and so on. I also had the respect of the Office of Naval Research, so that helped a lot. We got the habitat in place and put out these weigh stations that the divers could have refuge in.

Prior to doing that, of course, I took everyone on a night-diving exercise, for which we actually went out by boat, peeled off of the boat while underway, dived down and searched the areas and so forth. We were very concerned about sharks. In fact, we had some problems of remoras while we were working there. Lampshire Bay, being a tropical area, develops a lot of plankton, and the remoras are almost as big as sharks down there. We had one diver who was fairly robust, and the remoras loved to come in and try to attach to him, as they do to whales and sharks, I guess. They would circle out around us, so we'd have to be concerned.

We had bang sticks. They were basically poles that we had constructed, with shotgun shell detonating devices, in case we did get attacked by a shark and were really in trouble and couldn't get away from it. We had those sticks right at our sides. Those remoras would cause us some concern. But finally, we got used to those, and we didn't have any shark problems in the daytime. At night, we found that the nurse sharks would come in and settle on the bottom. Of course, the aquanauts that we were going to be dealing with were going to be doing night operations. Because I was to become the safety diving officer, and the salvage officer was going to become the operations officer, once the project got underway, I wanted to do a complete survey of the area and find out what the hazards were. The remoras and poisonous eels were part of the threat.

Anyway, we got the habitat down, and we got the aquanauts into the habitat. We, of course, had a hyperbaric facility on the support platform. The aquanauts got down, and they had never worked in this environment before. Of course, back at the Deep Submergence Systems Project, we had Scott Carpenter and all of those guys, who were very seasoned. These guys were completely green. They were good divers, but they didn't understand all of the elements of the problem. They were mostly scientists. We had to be really concerned that they might get so involved in their science that they would end up not doing what was right. They were using hooker [hookah?] rigs, incidentally. Their air supply was back in the habitat. They had both oxygen rebreathers and hookahs. They used hookahs a lot. This was basically a habitat-supplied line that ran out through a mask. I don't know if you're using those now today. But it turned out that one of them proceeded to swim out and failed to turn on his supply. He got out a long ways on just the residual in the mask and tube. Suddenly, he decided that he didn't have gas and came swimming back. He barely made it.

That kind of thing concerned us a lot. I was a safety diving officer. Of course, the salvage officer was in charge, and he decided to raise heck with these guys. Well, they weren't about to take orders from anybody. We had a close circuit television in the habitat, so we could see everything they were doing. That enabled us to know what was going on and allowed us to intercede in case there was a problem.

INTERVIEWER: Were the divers civilians or military?

CDR EAGER: These were civilians. Yeah, these were civilian scientists who basically worked for the Department of the Interior ---- survey was one, and one was a geologist. I think the other two were biologists.

INTERVIEWER: Okay.

CDR EAGER: This was, of course, Tectite I. There was a different mix on Tectite II. Anyway, they

had decided that they were going to thwart the whole operation, in terms of safety. They proceeded to put a t-shirt over the closed-circuit television, which cut us off completely. The decision was made to not pull them out, not to go down and take them out and let them go with a warning. We still had oral communication there. Things went rather well from that point on.

Having, of course, been brought in from the Deep Submergence Systems Project six months before we had to go to sea, I think, I had done everything I could do to get the project ready. We were supposed to have the habitat down in December of 1968, I think. I could be wrong on some of these dates, but they are in the paper pre-print.

While I was down there working as a safety diving officer, I thought, “Gee, wouldn't it be wonderful if we could start the underwater construction teams in an experiment?” Incidentally, this was a medical experiment, or an experiment that involved approval from the Bureau of Medicine [and Surgery?]. I figured, “Wouldn't it be great if we could go down there and start doing underwater construction on a saturated diving basis like what we had been doing?” Of course, we had brought devices to test soil strains and all of that stuff, so we had already done a lot of this work. We thought, “Well, it would be interesting to do this under saturated conditions.” I wrote a proposal and went back. I left the team there, and went back to Washington. At that time, NAVFACS was over in Arlington, Virginia. I worked with the Bureau of Medicine [and Surgery] to try to get this approved. But the policy required a long lead-time for getting approval to use human subjects, and I failed at that. I went back to Tectite a bit disappointed, but understanding that that policy was pretty rigid and there was a reason for it.

Back there, we completed the project successfully, and as I said, we had many prominent visitors from the Cousteaus to *National Geographic* and the whole works, and got lots of publicity throughout the country. That was helpful because it had some influence on how the command

structure at NAVFACS viewed us. It was really important that we didn't fail. Of course, as you all know, when you go to sea to do something, you can't run to the hardware store. You've got to have everything planned out precisely. You've got to have every I dotted and T crossed, and you've got to end up making very sure about the safety aspects.

We succeeded in everything that we had planned to do. Oh, there were some interesting incidences. The saturation depth was, I think, forty feet. The entry well for the habitat was at forty feet water. The saturation depth was forty feet, but it was still saturation diving because those guys had been down there for months.

One night, we ended up having the water bladder. Of course, we had to bring water in from St. Thomas, and it came in bladders. Basically, the bladders the Seabees used were gasoline bladders or something like that, rubber bladders. Those were, of course, up on the support platform, and there was, incidentally, a command center up on the support platform with all the televisions. It was a van up there. One night, all of a sudden, the bladder went flat, so I took a team of divers down. We followed the supply line out to the habitat and found that there was actually a separation in the line. In the course of doing so, we were, of course, using lights, and as we were swimming along, we could see the sharks and the poisonous eels on the bottom. Anyway, we saw those. Of course, when we got back, some of them came up, and when we got back to the camp, the base camp, we mentioned what we had seen. They were three or four-foot sharks. I won't tell too big a fish story here, but they ended up being six and eight foot sharks. Most of them were nurse sharks. Of course, in the southern hemisphere, they're on a severity rate of two, I think. But in that area, they were so well fed. Incidentally, Lampshire Bay went down to about sixty feet. Then, as you went off there, it dropped off [to an abysmal?] depth. It was a really interesting area with lots of sea life.

The coral was just beautiful. It was all formed up on the side of this island, the piroclasts, the

igneous rock island, and it was just beautiful. You'd go touch them and they'd just pop in, flowers and so forth [?]. It was beautiful. Anyway, we completed that project. It turned out the ranger station for the national park was on that island. The ranger's house was on that end of the island, and there were lots of tourists who came to Lampshire Bay because, unlike Camille Bay, which was effected by the storms, this was on the lee side.

When we went down and built the base camp and installed templates and so forth, we came back on the deployment with the LSD, or landing ship dock, and had things ready to go. We had the diving barge down there. I have to work the webs out of my memory. I was just trying to figure out how we got that diving barge down there. I guess that came down to the final deployment. Anyway, for liberty, we would actually take the diving barge over to [Salt?] Island and some of those places, and look for wrecks. At about the turn of the century, there was a royal ---- steamship line that got caught in a hurricane. It went down and broke up in thirty feet and sixty feet of water off [Salt?] Island, and it was our target. We went out there with ---- on the back of this barge, which were basically pontoons. That was how we gave our divers wreck diving. We went down and took pieces off of the ship. There was a cannon on it, but we worked pretty hard with just scuba gear. We weren't able to get too much off, but we got bottles, porthole nets and stuff like that, which I think the Seabee divers really enjoyed.

Now, we'll go back here. I guess I had better just go ahead and provide all the linen here, dirty and otherwise. I've got to tell you this. When we went down to build the base camp, of course, we deployed with ACB-2. The Seabees from ACB-2 did the base camp construction.

INTERVIEWER: Were the Seabee divers part of Fifth Seabee II at that time?

CDR EAGER: No. Those were UCT-1.

INTERVIEWER: Okay.

CDR EAGER: Yeah, the divers were UCT-1. I'm pretty sure that's right.

INTERVIEWER: Right, those were the east coast organizations.

CDR EAGER: ACB-2, okay. Well, I'll tell you. You need to check that. You have to realize that this was 1968. That was 35 years ago, so I'm a little bit off on this. Let me flash back one more time to when we were doing the preparation of the ante-pontoons. Of course, ---- was at NAVFACS when we were doing this, and ---- was very interested in this project, so we consulted with him quite frequently and came to understand his ante-pontoons very, very well. He was a very, very impressive fellow who has done a lot for the corps. Anyway, ACB-2 actually did the modification of those ante-pontoons to create the platform on which the habitat was to be placed.

I've always felt that on these new projects, the officer needs to get right in there with the enlisted men. You've got to know what you're commanding. During this work, we had to cut holes in the compartments of these ante-pontoons, in the bottom and in the compartments and prepare them, and I made a practice of going in there while the welding was going on to inspect everything that was done because it was my responsibility. Of course, what customarily happened was that an unrated or third class welder or steel worker would be doing the work, and those above him would be sitting back and having coffee in the ward room. On the first day that this work started, I crawled into that ante-pontoon, and pretty soon, I had the chief and everyone else right down there with me. They came to understand that it was a project that you did not end up delegating to your lowest rated man, and that worked out well.

Okay, now, we'll go back to Tectite. The project being over, of course, we put all of our equipment back on the pontoon causeways and got the ante-pontoon with the support platform jack down, and got the habitat back on the ante-pontoon that we sunk down to load it. No. That's not correct. Actually, let's see. I think we may have floated the habitat. We dumped the ballast. No. We

kept the ballast. Anyway, I think we floated the habitat. Oh, I should also say on the way down, we hit a storm off Cape Hattaras, and that was the storm of all storms, at least for me. Of course, the gear was all latched down and so forth, but this ship really was in a terrible roll condition. You could hear the stuff moving around in the well deck of this amphibious LSD. That created a few moments. I think there were only saltine crackers eaten for a couple of days on that whole ship. The Seabees got a good chance. Well, of course, they were used to it.

Anyway, getting back to Project Tectite, we got everything ready to go. I had two junior officers down there, one ensign and one lieutenant, I believe, with ACB-2. Of course, they had great expertise in dealing with amphibious equipment, and that was very helpful. The landing ship dock was to come get us. You have to understand that this was a time when Navy budgets were extremely tight. One of the things not happening was the maintenance on our landing ship dock. The captain of the ship was supposed to come into Lampshire Bay, well inside of the area where lee was created. Then, we'd load there. That was what was agreed to. We went aboard and had the pre-loading conference, and everything was set. They were going to stay in there, in Lampshire Bay, and we were going to load from there. Well, it turned out that a squall blew up that night, and because of money restrictions, the radar and so forth on the ship, the radar, principally, was not working well. The ship captain got a little goofy about this thing and moved out into the open sea. The next morning, we got ready to load, and I had radio communications, walkie-talkies, to the ship. The captain said that he was not going to come back in, so we were to load out there. I debated with him for quite some time because I was quite concerned about this. The sea had calmed somewhat, and I thought he should be able to come back in, but he wasn't about to. I agreed to let the deployment go on out there. Now, I was staying on the island. I had invited my wife, mother, and kids to come down, and we were going to spend some time there while the rest of the crew went back. We went to bed that night. Actually,

we were staying at the ranger's house, and I could see everything there, way above. It was during daylight. The causeways and the mike boats with the causeways hooked to the sides of them and so forth went on out.

The habitat was already in, and the support platform was in. No, that's not quite right. Anyway, they got out there and a squall developed. The causeways were beating against the mike boat, and the ship, of course, was headed into the wind. They couldn't beat their way up to the ship. I was becoming very, very concerned because I was watching this with a pair of binoculars. This went on for hours. Finally, the wind abated a little bit, and I could see the lights from the trucks that were on the causeways come up toward the landing ship dock. They had been at once before [?], but they failed to throw them a line to secure these, so they drifted back and got beaten up some more.

Finally, at about midnight, I saw the lights on the truck actually merge into the well deck of the LSD. I breathed a sigh of relief and went to bed. I got up the next morning, and there I saw a mike boat and a causeway section drifting free. It ended up down on a reef down island, down the shore a ways, and the other mike boat was coming ashore with a causeway section.

Oh, and then, the mike boat decided to cut the causeway loose, and it drifted down the island with the truck. I guess there was just one of each of those. As they got back into Lampshire Bay, I saw the junior officer stand on the side of the mike boat and ceremoniously take out his wallet, throwing it into the well deck of the boat and jumping into the water. That really surprised me. It turned out that the causeways punched a hole in the mike boat, and it was sledding. Well, again, I don't think I can be court marshaled for this now, so I'll tell that part of the story, too. It turned out that I was so impressed with these Seabees that I had worked with, and there was a problem on that island.

We were on the remote end of the island and there was just nothing for them to do. This was one of the reasons I agreed to letting a barbie set-up, which was a very serious mistake. I allowed one

of my officers to put a motorcycle on board one of the mike boats, which was strictly against Navy regulations. Let's see, did we have two on board? I think we might have had two on board. The mike boat was coming back. It had this motorcycle on it, so I could see a big problem for the Seabees, and for me, if a salvage officer came to rescue that mike boat.

I was determined to salvage the boat and get that motorcycle off. I had kept some diving gear there, or I rented some diving gear from the local diving shop. Anyway, the park service had a boat and a little submersible that could be towed, so I searched the bottom of Lampshire Bay to find that mike boat. Incidentally, the Seabees who were on board the ship stayed there. The Seabees who were on board came ashore with some coxswains from the mike boat, on a personnel boat. It turned out that their equipment on the ship was so bad that they could not communicate. Their communication gear for messages between the ship and the shore didn't work. My wife's pocket mirror was used to send light signals to the ship to communicate as to what was going to happen.

My kids, of course, were four and six or something like that, and they saw the Seabees coming ashore, the few Seabees coming ashore, and they were really impressed. Of course, when the sea rations came out, they were even more impressed. They arrived the next day. Because the storm had died, we decided to try to recover the causeway sections.

What had actually happened was that the causeway sections had damaged the mike boat. There were supposed to be two of them coming alongside each other into the well deck of the LSD, but it turned out they wouldn't fit. That was why they got pushed back out that night and got beaten up. That was why we had the sinking. Anyway, we got the motorcycle off of the boat with the salvage bags, which I think I had also rented, and brought it over into the adjacent bay. I've forgotten which one that was. We moved that motorcycle over until it grounded out in the bay. There was a group of school children on an outing, a teacher, an old fellow and so forth, and all of a sudden, this group saw one of

our chiefs wade out in his green and khaki camouflage uniform, and wade out into the ocean, into the bay. Then, they saw the two divers' heads emerge. Then, all of a sudden, they saw this chief coming out of the bay.

My wife was there with all of this, and the old fellow said, "Well, I'll be darned. I'll be darned," so it was really pretty humorous, but not so much for me. Anyway, we got the junior officer's motorcycle back, but it was kind of spoiled. I went on board the mike boat, on board the landing ship dock, up the Jacob's ladder and all, and we had a conference to figure out what was going on. It turned out that the captain had an appointment in Puerto Rico, and he decided he wanted to go back.

Anyway, I called. The telephone was still operating. I called COMSEABEELANT and told him what was happening. When he got to Puerto Rico, he was told to return and came back. I guess he actually took off. Once the mike boat was ashore, he took off. I was furious over this, so I called COMSEABEELANT and told them what was going on. They ordered the boat back, and the boat came back, and we went aboard and did a planning conference to try to figure out how to salvage these things. It turned out that the captain still was very reticent, so they took off. I guess they ended up selling the salvage boat to take the causeway sections off, and the mike boats. Anyway, that was kind of the story.

Now, these things are important because, again, they tell what kind of pressures, concerns, and things that we dealt with in that early part of the program. I should also tell you that there were some really interesting race relationship problems there. This is late enough now that it's not going to affect anybody's career in the National Park Service.

When we first arrived on the island, we had a conference with the park ranger. You have to understand that the park ranger there, that billet, was a stepping position to the director of the National

Park Service because it had a lot of prominence with regard to congressional visitors and so forth. In fact, Lady Bird Johnson and her family were down there. They were taught to snorkel by one of the guides down there, one of the black guides with whom we worked, in fact. It was a really prominent position. This fellow was on sort of a political hot seat. There were black and white population on St. Johns, but it was predominantly black. The schools, though, were completely integrated. There were very jealous attitudes among the whites and the blacks about their relationships. They felt this relationship was extremely strong, and that there was no bias in the system and so forth.

Well, you have to understand that historically, this was a time during which there were some activists who were trying to stir up black hatred here in the United States, and particularly in the Caribbean islands. You can recall the history of Grenada and that sort of thing.

There was a guy who had been the head of the Congress of Racial Equality, Roy Iness , and his wife was the administrative assistant to the governor of St. Johns. In fact, I was invited over to spend a few of my leave days at that house. He spent his time in St. Thomas, and I got to know Mary Iness very well.

The two were either separated or divorced. Roy was running around the Caribbean islands, trying to get a black power movement started, a hate group, and Mary would have no part of that. Mary basically told me about the situation, but that was after, of course, I had interacted with the Park Service superintendent. He wasn't a ranger. He was park service superintendent. Anyway, the superintendent told me to try to keep my Seabees separated from the black population because he was concerned about race relationships. This was when we were building the base camp. We had been on the island for ten days, and because of the time pressures we were under, I didn't give liberty to anyone for ten days. All of a sudden, the park service ranger got a call from the ---- *Amali* newspaper, of St. Thomas Island, saying that she heard that there was a racial bias going on here because we were

not allowing the Seabees to come into the community.

Incidentally, I think that was one of the reasons that we brought the motorcycle there. We were concerned about what the guys had to do, and particularly because we were warned ahead of time. Anyway, the park service ranger called me and said, "We got problems," and I said, "Oh?" He said, "There's an accusation that there is racial bias going on here, and we need to deal with that. I need to come over and talk to you immediately." He came to me. As an aside, these were formerly Danish islands. You drove on the left side, and the roads to that end of the island were really bad, but he made it in record time. We sat down and he said, "You know, we got this problem. I'm going to rescind everything I told you." I said, "Hey, there's no problem. First off, our guys haven't been out there because I didn't give leave or liberty, so that's what we tell the newspaper." That solved that problem.

However, from that point on, we brought black people into the base camp, and we had dances there and all sorts of things. It was a really interesting island because it turned out that when the Danish left there, they vacated these sugar lands. The island was basically a sugar production island, and there were no slaves to work there. Slavery had been abolished; there were no slaves to work the plantations, so economically, they went down. A lot of the land went back to the blacks who had worked the land for many years. There were guys with baseball caps running around there who owned a lot of the islands. We got to know these people. They were really fascinating people. It was really an interesting cultural situation for our Seabees and everybody involved.

INTERVIEWER: Seabees, even today, still do a lot of outreach programs on behalf of the State Department.

CDR EAGER: Yeah. That was an interesting aside. You can see that we had some pretty fascinating times getting this program started. Well, we went back, of course, and with all of this publicity and having kept under control all of the problems that developed, the organization became quite accepted

at NAVFACS.

Now, I don't know if there was actually BC-2 was actually in existence when I left on this project. I think it was. A guy named Whitey Oden , incidentally, was back at NAVFACS as a civilian, and he was a very good person. He helped a lot. He deserves credit. He probably didn't get as much credit as he should have.

We came back from that operation. Of course, ONR was very pleased with the outcome. I think everyone was. We came back and got the base going for the team. Now, what's failing in my memory right now is whether we had an underwater construction team at the amphibious base or not. I know UTC-1 was involved. UTC-2 was out in Port Wahnemie . We used UTC-1, from Davisville. I don't think there was anything at ACB. I think everything was UTC-1.

INTERVIEWER: Okay.

CDR EAGER: We came back. Then, of course, we started organizing. There may not have been a UTC-2. Well, I'm sure there was.

INTERVIEWER: They were both established at the same time.

CDR EAGER: They were?

INTERVIEWER: Yeah, or they were both commissioned at the same time.

CDR EAGER: Okay. Well, you're going to have to check that history because I've forgotten whether we got them started ahead of time or not. Anyway, we got them well organized.

INTERVIEWER: Were these a part of the regiment at that time? They were so like ----.

CDR EAGER: Yeah. I think that was it. I'm sure that was it. I've forgotten all the things we did to get prepared there, like whether they went into training while we were doing the engineering or what that was, but it was something like that. Now, we went back. Let's see what project came up next. There were two projects. ——— was one of them. What's in this book, or in the photos at least, is the AFAR.

Let me talk about the AFAR. I've forgotten now whether — preceded AFAR. In any event, NAV— got really interested in us, and again we had established ourselves independently of the salvage Navy by that time. The Naval Research Lab in New London wanted to put an antenna ray on the sea mounts off the Azores Islands, and the antennae were to be a test facility to determine whether we could actually go through the water for direct communication from submarine to submarine. These sea mounts were very sharp mounts that came up within 1,000 to 2,000 feet of the surface of the ocean. This was a NATO nation project. Now, that meant it wasn't a NATO project. It was a NATO nation project that also involved France. We actually did the test in the — range on this thing, but then there were other — projects as well.

In any event, we put together a cable laying ship from Italy, on which I deployed for a while, and we had a French ship for in-placing the antenna and a German ship that supported the diving operation that had to occur at the surface before the antenna went down. Of course, we were self-sustaining from the shore, with regard to the in-shore cable.

There was a laboratory on the top of the island. The cable ran down, over the land and into the in-shore zone, and over rock, incidentally. The sediment went to sea each winter, so our responsibility was principally for the in-shore portion. We used cast iron armor and anchored in that in-shore zone. But I was involved in other parts of the operation. Bob Hudspeth ,who had been aide to Admiral Hudson , was my junior officer. Bob actually went on and got his Ph.D. at Florida Atlantic, I think, under Dr. Dean, and is now a professor at Oregon State University. I see him fairly often.

Anyway, he and a couple other officers wanted to get as many people involved in this thing. We started getting some input from the ocean engineering post-graduate program. That project was carried out pretty much, I suspect, similarly to what you are doing now, with regard to in-shore cable.

We had to do some blasting of rock in certain areas with plastic explosives to prepare the path. Then, they would put this armor on. We then anchored the armor because it was pretty rough.

INTERVIEWER: Was that like a split pipe?

CMDR. EAGER: Yes. Anyway, I participated in part of this project, but we then had a lot of organizational work back to do at —, so I left Bob Hudspeth in charge and came back and prepared for this thing.

I was involved in the testing of the launch. We did that in the — range. I directed the design of that. Again, we had really low budgets and once again turned to the ante-pontoon. As you can see in this picture in this paper that I've provided, we took an ante-pontoon and put individual pontoons alongside on the corners. We then used salvage bags and basically brought that array to the island. Which island that was, I don't know. It's in the paper, anyway. We prepared it.

As a practice, I would take my junior officers, and we would go through a stress analysis even after all the engineering had been done and we got there. We'd go through a stress flow analysis all the way from the top of that antenna down through all of the structure to look for potential local buckling and that sort of thing. We calculated in our minds what was going on so when we got to sea, anything went wrong [?]. All of that was completely in our minds. We know exactly what was happening, structurally. Basically, we were going to put this thing out.

Now, the weather out there was too severe for that kind of work, so we set up the weather watch. The wind direction changed when storms passed through, because this was on the windward side of the island. We ended up taking this from the island out to where we had to launch it. It was going to be going down in, if I recall correctly, 1,500 feet of water.

Of course, I had gone aboard the — that was provided by the Canadian, I think, to do the survey work underneath, on the bottom. This thing had an anchor on the bottom, and it had buoyancy

at the top, the antenna did. They were hollow-tubed antenna structure, and they were pressure-compensating.

In other words, once the antenna started lowering, seawater would come in through a lithium high dried bed, generate hydrogen, pressurize the inside of these flattened, hollow tubes that were in an antenna ray, looking somewhat like an antenna from a satellite. But instead of being solid in the back, like a microwave, it had spaces between the tubes, which show up in the picture here [visual].

We went out and basically flooded the pontoon again, this time using salvage pontoons at the surface to stabilize, as well as the fixed pontoons, and winched from the salvage pond to the platform down until we could float the antenna ray off of this pontoon. The antenna ray was way up above the pontoon. We had to be really concerned about stability problems.

Well, we got it out and went down, did this experimental work and then recovered it. When we recovered it, as we were coming back, again we watched for the weather to give us the condition. I was on the platform on the barge, in command, so this was a command at sea project whether the Navy knew it or not, and there were no salvage people around. There were no line people around.

When we were coming back into port, a storm blew up, and this was serious business. Fortunately, I had done a lot of sailing and understood the sea, with regard to how it works, and I managed to basically tack back into port, so we got in there to port safely, got the project put to bed and flew out the next morning, having worked all night.

Actually, we brought it in at night. This whole structure was brought in at night. I think we finished up at 6:00 in the morning, caught an airplane and flew back. We had no trouble sleeping through an eclipse of the sun on that trip back.

The other one that I participated in was the installation associated with the test of magnetometers for submarine detection in the —— range. Let's see how much of that I remember.

Compared with these other projects, it was not so notable. The devices we put down were fairly simple. Oh, I could tell you a little story about one of the things that occurred while I was [?] a deep submergence systems project, or possibly while I was a PC-2, probably a PC-2.

For experience, I went out to the Bermuda range, and of course, there were sensors out there, basically sound sensors. One was put down on the bottom, floating up from a radio isotopic generator. I think the Naval Electronics Laboratory in New London did that one, too, and it had been put down five years earlier. Of course, it was down at about 16,000 feet. I think it had some problems.

We took one of the ATT cable ships to go and recover it with a grappling hook. There were cables strung out that you could grapple and bring back. I guess that was the most impressive corrosion exhibit I have ever seen. It was, of course, mild steel. When it was pulled out of the water off the bow of that cable ship, you could see the label of the naval laboratory. It was in perfect condition, with no corrosion whatsoever. You could see the red growing on this device as it hung off the end of the bow, a really impressive sign. That was principally it. The rest of the work was done back at NAVFAC. By that time, things were going well, people were well trained, and deployments to Iceland were occurring. I continued on until 1974, building the organization and dealing with the organizational problems associated with it.

INTERVIEWER: Let me get a little background information. That was a great story, a book in itself.

This is great stuff, but I want to get a little background. When and where were you born?

CMDR. EAGER: I was born in Butte, Montana, in 1931.

INTERVIEWER: Where did you go to school? CalTech?

CMDR. EAGER: Yes. I went to high school in Butte and was selected to CalTech in 1949. I went there to study physics, actually, and decided after I was there, engineering was the better course for me because the competition there was extremely intense. There were 700 undergraduates and 700

graduates. The IQs for the physicists were out of this world. Something like 140 was the minimum. I studied engineering there, and it was a very broadly disciplined course. Although it said 'mechanical engineering,' it was an all-across engineering. I studied geology there, too. That was a required course at Cal Tech for sophomores, and it was a very analytical program.

When I left there, I went to design amphibious vehicles for food machinery preparation. Some of the amphibious vehicles that you see in Iraq are successors, or descendants, of those we built, the M-59, the T-119, and the Marine and Army vehicles. Then, of course, I was selected to the naval post-graduate school to the nuclear engineering effects program. I taught nuclear engineering to the engineers and officers who actually designed the missile facilities for the Titan and others. We were teaching those people at ——.

INTERVIEWER: That's interesting. This was all before ocean engineering even was ——?

CMDR. EAGER: That was before, yes.

INTERVIEWER: Did you ever play sports or any other extracurricular activities during high school or college?

CMDR. EAGER: I played tennis.

INTERVIEWER: You talk about why you came into the Navy, but why have you agreed to be interviewed today?

CMDR. EAGER: Well, I'll tell you. I had second thoughts. Jim Osbourne approached me once, and I was pretty busy as an engineering consultant. I've done a lot of work in ocean engineering, ocean mining, incidentally, and a lot of work in the corrosion control of concrete bridges on the west coast. I was extremely busy, and I rationalized that I really thought NAVFAC ought to be looking forward instead of back.

Sometimes, I think we spend too much time looking back. My career has always been spent looking forward, and I've had one of these wonderful projects after the other from nuclear power, nuclear engineering effects work, missile silos, and all that stuff. I didn't have a difficult career. Incidentally, I was continuously warned by admirals and captains that I wouldn't make commander if I didn't move out of that specialty, but I said, "I don't care."

INTERVIEWER: Some things just don't change.

CMDR. EAGER: Right. I was determined to create the conditions while I turned my back on the nuclear power program. I was determined to make the ocean program because I could envision its value to the Navy. I was determined to make that a program in which we did have officers who were as respected as the people who had the typical career pattern. I was scheduled to become the head of the laboratory there as my next duty assignment. I had stayed, of course, in Washington, to make sure this program was on a solid basis before I would leave.

It turned out that at that time, there was a lot of problems in the area with school, drugs, and so forth. One of the civilians I knew said that his daughter was continually forced to flush narcotics down the drain. I wanted something better for my kids, so we decided to head off to Corvallis. I settled in Corvallis, where there were some facilities for testing ocean systems with the principal consultant, International Nickel Company, on manganese — mining. That turned out to be a cover story, but it was still an interesting program. It wasn't the International Nickel part of it. They got sucked into it, and while I was with NAVFAC, incidentally, I held — at about Op 23, so that told you a little bit about what was going on. I didn't know.

INTERVIEWER: You were involved in that?

CMDR. EAGER: Yes. Then, of course, I went on. I didn't think too much of looking back. Well, as you grow older, you grow a little bit wiser. I started thinking, "Well, maybe this is needed, as a tool

for motivation, for the understanding that we really need diversity in the civil engineering corps.” We probably lost something when we got rid of the draft. That was the only reason, probably, that I ended up in the civil engineering corps.

We need diversity, not just what you get from academy or ROTC, but something broader than that. I don't know how you can get that now, but I'm not sure it isn't really important, because there may be something that the Navy needs to be doing now completely different from what ocean engineering. I'm just extremely pleased to receive your briefing today and understand what has happened with the program. Everything that I had envisioned has happened and even more.

INTERVIEWER: That's great.

CMDR. EAGER: But it's important to communicate. The paradigm is of value to us because it gives us tradition, and it gives you opportunity to recruit and continue to do things you've been doing. Vision is extremely important, too, and it was vision that got this program going. That is one of the reasons I'm doing this interview. Another reason is that I can see there's some advantage from a recruiting standpoint.

INTERVIEWER: I think some — ought to stay — where we came from. I want to talk a little bit about diving because the focus on the oral history program for the ONR side is really the diving track. You first got into diving as part of the DSRV program?

CMDR. EAGER: Actually, my program was the Man in the Sea program, which was man-diving. The DSRV, of course, was a vehicle program, but I was sitting right next to it saw everything that was going on there. I should mention, incidentally, a little bit about how there was real recognition of our program, and I can tell you about some of the elements of that. I was awarded the Legion of Merit for work on project Tektite, in fact. Senator Warner was the one who, as Assistant Secretary of the Navy, awarded that. There were awards given. I think the Navy commendation medal was given to my

senior chief. From the deep submergence system project, I got the Navy commendation medal, and from NAVFAC, I got the meritorious service medal. In terms of medals, that shows that there was a basis for this program being recognized.

INTERVIEWER: Were you always motivated to get into diving or did you have a mentor who influenced you into that direction. Did you just fall into it?

CMDR. EAGER: No. When I go into any project, I go into it a hundred percent. There was no way that I wasn't going to be a diver when I was managing diving operations. Now, let me tell you, I wasn't a good swimmer. I had one heck of a time passing my swim test at OCS in Newport. I was a little weak when I got here and trained from one of our civilians at DSSP. I trained in the Bethesda pool. Diving, per se, has not had a major impact. What has had an impact, of course, is the engineering experience that I developed while in this program, including the construction experience, which was a vital part of the engineering experience, since this was a new field.

I did get involved in some diving with regard to the test work associated with the deep ocean mining. We did a test of the nodule collectors at the weigh tank at Oregon State University. As an aside, my kids got involved with me as technicians and became engineers. One of them is now a lieutenant colonel with the Air Force, directing a special sensors project for the Defense Intelligence Agency. My other one is involved in Star Wars, basically in adaptive optics, using flexible telescopes to take astronomical observations.

Anyway, I guess that's really not a part of this, but the ocean mining thing was a really interesting thing. In fact, I used a consultant to do some analysis, Dr. Lew , at NCL. We were doing the analysis on the electromechanical cable that put down the test vehicles. It was pretty interesting because it was a multi-national project. The Japanese were involved, and I learned about face saving in Japan. I had informed them that if they failed to put a particular device on sleds that they would end

up — the cable, and it would break at a hundred feet as they were bringing it back. Sure enough, it did so. There was a Japanese collector sitting down at 15,000 feet about 1,000 miles south southwest of Hawaii. That was a major project.

I was all set to go to Bechtel and work in their program once I got out, but I interviewed there and decided that that was too big an organization. I decided instead to go on my own as a consultant. Anyway, that would have been ocean engineering work, basically waterfront work — ended up taking that.

A little later on, I collaborated with Bob Ballard, who was the one who found the Titanic, on a deep ocean mining project that involved the mid-ocean ridge. We did a study for major mining companies in that area. We had a team together back at Woods Hole to do that.

Gradually, I went on over into certain other fields in my consulting practice because there wasn't a lot going on at that time. Well, that was a time, of course, when the oil companies bought up a lot of the minerals industry, which went flat. They started digesting these companies, and there was really nothing going on in that area. I did work for the Oregon Department of Transportation, and that was work that relates to what you're doing.

INTERVIEWER: That was with the bridges?

CMDR. EAGER: Yes. Actually, the coastal bridges are concrete bridges, and they were built back in the Depression period. The salt had finally worked its way through the rebar, and it started — the concrete. They had actually replaced one bridge, and it was an old bridge, and they gotten in a lot of trouble with the public. I came in there and said, "Hey, we can save these bridges." The next bridge, we did corrosion protection on. Basically, it was a process of replacing any really damaged rebar using — to cover it up, spraying it with zinc, and setting up a rectifier to methodically protect it.

That was a major program. That got started in that organization, too. I have to tell you that I brought a CEC officer in there to relieve me, Frank Nelson . I don't know if you know him.

INTERVIEWER: I do know Frank.

CMDR. EAGER: That program is going well now. In fact, his organization is the only one that isn't getting privatized. Basically, it was ocean engineering that I was involved with, and things related to ocean engineering, like bridge work. I also designed rehabilitation for ——— bridges and stuff like that.

INTERVIEWER: In your diving career, what is the one thing you found or did underwater that you will never forget?

CMDR. EAGER: I guess it was so routine to me. In the salvage Navy, the diving officer stood on deck. In the Navy that I was running, the officers were in the water with the enlisted men, observing and learning and directing where necessary. I was inside the base of that habitat, checking out the ballast and all that stuff. I got trapped in there one time and had to get out by really staying calm. I was able to move myself out because the access was pretty small. I set up a safety program as a result. I was the first one in, and I set up a safety program to make sure that safety was involved. It was like driving. For me, it was a tool to get a job done. Like your program, if there's a better way to do it, that's what we want to do it. Diving is important, very important, but it needs to be looked at in the same way we ought to be looking at unmanned space flight. We ought to be looking at unmanned ocean flights, and you're doing that, so that's good.

INTERVIEWER: It's interesting you say that, because one of the things that our paragon different than most of the other fleet organizations [?] is we take diving as just a means to get to the job site. It's not the job itself, but it's interesting from the very beginning you have that attitude.

CMDR. EAGER: I might throw one other thing in there. One of the things that disturbed me a great deal was that business of alcohol and diving. I saw it in the salvage Navy, and I saw people die as a result of it. Unfortunately, some of our officers are too close to that bottle. I did everything I could to discourage that, knowing that it's almost impossible. When I got out of the Navy, I started getting the retired officers magazine, and I saw the number of alcoholic treatment center advertisements in it. I understood, and particularly with regard to this salvage officer that I had down on project Tektite, how much damage alcohol can do.

From that point on, the alcohol got out of my house and was never seen again. My kids have never taken an ounce of alcohol. This sounds like a men's temperance league thing, but if there's any of that going on in our diving system now, get rid of it to the extent that you can. We ought not have packaged liquor stores on Navy bases, Army bases, or anywhere else. There are more problems, socially, that people just bury, and it is worse than what you have from narcotics.

INTERVIEWER: I think you'll see that the Navy as a whole has taken a very strong attitude against that. It used to be a guy would get a DUI, and wink, wink, someone would take care of it. Now, as an officer, if you get a DUI, you've terminated your career, absolutely terminated it. You'll find that at a lot of the social gatherings, a lot less alcohol is being consumed. People have more soda, more juices, because the Navy has just taken a real intolerance to it. It has started to come around. We're not there yet but it's going in the right direction.

CMDR. EAGER: What about your divers?

INTERVIEWER: We still have a problem. They still have that attitude of work hard and play hard. But I've got to say that even in my short twenty-year career, there's a lot less of it now than there was twenty years ago.

CMDR. EAGER: Let me tell you what the low point of my experience with ocean engineering was. I don't think it was alcohol-related, but it was the loss of that diver in, I think, the Azores. We lost one there who went down, panicked and embolized.

INTERVIEWER: I can see that. A lot of talk has been not so much about Tektite but about the SeaLab program. The feeling is that when the Navy lost Berry Cannon on SeaLab III, the whole habitat diving program lost its luster. What is your opinion? Was it Barry Cannon's unfortunate death or something else that was going on in the background?

CMDR. EAGER: I'm not sure I know. I knew some of the personalities in that program. I knew Scott Carpenter quite well, and of course, there tends to be a macho attitude amongst divers. They can't die, and so on. I know Scott Carpenter was careless. He had the benefit of all of the information about physiology and so forth. He decided to stay on double time there and ended up with a necrotic condition. He, of course, was a risk taker. Now, you need risk takers. I'm a risk taker. But you need calculated risk takers. Of course, Scott Carpenter, as you recall, was the one who ended up 400 miles off target in Gemini. The Navy had to go chase him, and he got into a lot of other things that suggested that the guy should have been weeded out. He got into aquanatics when he washed out of astronautics. I think the lesson that can probably be learned there is that we should pay attention to psychological condition. If there can be a test to screen divers, it should be used. I was thinking about that with regard to Iraq and the suicides that have occurred as a result of Iraq and other wars. There ought to be a way of moving those people out before they're exposed to that environment. I don't know what history you've had with regard to loss of divers in our program. Have you had any more after that one? Now, you had the one, of course, that the terrorist had killed.

INTERVIEWER: We've had several, unfortunately.

CMDR. EAGER: Were they from diving accidents?

INTERVIEWER: Yes.

CMDR. EAGER: Well, my only suggestion is that you might talk to really knowledgeable psychologists. There's a bunch of quacks out there. See if there's anything that can be done maybe in coordination with ONR and the salvage Navy, perhaps, although I don't know that they're going to listen. See if there's a way of screening people so that you get calculated risk takers.

INTERVIEWER: That is a good point. Well, this is more on the DSRV strike.

CMDR. EAGER: Let me go back to Berry Cannon. I didn't know him. That actually occurred before I went to DSSP. I was at DSSP in 1966, I think, and it occurred before that.

INTERVIEWER: But Tektite happened after the SeaLab program, so we did try to get back into it. For other reasons, that whole program got cut. You said you were involved a little bit in the submarine recovery, the DSRV ——?

CMDR. EAGER: Oh, well, I was alongside it. Now, let me tell you another part of my experience with DSSP. That was to develop a system for submarine escape from American submarines. It turned out that was one of the DSSP responsibilities, escape from shallow enough water. The British had a great system. Ours put four guys in a trunk. They'd compete with each other as to who could get out the hatch. By that time, they've absorbed so much air pressure that they've got a problem. The British started from 600 feet, and they put one man in at a time and evacuate him in a closed container, completely closed, with air flowing over his face. He rips off that face mask when he gets to the surface. I made that escape at Southampton and came back and tried to sell it to the Navy. I got absolutely nowhere.

INTERVIEWER: It's interesting. One of the questions here is about your opinion of the equipment that was developed for submarine rescue, such as one atmosphere diving suit, submarine escape emerge equipment, and the British submarine personnel escape system, and you just answered that.

What would you consider to be the most significant achievement made in the underwater field in the past fifty years and why?

CMDR. EAGER: Well, I think it was probably the development of the deep submersibles, in particular, the unmanned deep submersible. I think for certain reasons, which you know, and I'm not going to mention, they were extremely important to us. I think also of major importance is our ability to put down arrays and intelligence devices that stayed there, because there were lots of failures before we got involved.

INTERVIEWER: They weren't moving around because they were fastened to the sea floor?

CMDR. EAGER: Well, no. The Naval Research Lab, or another lab, had the suspended array, which was supposed to be a successor to SOSYS. Again, not taking care of how you designed the facility and doing contingency planning, resulted in failure. In fact, that failure was probably one of the reasons that we were invited into that Tektite program.

INTERVIEWER: That's interesting. Think about your career, which is just absolutely fabulous, in my opinion, in undersea technology. If all barriers had been removed, and I fully appreciate your comments about our CEC brethren, and you had been given absolute authority to do anything you wanted, what would you have changed?

CMDR. EAGER: What would have changed in the CDC or in our program?

INTERVIEWER: What would have changed in our ability to work underwater, in underwater technology?

CMDR. EAGER: Well, of course, I would have probably done precisely what you all have done, and that is to start moving over to unmanned operations and continually concentrating on how we could best serve the fleet, and you've done that. In terms of details, we've got to be careful not to end up

getting a toy and playing with it. In other words, things need to be used that really have a need to be used.

For example, simply going and getting a deep underwater vehicle like what they use up at Woods Hole and playing with it, is not the way to do it. You need the mission first. Then, you decide what to get to support that mission, in terms of efficiency and cost. That's the other consideration, value engineering on this system. I went through the American History Museum and saw some of the stuff that went on early, and I could see value engineering completely disregarded, and we valued engineering because we didn't have money. But we wanted to keep value engineering to make sure we don't spend anymore of the taxpayer's money than we absolutely had to in order get the job done properly, safely, and effectively.

INTERVIEWER: Look at about a hundred-year time line in the development of undersea technology. Of the many events that took place over the last century, what do you believe were probably the top three events that caused major changes in the way man viewed undersea technology and the whole philosophy of Man in the Sea?

CMDR. EAGER: Well, of course, saturation diving had a major effect, commercially, for the oil industry and so forth. Of course, they are using remote vehicles, too. I think the use of remote vehicles and the development of integrated circuits that give more automated control of those technologies can continue to be exploited to improve efficiency and safety and effectiveness.

Not looking into your black programs, with regard to the highly classified programs, knowing that I was going to leave the Navy, I specifically avoided exposure because I didn't want to take any chances. I wanted to have complete freedom to do what I needed to do. But my vision into that area tells me that there was a huge amount that could have been done. I suspect that you've probably done those, so that's where I would have concentrated.

INTERVIEWER: For the first half of the century, the Navy was the world leader in diving. Since that time, many of the Navy divers have been leaders in the commercial diving field, as you mentioned already, but currently, neither of these facts seems to be prevalent. What are your thoughts on that? Is that a normal course of evolution?

CMDR. EAGER: I'll go back to the idea that you need a problem before you start inventing a solution. As long as you can effectively get your job done for the Navy, you can either develop it yourself or bring on board from other organizations, agencies, or private industry. It doesn't matter where you get this technology. The key is that you get it and certainly don't want duplication. If industry is going on and doing things that benefit you, fine. If for some reason, because of their particular environment and requirements, they miss some areas, those are the pockets you want to look for. That's where you want to concentrate your technology.

INTERVIEWER: You said we should always be looking forward. Now, what would be your prognosis for our future? Where will we be going?

CMDR. EAGER: Well, not knowing the black programs, I really have difficulty in answering that. But it's very clear that our focus ought to be heavily on the business of how to protect our fleet, some of which you're doing now.

There's probably someone around with a vision who could spend some time and look at contributions that you could make. Maybe the people who are currently running the program cannot see or do not have time to see. Again, we get back to this business of making sure we don't inbreed and instead keep people coming in who are different. They might be the Steve Jobs kind of people. We need to be patient with them and let them look at where you ought to be going, independent of you, and when they're debriefed, debrief them fully before you start putting up barriers. Work with them.

Vision is something lacking in humankind, and vision is the most important thing in keeping one's organization from becoming obsolete. I would say that a focus on the business of how to overcome terrorism is a really important aspect. It ought to receive a lot of attention. People who are not involved are somewhat compartmentalized from those who are running everyday operations.

INTERVIEWER: I want to thank you for your time. This has just been fascinating.

(Whereupon, the PROCEEDINGS were adjourned.)

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